



Combating land degradation through integrated and sustainable range and livestock management to promote resilient livelihoods in Northern Punjab

Part I: Project Information

GEF ID

10693

Project Type

FSP

Type of Trust Fund

GET

CBIT/NGI

CBIT **No**

NGI **No**

Project Title

Combating land degradation through integrated and sustainable range and livestock management to promote resilient livelihoods in Northern Punjab

Countries

Pakistan

Agency(ies)

FAO

Other Executing Partner(s)

Ministry of Climate Change and Punjab Forest Department

Executing Partner Type

Government

GEF Focal Area

Land Degradation

Taxonomy

Climate Change, Climate Change Adaptation, Mainstreaming adaptation, Community-based adaptation, Livelihoods, Ecosystem-based Adaptation, Private sector, Climate resilience, Climate Change Mitigation,

Agriculture, Forestry, and Other Land Use, Focal Areas, Influencing models, Demonstrate innovative approaches, Convene multi-stakeholder alliances, Land Degradation, Land Degradation Neutrality, Land Productivity, Land Cover and Land cover change, Carbon stocks above or below ground, Sustainable Land Management, Sustainable Livelihoods, Sustainable Forest, Improved Soil and Water Management Techniques, Community-Based Natural Resource Management, Sustainable Pasture Management, Restoration and Rehabilitation of Degraded Lands, Ecosystem Approach, Income Generating Activities, Integrated and Cross-sectoral approach, Drought Mitigation, Stakeholders, Beneficiaries, Type of Engagement, Participation, Consultation, Information Dissemination, Partnership, Communications, Public Campaigns, Awareness Raising, Private Sector, Financial intermediaries and market facilitators, Individuals/Entrepreneurs, SMEs, Local Communities, Civil Society, Non-Governmental Organization, Community Based Organization, Gender Equality, Gender results areas, Knowledge Generation and Exchange, Access and control over natural resources, Access to benefits and services, Capacity Development, Participation and leadership, Gender Mainstreaming, Women groups, Gender-sensitive indicators, Capacity, Knowledge and Research, Innovation, Learning, Theory of change, Adaptive management, Indicators to measure change, Knowledge Exchange, Enabling Activities, Knowledge Generation

Sector

Mixed & Others

Rio Markers

Climate Change Mitigation

Climate Change Mitigation 1

Climate Change Adaptation

Climate Change Adaptation 1

Submission Date

11/30/2021

Expected Implementation Start

4/1/2022

Expected Completion Date

4/30/2026

Duration

48In Months

Agency Fee(\$)

207,395.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
LD-1-1	LD 1-1 Maintain or improve flow of agro-ecosystem services to sustain food production and livelihoods through Sustainable Land Management (SLM)	GET	1,683,105.00	10,102,100.00
LD-1-3	LD-1-3 Maintain or improve flows of ecosystem services, including sustaining livelihoods of forest-dependent people through Forest Landscape Restoration (FLR)	GET	500,000.00	3,000,000.00
Total Project Cost(\$)			2,183,105.00	13,102,100.00

B. Project description summary

Project Objective

To conserve and restore critically important rangelands and livestock production systems and strengthen the resilience and sustainability of rangeland-dependent livelihoods in vulnerable dryland regions of northern Punjab, Pakistan

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
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Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Government capacity to assess and plan for effective rangeland management	Technical Assistance	<p>Outcome 1.1:</p> <p>Land degradation is reduced in the in Punjab Province through strengthened provincial and district policy and planning frameworks and capacities</p> <p>Targets:</p> <p>1. One provincial policy for Punjab endorsed covering all rangeland in the province</p> <p>2. Three district sustainable land and resource management plans developed through cross sectoral collaboration to implement / support sustainable land and resource management plans linked to the provincial policy (CI 11)</p> <p>3. A minimum of 200 staff of government</p>	<p>1.1.1 - Provincial rangeland management policy developed</p> <p>1.1.2 - Comprehensive assessment of the status of all rangelands in the project area</p> <p>1.1.3 - Provincial and district sustainable land and resource management plans developed and under implementation</p> <p>1.1.4 - Land and resource information, monitoring and decision support systems established</p> <p>1.1.5 ? Capacities of provincial and district stakeholders for sustainable rangeland management strengthened</p> <p>1.1.6 - Provincial and district</p>	GET	239,078.00	1,950,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Community led livestock management to reduce land degradation	Investment	<p>Outcome 2.1: Community rangeland and livestock management systems and climate smart livestock practices (CSL) in place to reduce land and water degradation and ensure sustainable production</p> <p>Targets:</p> <p>1. A total of 1500 beneficiaries trained in community rangeland and livestock management systems (CI 11)</p> <p>2. Three (1 per district) community rangeland management plans are developed (CI 11)</p> <p>3. Sustainable food production is scaled to 3,000 ha under a range of diverse production contexts (CI 4.3 and CI 11)</p>	<p>2.1.1 - Capacities of communities / community groups to implement sustainable rangeland and livestock management strengthened</p> <p>2.1.2 ? Community-level rangeland and livestock management plans and CSL developed and under implementation</p> <p>2.1.3 ? Mechanisms in place to support the participation of women in rangeland and livestock management</p> <p>2.2.1 - Rangeland areas conserved through improved land management / production approaches / CSL practices</p> <p>2.2.2 ? Degraded rangeland areas</p>	GET	1,468,642.00	10,025,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Knowledge management and M&E	Technical Assistance	<p>Outcome 3.1:</p> <p>Effective knowledge management, communications and project M&E</p> <p>Targets:</p> <p>1. 400 members of different participant organisations, community members, and FFS participate in field days and exchange visits to innovative, sustainable business initiatives based on project selected VCs. (CI 11)</p> <p>2. Total of 7 Knowledge Products developed</p> <p>Project midterm and final review process conducted</p>	<p>3.1.1 Increased local awareness and understanding of problems and opportunities associated with rangelands and livestock</p> <p>3.1.2 Project knowledge management plan developed and under implementation</p> <p>3.1.3 Effective project M&E plan in place</p>	GET	371,428.00	500,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Sub Total (\$)					2,079,148.00	12,475,000.00
Project Management Cost (PMC)						
		GET		103,957.00		627,100.00
Sub Total(\$)				103,957.00		627,100.00
Total Project Cost(\$)				2,183,105.00		13,102,100.00

Please provide justification

C. Sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Recipient Country Government	Government of the Punjab - Forestry, Wildlife & Fisheries Department	Public Investment	Investment mobilized	13,102,100.00
Total Co-Financing(\$)				13,102,100.00

Describe how any "Investment Mobilized" was identified

Investment mobilized will be supplied through the Ten Billion Tree Tsunami Programme project.

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

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
FAO	GET	Pakistan	Land Degradation	LD STAR Allocation	2,183,105	207,395	2,390,500.00
Total Grant Resources(\$)					2,183,105.00	207,395.00	2,390,500.00

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount (\$)

100,000

PPG Agency Fee (\$)

9,500

Agency	Trust Fund	Country	Focal Area	Programmin g of Funds	Amount(\$)	Fee(\$)	Total(\$)
FAO	GET	Pakistan	Land Degradatio n	LD STAR Allocation	100,000	9,500	109,500.00
Total Project Costs(\$)					100,000.00	9,500.00	109,500.00

Core Indicators

Indicator 3 Area of land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
3000.00	28000.00	0.00	0.00

Indicator 3.1 Area of degraded agricultural land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
	28,000.00		

Indicator 3.2 Area of Forest and Forest Land restored

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

Indicator 3.3 Area of natural grass and shrublands restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
3,000.00			

Indicator 3.4 Area of wetlands (incl. estuaries, mangroves) restored

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

Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
28000.00	3000.00	0.00	0.00

Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
	3,000.00		

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

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

Type/Name of Third Party Certification

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

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
28,000.00			

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

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

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

Title	Submitted
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Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (direct)	157066	232419	0	0
Expected metric tons of CO ₂ e (indirect)	0	0	0	0

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

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (direct)	157,066	232,419		
Expected metric tons of CO ₂ e (indirect)				
Anticipated start year of accounting	2021	2022		
Duration of accounting	20	20		

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

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (direct)				
Expected metric tons of CO ₂ e (indirect)				
Anticipated start year of accounting				
Duration of accounting				

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

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

Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

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

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	10,000	10,000		
Male	10,000	10,000		
Total	20000	20000	0	0

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

Part II. Project Justification

1a. Project Description

1. PROJECT DESCRIPTION

1.1. National Context

Pakistan lies between 24° to 37° North latitudes and 61° to 76° East longitudes[1]¹ and covers an area of 88,430 million hectares[2]². Most of its area is classified as arid (49%) and semi-arid (35%), they receive average rainfall from 200 mm to 500 mm[3]³, though humid sub-tropical zones and mountainous areas are also present.

Pakistan has one head of livestock per person, a total population of 213 million people[4]⁴, as well as 213 million head of livestock.[5]⁵ The country's GDP is USD 304.4 billion, but 39% of the population lives below the poverty line[6]⁶. The majority of the rural population draw its livelihoods from subsistence agriculture, with pastoralism contributing a significant component of livelihoods. The raising of livestock, which takes place predominantly in rangelands, constitutes 11.2% of Pakistan's GDP and 3.1% of its export earnings[7]⁷. The livestock sector is increasingly important to the national economy; over last 45 years, the population of cattle has increased by 219%, sheep by 299%, and goats by 650%.[8]⁸

1.1.1. Pakistan's economy and the role of agriculture sectors

Economic growth in Pakistan has historically remained volatile and subject to economic uncertainty. Historical data suggests volatility was especially high during the last half of the XX century, though has remained on average strong in the last two decades[9]⁹. Real GDP growth was above four percent in 2013-14 and has smoothly increased during the last four years to reach 5.28 percent in 2016-17, which was the highest in 10 years[10]¹⁰.

Agriculture is the lifeline of Pakistan's economy accounting for 19.5 percent of the GDP, employing 42.3 percent of the labour force, and providing raw material for several value-added sectors.[11]¹¹ Pakistan's export profile for vegetables is dominated by potatoes (52%), mainly being exported to Afghanistan; onions constituted the second largest share of Pakistani vegetables exports. Pakistan has

potential to increase its production and trade in other vegetables such as tomatoes, carrots, turnips, cabbages, etc, and provincial administrations are promoting the adoption of good agriculture practices and improvement in post-harvest handling of produce to ensure sufficient quality for export markets[12]¹². Pakistan's fruits export sector has also witnessed an average annual growth rate of 27 percent and shows further indications of growth potential, though it currently accounts for only 0.40 percent of the global market.

The agricultural sector acts as a source of raw materials for country's major industries; textile, leather, rice, edible oil, sugar and various food processing industries. Fruits, vegetables and other horticulture products are processed to make value added products like pulps, purees, pastes, concentrates, juices, jams, jellies, preserved fruits and vegetables, etc., which have an established international market. Pakistan's export for value-added horticulture products is 48 million USD, having grown by 118 percent between 2008 - 2018, with an annual average growth of 13 percent[13]¹³.

Pakistan has 213.1 million head of livestock[14]¹⁴, comprised of 51.5 million cattle, 42.2 million buffalo, 31.6 million sheep, 80.3 million goat and 7.3 other.[15]¹⁵ The majority of this livestock, with exception of 76.8 million dairy animals, [16]¹⁶ depend exclusively or partially on grazing in areas classed as rangelands, which cover approximately 40 million ha, or 45 percent of national territory.[17]¹⁷ Pakistan also has Alpine Pastures in north extending over 1.64 percent of the territory, scrub forests in sub-Himalayas covering 3.46 percent of its area, and 8.69 percent of land declared barren with sparse shrubby vegetation. Grazing areas thus represent an enormous ecological, economic and social resource for the national economy and pastoral livelihoods. The extent of each class of grazing lands of Pakistan is provided in the table (Table 1) below:

Table 1. Recognised classes of grazing Areas in Pakistan (Source: Landcover Atlas, Pakistan, 2012)

Type of Grazing Area	Area (ha)	Percentage as of total area
Alpine pastures	14,469,311	1.64
Rangelands	39,922,648	45.15
Scrub	3,065,447	3.46
Barren Lands	7,687,236	8.69
Total	75,144,642	58.94

Pakistani livestock herders engage in sedentary and transhumant grazing practices, though improved land tenure rights and access to local rangelands has encouraged less nomadic lifestyles and increased the attractiveness of a fixed residence for herder families. In addition to national herds and pastoralists, various groups from neighboring Afghanistan (e.g. the Pawindas) and the Bakarwals from State of

Azad Jammu & Kashmir (AJK) bring substantial livestock herds into western Pakistan (including the project target areas) for seasonal grazing.

Pakistan has also 1,577.7 million poultry birds including 91.59 million birds of domestic poultry.[18]¹⁸ Poultry sector is one of the most organized branches of the agriculture sector of Pakistan. Its growth rate is 10-12 percent per annum, with over 15,000 poultry farms being distributed in rural areas across the country. [19]¹⁹ Demand is high, with 40-45 percent of the national meat consumption being procured from poultry products. Capacity of farms usually range from 5,000 to 500,000 broilers. Sale and marketing channels of broilers and eggs are predominantly still conducted through unorganized value chains.

1.1.2. Land Degradation and impacts on rangeland and forestry

A variety of natural and human factors are contributing to desertification in Pakistan, including land fragmentation, deforestation, drought, overgrazing/uncontrolled grazing, overexploitation of land and water resources, cultivation of marginal lands, acute soil erosion, water logging and salinity and the use of unsustainable agricultural technologies, such as excessive use of chemicals and irrigation water.[20]²⁰ A table showing the UNCCD National Action Programme (NAP) data on water **erosion and soil salinity** are provided as Tables 2 and 3. As can be seen, erosion has increased in intensity and severe erosion has

Table 2. Extent and intensity of land degradation due to water erosion in Pakistan (Source: UNCCD NAP, 2019)

Intensity of Water Erosion	Area affected (million ha)		% increase
	1998	2007	
Slight to Moderate Erosion	3.979	5.165	130
Moderate to Severe Erosion	3.581	20.003	559
Severe to Very Severe Erosion	3.745	17.677	472
Overall	11.306	45.127	399

Table 3. Extent of Salinity in Pakistan (Source: NAP, 2019).

Nature of Salinity	Extent of area affected (%)
Unaffected lands	82.2
Slightly saline	12.2
Severe to very severe saline	1.3
Moderately saline	0.9
Other Areas	3.4

The cost of loss of agricultural soil degradation has been assessed as 437.5 million USD per annum and for rangeland degradation and deforestation losses are at 37.5 million USD.[21]²¹ Through vegetation cover and biomass loss and conversion of more productive rangelands to other land uses, **rangeland**

productivity has been reduced from 20.8 m/tons/ha to just 6.6 m/tons/ha. On these same areas, nutritious and palatable species have been reduced by 30 percent and foliage cover has reduced by approximately 40 percent over 43.3 million ha rangelands.[22]²²

Pakistan lost 625,000 hectares of forests (24.7% of its total forest cover) between 1990 to 2005.[23]²³ The current per capita forest area in Pakistan is 0.03 hectare and 27.6% has capacity to produce commercial-grade timber.

Land degradation and erosion has **significantly affected national waterways** with the Indus River transporting 4.5 tons/ha sediment in 2007 making it **fifth in the world most affected by sedimentation**; water reservoirs capacity has decreased by 30 percent due to sedimentation.[24]²⁴

1.1.3. Drivers of Land Degradation in Pakistan

At a national scale, Pakistan is facing the current challenges and development issues.

Population growth) Pakistan currently adds 4.4 million people to its population each year, doubling in size since 1991 (29 years). UN estimates project a population of 403 million inhabitants by 2050.[25]²⁵ The high fertility rate, of over 3.5 births per woman compared to 2.4 for South Asia combined, is declining a slower pace than regional neighbours. The rate of increase is exerting pressures on urban density, public services and physical infrastructure, quality of life, resources, availability of water and other natural resources.

Poverty) The Economic Survey 2008-09[26]²⁶ data showed that the headcount ratio in Pakistan was estimated to be 33.8 percent in the 2008 and 36.1 percent in 2009. That number in 2015 was placed at 39 percent of the population living below the poverty line.[27]²⁷ However, this ratio is much higher in rural areas as compared to urban areas of the country. Moreover, inflation in Pakistan has remained in double digits since 2007. The Economic Survey 2008-2009 indicated that the high incidence of poverty in rural regions was linked to inadequate infrastructure, lack of opportunities and resources[28]²⁸. Urban poverty remains lower than both overall and rural poverty because of the relatively easier access to resources and opportunities in these areas.[29]²⁹

Land Tenure rights) Historically, the private sector was restricted from entering areas of business dominated by government, resulting in limited incentives to develop markets, create demand, and increase economic activity. At the same time, the Green Revolution that began in the 1960s and brought significant increases in crop yields to Pakistan was largely confined to larger farms in areas with access to irrigation. This has led to an income gap between irrigated and Barani (rain-fed) areas and meant that 80 percent of small holders, who constitute 90 percent of the pastoralist and livestock producers, are landless.[30]³⁰

Labour Productivity challenges) According to ILO estimations, between 2010 and 2019, output per worker grew less than 20 percent in the case of Pakistan, compared to an 86 percent increase in China, 68 percent in India, and 50 percent in Bangladesh.[31]³¹ A large part of the problem is that due to low educational attainment, the workforce structure predominantly tends towards unskilled labour opportunities and little value-adding or product development. Improving access to education and outcomes in the sector, while scaling up efforts to skill the labour force, are urgent priorities.[32]³²

Infant nutrition, health and labour) Maternal mortality in Pakistan has been improving steadily over the past 3 decades. From 1990 to 2015, the Maternal Mortality Rate (MMR) has declined from 431/100,000 live births to 178/100,000 live births. Despite progress, MMR in Pakistan is still extremely high. From 2012 to 2017, the Infant Mortality Rate (IMR) declined from 66.2/1,000 live births to 58.4/1,000 live births.

Water) Rising water scarcity is the most existential of all the challenges facing Pakistan. According to the World Resources Institute's 'Aqueduct Water Risk Atlas', Pakistan ranks 14th in terms of countries facing extremely high risk of water scarcity. Annual per capita water availability has declined to the scarcity threshold of 1,000 cubic meters when in 2009 the per capita water availability in the country was around 1,500 cubic meters.[33]³³ At the same time, investments in water storage options are comparatively very low for such a large country. Storage capacity is less than 30 days, while the US, as an example, can hold up to 900 days of river run-off.[34]³⁴

Electrical Power supply) Power crisis have been consistent since the last century and have worsened since 2007.[35]³⁵ Rolling blackouts across much of the country have cost Pakistan over 2 percent of annual GDP and reduced confidence and investment in industry and jobs.

COVID-19 Pandemic) During the COVID-19 pandemic and travel restrictions, inherent vulnerabilities within the national food system became more acute in both supply and demand chains, and the pandemic exposed gaps in policies, institutional capacities, and response strategies. [36]³⁶ Of those particularly vulnerable to the pandemic's effects were the following social groups: i) **nearly half of all households in the country rely on agriculture and livestock as their primary and/or secondary source of livelihood**; ii) some 22 percent are dependent on wage labour (skilled/unskilled non-agricultural labour, forestry workers); iii) **around 62 percent of households in the poorest wealth quintile rely on farm labour and daily wage as livelihood strategies** (33 percent on farming - small/medium/large farming, livestock, fishing and agricultural labour) and 29 percent on wage labour (skilled and unskilled non-agricultural work).

In addition to these aforementioned, other vulnerable people include those who are experiencing disruption in the provision of essential services. For example, i) nearly 42 million school children are not being able to attend their school; ii) almost 17 million children under age 5 are at-risk due to delay or complete miss of their immunization; iii) around 47 pregnant women are not properly getting pre- and post-natal care; iv) **an additional 2.45 million people, in addition to existing 40 million, are now food insecure**; v) around 12 million children are malnourished. Several studies reported unavailability of farm labour, machinery and transport, high input prices such as fertilizers, and seed and limited access to middlemen and traders as the key issues that negatively affected the farm production and

incomes.^[37]³⁷ The livestock sector was also affected by the COVID-19 pandemic. According to the Asian Development Bank reports (2020), the lockdowns caused a decline in dairy income due to limited access to markets or intermediate traders. This also led to a decrease in the farm gate price of milk and other dairy products paid to primary producers.

For a full description of how the COVID19 Pandemic affected specific components of the food system, please see Figure 1.

Sector/Category	Key impacts	Region
Food availability	Lockdowns affected the supply of food items (particularly wheat flour and sugar) and thus increased the food prices manifold.	Balochistan, Punjab, KP, Sindh
Crop production	Impact on wheat production was limited.	Balochistan, Punjab, KP, Sindh
	COVID-19 related restrictions coupled with climate factors and locust attack badly affected the agriculture production.	Balochistan, Sindh
	Crop production during Kharif season was affected in areas of high number of COVID-19 cases.	Punjab
Farm operations	Harvesting was affected due to the immobility of farm machinery from one region to another and the closure of repair and maintenance shops.	Punjab, Sindh
Food processing	Lockdowns affected the production of wheat flour due to lack of transport and labour as well as an intra-provincial ban on wheat procurement and trading.	KP
	Following the SOPs, agro-food processing firms did layoffs reducing their labour to half and thus production declined.	Punjab, Sindh
	Meat export doubled during the pandemic.	Punjab
Food supply chains/Agri-markets	Perishable crops (such as tomato) and dairy products were affected due to market closures	Balochistan, KP, Sindh, Punjab
	Online food (fruit and vegetables) delivery was operationalized in 12-13 districts.	KP
Food consumption	Consumption of food (such as dairy products and vegetables) were halved due to shocks on household incomes and food supply shortages.	Punjab, KP, Sindh
Social system shocks	People denied getting grocery on credit from local shops and markets. This has compelled them to sell livelihood assets to meet daily expenditures on food, health, and education.	KP, Sindh, Punjab
	Social support from friends and relatives for obtaining loans declined, particularly for the poor and daily wage earners.	KP, Punjab, Sindh
Farm inputs	Farm inputs (such as feed, fodder, seed, and fertilizer) are either unavailable when required or prices become doubled due to supply shortages	KP, Punjab, Sindh
	Farmers are unable to pay utility bills	KP, Punjab, Sindh
Livestock and Dairy business	The impact on the livestock sector was huge due to the unavailability of feed, fodder, transport, vet medicine, and decreased demand. 47 % of poultry farms closed after the pandemic in KP alone.	KP, Punjab, and Sindh
	Mortality of livestock due to inaccessibility to vet. doctors or hospitals for vaccinations	KP, Punjab
Farm income/prosperity	High uncertainty and instability in farm incomes	Balochistan, Punjab, KP, Sindh
	Delayed payments by consumers, particularly dairy products (such as milk)	KP
Migrant returnees	Direct adverse impacts on those families who were receiving internal remittances	KP, Sindh, Punjab

Figure 1. Impacts of COVID19 Pandemic on the Pakistan food system (Source[38]³⁸)

As an immediate response to COVID-19, the Federal Government of Pakistan has announced a fiscal stimulus of PKR 1.2 trillion (7.1 billion USD^[39]), and the Provincial Governments have announced various fiscal measures for their respective provinces. Some of these include expanding the outreach of the Ehsaas social emergency program from 4.9 million to 12 million households and distributing PKR 144 billion (856.2 million USD ^[40]) at PKR 12,000 per household (71.41 USD^[41]); providing a cash grant of PKR 158 billion (939.4 million USD^[42]) to 3 million daily wagers in the formal sector; allocating PKR 50 billion (297.3 million USD^[43]) for providing food items at subsidized rates to poorest people; reducing all petroleum products price: instalments of electricity and gas bills payment over three months; strengthening public hospitals' capacity to deal with the pandemic; tax refunds to exporters; and enhancing targets for wheat procurement to inject a cash stimulus to the rural economy.^[44]

Climate Change) Pakistan ranked the 5th among countries experiencing highest number of extreme weather events during the 1999-2018 period,^[45] and the 8th most vulnerable country in the world to climate change impacts.^[46] After suffering a severe drought in 2018 and 2019, August 2020 was the wettest year on record, with heavy rains and flooding affecting 77,000 ha of arable lands, mostly in the Sindh province, and 46 districts in the Indus River Basin were affected by desert locust outbreaks during 2020. Pakistan is therefore experiencing the impacts of Climate Change; heat-stress conditions, in addition to changes in water availability, are expected to shift spatial boundaries of crops, increase area of marginal lands and reduce agricultural and ecological productivity.

Climate change is also having profound negative impacts on the rangelands of Pakistan. The project area in north-western Pakistan is particularly vulnerable to the impacts of climate change, as it is primarily arid and semi-arid and livelihoods are predominantly agro-pastoral. Furthermore, overall aridity and the frequency of recurrent droughts have increased, resulting in higher rates of crop failures and less ground cover and grazing biomass for livestock. If the process of land degradation and crop failures cannot be arrested and reversed, it is feared that the practice of subsistence agriculture will continue to diminish, and pastoralism will increase, leading to further deterioration of depleted rangelands, and the possibility of climate-forced migration.

1.1.4. Barriers to Sustainable Rangeland Management

Those barriers identified to Sustainable Rangeland Management that are within the project sphere of influence and that through project activities will be addressed in order to allow for the project core indicators to be achieved in the lifetime of the intervention, are listed as the following:

Barrier 1: Limited information and government capacities and planning frameworks to support sustainable rangeland management.

A lack of clear policy guidelines and institutional arrangements greatly constrains the management of rangelands and livestock in Pakistan. For example, although a draft national rangeland policy exists, it has not received support from provincial authorities and therefore has yet to be ratified and implemented. In addition, responsibilities for rangeland management are spread among several agencies at the provincial level, with independent Forestry, Environment and Wildlife Departments responsible for rangeland forest resources, the Agriculture Department responsible for fodder

production on the agricultural lands, and the Livestock Department responsible for livestock raising and health. At present, there are no coordination mechanisms to enable the effective integration of these rangeland management, livestock management and fodder production policies and measures. The lack of clear policies and mandates also means that disputes between tribal groups and the government over rangeland management occur on a frequent basis.

In addition to policy constraints, government agencies have insufficient capacities to effectively implement sustainable and resilient rangeland management or enforce regulations and restrictions. Though government agencies have theoretical and academic knowledge on the management of rangelands and livestock, the number of staff with practical and on-the-ground skills to translate knowledge into action is limited. In addition, decision-makers and land? planners responsible for rangelands and the livestock sector have little knowledge, understanding or experience with sustainable rangeland management approaches or of strategies for integrating climate change mitigation and adaptation measures into relevant policies, development programs, and management in the field. Although there are no major conflicts over land and resources in the project area, minor conflicts do occur over the use of rangelands, especially between local and migratory livestock grazers. Although such conflicts are mostly settled peacefully, there is a need for well-structured and widely accepted community-level conflict resolution platforms in the area specific to rangeland management and access to resources.

Pakistan generally has very low levels of data and information regarding the extent and health of rangelands and trends in rangeland conditions, including information on the extent and status of the aforementioned rangeland ecosystems, species composition, productivity and biomass, fodder resources (including which species are palatable for livestock), and the extent and degree of rangeland degradation.

In terms of LDN indicators, global indicators such as soil organic carbon, land productivity, and land cover are measured under the UN REDD+ initiative in Pakistan. However, there have been no significant assessments carried out in the country of land degradation conditions and trends; there is no existing system of land degradation classification in Pakistan; and very few programs / projects to address land degradation have been implemented to date.

The carrying capacities of rangelands in Pakistan have never been assessed, and as a result, every year the provincial forest departments issue permits to livestock herders without technical data and information on of the sustainability of the allowed grazing levels. There is also insufficient information on livestock grazing patterns or the size and composition of livestock herds. This lack of information prevents rangeland managers and local communities from making effective decisions on rangeland and livestock grazing management, and from mobilizing programs and support for the most critical areas and interventions.

Barrier 2: Limited understanding, technical support for market mechanisms, and capacities of local stakeholders to participate in rangeland management and to adopt sustainable rangeland and livestock management practices.

Traditionally, the rangelands managed under a *de facto* open access or communal grazing system were able to sustain these patterns of livestock grazing, including the seasonal movements of herds and the people who tended them. However, in recent decades, significant increases in the numbers of the livestock in the area (including the addition of significant herds belonging to IDPs and Afghan refugees) have exceeded the carrying capacity of the landscape, leading to significant ecosystem degradation, reduced animal productivity, and increasing levels of disease among livestock herds. Furthermore, traditional local grazing systems such as *pargorh* (deferred rotational grazing) which allowed for adequate plant recovery times following grazing have largely declined, with a few local exceptions.

Rangeland ecosystems in the project area are also threatened by the lack of any land classification system that provides legal / policy barriers or other restrictions to land cover conversion, including the

conversion of rangelands to other uses, including rain-fed cropping or urbanisation. As a result, rangelands in the project area remain legally unprotected and are being converted to other, more profitable land uses, including housing estates, orchards and agricultural fields (especially in areas where irrigation is possible). More recently, significant areas of rangelands have been converted into forests due to massive afforestation initiatives. The result of this has been to concentrate the ever-growing livestock herds into smaller and smaller grazing areas.

Local stakeholders have limited knowledge and capacities to effectively manage landscapes for multiple global benefits, including adapting to the effects of climate change. Local pastoralists' knowledge of livestock and rangelands is mostly limited to that which has been passed on orally from generation to generation, and only very limited technical knowledge has been developed and disseminated to extension workers or herders. As a result, livestock rearing in the project area is characterized by low productivity levels, overgrazing is widespread, and herders continue to employ unsustainable practices that contribute to soil erosion, loss of vegetative cover, and other land degradation impacts.

Lack of technical support for sustainable livestock rearing and communal land management in the area is also contributing to insufficient market development, with the value chains for sheep, goats, cattle and other livestock in the project area being unorganised, with reduced value-adding capacity or incentives for agri-environmental initiatives. Most livestock herders interviewed during the PPG have stated poor access to markets, low prices and lack of quality feed as key barriers to SLM. In addition, the poor health of many animals by the time they reach purchasers means that prices for livestock are very low

Barrier 3: Insufficient knowledge, understanding & awareness of rangeland management issues.

Awareness and understanding of the importance of rangelands, their biodiversity and their contribution to livelihoods and rural economies is very low among policy makers, resource managers, and local communities. Options for sustainable management of rangelands and livestock in the project area is virtually inexistent and no examples of sustainably managed private or communal rangeland or grassland areas are publicly available or known.

Generally speaking, public and private stakeholders are only knowledgeable about traditional approaches to rangeland management and livestock rearing which have proven unsustainable in today's context of land social and biophysical potential and are increasing the cumulative impacts of land degradation. Combined with CC, the landscape is reaching ecological thresholds and is situated well beyond the carrying capacity of the landscape, according to provincial technical staff and pastoralists. This to a large part is driven by a general lack of knowledge regarding integrated approaches to sustainable food production that link land and water resource conservation, food security, climate resilience, and the sustainable livelihoods of farmers and pastoralists.

Finally, there are no systems in place to facilitate the sharing of knowledge on best practices or lessons learnt in sustainable management of rangelands and livestock between different agencies, districts or provinces, and local communities and livestock herders generally receive very limited awareness raising regarding sustainable practices, the impacts of their activities on the rangeland and the ecological and economic importance of preserving ecosystem services.

1.2. Project baseline for implementation

This section describes the baseline to date for co-financing opportunities, as well as the enabling environment in terms of relevant policies, laws, regulations, and strategies addressing sustainable agriculture and pasture and forest management. This information is followed by the description of the **project districts of Attock, Chakwal, and Jehlum**, and the socio-economic and landscape baselines that were established during the PPG phase.

1.2.1. Legal and Institution context

The concept of 'Range Management' was expressed for the first time officially by the Forest Policy 1962. Accordingly, a Cento Team visited Pakistan in 1964 and a Range Management Conference was held in Pakistan Forest Institute, Peshawar in 1966. In the same year, the Range Management Branch was established in the Pakistan Forestry Institute to strengthen research and education in Range Management. Thereafter, in 1971 a Range Management working group was established and in 1988 the National Commission for Agriculture developed guidelines for promotion of range management in Pakistan. The range resource was first assessed using satellite images in 1992 during preparation of 25 years Forestry Development Plan. A detailed monograph on range management was developed, that provided baseline data for subsequent interventions. A brief description of salient strategic documents developed at national level that impact rangeland management and tenure is tabulated below (Table 4):

Table 4. Legal and Policy Frameworks in Punjab that affect rangeland management and tenure.

#	Date	Name of Policy/law or regulations	Type	Areas addressed by Policy/law regulation
1	1992	Forestry Sector Master Plan	Strategic Plan	FSMP assessed area, reviewed available information and proposed the development of a dedicated authority for the development of range lands. Also devised strategic recommendations.
2	1992	National Conservation Strategy	Strategy	NCS reviewed the rangelands situation and developed Strategy for restoring rangelands and improving livestock as one of its 14 prioritised areas.
3	2012	National Climate Change Policy	Policy	This policy specially focuses on forestry, biodiversity, agriculture and livestock. It emphasizes watershed management, NTFPs and range management and calls for conservation of all vulnerable ecosystems.
4	2015	National Forest Policy	Policy	This policy has special provision that federal Government will provide support for implementation of international covenants, including CCD.
5	2015	Biodiversity Action Plan draft	Strategy and Plan	Emphasis upon biodiversity conservation of critical ecosystems.
6.	2015	National Environment Policy	Policy	Provides comprehensive guidelines for natural resource sectors
7.	2012	National Sustainable Development Strategy	Policy	Provides guidelines for controlling land degradation
8.	2010	National Range land policy (draft)	Policy	Conservation and development of rangelands and mitigation of CC impacts
9.	2017	National Action Plan to Combat Desertification	Action Plan	Contain land conservation and range resource conservation strategies to reduce desertification
10	2014	National Agriculture and Food security policy draft	Policy	Covers land and water and food security and livestock issues. It also intends to promote climate smart agriculture. Covers rainfed agriculture and marginal areas management.
11	2020	National voluntary LDN targets 2030	Target setting	Pakistan committed to restore 6% of rangelands in the context of reaching LDN by 2030.

A number of national and provincial policies and programs specifically address forest management in Pakistan. The National Forest Policy cited above and the Provincial Forest Policy of Punjab call for

measures to prevent land degradation and desertification through afforestation programmes, improved land use planning, conservation of existing forests, increased research on dryland planting, and treatment of degraded lands. The National Forest Policy provides a legal basis for the federal government to arrange and extend support to all provinces and regions towards achieving their respective targets and meeting international obligations by improving their capacity and financial gaps. In addition, the Forest Acts of each province are being amended to provide stronger regulations to reduce the cutting of trees and prohibit land use changes.

However, no specific policy aimed at rangeland/grazing management or regulations currently are in force, with the National Rangeland Policy and the Punjab Provincial Rangeland Policy both existing only in a draft state.

Land Degradation Neutrality (LDN) is providing options for data collection and informed decision-making through participatory stakeholder forums, and has played a role in increasing awareness and community actions to address land degradation in grazing situations. In reference to the LDN targets cited above in Table 4, Pakistan has set the following targets through the UNCCD-led Target Setting Programme (TSP) to be achieved at a national level by 2030.^[47] These targets are:

- ? Attain Land Degradation Neutrality in:
 - o At least 30 per cent of degraded forest
 - o At least 5 per cent of degraded croplands
 - o At least 6 per cent of degraded grasslands (rangelands)
 - o At least 10 per cent of degraded wetlands
- ? Limit conversion of forest lands/grasslands/croplands to artificial land
- ? Conversion of other lands (bare lands) into croplands and productive lands to avoid soil loss/erosion and reverse land degradation
- ? Reclaiming forest lands
- ? Enforcement of Land Use Plans and sustainable management practices
- ? Improved Climate Change Resilience for sustainable water management
- ? Shift to Green Economy through social enterprise and businesses

1.2.2. Land Use Planning in Pakistan

Pakistan has three tiers of Government: Federal Government, Provincial Government and District Government. The Forest Department is placed under the provincial government, while Livestock and Agriculture Departments are under district government frameworks.

The recurrent budget is meant to provide funding for the establishment, consumables and other annexed recurrent activities, while the new expenditure is demanded through Schedule of New Expenditure under recurrent budget (standard expenses) or through development budgets (those that have temporary programme objectives and goals). The Federal Development budget is called Public Sector Development Program (PSDP), while Provincial Development Program is called Annual Development Program (ADP). Recently, a Medium-Term Development Framework (MTDF) was

introduced that contains development projects which extent beyond a single year. The Federal Planning Commission of the GoP has introduced five planning proformas as per following detail:

PC-I: Main project document.

PC-II: Project concept format

PC-III: Periodic progress report for tracking progress

PC IV: Project completion report

PC-V: Project impact assessment report

In the case of the Punjab Province, where the project districts are located, a Board was established and issued the Punjab Planning Code (2015) to effectively regulate the budget planning process. Each year this board develops ADP formulation guidelines for development of ADP and addresses new project proposals. Generally, the ADP is developed in accordance with Vision-25 and Punjab Growth Strategy, 2018-23, while, each year planning guidelines are circulated by 30th November (Table 5).

Table 5. Planning Cycle of Punjab (Source: Planning Code Government of Punjab, 2015)

Time line	Action
30th November	Guidelines circulated from Punjab Planning Board, Lahore.
01st to 31st December	Planning proposals proposed by District heads are screened and finalised by CCF Planning and Development are submitted to Secretary, who develop planning strategy on pass it on to the Planning board.
01st to 31st January	Project concepts are developed and fiscal space available to each sector is decided by board.
15th February	Draft ADP for sector is developed by respective department and development and approval of projects started that is finalised by end of April.
16th Feb to 15th March	Board scrutinize draft ADP
16th March to 15th April	Discussions held between department and board to finalise proposal
25th April	Final draft ADP submitted by Department to Board.
01st to 15th May	Briefing held to Chief Minister and ADP proposals finalised.
25th May	Draft Provincial ADP submitted to Finance Department. Finance Department incorporate development budget in Proposed Budget.
June	Budget is placed before cabinet and after approval sent to Provincial Assembly for approval. Assembly approves budget
July	Approved ADP is circulated and accordingly its implementation starts with release of budget.

National programme approval is the role of the Departmental Development Working Party (DDWP), which is chaired by Secretary of the concerned Federal Department. It can approve projects up to Rs 2.0 Billion (12.5 million USD) in case foreign aid in programme is less than 25% of total project cost. At Provincial level this committee is called Departmental sub-committee (DSC) that is chaired by the Provincial Secretary and it can approve projects up to Rs 200 million (1.25 million USD) in ADP in the case it has no funding through foreign investors.

The Provincial Development Working Party (PDWP) is chaired by Additional Chief Secretary and approves provincial projects, while the Central Development Working Party (CDWP) is an equivalent

forum at Federal Government level. CDWP is chaired by Deputy Chairman Planning Commission. Both PDWP and CDWP can approve projects up to Rs 10 Billion (62.5 million USD). In case project involves foreign funding or is of cost exceeding PDWP project is sent to Central Development Working Party (CDWP) for approval. CDWP technically clears projects for submission to the Executive Committee of National Economic Council (ECNEC) when the budget is more than 62.5 million USD.

The projects that are over 62.5 million USD are approved by ECNEC, which is highest planning forum of Pakistan. It can approve projects up to any cost.

Budget and funding monitoring systems are in place in Pakistan budgetary framework. The executing departments submit quarterly progress reports that are securitized by the Planning Board and guidance is provided. Punjab Planning Board has an independent Directorate General for Monitoring and evaluation that carries out monitoring of important projects periodically. Punjab Forest Department has its CCF Planning and Monitoring who has facility of GIS as well. This CCF carries out monitoring of national programme regularly.

Although, Livestock and Agriculture sector have their own monitoring cells, national programme monitoring is carried out by main development partner, i.e Punjab Forest Department in this case.

1.2.3. Relevant institutional frameworks

The institutions with a role in land and natural resource management, commerce and trade, land tenure, law enforcement and infrastructure and human capacity development are listed in the table below (Table 6).

Table 6. Government Ministries and Division. Source: GoP[48]⁴⁸

MINISTERIES	MISSION STATEMENT OR MANDATE	DIVISIONS
Ministry of Climate Change	To mainstream climate change in the economically and socially vulnerable sectors of the economy and to steer Pakistan towards climate resilient development	Climate Change Division
Ministry of Commerce and Textile	Contributing to the national economy through trade liberalization and facilitation, improving export competitiveness and reducing cost of doing business. Aim to achieve higher market access for Pakistani products in existing markets as well as new markets with ultimate aim of improving quality of life of the people of Pakistan	Commerce Division Textile Division
Ministry of Federal Education and Professional Training	Developing Pakistan as a progressive and prosperous country by providing all citizens a fair and equal opportunity to receive quality education and skills to achieve optimum potential?	Federal Education and Professional Training Division

Ministry of Finance, Revenue and Economic Affairs	To assist in the formulation and ensure the effective execution of sound and equitable economic and financial policies, that put Pakistan on the path of sustained economic development and macro-economic stability with a view to improving the quality of life of the people of Pakistan.	Finance Division Economic Affairs Division Revenue Division
Ministry of Human Rights	Establishing and strengthening necessary institutional mechanisms for protection and promotion of human rights as enshrined in the Constitution of Pakistan, the Universal Declaration of Human Rights and the international Human Rights Conventions and Covenants ratified by the Government of Pakistan.	Human Rights Division
Ministry of Industries and Production	To play the role of facilitator in industrial development and entrepreneurship through policy intervention, setting up Industrial Parks and Export Processing Zones for investors, skill development of human resource for industrial sector and socio-economic development of country with particular focus on SME development and promotion of traditional crafts of Pakistan	Industries and Production Division
Ministry of Interior	To make Islamic Republic of Pakistan a country where rule of law reigns supreme; where every Pakistani feels secure to lead a life in conformity with his religious beliefs, culture, heritage and customs; where a Pakistani from any group, sect or province respects the culture, tradition and faith of the other, where every foreign visitor feels welcome and secure.	Interior Division
Ministry of Inter Provincial Coordination	Premier contact point between the federal government and the federating units. Major functions of the Ministry of IPC are coordination between the Federal Government & provinces in economic, cultural and administrative fields, promoting uniformity of approach in policymaking and implementation in all fields of common interest, and provision of a platform for discussion on policy issues received from the provinces, and therefore, playing a pivotal role in strengthening the federation.	Inter Provincial Coordination Division
Ministry of National Food Security and Research	The Ministry of National Food Security & Research is mainly responsible for policy formulation, economic coordination and planning in respect of food grain and agriculture. It also includes procurement of food grains, fertilizer, import price stabilization of agriculture produce, international liaison, and economic studies for framing agricultural policies.	National Food Security and Research Division

Ministry of Privatization	Privatisation in an Open, Fair and Transparent Manner, for the Benefit of the People of Pakistan, in the Right Way, to the Right People, at the Right Price	Privatization Division
Ministry of Science and Technology	To achieve the security, prosperity and social cohesion of Pakistan through equitable and sustainable socio-economic progress using science, technology and innovation as central pillars of development in all sectors of economic activity.	Science and Technology Division
Ministry of Statistics	Responsible for collection, compilation and dissemination of reliable and timely statistical information to the policy makers, planners and researchers.	Statistics Division
Ministry of Water Resources	Development of country's water and hydropower resources to meet current and future challenges of water shortage and provision of affordable, environmental friendly renewable energy, act as catalyst in the implementation of the National Water Policy by taking all stakeholders on board, through creativity, initiative, innovation and technology.	Water Resources Division

1.2.4. Stakeholder Mandates and roles/responsibilities in project implementation

With these policy and institutional baselines, the proposal for stakeholder roles and responsibilities in project implementation are described below in Table 4. Consultations and engagements is further explored in [Section 2](#).

Table 7. Recommended stakeholder roles and responsibilities.

Stakeholder (group)	Responsibility
Ministry of Climate Change	<ul style="list-style-type: none"> ? Key decision-maker (chair of PSC); ? Responsible for project execution ? Co-financier ? Responsible for upscaling results into national policy discussions; ? Beneficiary of capacity development. ? Advisory support for policy development
Punjab Forest, Wildlife and Fisheries Dept.	<ul style="list-style-type: none"> ? Responsible for project execution ? Member of PSC ? Co-financier ? Key recipient of LDN DSS and other spatial or land management related tools and resources ? Supervision and approval of district rangeland management plans (ILM plans) ? Beneficiary of capacity development. ? Advisory support for policy and technical issues regarding land management practices and regulations
Ministry of National Food Security & Research	<ul style="list-style-type: none"> ? Member of PSC ? Data sharing partner ? Technical and policy support regarding livestock sector ? Responsible for upscaling project results regarding livestock and fodder production value chains ? Beneficiary of capacity development and project developed tools and approaches
Punjab Livestock and Dairy Development Department	<ul style="list-style-type: none"> ? Member of PSC ? Recipient of VC and knowledge product materials ? Data sharing and coordination of extension service collaborations ? Technical backstopping of district and community value chain activities ? Beneficiary of capacity development. ? Advisory services regarding livestock and dairy VC issues, disease patterns and regulations
Punjab Environment Protection Dept.	<ul style="list-style-type: none"> ? Member of PSC ? Recipient of LDN capacity building, ILM and other SLM approaches, tools and materials ? Data sharing and coordination of data collection points on rangeland sites ? Technical backstopping of district and community scale rangeland management plans ? Beneficiary of capacity development. ? Advisory services regarding biodiversity issues and environmental regulations

International Centre for Integrated Mountain Development (<i>ICIMOD</i>)	<ul style="list-style-type: none"> ? Member of PSC ? Recipient of LDN capacity building, ILM and other SLM approaches, tools and materials ? Data sharing and coordination of rangeland assessment systems and DSS ? Advisory services regarding rangeland management policy
FAO	<ul style="list-style-type: none"> ? Provide oversight as GEF Agency ? Member of PSC ? Co-financier ? Data sharing partner ? Advisory services regarding GEF regulations and requirements
Grazier Organizations	<ul style="list-style-type: none"> ? Representation of graziers interest and objectives ? Beneficiary of capacity development ? Beneficiary of project demonstration sites and materials ? Beneficiary of rangeland management plan activities and materials ? Beneficiary of incentive programmes
District authorities of Attock, Chakwal, and Jehlum	<ul style="list-style-type: none"> ? Key stakeholder for district scale land planning processes ? Participation in awareness raising campaigns and data sharing ? Beneficiary of capacity development and training activities. ? Beneficiary of project DSS (Output 1.1.4), and other land planning, governance and land monitoring tools
Private Sector	<ul style="list-style-type: none"> ? Participation in awareness raising campaigns ? Support in Value Chain strengthening activities ? Key stakeholders in agri-environmental incentive programmes ? Beneficiary of increased rangeland and forest productivity ? Beneficiary of capacity building and VC materials
NGO / CSO	<ul style="list-style-type: none"> ? Awareness raising campaigns ? Support in Value Chain strengthening ? Recipient of capacity building, ILM and other SLM approaches, tools and materials
Smallholder producers	<ul style="list-style-type: none"> ? Principal project beneficiary ? Participation in awareness raising campaigns ? Support in Value Chain strengthening activities ? Key stakeholders in agri-environmental incentive programmes ? Beneficiary of district and community rangeland plans and materials ? Beneficiary of improved water points and distribution systems ? Beneficiary of capacity building and VC materials ? Practice and upscaling of project demonstrations and practical exercises

1.2.5. GEF Funded projects and baseline initiatives

Coordination with the following projects will be managed by FAO, MoCC and the Project Management Unit:

? UNDP-GEF Sustainable Land Management Project II: This project, which commenced implementation in March 2015 with USD 3,791,000 in GEF funding, has the objective of ?sustainable land and natural resource management in the arid and semi-arid regions of Pakistan alleviates

environmental degradation and maintains the continuous flow of ecosystem services, while increasing resilience to climate change?. The project is an up-scaling of the SLMP pilot phase project and is being implemented in the provinces of Punjab, Sindh, Balochistan, & Khyber Pakhtunkhwa. The project has a broad approach to SLM activities, including interventions in both agricultural and rangeland ecosystem, with a significant focus on soil erosion and soil stabilization activities. Several activities of the SLMP-II project are relevant to this proposed project, including: participatory rangeland management plans to reduce grazing pressures; establishment of community tree nurseries and re-forestation programmes, and re-seeding and re-forestation of rangelands; and establishment of on-farm energy plantations to help restore degraded dryland forests. Both projects are being executed by the Ministry of Climate Change, and the ministry will ensure that lessons learned, training and awareness materials, etc. from the SLMP II project are used to guide activities under this project.

? UNDP-GEF Sustainable Forest Management Project: This project, which commenced implementation in 2016 with USD 8,338,000 in GEF funding, has the objective ?to promote sustainable forest management in Pakistan's West Himalayan Coniferous, Scrub and Riverine forests for biodiversity conservation, mitigation of climate change and securing of forest ecosystem services?. The project will focus on Temperate Coniferous forests in Khyber Pakhtunkhwa province, Scrub forests in the Salt Range in Punjab province, and Riverine forests in Punjab and Sindh provinces. Some of the activities of the SFM project, including the development of strategies for reducing firewood collection and grazing pressures in forests, and the management of grazing within forest areas integrated into community forest management programs, may provide important models or best practices for similar initiatives in the rangeland areas of the three districts in Punjab Province targeted by this proposed project.

? FAO-GEF project ?Reversing deforestation and degradation in high conservation value Chilgoza Pine Forests in Pakistan?: This project, which is one of the child projects under The Restoration Initiative (total GEF resources of USD 3,978,440), is working in Sherani district of Balochistan, South-Waziristan Agency of FATA, Chitral district of Khyber Pakhtunkhwa and Diamer district of Gilgit-Baltistan. The focal government agency for this is the Ministry of Climate Change. The project has three components: 1) Strengthened regulatory and policy environment for integrated and sustainable management of Chilgoza forest ecosystems; 2) Implementation of Chilgoza Forest Landscapes Conservation, Restoration and Value Chain Development options at community level; 3) Strengthened local institutions for integrated and sustainable management of Chilgoza forest ecosystems; and 4) Knowledge, partnerships, monitoring and assessment of Chilgoza forest ecosystems. The project will bring around 30,000 hectares of chilgoza forests under sustainable forest management through active participation of the local communities, including 3,600 hectares under Assisted Natural Regeneration and 800 hectares under agroforestry and farm forestry. As both the Ministry of Climate Change and FAO are involved in the TRI Child project, as well as this proposed GEF 7 project, both agencies will ensure that lessons from the TRI project on community involvement are applied to the Punjab project. In addition, some of the work on assisted natural regeneration could also be relevant to the GEF 7 project.

Other relevant initiatives and opportunities can be listed as follows

The Green Pakistan Programme is a national forestry sector programme whose main objective is to facilitate the transition towards an environmentally resilient Pakistan by mainstreaming notions of adaptation and mitigation through ecologically targeted initiatives covering afforestation, biodiversity conservation and enabling policy environment. The estimated cost of the project is Rs. 3.652 billion for a period of five years. The program is targeting the planting of one hundred million new indigenous plants over five years in different ecological zones, and key activities that complement the proposed GEF project include the restoration & improvement of scrub forests; conservation of watersheds and soils in hilly and river catchment areas; and the promotion of participatory forestry approaches.

Pakistan's National Rural Support Programme (NRSP) and provincial rural support programs are especially active in areas with degraded lands, focusing on alternate livelihoods and financing

programs. Similarly, many NGOs and CBOs are working in degraded areas to help people in diversifying the sources of income thus reducing pressure on agricultural and pasture lands. The organization SCOPE has implemented several projects to provide water infrastructure, livestock support services and vocational and marketing training in various trades. Similarly, Thardeep (NGO) is providing micro credits and vocational support to thousands of people to earn livelihoods and come out of poverty, while PVDP (NGO) has provided assets such as goats and fruit trees with water tanks to communities.

Pakistan, together with partner international organizations, is developing a number of strategic programmes for responding to the COVID-19 pandemic, and the proposed project will seek to collaborate with and learn from those programmes as they begin to be implemented. These programs include: FAO's COVID-19 Response and Recovery Programme; the UN System's framework for immediate socio-economic response to COVID-19 in Pakistan ('COVID-19: Pakistan's Socio-Economic Framework?'); and the Government of Pakistan's Covid-19 Responsive Annual Plan 2020-2021.

The Billion Trees afforestation Project, which was implemented in Khyber Pakhtunkhwa province, rehabilitated 627,922 hectares and increased the provincial forest area by 6.3%. Under this project, around 13,000 nursery units were established, 9,000 individuals were trained in nursery raising, forest fire fighting and grazing control, and several hundred thousand persons were employed in tree planting activities. The project significantly raised the profile of reforestation efforts and land and forest degradation issues throughout Pakistan.

The Ten Billion Tree Tsunami Programme (Phase-I, Up scaling of Green Pakistan Programme) is building on the billion trees project by undertaking a national afforestation effort being implemented by the Ministry of Climate Change and Provincial Forest and Wildlife Departments from 2019-2023, with a total budget of 125 billion rupees (USD 746 million). The 10 billion trees project is relevant to the proposed GEF project as the forests of Pakistan support large numbers of livestock in terms of fodder production and grazing area. In addition, the 10 billion trees project will contribute to a number of sectoral and development objectives of the Government that are relevant to this project, including: 1) conserve and rehabilitate natural forest ecosystems and undertake tree planting and assisted natural regeneration in forests and communal and private agricultural lands so as to meet the needs of local communities for timber, firewood and fodder production; 2) increase the productivity & related services and functions of rangelands (pastures); and 3) enhance the protective functions of watersheds for regulating their water regimes, retarding soil erosion and siltation of reservoirs. The proposed GEF project will coordinate with the Ten Billion Tree program and benefit from its activities supporting rangeland ecosystems (including pastures and scrub forests), while the GEF project's activities will help the Ten Billion Tree program towards its goal of improving habitat for biodiversity and wildlife resources.

The Punjab Forest Department carried out the project Enhancing Rangeland Production and Planting of Fodder Trees for Farmer Communities from 2016-2019, with a budget of approximately USD 4.55 million. This project aimed at increasing the carrying capacity of depleted rangelands to provide sufficient fodder for livestock populations through soil conservation, pond excavation and desilting, and the reseeded of grasses over an area of 10,800 hectares and the planting of fodder trees over an

area of 680 hectares. The proposed project will build on best practices developed under this project on the choice of fodder species, techniques for reseeding of grass species, and community participation

Projects that set the baselines for rangelands for the province of Punjab according to the listed in Table 8.

Table 8: Project baselines for rangeland in the Punjab Province (Source: Planning Code Punjab, 2015)

#	Name of Project or Initiative	Donor / Years of implementation	Relevant Lessons Learnt
1	Range Utilisation Model Lohi Bher Pothwar Plateau	Pakistan Agricultural Research Council Research Project 1983-1988	Developed technology package for Range Management in Pothwar through research over 435 ha. It provides useful package for introducing ranching in the tract.
2	Management of land and water resources in Gully eroded areas in Pothwar Plateau	PARC research Project	In 1944 Dr Gorri started Gullies treatment and based his work PARC developed project to develop best land use of available resources.
3	Restoration of Productivity in Barani Lands	Agency for Barani Areas Development	ABAD successfully restored deserted baran lands through integrated treatment including soil and water conservation, land reclamation, fruit and forest trees planting, gullies plugging, and water development.
4	Barani Village Development Project	Punjab, ADB Loan 1990-2007	Meant to introduce sustainable land and resource management to improve income and productivity to stop migration from Barani rural areas to urban centers. From 1981-90 IFAD funded it then ADB loan. It included range Management and livestock in its package.
5	Increasing Range land productivity through range improvement and mitigate poverty	Govt of Sindh USD 6 million 2003-2008	Confirmed that Range Management in arid zone can improve land productivity enhance and diversify income opportunities and eradicate poverty.
6	Combating desertification in riverine Forests of Sindh.	Govt of Sindh USD 2 million 2005-2008	Technology developed, tested and made capable to upscale.
7	Revamping range management with participation of stakeholders	Cholistan Punjab, Govt of Punjab 2005-2008	Effect of reseeding and water points established for range improvement.
8	Malakand Social Forestry Project	KP Govt and Netherlands Govt 1988-1999	This project proved that actual problem is social of grazing management because mostly seed bank is there but due to continuous grazing seedlings are killed. It brought out that intensive grazing with rest can activated seed bank and rehabilitate area without reseeding.

Internationally, the project will establish linkages with the **Sustainable Forest Management Impact Program on Dryland Sustainable Landscapes (DSL-IP)**[49]⁴⁹ which will allow for further integration and information sharing opportunities for dryland areas across the globe. The 104 M USD funding under the GEF-7 funding cycle, along with over 800 M in co-financing, will assist 11 countries

located across Africa and Asia in fostering resilience of production systems in drylands, promoting restoration and rehabilitation, and improving livelihoods through a comprehensive landscape approach. Moreover, the Program is designed to deliver scalability beyond the boundaries of the 11 targeted countries, highlighting the importance of transboundary commitment towards dryland restoration, landscape management at scale, and biodiversity conservation. Its potential ties to this project are diverse and collaborative activities clearly would be beneficial for all parties involved.

The project will also create links to the **Dryland Restoration Initiative Platform (DRIP)**[50]⁵⁰. Responding to the **Rome Promise** on Monitoring and Assessment of Drylands for Sustainable Management and Restoration, DRIP was initiated in 2016 as a monitoring and reporting tool in the form of an interactive web portal for the Forest and Land Restoration. On the 1st of March 2019, under Resolution 73/284, the United Nations General Assembly proclaimed 2021-2030 to be the United Nations Decade on Ecosystem Restoration, with the primary aim being to prevent, halt and reverse the degradation of ecosystems worldwide. The Committee on Forestry's Working Group on Dryland Forests and Agrosilvopastoral Systems[1] in its inaugural meeting considered the development of the DRIP platform for documenting and monitoring the different transformation projects and programmes (TPPs) and initiatives implemented in contributing to LDN achievement in drylands. Accordingly, the DRIP will be intended to fulfil the needs to monitor the dryland ecosystem specifically, and that can enable country convention reporting using the Framework for Ecosystem Restoration Monitoring (FERM) as a part of the UN DECADE commitment.

1.2.6. Description of the Province of Punjab

The Punjab Province is the most densely populated province of Pakistan with a population of 110 million (2017)[51]⁵¹ with an average annual growth rate of 2.13 percent, with 55,958,974 (51 percent) men, 54,046,759 (49 percent) women, and 6,709 transgender persons. There are approximately 1 million more men than women in Punjab. The sex ratio for Punjab is 103 men for every 100 women with a higher ratio for urban areas (106 men for every 100 women). Of the 110 million people living in Punjab, 40.4 million (37 percent) live in urban areas while 69.6 million (63 percent) live in rural areas. 110 million people live in 17.1 million households, with an average household size of 6.43 persons as compared to seven persons in 1998. The decrease in household size can partly be attributed to a declining Total Fertility Rate (3.2 in 2012 to 2.7 in 2017).[52]⁵²

The province extends over an area of 20.54 million ha.[53]⁵³ Of this area, approximately 58 percent lies in the arid zone and 29 percent in the semi-arid zone. The area officially supports 50.544 million livestock and 23 million poultry.[54]⁵⁴

The Punjab province contains approximately 18% of the country's rangelands, covering 8.2 million ha or 40% of the province; these rangelands vary from largely temperate in the North, Mediterranean in the Western mountains of the Suleiman Range, and arid and semi-arid desert in the region of Cholistan. Although the northern temperate areas contain the most productive rangeland areas, the extensive semi-desert and desert rangelands of the Punjab are also an important resource that needs to be re-examined as many of the deserts in the province are man-made and have resulted from a long history of overgrazing and other forms of mismanagement. Most of the forests and rangelands in the Punjab are in the public sector and are managed under the Forest Act of 1927 (some private/community owned rangelands also exists in the area).

On public lands, local populations have rights of way, the right to collect water and fuelwood for domestic use, and livestock grazing rights (in some cases, grazing rights require partial or full payment of grazing fees, placed at as Rs 30 per goat, Rs Rs 10 per Sheep, Rs 50 per cattle by provincial technicians)). There are some minor conflicts over the use of rangelands, usually between local and migratory livestock herders. Livestock rearing is characterized by large flocks of sheep and goats managed by a mix of sedentary, nomadic and transhumant pastoralists, who will often change grazing patterns and livelihood strategies depending on forage availability.

Agriculture-based products account for around three fourth of country's total export of which about 60 percent share is contributed by Punjab. Overall, two third of the total cropped area of Punjab is used by the three largest crops; wheat, cotton and rice. Cereal and cash crops constitute a bigger share of the total value and enjoy an added importance due to their higher relevance in ensuring food security[55]⁵⁵. Fodder is another large produce of Punjab (10.6 percent share of the cropped area), which fulfills the need to feed the large livestock population of the province. Maize and sugarcane are the two other main crops[56]⁵⁶.

Punjab's total horticultural production of 10.7 million tons accounted for 67 percent of the total national production.[57]⁵⁷ Punjab contributes 64 percent of the national fruit production, with citrus and mango being the two main contributors in Punjab's total fruit production, followed by guavas. Punjab's share in national vegetable production (excluding potatoes) is 63 percent with a wide range of vegetables grown across the province for local consumption and some are also being exported. Punjab enjoys a monopoly in potato production by producing 3.83 million tons and claiming 96 percent share in the total national production. 79 percent of the edible oil seed and 83 percent of pulses and grams in Pakistan are also grown in the Punjab Province.

The partial lockdown during the wheat harvesting period (April-May 2020) in Punjab helped the farmers to access the market and manage transport and labour. The sowing of Kharif crops (2020), vegetables and fruits were largely impacted during the lockdown and mobility restrictions. The fruits and vegetable producers in Punjab faced financial losses in terms of low farm prices, as they were unable to find middlemen or traders to market their produce. In this regard, losses in fruits and vegetable crops reduced GDP by approximately USD 40 million. In addition, a loss of USD 630 million to GDP due to disruption in traditional export crops such as rice and cotton is recorded. The rice-growing districts of central Punjab mostly faced difficulties in obtaining seed, while in southern districts of mixed cropping zone, the farmers were unable to access pesticide and diesel fuel.

In Punjab, only 65.5 percent of the sample dairy farmers found it difficult or were unable to market their milk during the early months of the COVID-19 pandemic. The loss to GDP due to disruption in the livestock and dairy sector during the initial period of lockdown was about USD 330 million. On the demand side, the loss of income and livelihoods led to lowering economic access to food. In the case of Punjab, the pandemic impact on rural households remained low. According to the Asian Development Bank report (2020), only 9.8 percent of the sample households reported a reduction in food consumption, whereas 11.2 percent reduced non-food expenditure.[58]⁵⁸

In terms of gender equality and empowerment issues in Punjab, the Labour Force Survey (2014-15) reveals significantly different figures for men and women's Labour Force Participation Rate (LFPR) at a provincial level, indicating differences in the availability and accessibility of economic opportunities for men and women. Female LFPR, at 27.8 percent, is considerably lower than the male LFPR at 69.4 percent. Rural female LFPR, at 35.5 percent, significantly exceeds urban female LFPR of 12.8 percent. A higher rural LFPR of women can be contributed to their greater representation in the Agriculture sector. In Punjab, 20.7 percent of women and 23.9 percent of men are employed in agriculture. In the non-agriculture sector, there are only 7.7 percent women as compared to 47.7 percent men. LFS findings reveal that at all levels of education; a higher number of men are employed as compared to women. Only 3.7 percent of the literate female population is employed as opposed to 20.9 percent of the literate male population. Women who are employed experience considerable wage disparities. In Punjab, 53.6 percent of women (in paid employment) in rural areas and 40.2 percent of women in urban areas earn less than Rs. 5,000 per month as compared to only 8.9 percent and 6.6 percent of men in rural and urban areas respectively[59]⁵⁹.

Not only do women lack access to income-generating opportunities, but they are also disadvantaged in terms of resource ownership. In Punjab, there is a considerable variation between the number of male and female agricultural landowners. Of the 63,560,831 agricultural landowners, 43,655,022 (68.7 percent) are men and 19,905,809 (31.3 percent) are women, with a GPI of 0.455. There is also a huge disparity in the number of men and women who own vehicles and possess driving licenses in Punjab. In 2017, out of the 1,649,044 vehicles owned, 123,448 (1 percent) were owned by women. In 2017, the number of licenses issued was 305,146, out of which 15,883 (5.2 percent) of licenses were issued to women[60]⁶⁰.

Women also remain relatively disadvantaged in terms of access to finance. At the end of Fiscal Year (FY) 2016-17, women-owned 26.8 percent of deposit accounts, 24 percent of the current accounts, 6 percent of loan accounts, and 5 percent of long-term loan accounts in Bank of Punjab.[61]⁶¹

As for provincial land management strategies, policies and programmes, the Punjab Agriculture Sector Plan formulated by the Department of Agriculture in 2015 states the following four principal functions of the agriculture sector.

- ? Increase the supply and quality of agriculture crops and products for local consumption and for export
- ? Improve living standards of small and subsistence farmers through increase income generation from agriculture
- ? Contribute towards national food security
- ? Promote integrated and sustainable use and management of natural resources

In 2018, the Punjab Agriculture Policy was developed as a sectoral policy document and established specific goals:

- ? Enhance competitive position of agriculture sector in line with global and domestic market demands, including to benefit from China Pakistan Economic Corridor (CPEC) opportunities;
 - ? Increase food production to improve food quantity, quality and nutrition diversity through higher yields and better crop mix;
 - ? Increase farmer profitability to raise living standards of the farming families, with increased participation of rural women and youth;
-

- ? Conserve agricultural resources with efficient use of land, water and labour deployed for agriculture in the province;
- ? Enhance sustainability and resilience in the wake of climate changes and implications thereof;
- ? Enable private sector participation in agriculture value chains with increased investment, technology infusion and management resources.

While the Policy aims to provide benefits for the overall population of the province, especially the farming communities, it particularly targets at beneficiary groups of Small Commercial Farmers, women and rural youth to ensure food security. The increase in economic activity at Small Commercial Farmers (SCFs) will increase earning opportunities and reduce poverty for rural communities including the landless farmers, rural women and rural youth. Women's role in agriculture in Punjab cannot be overstated, according to this policy. The economic inclusion of rural women will increase the household incomes, reduce poverty and make the Punjab food and nutrition secure. The Policy also promotes the Safety Net for Small Farmers through area Yield Index Insurance.

Policy thrusts and strategic means to accomplish overall objectives and goals are indicated as:

- ? Increase farmer profitability;
- ? Reduce cost of inputs for farmers;
- ? Encourage crop diversification to improve crop-mix;
- ? Optimize subsidy programs through targeting and Information and Communications Technology (ICT) technologies;
- ? Improve access to finance for farmers through Mobile Money Operators;
- ? Transform agriculture produce markets;
- ? Initiate a markets and storage expansion drive to ensure competitive prices, establish warehouse receipt financing;
- ? Encourage Small Medium Enterprise (SME) level food processing with a focus on exports.

In addition, the Policy recommends four broad strategic areas of focus for Climate Smart Agriculture (CSA):

- ? Adaptation and building resilience by addressing vulnerability due to changes in rainfall and temperature, extreme weather events and unsustainable land/water management and utilization;
- ? Mitigation of GHG's emissions from key and minor sources in the agriculture sector;
- ? Establishment of an enabling policy, legal and institutional framework for effective implementation of CSA;
- ? Minimizing effects of underlying cross-cutting issues such as human resource capacity and finance which would potentially constrain realization of CSA objectives.

Along the similar lines is the Punjab Forest Policy of 2019, whose goal is to develop, maintain and maximize forest resources in a scientific, environmentally sustainable, ecologically stable, economically viable and socially acceptable manner. The Punjab Forest Department manages 2.64 million hectares of rangelands spread among 12 districts within 4 range management divisions (Chakwal, Bhakkar, D.G Khan and Bahawalpur). These rangelands are managed entirely for the benefit of the farming communities located within and near to the rangelands. The basic objectives that should govern the Punjab Forest Policy are:

- ? Preserve, conserve, develop and enhance existing forest resource and tree cover in the Province in line with the National Forest Policy.
- ? Improve tree cover on private and farm lands through agroforestry practices supported by an independent extension service within the Department.

- ? Promote Public Private Partnership to encourage investment opportunities in forestry sector, in addition to sponsorship for afforestation through Corporate Social Responsibility.
- ? Strengthen & diversify the forest research activities to support planning process, integrating the enhancement of in-service training to meet emerging challenges of forestry sector.
- ? Plan activities in compliance to the obligations under various international Multilateral Environmental Agreements, ratified by Pakistan.
- ? Discourage the commercial exploitation of forest resource and manage them based on sustainable forest management, without jeopardizing the future existence of forest resources of the Province.
- ? Manage and conserve forest resource as biological reserve and ecological assets for providing multiple eco-system services, with management principle of landscape approach instead of obtaining timber and firewood only.
- ? Development of institution within the department to strengthen the discipline of extension, watershed management, range management and protected area management etc.
- ? Make necessary legislation in form of rules under the Forest Act, 1927 (Amended upto 2016) to address various emerging challenges and streamline the activities provided under the Act *ibid*.

The Livestock Development Policy of Punjab Province is amplified in "The Policy Papers" formulated by the Provincial Livestock and Dairy Development Department (L&DD) in June 2015. The Policy Papers summarize the major challenges in the following fields; 1) Public Policy, 2) Governance, 3) Knowledge, 4) Marketing, 5) Finance, and 6) Production, upon which the aims and objectives of provincial livestock policy would be formulated as follows:

- ? The development framework: Sustainable development of the livestock and dairy sectors is the basic mandate of the L&DD through optimal utilization of resources and enabling the stakeholders to take productive decisions in the very domains of livestock and dairy.
- ? Market growth: The heart of the proposed policy is that the private sector should be in the driving seat and government should work as a facilitator & stabilizer of business environment.
- ? Governance framework (paradigm shift from curative to preventive): The L&DD is required to work as a facilitator ?Livestock Asset Manager of the Province? and not merely the administrator, implementing the following measures; 1) Human Resource Development, 2) Disease Prevention (through disease surveillance and forecasting, vaccination, improvement of animal husbandry practices, and deworming), 3) Improvement of Food and Nutrition, 4) Enhancement of Extension Services, and 5) Capacity Building of Livestock Production Systems.
- ? Partnerships for socio-economic change-livestock activists: Livestock is not only an economic activity, rather a way of life. Woman is the one who spends maximum time with the livestock. The government has decided to encourage the participation of rural women, Imam Masjid and students as catalysts of socio-economic development of the farmers - the primary producers of livestock.
- ? The regulatory framework: The government has decided to create a Provincial Drug Control and Marketing Facilitation Authority to regulate the production, marketing, sale and administration of medicines and products pertaining to the livestock sector.
- ? The service delivery framework: It encompasses the service delivery architecture pertaining to ensuring food security, competitiveness of the sector and prosperity of stakeholders and generating exportable surpluses.

Apart from the ?Policy Papers?, ?the Punjab Livestock Breeding Act of 2014" was introduced and the Livestock Breeding Service Authority was established. in 2014. Under this Act, the Livestock Breeding Service Authority has the following mandate: 1) regulate provision of breeding services in accordance with the provisions of the Act; 2) raise awareness regarding standards and quality of breeding services; and 3) conserve and develop local genetic resources. In terms of the standards and procedures of breeding, details of the following subjects are stipulated in "The Standard Operating Procedure for Performance Recording and Progeny Testing"; 1) selection of breeding animals, 2) collection and production facilities, 3) use of semen, ova and embryos, 4) AI technicians, and 5) contents of certificates

The Livestock and Dairy Development Department has also been tasked to initiate next generation reforms that would allow for the livestock and dairy sectors to transition into competitive and productive sectors of the economy and ensure the food security and economic prosperity to producers, while at the same time generating exportable surpluses. The principal focus of reforms is on the indigenous capacity building by using local strengths and wisdom, in addition to local genetic resources. The Punjab Growth Strategy 2023 also consider Livestock development as one of 4 sectors in which Punjab has comparative advantage and proposed number of interventions in this sector for speedy development.

Under the Livestock Policy of Punjab, the southern areas of the Punjab Province, particularly Multan, Bahawalpur and Cholistan area have been targeted to produce organic meat; DG Khan Division, particularly the Tribal areas of DG Khan and Rajanpur has been focused for the first time for boosting local economy by producing organic meat through small ruminants. Central Punjab will be converted into production house of silage and hay for local and foreign markets besides becoming production house of milch animals. **Northern Punjab will be the focus for production of small ruminants and rural poultry aiming at foreign markets.** It has been decided to harness the prowess of local breeds by unleashing the genetic potential and re-defining the benchmarks that led to certain un-economic decisions by the farmers with undesirable fallout. Camel is focused for meat, particularly veal production and milk products. Modern processing technologies for small to medium players of the supply chain will shift the value gain up to the primary producer i.e. the subsistence level farmer.

The Government will focus its contribution on disease prevention through with protocols of vaccination, deworming and disease surveillance. The crux of approach is on disease prevention rather than treatment. The Government of Punjab province has also engaged experts to develop and implement a Livestock Products Export strategy to cater to selected export markets that can provide high returns in a relatively short time period, and the province is also working to improve the functioning of livestock markets (i.e. by streamlining regulations in the livestock sector; improving the functioning of livestock markets; and rationalizing relevant laws and regulations)^[62]. Soil Conservation units within provincial Agriculture Departments are making concerted efforts to protect watershed areas and conserve soil on fragile slopes.

1.2.7. Description of the project target landscapes

The project area consists of three adjoining districts of in northern Punjab province: **Attock, Chakwal, and Jehlum**. This part of Punjab province was targeted because of the high degree of land degradation in the area (due to overgrazing); the poverty of local communities; the lack of effective rangeland management systems; the mix of rainfed and irrigation agriculture in the area that will allow for testing of different approaches to rangeland management; and the relatively high level of accessibility of this area, which will facilitate replication and up-scaling of project activities and lessons learnt.

[1] Mufti, S.A, Hussain,S and Arshad M Khan, 2003: Mountains of Pakistan, Contribution of mountains in Pakistan's water resources status and prospective. GCISC, Islamabad.

[2] Bukhari, S.B, T. Laeeq, and H. Ali. 2012. Landcover Atlas of Pakistan, Pakistan Forest Institute, Peshawar

[3] FAO.2019. Forestry Sector Review, Pakistan. Report compiled for WB funding in Pakistan.

[4] Govt of Pakistan. 2021. Economic Survey of Pakistan 2020-21 Chapter-2 Agriculture-P 17, https://pc.gov.pk/uploads/cpec/PES_2020_21 Pakistan Economic Survey 2018-2019; Finance Division, Government of Pakistan. p. 57

[5] Idem

- [6] Govt of Pakistan. 2021. Economic Survey of Pakistan 2020-21 Chapter-2 Agriculture-P 17, https://pc.gov.pk/uploads/cpec/PES_2020_21
- [7] *ibid*, p. 56
- [8] Livestock population census 1976, with projected estimates for 2020. Wikipedia.
- [9] https://www.finance.gov.pk/survey/chapters_17/overview_2016-17.pdf -Pakistan Economic Survey 2016-2017
- [10] https://www.finance.gov.pk/survey/chapters_17/overview_2016-17.pdf -Pakistan Economic Survey 2016-2017
- [11] Economic Survey 2020-21 based on inter census growth rate of 1996 & 2006 estimated by Ministry of National Food security and research. Table 2.21 and table 2.24.
- [12] <https://pbit.punjab.gov.pk/system/files/PAP.pdf> -Punjab Agriculture Policy 2018
- [13] <https://pbit.punjab.gov.pk/system/files/PAP.pdf> -Punjab Agriculture Policy 2018
- [14] Govt of Pakistan. 2021. Economic Survey of Pakistan 2020-21 Chapter-2 Agriculture-P 17, https://pc.gov.pk/uploads/cpec/PES_2020_21 Pakistan Economic Survey 2018-2019; Finance Division, Government of Pakistan. p. 57
- [15] *idem*
- [16] Govt of Punjab. 2018. Punjab Growth Strategy, 2023. Published by Planning & Development Board, Lahore.
- [17] Bukhari, S.B, T. Laeeq, and H. Ali. 2012. Landcover Atlas of Pakistan, Pakistan Forest Institute, Peshawar
- [18] Govt of Pakistan. 2021. Economic Survey of Pakistan 2020-21 Chapter-2 Agriculture-P 17, https://pc.gov.pk/uploads/cpec/PES_2020_21 Pakistan Economic Survey 2018-2019; Finance Division, Government of Pakistan. p. 57
- [19] Pakistan Poultry Association 2020, an Overview Of Pakistan Poultry Industry Year 2020-2021
- [20] MOCC, 2020. Voluntary Targets and associated measures towards achieving LDN.
- [21] WB 2006. Pakistan Strategic Country Environmental Assessment Report. World Bank - 2006 - elibrary.worldbank.org
- [22] FAO. 2016. Rangelands of Pakistan, ?Current Status threats and potential?.
- [23] UNCCD National Action Plan 2008
- [24] Iqbal. M. 2018. Soil & Water Conservation Needs Assessment using Geospatial Techniques: A case Study of Potohar Region of Pakistan. United nations/Pakistan/PSIPW 4th International Conference on the Use of Space Technology for Water Management February 26th?March 02, 2018 Islamabad Pakistan
- [25] Sherani, S 2021, ?Defining challenges?, DAWN Newspaper, Published January 29, 2021, <https://www.dawn.com/news/1604242>
- [26] <http://www.finance.gov.pk/survey/chapters/overview09.pdf>
- [27] Govt of Pakistan. 2021. Economic Survey of Pakistan 2020-21 Chapter-2 Agriculture-P 17, https://pc.gov.pk/uploads/cpec/PES_2020_21 Pakistan Economic Survey 2018-2019; Finance Division, Government of Pakistan. p. 57
- [28] http://www.issi.org.pk/wp-content/uploads/2014/06/1299051742_14233891.pdf
- [29] Pakistan Economic Survey 2008-2009
- [30] GOVERNMENT OF THE PUNJAB LIVESTOCK & DAIRY DEVELOPMENT DEPARTMENT
- [31] World Employment and Social Outlook: Trends 2020, international Labour Office ? Geneva: ILO, 2020
- [32] <https://www.dawn.com/news/1604242>
- [33] *idem*
- [34] *idem*
- [35] *idem*
- [36] COVID 19 - Pakistan Socio-Economic Impact Assessment and Response Plan (version 1 May 2020)

- [37] https://sdpi.org/wp-content/uploads/2021/06/Need-Assessment-Report_final_17June2021.pdf#page=5&zoom=100,92,96
- [38] COVID 19 - Pakistan Socio-Economic Impact Assessment and Response Plan (version 1 May 2020)
- [39] 1USD= PKR168.191 on 13 Sep, 2021
- [40] 1USD= PKR168.191 on 13 Sep, 2021
- [41] 1 USD = 168.04 on 9 Sep, 2021)
- [42] 1USD= PKR168.191 on 13 Sep, 2021
- [43] 1USD= PKR168.191 on 13 Sep, 2021
- [44] COVID 19 - Pakistan Socio-Economic Impact Assessment and Response Plan (version 1 May 2020)
- [45] Alvar-Beltran et al 2021, Assessing the impact of climate change on wheat and sugarcane with the AquaCrop model along the Indus River Basin, Pakistan, Agricultural Water Management, Volume 253, 1 July 2021, 106909
- [46] Project PIF 2020
- [47] Pakistan Ministry of Climate Change 2020, Voluntary targets and associated measures towards achieving Land Degradation Neutrality August 2020
- [48] https://pakistan.gov.pk/ministries_divisions.html, viewed 15/10/2021
- [49] <http://www.fao.org/gef/dryland-sustainable-landscapes/en/>
- [50] <https://www.fao.org/in-action/dryland-restoration-initiative-platform/en>
- [51] <https://www.pbs.gov.pk/content/final-results-census-2017>
- [52] Population and Housing Census 2017, Pakistan Bureau of Statistics
- [53] Land Cover Atlas Punjab, 2018
- [54] Punjab Board of Investment and Trade, 2018, Situational Analysis: Poultry Industry of Punjab Amidst COVID 19 ,Threats, Challenges and the Way Forward
- [55] <https://pbit.punjab.gov.pk/system/files/PAP.pdf> -Punjab Agriculture Policy 2018
- [56] <https://pbit.punjab.gov.pk/system/files/PAP.pdf> -Punjab Agriculture Policy 2018
- [57] PPG LD report 2021, Hussain, S, GCP/PAK/905/GFF
- [58] https://sdpi.org/wp-content/uploads/2021/06/Need-Assessment-Report_final_17June2021.pdf#page=5&zoom=100,92,96
- [59] https://pcsw.punjab.gov.pk/system/files/PGPR-2018_0.pdf -Punjab Parity Report 2018
- [60] https://pcsw.punjab.gov.pk/system/files/PGPR-2018_0.pdf -Punjab Parity Report 2018
- [61] https://pcsw.punjab.gov.pk/system/files/PGPR-2018_0.pdf -Punjab Parity Report 2018
- [62] Punjab Growth Strategy 2018: Accelerating Economic Growth and Improving Social Outcomes. Government of the Punjab. Final Version ? March 2015

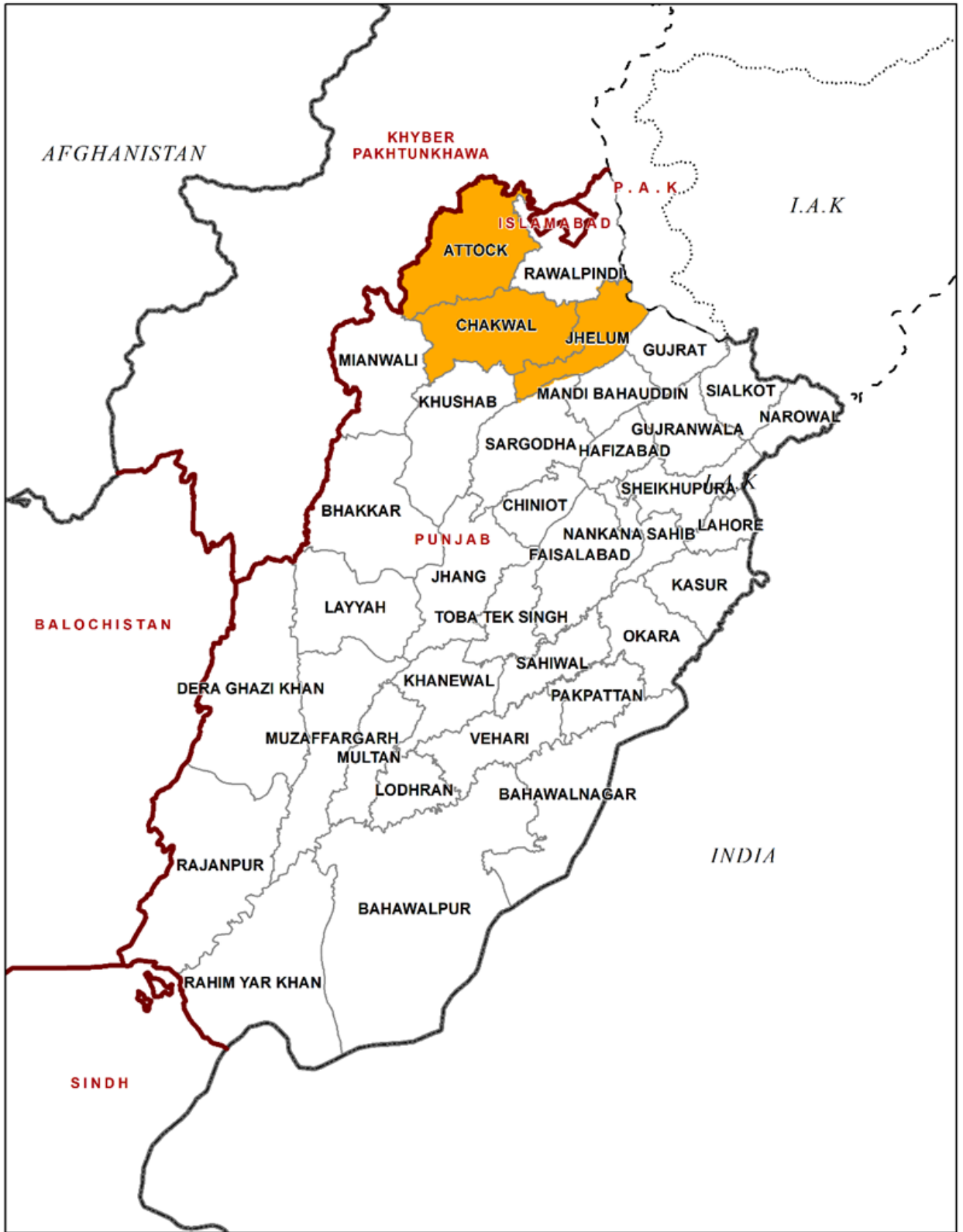


Figure 2. Location of selected project districts within the Province of Punjab (Source: GCP/PAK/905/GFF PIF)

The three specific districts were specifically selected based on the following criteria: 1) high percentage of rangeland in the district; 2) high percentage of rainfed area in the district; 3) high livestock density levels; 4) high vulnerability to droughts; and 5) high percentage of small farmers.

The Attock, Chakwal and Jehlum are rainfed Districts. In these Districts subsistence agriculture is mostly practiced, while livestock rearing constitute integral component of rainfed agriculture (Tables 9 & 10). The tract has 777,269 households and human population of 4,602,188 (Population Census, 2017), while 191,714 registered livestock farmers have 2,267,916 number of livestock (Livestock Dept.). Rangelands and livestock play a vitally important role in these three districts; 80-90% of the population in the districts is directly or indirectly involved in livestock related activities, and the people of the area have a strong cultural attachment to livestock, so that even rich households will frequently keep some livestock in their homes. Major vegetative species include: Phulai (*Acacia modesta*), Dhak (*Butea frondosa*), Kao (*Olea ferruginea*), Mallah (*Zizyphus nummularia*), Garanda (*Carrisa spinarum*), Patakhi (*Gymnospora royaliana*), Pharion (*Digitaria bicornis*) and Lumb (*Aristida depressa*).

Table 9. Landuse statistics of Project Districts in Punjab (Source: Land Cover Atlas of Pakistan, The Punjab 2014)

Land Uses	Attock		Chakwal		Jehlum		Total Area (ha)
	Area (ha)	%	Area (ha)	%	Area (ha)	%	
Orchards	333	0.0	003	0.0	019	0.0	355
Crop Irrigated	000	0.0	000	0.0	18,892	5.2	18,892
Crop saline Irrigated	000	0.0	000	0.0	3,709	1.0	3,709
Crop in flood Plain	819	0.1	040	0.0	8,378	2.3	9,237
Crop Rainfed	411,283	60.6	381,597	58.2	138,669	38.2	931,549
Total Arable Land	412102	60.7	381,637	58.2	169,648	46.7	963,387
Forest	26,567	3.9	50,259	7.7	16,940	4.7	93,766
Nat Veg in Wetlands	17,574	2.6	4,776	0.7	10,817	3.0	33,167
Total Forest	44,144	6.5	55,035	8.4	27,757	7.7	126,933
Rangelands	200,788	29.6	200,561	30.6	131,720	36.3	533,069
Total Grazing Area	244,932	36.1	255,596	39.0	159,477	44.0	660,002
Built Up	13,162	1.9	13,836	2.1	10,464	2.9	37,462
Bare Area	240	0.0	193	0.0	397	0.1	830
Bare area with sparse Vegetation	051	0.0	000	0.0	179	0.0	230
Wet Areas	7,351	1.1	4,320	0.7	22,488	6.2	34,159
Total	678,168	100.00	655,585	100.00	362,672	100.00	1,696,425

Table 10: Livestock and rangeland information on three districts in the project area

District	Total Area (ha)	Area of rangeland[1]		Livestock Population[2]		
		Hectares	% of District	Livestock*	Poultry	Total
Attock	678,168	200,788	29.6	1,375,062	952,432	2,327,494
Chakwal	655,586	200,561	30.6	1,402,459	818,951	2,221,410
Jhelum	131,720	131,720	36.3	713,339	329,776	1,043,115
Total	1,696,426	533,069		3,490,860	2,101,159	5,592,019

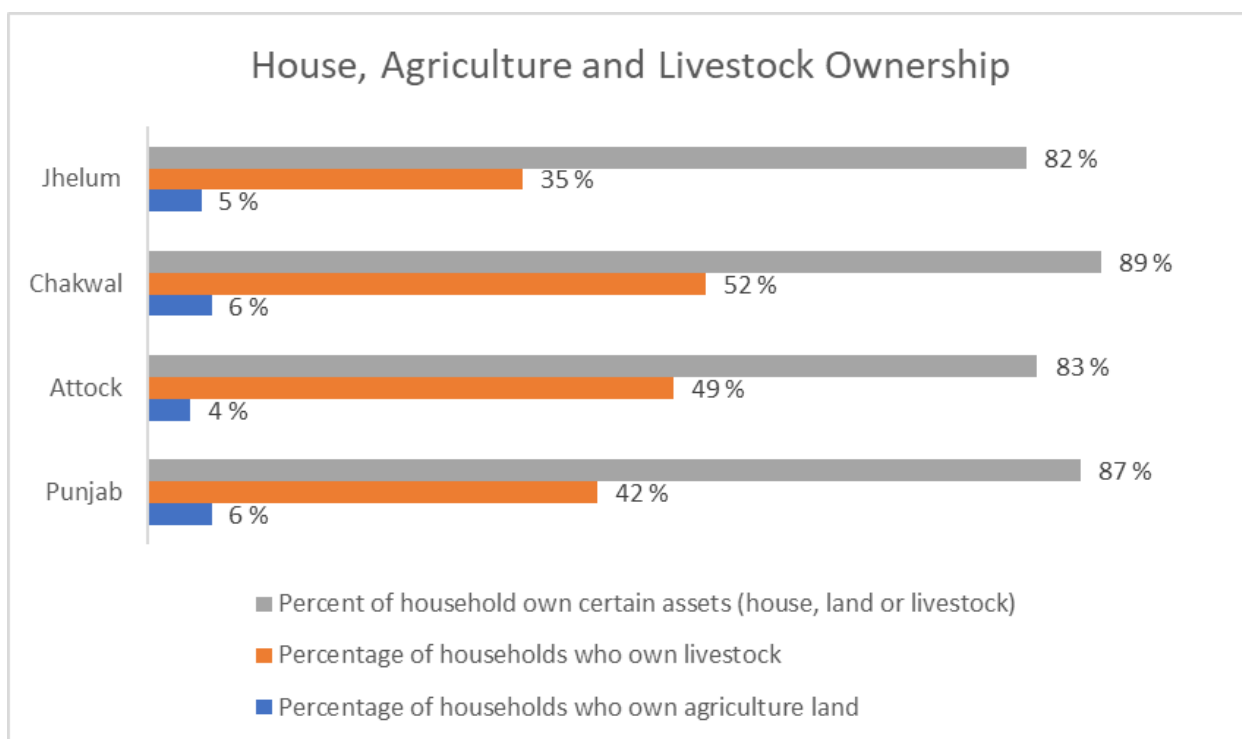
* Cattle, Buffalo, Sheep, Goats, Camels, Horses, Mules, Asses

A brief overview of the three districts is provided in this section, but further information on the area can be found in the PPG Socio-Economic Report in Annex P.

According to MICS 2017-2018, the mean household size in Attock is 6.4, Chakwal 5.8, and in Jhelum 6. While in Punjab the household size is 6.3. Moreover, 3.5, 3.3 and 3.2 persons are living per room in Attock, Chakwal, and Jhelum respectively. Less than 6 percent of the target households own agricultural land (Figure 3), while in Attock 49 percent, Chakwal 52 percent, and in Jhelum 35 percent of the household own livestock.

[1] Rangelands include pasture as well as sub-tropical thorn forests

[2] Punjab Livestock census report- Bureau of Statistics Pakistan



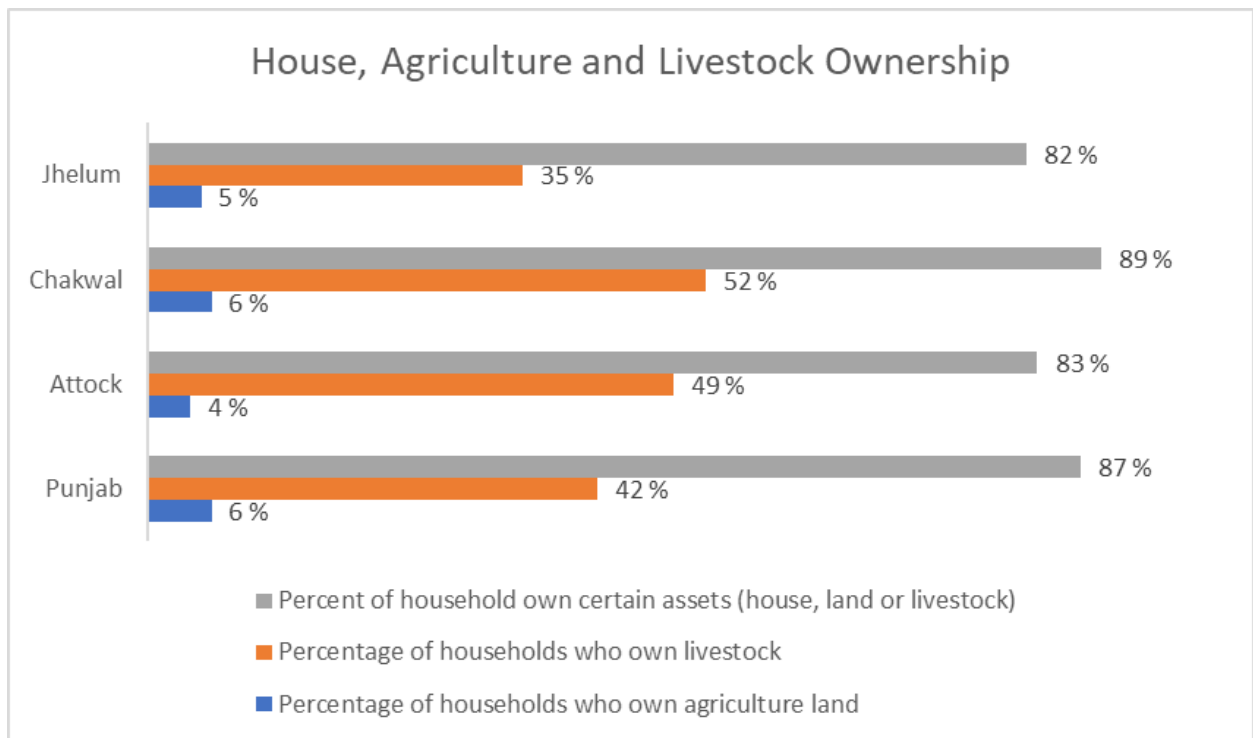


Figure 3. Ownership patterns for project districts (Source: MICS 2017-2018, Vol II)

MICS 2017-2018 indicated that more than 99 percent of the households in the target districts have access to electricity. The indicator also contributes to the SDG indicator 7.1.1. While in Punjab 95 percent of the population living in the rural areas and 99 percent in urban areas have access to electricity. At a provincial level, 46 percent of households primarily rely on clean fuels and technologies for cooking, while at a district level the figures were Attock 52 percent, Chakwal 44 percent and in Jhelum 55 percent of households. In the target districts (Attock 12, Chakwal 7 percent, and Jhelum 9 percent), specifically in rural areas, the communities are using three-stone stove/open fire and for that, they are dependent on forest wood. However, a large percentage of households rely on LPG (Liquefied Petroleum Gas) stove, piped natural gas stove, traditional solid fuel stove, and manufactured solid fuel stove.

In Punjab, 66 percent of women and 83 percent of men have some education (Figure 4). The overall trend in the literacy rate is increasing. MICS 2017-2018 calculated the literacy rate for women and men age 15-49 years. More than 79 percent of the target men aged 15-49 years are literate while the literacy rate among targeted women is more than 52 percent and less than 74 percent. While in Punjab, on average the literacy rate among women is 58 percent.[1]

[1] https://bos.punjab.gov.pk/system/files/MICS%20SFR_Final_Vol1_0.pdf

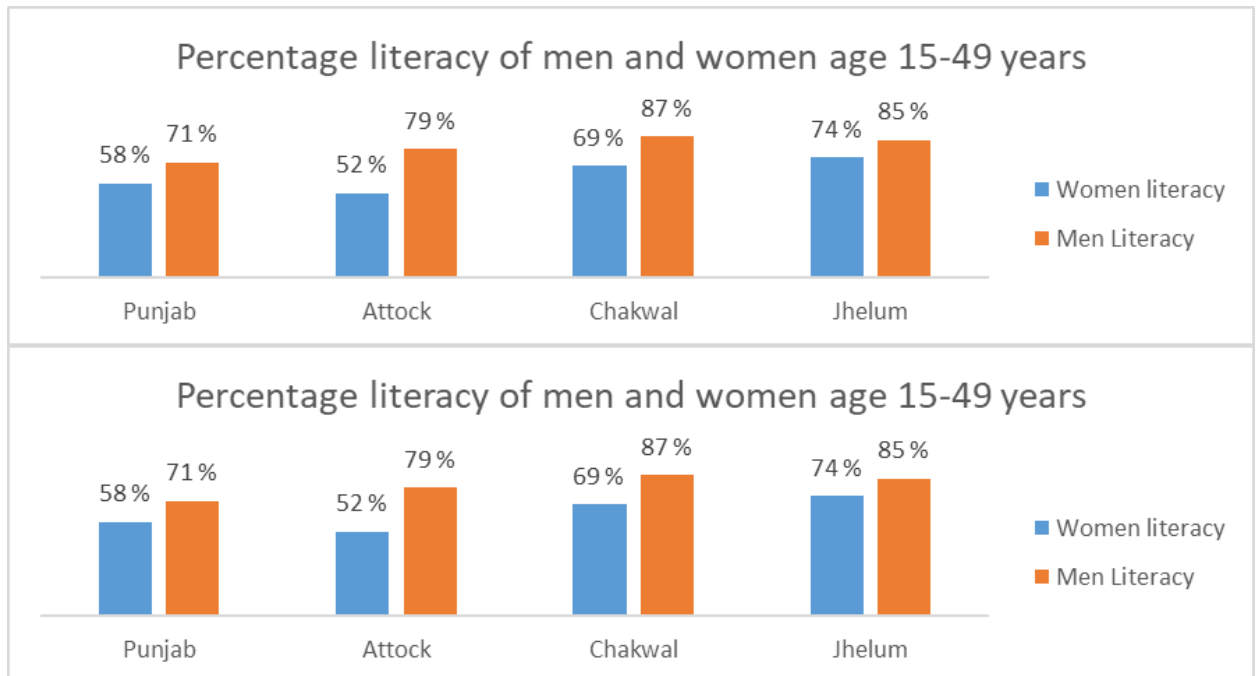


Figure 4. Literacy rates among men and women for Punjab and project districts (Source: MICS 2017-2018, Vol II)

In Punjab about every 3 children out of 5 of age 5-9 years attend primary school levels which are grades 1 to 5. Among children ages 5-9 years old attending primary school, the sex ratio of boys versus girls is 1.01, or 100 boys for every 99 girls. About 1 in 8 children ages 5-9 years (or 12.5 percent) do not attend any school (neither preschool nor primary school) nor receive formal education. Among children of primary school ages 5-9, girls have a higher proportion (15 percent) of school absenteeism than boys (11 percent) of a similar age. Children from the wealthiest quintile are much more likely to complete primary, lower, secondary, and upper secondary school.[1]

The figure shows that overall, the number of schools and enrolment in schools has decreased in the target districts; similarly the number of teaching staff has drastically decreased in Jhelum from 1998 till 2016. While in Attock and Chakwal there is a nominal increase in the number of teachers.

According to MICS Punjab, 2017-18 the data reveals that 89, 94 and 87 percent of the men are continuously living in the same residence of district Attock, Chakwal, and Jhelum respectively (Figure 5). 37 percent of women in Attock, 28 percent in Chakwal, and 39 percent in Jhelum have not lived in the same residence since birth, whether they lived in a city, town, or rural area and the name of the region they lived in before moving to their current place of residence.

[1] https://bos.punjab.gov.pk/system/files/MICS%20SFR_Final_Vol1_0.pdf

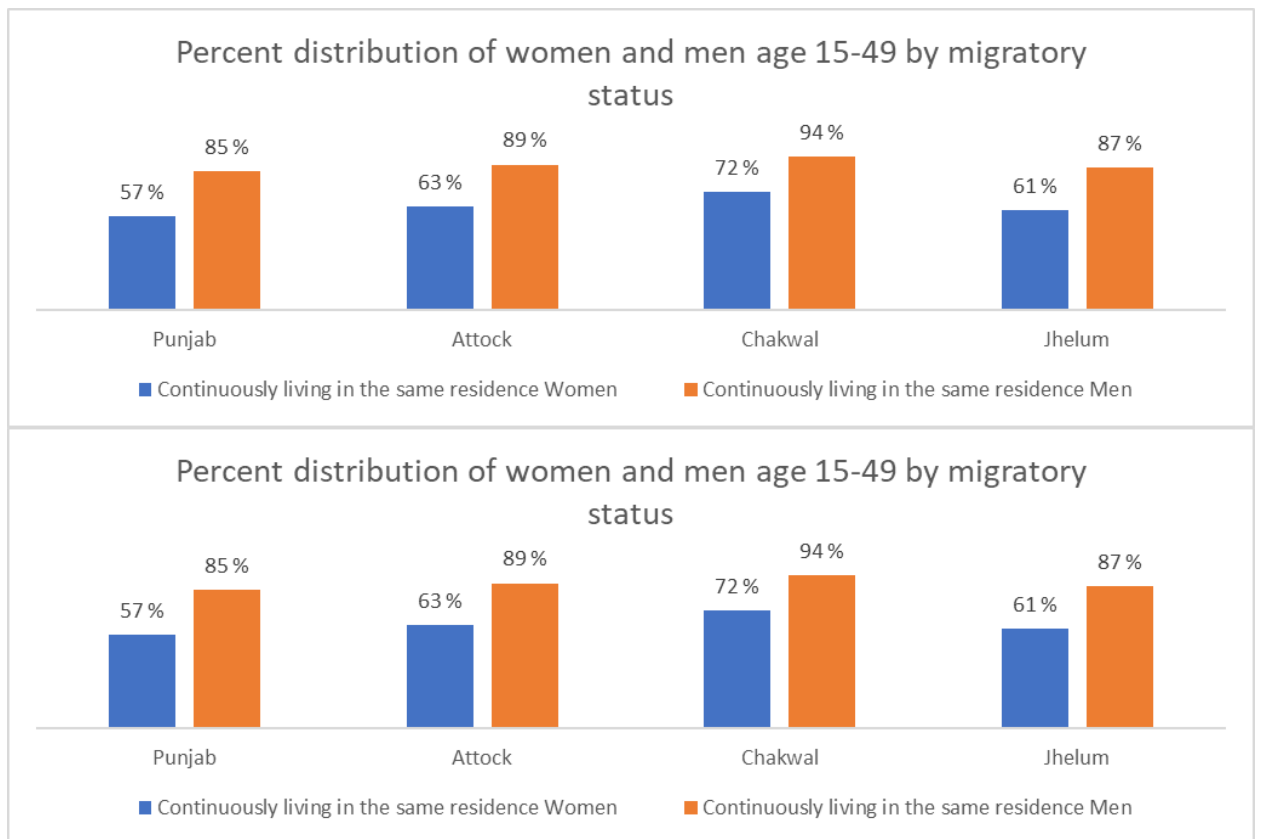


Figure 5. Migratory status for Punjab Province and project districts (Source: MICS 2017-2018, Vol II)

Although problems exist with power supply, the majority of homes in Punjab and the project districts are connected to the national energy grid and enjoy power for most of the day. Almost one-third of households in Punjab have access to the internet at home. About 17 percent - every 6th household -- in Punjab owns a home computer. Three out of ten households in Punjab do not have a television in their homes. In the target districts, more than 73 percent of the households have access to television, more than 94 percent of the household have access to a mobile phone, and on average 28 percent of the households have access to the internet at home, while less than 5 percent of the households can access a radio, as seen in Figure 6.

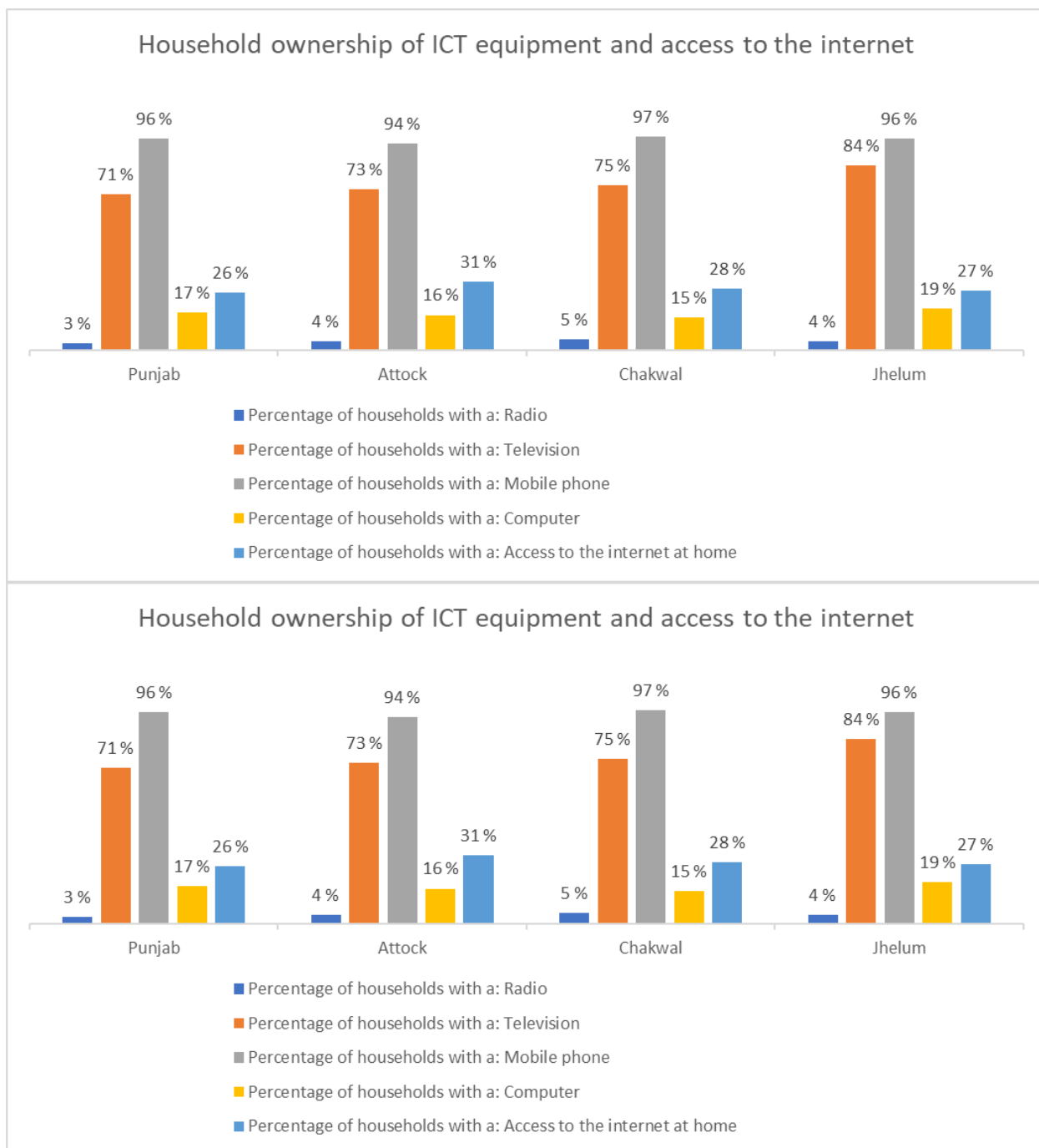


Figure 6. Household ownership of ICT equipment and internet access (Source: MICS 2017-2018, Vol II)

The management of natural resources including that of rangelands is under the responsibility of the provincial governments. For management of rangelands Punjab Forest Department has established Range Management Circle with four Range Management Divisions; Chakwal, Thall, Dera Ghazi Khan and Cholistan. The Chakwal Range Management Division is responsible to manage rangelands in Pothohar tract; extending over Attock, Chakwal, Jhelum, Khushab, Mandi Bahaodin and Gujrat Districts. Range Management Circle manages state owned rangelands alone spreading over 1.217 million ha under the Forest Act of 1927 as amended up to 2016.

ATTOCK DISTRICT

The Attock district, situated on the left bank of Indus River, consists primarily of hills, plateaus, and dissected plains ranging from 596-946 meters above sea level. It is inhabited by 306,649 hhs having 1.884 million population in 2017, According to the last census .[1] The average household size is 6.1, 81.1 percent of population was rural and the dependency ratio was 78.5 percent.

The District was created in 1904, it has 6 tehsils (Attock, Hassan Abdal, Hazro, Fateh Jang, Jand and Pindi Gheb) and 72 Union Councils and 446 villages.[2] The tract has almost above 80% households engaged in some form of livestock rearing however in 2006 there were 107,703 registered farming households (35%) and 63,368 (21%) in 2018. 412,102 ha is cultivated lands and a marginal area is irrigated through micro-dams and wells in high water table areas in Hazro tehsil. The main dryland crops are in the Rabi grouping (wheat, gram, lentil, rape seed and mustard) and the Kharif grouping (maize, jowar, bajra, pulses and groundnuts). Attock has comparatively higher proportion of big landlords especially in southern parts in Jand, Pindi Gheb and Fateh Jang tehsils, where the majority of farmers work on share crop basis as tenants.

The Attock occurs in Plateau in the bottom of outer Himalayas and approximately 36.1% of the district is rangeland. The area has a high livestock density (Table 11) and the rangelands are highly important for local livelihoods and household income; these grazing lands are also utilized by nomadic graziers during the winter. The district is a subtropical sub-humid region, with annual rainfall from 750 to 875 mm, over 70% of which occurs during the summer monsoon (meaning that there are frequent shortages of livestock forage during the winter and spring).

Table 11. Livestock numbers per Tehsil in Attock (Source: Pir Wahab Barani Agriculture University undated but possibly after 2013)

Tehsil	Cow	Buffalo	Sheep	Goat	Poultry
Attock	46,421	9,204	13,820	35,387	47,172
Jand	65,273	8,639	59,092	94,630	80,569
Fateh Jang	86,826	24,429	27,490	68,541	70,342
Pindi Gheb	46,679	9,037	49,327	78,148	55,066
Hazro	41,075	10,545	14,135	15,050	39,708
Hasan Abdal	16,044	8,639	7,153	15,932	12,863
Total	302,318	53,232	171,017	307,688	305,720

Pir Wahab, [3] (Barani Agriculture University) reports that he observed that the main sources of livelihoods in Pind Sultani in southern Attock in Jand Tehsil are agriculture, services and private business. He adds that out of 137 respondents 83 had some form of income from livestock (61%). His following table express income distribution of 137 households (Table 12). As most food produced is consumed within the household, it provides a proportionately high incidence of sales from hides, skin and wool.

Table 12. Livestock contribution to the income in Pind Sultani Attock (Source: Pir Wahab Barani Agriculture University undated but possibly after 2013)

Products	Frequency	Percentage
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Animal sales	21	15%
Dairy product	27	20%
Draught animals	7	5%
Waste material	14	10%
Hides, Skin, wool	62	45%
Fats of animal	5	4%
Blood, bone, intestine	1	1%
Total	137	100%

There are number of important hill series in the district. The Gandgar and Khermar hills in north, Kalachitta range in mid that divide Attock in northern and southern part, Kheri Murat hill series in the east, and the Makhad and Surghar ranges in south west.[4]

The Attock District has 75,682 ha reserved forests these forests are managed by Attock Forest Division, in majority of these forests grazing is permitted on permits to right holders and nomads. Detail of reserved forests area (ha) for each tehsil are provided in Table 13.

Table 13. Forest reserve area per tehsil (Source: Pir Wahab Barani Agriculture University undated but possibly after 2013)

Forest Reserve per tehsil of Attock	Ha.
Attock	19,409
Jand	26,205
Fateh Jang	7,493
Adhwal	5,068
Hassan Abdal	1,011
Pindi Gheb	16,496
TOTAL	75,682

CHAKWAL DISTRICT

The Chakwal District, located at the base of the Potohar Plateau and the Salt Range, ranges from 300 to 1,500 meters in elevation and consists of scrub forest covered hills in the southwest and level plains interspaced with dry rocky patches in the north and northeast. The district was created in 1985 and has 266,109 households having population of 1,495,982 (2017) and average household size of 5.6 persons (Bureau of Statistics, 2017). It has 5 tehsils (Chakwal, Choa Saidu Shah, Kalar Kahar, Talgang and Lawa), 68 union councils and 420 villages, and covers an area of 8,508 ha. Rangelands and forests cover 39% of area of the district and are primarily used for the grazing of sheep and goats. It is drained through Soan River which has Ghabir, Drab, Sarang and Sanj as its major tributaries. Its small eastern part drains through Bunha Stream into Jehlum River. This tract has agro-silvo-pastoral mode of livelihoods.

Rainfed agriculture is widely practiced in this district; wheat, maize, millets, groundnut, gram, mustard, sunflower, and soybean are major agricultural crops. The district climate ranges from sub-tropical, semiarid to sub-humid; annual rainfall varies from 410 mm in the southern part of the Salt Range to nearly over 750 mm at Chakwal.[5] Many areas of the district are subject to heavy soil erosion and gully formation due to inappropriate land use and unrestricted removal of vegetative cover. The scrub forests in the district are gradually disappearing due to excessive exploitation for firewood and grazing

by livestock, and the carrying capacity of grazing areas in general has been greatly diminished and much of the area is now covered with unpalatable plant and grass species.

The Ara Reserve Forest (4326 ha), Noorpur Reserve Forest (1126 ha), and Mari Reserve Forest (3056 ha) are being managed by Chakwal Range Management Division, while 58,103 ha forests are managed through Chakwal Forest Division. Of this 44,771 ha are classed as Reserve, 13,313 ha are unclassified and 19 ha are protected as section-38 forests. The district also is the location of the Chinji National Park that has 6095 ha total area. It is used by 88,003 registered livestock farmers. The detail of livestock in different Tehsils is provided in the table below (Table 13):

Table 13. Tehsilwise Livestock in 2021 in Chakwal Source: Livestock Department Chakwal.

Tehsil	Buffalo	Cow	Sheep	Goat	Poultry
Chakwal	46,558	80,026	23,421	72,880	110,720
C.S. Shah	4,561	20,344	1,146	16,612	20,981
Kallar Kahar	7,277	32,695	8,137	36,012	34,087
Talagang	15,312	89,312	78,940	117,897	124,354
Lawa	3,947	36,107	59,830	82,755	92,875
Total	77,655	258,484	171,474	326,156	383,017

JEHLUM DISTRICT

The Jhelum River passes through the eastern and southern part of Jhelum district; the lands along the river are generally flat, alluvial and quite fertile, allowing for a wide variety of crops to be produced. However, the northern part of the district is primarily rough and broken upland, and contains the Khwera salt mines, which are one of the largest salt mines in the world. It was established as a District in 1849. In 1904 parts of it were annexed to Attock and in 1985 to Chakwal Districts. It has 4 Tehsils, 53 union councils and 652 villages. Its population was assessed as 1,222,650 (2017), having 204,792 households.^[6] The average household has 5.97 members. Rangelands and forests cover 44% of the district area and support large numbers of livestock (Table 14), and local livelihoods are highly dependent on livestock grazing; nomadic herders also come here from the hilly areas of Kashmir and Khyber Pakhtunkhwa.

Most grazing lands consist of dry, deciduous scrub vegetation or some open forest areas. In the Jhelum District, the Phadial Reserve Forest of 4,433 ha is managed by Chakwal Range Management Division as state owned rangeland, and grazing permits allow for grazing to take place. A total of 42,528 ha forests are managed by the Jhelum Forest Division; of this land, 4,960 ha are under military use and 8,751 ha are devoid of vegetation. Hence net area with department is 37,568 ha; of which 321 ha are resumed land, 2299 ha are unclassified and 65 ha are closed as section 38 forests, while 34,883 ha are under reserve classification. It has 40,343 registered livestock farmers.

Table 14. Tehsil Livestock Statistics of Jhelum (Source: Livestock Department Jhelum 2021 data)

Name of Tehsil	Cow	Buff	Sheep	Goat	Rural Poultry
Jhelum	30270	27274	3433	28188	44315

Dina	19014	12630	1056	20146	27235
Sohawa	51567	11980	5724	51561	30780
P.D.khan	44284	43049	13051	54380	60968
Total	145135	94933	23264	154275	163298

1.2.8. Description of the project watersheds and their selection process

Over the past several decades, pasturelands (including grasslands and scrub forests) in the project target area have suffered from significant degradation due to overgrazing and lack of proper pasture management systems. Historically, livestock ranges in the project area had vegetative cover of over 50%, but decades of over-grazing and recurrent droughts have resulted in devastating declines in rangeland health and productivity. Social changes have eroded cultural norms and traditional production methods that prevented degradation and/or facilitated pasture recovery (communal herding, rotational - seasonal grazing areas, drought reserves, etc.). In addition, the arrival of large numbers of Afghan refugees and their livestock herds in early the 1980s, as well as Internally Displaced Persons (IDPs) in more recent years, has pushed many rangelands beyond their carrying capacities. As a result, today the vegetative cover in considerable areas of these districts has been completely eliminated, while the remaining grazing areas are significantly degraded with shrinking numbers of nutritious and palatable plant species. With the loss of vegetative cover, soil erosion has increased dramatically, contributing to the degradation of downstream areas and declines in water quality. The loss of native vegetation has also allowed invasive alien species to spread widely in some areas, including for example *Parthenium hysterophorus* in Attock District. Other threats to rangelands in the project area include construction of housing, roads and mines in Attock District, and coal mining and oil and gas exploration in Jehlum District.

To adequately address LD and socio-economic drivers, the project development team in close collaboration established criteria for the selection of project pilot watersheds in which to conduct field tests, stakeholder engagement and project workplan, investment and VC validations and inputs. Baselines were therefore established from 3 primary sources i) stakeholder engagements and inputs, remote sensing and field surveys.

The Watershed approach was proposed and approved by project stakeholders in various project led workshops or meetings. Not only does the county have a long tradition of working with this approach to resource management, it is described and listed as best practice in the majority of national and provincial legislation and policy documents.

The final selection of the watershed and rangeland areas for project activities and demonstration sites was a largely stakeholder driven process. Selection criteria was based on field survey results, advice of Forest Department and guidance of FAO experts. It is described as follows:

- ? Total area of rangeland
- ? Current grazing intensity or carrying rate
- ? Extent of degradation and deforestation
- ? Represent all land tenures, State owned, grazing areas in Forests and community and private owned rangelands.
- ? State of management and infrastructure
- ? Options for diversity of SLM treatments and management systems
- ? Includes sedentary and nomadic management systems
- ? Include biodiversity hotspots
- ? Have elevated risk from Climate Change

- ? Acceptability by state, community and owners for treatment
- ? Threat demanding early and accelerated efforts for conservation
- ? Avoid duplication with similar projects
- ? Include upper, middle and lower riparian ecosystems

To apply this criteria, relevant watersheds in each District were identified. The tract had four distinct watersheds.

- ? Indus watershed comprising areas in northwestern and southwestern parts of Attock (Hazro and Jand Tehsils)
- ? Haro watershed in Attock draining Hassan Abdal and Attock Tehsil area occurring in northern part delineated by Kala Chitta Range.
- ? The Soan watershed of Fateh Jang and Pindi Gheb draining through Ser stream and directly into Soan River.
- ? Soan watershed of Chakwal District draining through Gabir, Sarang and Drabi streams and directly into Soan.
- ? The Bunha watershed of Chakwal draining into Jehlum River.
- ? In Jehlum District Bunha and Ghaan watersheds and direct Jehlum watershed in southern parts.

Final waterbasins selected for project activities and their total extent are listed below and can be seen in Figure 7:

- ? Indus- Hazro Watershed (47103 ha)
- ? Indus- Jund Sub-division (242,227 ha)
- ? Swan Sub-division in Pindighap (163,646 ha)
- ? Swan Sub-division in southern Talagang (112023 ha)
- ? Kot Sarang Sub-division in Talagang (184,276 ha)
- ? Ghan Nallah Sub-division (108179 ha)

These areas are presented below in Figure 7.

[1] Final Results 2017 census, Pakistan Bureau of Statistics: <https://www.pbs.gov.pk/content/final-results-census>

[2] Bureau of Statics, District Attock at a glance

[3] Pir Wahab carried out study in Pind Sultani Attock with 137 households- possibly after 2013.

[4] (Geological Survey, 2007

[5] PPG LD report 2021,

[6] Pakistan Bureau of Statistics, 2017 census

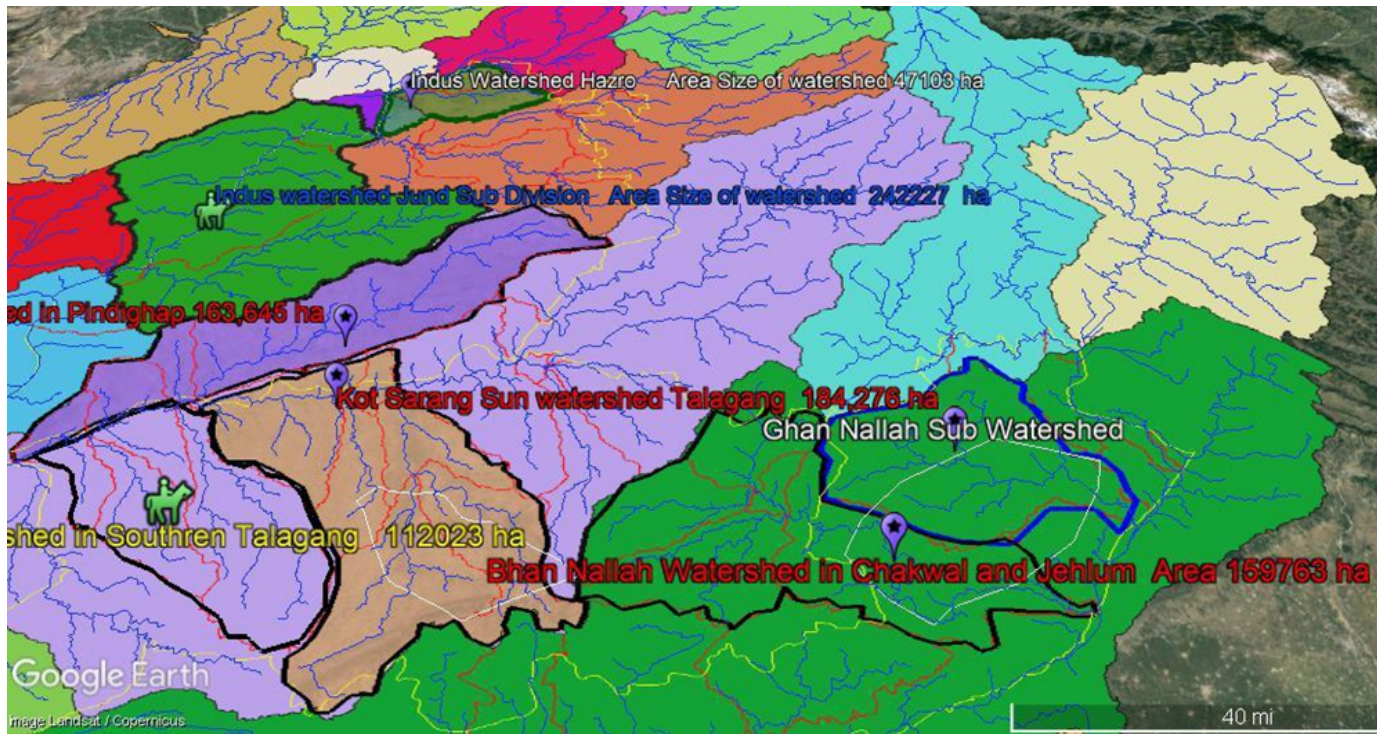


Figure 7. Project selected Watershed Sub-divisions

1.2.9. Socio-economic profiling and validation process of target beneficiaries, value chains and SLM options

The findings below represent the results of stakeholder consultations that took place from February to October 2021 under the PPG design phase, in accordance with GEF guidelines and GoP protocols and standards for participatory stakeholder data collection and gender equality. For the majority of these consultation practices, KII were carried out at a national, provincial, district and community level by the various national and international consultants. Travel constraints and logistical considerations given the COVID-19 pandemic were experienced, and Focal Group Discussions were conducted only when necessary to reduce contagion risk and travel. For further information on the methodology, typology of stakeholders consulted and results, please see the Stakeholder Engagement Document (Annex I2), and the PPG baseline reports provided as Annexes (Annexes P, Q, R and S).

PROJECT TARGET BENEFICIARY PROFILES

Upon realizing the stakeholder engagements and interactions outlined in Annex I2, beneficiaries of project activities can be placed under the following categories:

- ? Dependence on natural resources for livelihoods that are susceptible to climate change. 62 percent of the country's population resides in rural areas, and is directly or indirectly linked with agriculture for their livelihood[1].
- ? Dependence on rain fed crops and systems was included, including dependence on rain fed pastures and rangelands.
- ? Households suffering from poverty, or transient poverty due to seasonal incomes or external economic support. Only 0.05 percent of the households own greater than 2 ha of land in Punjab[2].

- ? Dependence on communities on marginal agriculture for goods and services, and state forest that are at risk due to land degradation and climate change.
- ? Low levels of education and professional skills that prevent members of poor households to transition to climate-resilient sources of income.
- ? Role of women in economy of rural areas. Women in these areas are traditionally responsible for the household economy and are active in fieldwork as well. Any negative consequences of LD or CC will therefore impact women the hardest. Women make crucial contributions in agriculture and rural enterprises in dry lands as farmers, animal husbandry, workers and entrepreneurs through their traditional knowledge.
- ? Youth, Poverty and Unemployed: High incidence of poverty in rural areas can be linked to inadequate infrastructure, lack of opportunities and resources[3].

When these groups were asked about their concerns and recommendations for project activities, as described in Annex I2, the following issues were most commonly cited:

- ? Water scarcity is a serious problem. Stakeholder communities advocate for increased surface water collection and its use both to promote deferred and rotational grazing as well as to irrigate farms.
- ? Increased and facilitated access to rangelands managed by state as well as to the adjoining forests
- ? Sedentary communities request that access be limited to transhumance and nomadic herds and local communities be given exclusive access to State lands.
- ? Greater participation in resource management decisions, especially those related to grazing (pasture access and watering). Community appreciate importance of livestock rearing and argue for rights in addition to obligations.
- ? Beneficiaries are poor and land degradation menace is beyond their economic or material capacities. They want support to control land degradation. As due to erosion land productivity is decreasing, while use of fertilisers in drought period further reduces productivity.
- ? Soil conservation practices and basic community infrastructure such as water storage capacity for domestic water, street pavement, increased road access to rural areas, etc.
- ? Reduced beaurocracy and introduction of a one window operational system, where all departments concerning rangelands and livestock and its feed may provide support from one centralised office.
- ? Capacity Building and training on rangeland management
- ? Women staff for extension services and training events
- ? Special focus on socially or disadvantaged groups

The Punjab Forestry Department, as one of the lead executing partners, also provided the following points for project activities, though some are outside of the project capacity and sphere of influence:

- ? Forest Department does not have the funding to supervise, monitor or investment in range management on State lands.
- ? Department has no data and assessment of resource in the Province, so has no policy as well. Department want that project should provide systems for rangeland resource assessment, policy formulation and development of range management plans for all range management divisions.
- ? Request support in mechanisms and incentives to extend its influence on privately owned rangelands.
- ? Department has no assessment and data of nomadic graziers so want to document and assess this practices, routes, periods and ultimate destination.
- ? Political support and funding for integrated and participatory planning for the rangeland resources to be carried out on a regular basis. Village Land-use Planning (VLUP) approach would then be employed with main focus on range resources.
- ? Political support and funding for rangeland management plans to be prepared for short, medium and long-term interventions, incorporating information about stakeholders? analysis, resource assessment and analysis, sustainable management and marketing of rangeland products.
- ? Support for systems that allow the Forest Department to assess livestock around its grazing lands, assess carrying capacity and take measures to arrest degradation and organise sustainable management.

- ? Forest Department needs support for extension and organisation of communities especially graziers.
- ? Capacity Building for

PROJECT VALUE CHAINS AND LINKS TO BENEFICIARY PRODUCTION SYSTEMS

To determine the adequacy and economic suitability of potential project value chains, a range of stakeholders including Meeting held with Key stakeholders; forest and Range management department, livestock, agriculture, academia, Livestock *mandise* organizers, medicinal plants sellers, graziers, farmers and community people in different intervals. Due to COVID?19 Sops, Zoom and telephonic conversation with different organization heads and NGOs. Meeting held with Key stakeholders; forest and Range management department, livestock, agriculture, academia, Livestock *mandise* organizers, medicinal plants sellers, graziers, farmers and community people in different intervals. Due to COVID?19 Sops, Zoom and telephonic conversation with different organization heads and NGOs. Meeting held with Key stakeholders; forest and Range management department, livestock, agriculture, academia, Livestock *mandise* organizers, medicinal plants sellers, graziers, farmers and community people in different intervals. Due to COVID?19 Sops, Zoom and telephonic conversation with different organization heads and NGOs. with Key stakeholders; forest and Range management department, livestock, agriculture, academia, Livestock *mandise* organizers, medicinal plants sellers, graziers, farmers and community people in different intervals. Due to COVID?19 Sops, Zoom and telephonic conversation with different organization heads and NGOs. The Punjab Forest and Range Management Depts., District Livestock Agriculture Depts., Academia, Livestock *mandise* organizers, medicinal plants sellers, graziers, farmers and community people in different intervals over the course of two separate field mission. Due to COVID?19 Sops, Zoom and telephonic conversation with different organization heads and NGOs when travel was not recommended.

During KII interviews, each person was asked to rank the most common horticultural crops based on 5 principal criteria, being i) adaptability to local environment conditions (Water scarcity/ abundance, rain intensity, temperature variations), ii) market demand and competitiveness, iii) value addition capacity, iv) seasonality and v) gender inclusiveness. These were then summarised under the following tables for each project district (Tables 15, 16 and 17). For more details on the process and approach, please consult Annex R.

Table 15. Stakeholder evaluations of the Horticulture Value Chain results for Attock (Legend 1 = Low, 5 = High)

Product	Market competitiveness (1-5)	Value addition capacity (1-5)	Seasonality (1-5)	Gender inclusiveness (1-5)	Environment: (1-5)	Total
Peanut	5	4	3	4	4	20
Grapes	5	3	4	4	4	20
Olive	5	4	3	3	4	19
Loquat	3	2	2	2	3	12
Gram	4	3	2	2	3	14

Wheat	5	2	4	3	4	18
Maize	4	3	2	2	3	14
Onion	3	2	2	2	1	10
Garlic	5	2	2	2	3	14

Table 16. Stakeholder evaluations of the Horticulture Value Chain results for the Chakwal District (Legend 1 = Low, 5 = High)

Product	Market competitiveness (1-5)	Value addition capacity (1-5)	Seasonality (1-5)	Gender inclusiveness (1-5)	Environment: (1-5)	Total
Peanut	5	5	3	4	4	21
Grapes	5	3	4	4	4	20
Olive	5	3	4	4	4	20
Loquat	4	4	2	2	3	15
Gram	4	3	2	2	3	14
Wheat	5	2	4	3	4	18
Maize	4	3	2	2	3	14
Potato	3	2	2	2	3	12

Table 17. Stakeholder evaluations of the Horticulture Value Chain results for the Jehlum District (Legend 1 = Low, 5 = High)

Product	Market competitiveness (1-5)	Value addition capacity (1-5)	Seasonality (1-5)	Gender inclusiveness (1-5)	Environment: (1-5)	Total
Peanut	5	4	3	4	4	20
Olive	5	3	4	4	4	20
Gram	5	4	3	3	4	19
Wheat	3	2	2	2	3	12
Maize	4	3	2	2	3	14
Potato	5	2	4	3	4	18
Onion	4	3	2	2	1	12
Garlic	3	2	2	2	3	12

Given the interconnectedness of livestock prices and value chains between districts, the results are presented as a group in Table 18 below.

Table 18. Stakeholder evaluations of the Livestock products for all project selected districts

Product	Market competitiveness (1-5)	Value addition capacity (1-5)	Seasonality (1-5)	Gender inclusiveness (1-5)	Environment: (1-5)	Total
Buffalo	4	4	5	3	4	20
Domestic Cow	5	4	5	5	5	24

Poultry	5	4	5	5	5	24
Goat	4	4	5	3	5	21
Sheep	3	4	5	3	5	20

As project outputs also deal with Non-Timber Forestry Products (NTFP), they were also explored and their suitability per district is presented in Table 19.

Table 19. Stakeholder evaluations of the Non-Timber Forest Products for all project selected districts

Jhelum	Attock	Chakwal	Products
			Honey Bee
			Acacia Resins
			Wild aromatic plants extracts
			Mesquite Wood Charcoal
			Sacrum/Bamboo made items

Given the beneficiary profiles presented above, stakeholder inputs and analysis on value chain gaps and weaknesses by the project development team, the following value chains were presented and validated by stakeholders during the final stages of the PPG process. They include the two most frequently reported households produced good items across all project districts (Dairy and Poultry), as well as address the chronic shortage of quality animal fodder. Dairy and poultry can also be considered as Gender Sensitive value chains. The NTFP value chains selected are Acacia Resins, also gender-sensitive, as well as Beekeeping, due to its cross-cutting social and environmental elements and importance to the SDG 15.3 indicators and objectives. These are briefly presented and described below.

FORAGE CROPS

Stall feeding is an important element of Pakistan's livestock culture, with crop residues and cultivated leguminous fodders forming the basis of daily rations for most small holders, while commercial stock rely on concentrated feeds.[4] At the same time, Pakistan has a two pronounced forage and feed deficient periods, the most severe being December to January, when the traditional winter fodders of berseem (the major winter fodder; *Trifolium alexandrinum*), Shaftal (*Trifolium resupinatum*) and Lucerne (*Medicago sativa*) are dormant. The other critical period is May to June, when the summer fodders of maize (*Zea mays*), pearl millet (*Pennisetum glaucum*), sorghum (*Sorghum bicolor*) and sorghum- Sudan grass hybrids (*Sorghum vulgare* var. *sudanense*) have only just begun growth, but the winter fodders are finished. Until recently, seed of improved fodders, especially multicut oats, has not been available, so there has been a scarcity of fodder in terms of both quantity and quality.

Due to severe and seasonal shortages of forage, animals remain under-nourished and unproductive in relative terms, and are subject to poor health and disease. Forage reliability remains a bottleneck for the development of the livestock industry and hence adequate availability of livestock products in these months. Consequently, prices of livestock products often become high during these months. Silage and hay making using balers is a viable option when plenty of fodder is available in peak season of crop especially in July-August and in February-March. [5]

The project activities related to the fodder value chain will seek to pilot forage production under water-saving technologies, salt-tolerant and leguminous shrubs plantations on marginal lands, improved hay-making equipment and storage facilities. The renewable solar energy funds outlined in the Budget (Annex B) are also available for developing feed concentration facilities that increase transport means and methods by reducing water and bulk.

DAIRY (Gender-sensitive)

Pakistan produces more than 59.7 billion tons of milk annually, implying an annual market size of more than USD 34 billion, mostly in the informal segment.[6] Packaged milk makes up only 9 percent of total milk consumption in the country and is vital source of food security and income for smallholder pastoralists.[7] Pothwar region's women contribution in animal rearing, dairy products, milking and in-house management is above 60 percent but in trade and business of animals and dairy products is less than 5 percent. On the supply front, milk yield is per animal has significant room for improvement. Similarly, absence of scale further compounds problems increasing overall cost of production, thereby resulting in an eventual increase in retail price, making it unaffordable for the majority of the population.

The export levels of certain commodities are controlled through non-price measures like export taxes or sometimes export ban on these commodities especially on milk, meat, potato, etc. These measures sometimes are unpredictable and thus become the major constraint on the cluster development as investors no longer invest under such uncertain environment.

Climate change is expected to decrease pasture productivity, decrease water availability, spatial distribution and quality and an increase heat loads on animals. High temperatures can also increase spoiling and loss dairy products without storage or refrigeration facilities.

POULTRY (Gender-sensitive)

Poultry has been selected given its importance in smallholder livelihoods, local diets and links to food security and gender issues. It was also identified in Punjab Livestock Policy as key product for development in selected project districts.

As mentioned above, the Poultry sector is one of the most organized branches of the agriculture sector of Pakistan. Its growth rate is 10-12 percent per annum, with over 15,000 poultry farms being distributed in rural areas across the country. [8] Demand is high, with 40-45 percent of the national meat consumption being procured from poultry products. Capacity of farms usually range from 5,000 to 500,000 broilers. Sale and marketing channels of broilers and eggs are predominantly still conducted through unorganized value chains.

Poultry rearing and production provide a valuable source of income and is recognized for making an important contribution to the reduction of food insecurity and rural poverty. In particular, the role of family poultry in poverty alleviation, food security and the promotion of gender equality is established, and rural poultry production generates cash income and employment opportunities for women and youth. [9] The market for poultry in Pothwar region is consistent, and prices tend to remain steady over time, as the demand for poultry and poultry products is constant throughout the year.

Backyard poultry management is especially important for women, as it can be undertaken within the household grounds and can thus be carried out alongside their other multiple tasks. In Pothwar region the traditional backyard system still dominates poultry production and is entirely women's responsibility. They often control the entire production and processing chain, from raising chicks to

marketing. Children may also be engaged in tasks related to poultry farming. While boys may be involved in constructing sheds, girls are most likely to work alongside their mothers on the different tasks related to the daily management and tending of poultry stock. Men also generally perform some tasks related to poultry farming. They tend to be better trained in husbandry and health practices (vaccination, treatment against internal parasites, etc).

Some of the key elements that contribute to the success and sustainability are:

- ? Improved breeding
- ? Innovation in production, husbandry and marketing channels
- ? Targeting of impoverished households for activities approach
- ? Incorporating a demand-driven or FFS approach of training

ACACIA RESINS

At an international scale, Pakistan has been leader of all gums and resins apart from Gum Arabic, supplying 21,962 tonnes in 2005.[10] The market is variable however, and price and production fluctuations are the norm. For instance, the total export values varied between 77,000 USD and 39,000 USD from 2016 to 2019.[11] This steady decline in prices, emerging international competition, in addition to **frequent outages in electricity** and gas supply also pose real challenges to production and economic sustainability.[12]

Little information is actually available on best practices in Acacia management or resin harvesting at a national or subnational scale. Project activities would therefore seek to provide more information on the markets, conduct value chain mapping and outline SLM practices and bottlenecks for VC strengthening, in addition to supporting training and investments in materials within Component 2.

Opportunities lie in strategic planning and design to create agrosilvopastoral production systems that both depend on and produce a range of products and services. Acacia forests or open, savannah woodlands not only provide natural gums and resins, but provide shade for livestock, fix nitrogen, produce fuelwood and allow for grazing and other land practices to continue. Therefore, agroforestry is a vital component of project activities, yet seeks to provide for livelihoods as well through value chain development.

BEEKEEPING

The Beekeeping industry is increasing within the Chakwal, Jelhum, Attock and surrounding districts of Punjab, according to recent publications.[13] Pakistan is currently producing approximately 7,500 metric tonnes of honey per year, with over 8,000 rearing imported bees in one million beehives, according to the Honeybee Research Institute in Islamabad. Most of the production is exported to Saudi Arabia, the UAE and Kuwait, generating near to \$6 million in foreign exchange annually.

The Prime Minister Imran Khan launched the 'Billion Tree Honey Initiative' in December 2020 to increase honey production to 70,000 metric tons in a year, a ten-fold increase target. The government estimates this would generate around 43 billion rupees (\$268 million) for the national economy and provide about 87,000 green jobs. Under the program, the government has pledged to increase the plantation of specific trees and flora to improve the quality and production of honey and grant interest-free loans to traders. Industry insiders predict the numbers of producers will continue to increase as the country's beekeepers benefit from Pakistan's push to reforest the land under its '10 Billion Tree Tsunami' project, launched in 2018.

CC will negatively affect this currently developing sector. A change in temperature upward to abnormal limits significantly reduces the flight activity of bees.[14] At high temperatures, a significant proportion of worker bees gather under the hive to cool their bodies. Research shows that the rise in temperature has caused the formation of toxic substances in nectar and pollen of many plants, which

can cause basic melliferous plants to become poisonous to bees.[15] Introduction and development of beekeeping in the region will consider the climate trends and future impacts to determine timing and geographical location of activities.

By increasing vegetation cover at micro and macro scales, the available apiary resources will increase and reduce temperatures. Decreasing temperatures, or the creation of cool-zones (areas of high vegetation cover to provide shade, or other temperature refuges, will decrease heat-loads of all livestock, including bees. SLM practices and approaches are provided in the following sub-section below.

VALUE CHAIN SUPPORT INVESTMENTS AND DEMONSTRATIONS

In addition to the targeted work on the aforementioned value chains, other support mechanisms will be provided for value chain enhancement and will constitute investments of demonstration models for sustainable production, product development and storage/transport.

Farmer-led investigations into locally led and adapted silvopastoral systems and natural-assisted rangeland regeneration will be supported through technical and material support. Community nurseries will also provide opportunities for increasing productivity and the availability of native species for forage and water point areas. The use of low-tech, but proven innovative approaches to reseedling, such as the use of seed balls which not only protect the seeds until rainfall is sufficient, but provide conditions needed for increased germination and survival rates of seed.

Renewable energies and cold storage options will be piloted and promoted through the project, in accordance with the PIF: The project will demonstrate the potential for solar-powered cold storage structures for local consumption or solar-powered cold transport options to enable producers to transport and sell goods in more distant markets. Solar driers for grapes resins, figs drying, mulberry are also to be considered as low-cost, energy efficient options that do not produce Green House Gases. If locally produced biofuel options are available for energy supply and transport, they will be considered, as will electric-powered transport vehicles or cost-sharing programmes. Other opportunities under this system is investing in shade structures for livestock in field and transport conditions, to reduce heat-loads, loss of animals and animal welfare.

The specific investments will be assessed using criteria on environmental and socio-economic sustainability, including potential impacts on sustainable land use. This output also will include a focus on training of women in business management, marketing, storage and processing activities along the entire value chain route, though links to ecological sustainability and rangeland restoration should continue to be a priority for selection.

VALIDATION OF SLM PRACTICES AND CLIMATE ADAPTED APPROACHES

The participatory stakeholder consultations also allowed for inputs on previous projects and GoP-led initiatives and SLM practices for the target watersheds. The FGDs and Key Informants Interviews (KII) revealed the projects implemented in the province over the last 10 years that had enjoyed success were focused on water-harvesting and storage options, increased irrigation area, were community-based and had a wide base of support by government and non-governmental organizations working in the targets areas.

More specifically, the SLM approaches that had been successful and were promoted as best practice by stakeholders are described below (Table 20).

Table 20. Description of the SLM technologies identified by stakeholders during project development:

NAME OF SLM	DEFINITION (FAO)	TARGETED BENEFICIARIES	BARRIERS
Water Harvesting	<p>“collection of runoff for its productive use”.[16]</p> <p>Runoff may be harvested from roofs and ground surfaces as well as from intermittent or ephemeral watercourses.</p>	Rural and urban communities, land users, especially those dependent on natural resources for livelihoods and drainage-basin communities	Cost of construction and upkeep, debatable returns on investment (lack of data), lack of economic incentives, knowledge gaps
Water-saving and recovery technologies	Technologies or approaches that increase production efficiency or water recovery rates for secondary uses	Small and medium size farms, rural households and communities, value chain operators	Initial investment costs and high amortization, maintenance, lack of economic incentives, knowledge gaps
Soil fertility practices & technologies	Soil fertility is the ability of a soil to sustain plant growth by providing essential plant nutrients and favorable chemical, physical, and biological characteristics as a habitat for plant growth. [17]	Small and medium size farms, rural households and communities, value chain operators	Lack of economic incentives, access to materials, knowledge gaps
Soil conservation practices & technologies	Reversing the degradation of soil, water and biological resources and enhancing crop and livestock production through appropriate land use and management practices are essential components in achieving food and livelihood security [18]	Small and medium size farms, rural households and communities, drainage-basin communities	Lack of economic incentives, knowledge gaps

Forest Regeneration	Forest regeneration is the application of technology to allow forest to return to their ecological climax after trees have been harvested or have died from fire, insects, or disease.	Rural and urban communities, land users, especially those dependent on natural resources for livelihoods and drainage-basin communities, value chain and tourism operators	Initial investment costs, lack of economic incentives and materials, knowledge gaps
Rangeland rehabilitation	Process by which rangeland species return to a contextually appropriate species composition and land productivity as stipulated by the Land Potential[19] and land management objectives	Pastoralists, rural households, rural communities and drainage-basin communities	Initial investment costs, lack of economic incentives, knowledge gaps
Agroforestry	Agroforestry is the collective term for land-use systems and technologies in which woody perennials (e.g. trees, shrubs, palms or bamboos) and agricultural crops or animals are used deliberately on the same parcel of land in some form of spatial and temporal arrangement.[20]	Rural and urban communities, land users, especially those dependent on natural resources for livelihoods and drainage-basin communities, value chain and tourism operators	Initial investment costs, lack of economic incentives, knowledge gaps
Climate Smart Agriculture and integrated farm design	Climate-smart agriculture (CSA) is an approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate.[21] Integral, holistic design of the production space is a key element to the approach.	Small and medium size farms, rural households and communities, drainage-basin communities	Initial investment costs, lack of economic incentives, knowledge gaps

Wetlands and Riparian zone rehabilitation	Process by which riparian forest and wetland species return to their historic species composition and density	Rural and urban communities, land users, especially those dependent on natural resources for livelihoods and drainage-basin communities, value chain and tourism operators	Initial investment costs, lack of economic incentives, knowledge gaps
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More specifically, the SLM and rangeland recovery recommendations that were received from local stakeholders and are presented in the PPG Field Survey Report (Annex Q) are presented in Table 21.

Table 21. SLM and rangeland restoration methods based on project baselines and stakeholder proposals.

Name of Activity
Capacity building trainings of State institutions in rangeland ecology and management practices
Establishment of Village development committees having 5 % female members in all 7 project watersheds
Community nursery development (2 per district)
Raising of native grass, shrubs and trees in community nurseries, including Acacia trees
Distribution of native grass, shrubs and trees to local project beneficiaries, including Acacia trees
Distribution of forage crops and forage trees seedlings to project beneficiaries
Improvement of grass lands with seed balls having four Acacia seed, mixed with local grass seed (2500 per ha)
Use of grass seed balls just before or during Monsoon rains (5000 per ha)
Maintenance work on existing Water Ponds
Development of a Grass Seed Nursery, whose function is to produce sufficient grass seed to meet demand
Afforestation of fodder trees with community demonstration sites with water harvesting techniques
Establishment of control range management enclosures (40 ha each) with establishment of mother tree source i.e. plantation 300 Acacia per hectare
Establish grass as an alternative to cultivated crops on highly productive farmland at Hazro and Jehlum, plant single species or simple mixtures of warm-season tall grasses that respond efficiently to nitrogen fertilization, are palatable, have inherently high livestock carrying capacity, and resist encroachment by less productive vegetation
Reseeding of Grasses i.e. The year before grasses are planted, establish forage or grain sorghum types in rows one to three feet apart, preferably in east-west rows at right angles to prevailing southerly and northerly winds that desiccate the grass seedbed or cause erosion.
Shelter belt plantation of fodder trees on arid agriculture lands.
Re-digging of old tobas
Reseeding of Grasses through multiple use-seed balls (3 fodders tree seeds mixed with grasses).
Development of infrastructure necessary to use <i>Prosopis</i> and other invasive plant areas as shade structures and cooling areas for livestock

Erosion works within watershed to reduce water speed, increase landscape spreading, infiltration rates and soil retention
Making of one earthen water spreading bund 10 each per 50 ha.
Making of one large water harvesting pond 1 each per 50 ha
Making of 5 small water harvesting pond

[1] https://www.finance.gov.pk/survey/chapter_10/02_Agriculture.pdf

[2]

<https://www.pide.org.pk/pdf/psde20AGM/Landlessness%20and%20Rural%20Poverty%20in%20Pakistan.pdf>

[3] http://www.issi.org.pk/wp-content/uploads/2014/06/1299051742_14233891.pdf

[4] FAO 2004, Chapter VI - FODDER OATS IN PAKISTAN (Dost, M), FODDER OATS: a world overview, viewed on 22/10/2021, <https://www.fao.org/3/y5765e/y5765e0a.htm#bm10>

[5] Mehmood et al 2020, Forage preservation technology for sustainable livestock industry in rainfed areas of Pakistan: A review. Pure and Applied Biology. Vol. 9, Issue 3, pp1849-1855. <http://dx.doi.org/10.19045/bspab.2020.90197>

[6] PPG Value Chains Report, Yahya, M 2021, Report to inform the Project Document on issues of Value Chains options and opportunities, GCP/PAK/905/GFF

[7] Mehmood. K. and Torsten H. (2003). A review of Milk production in Pakistan with particular emphasis on small scale producers. Pro-poor livestock policy initiatives. PPLPI working paper page 12. <https://assets.publishing.service.gov.uk/media/57a08cdd40f0b652dd0015fe/PPLPIwp3.pdf>

[8] Pakistan Poultry Association 2020, an Overview Of Pakistan Poultry Industry Year 2020-2021

[9] Economic survey, 2020-21

[10] Lemenih, M. and Kassa, H. (eds) 2011 Opportunities and challenges for sustainable production and

marketing of gums and resins in Ethiopia. CIFOR, Bogor, Indonesi

[11] Selina Wamucii 2021, Pakistan Natural Gum Arabic Prices, viewed 04/11/2021, <https://www.selinawamucii.com/insights/prices/pakistan/natural-gum-arabic/>

[12] Business Recorder 2017, Pakistan Gums and Chemicals,

<https://fp.brecorder.com/2017/12/20171226330346/>

[13] Bee Culture 2021, CATCH THE BUZZ ? Pakistan Honey Production is Growing, viewed 04/11/2021, <https://www.beeeculture.com/catch-the-buzz-pakistan-honey-production-is-growing/>

[14] FAO 2020, Project Document for ?Sustainable Forest and Rangelands Management in the Dryland Ecosystems of Uzbekistan?, GCP/UZB/003/GFF

[15] idem

[16] Critchley, W & Siegert, K 1991, A Manual for the Design and Construction of Water Harvesting Schemes for Plant Production, Water harvesting (AGL/MISC/17/91), FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS - Rome, 1991

[17] <http://www.fao.org/global-soil-partnership/areas-of-work/soil-fertility/en/>

[18] <http://www.fao.org/soils-portal/soil-management/soil-conservation/en/>

[19] Land potential is defined as the inherent potential of the land to sustainably generate ecosystem services required to meet today?s needs without compromising our ability to meet the needs of the future. <https://landpotential.org/knowledge/what-is-land-potential/>

[20]

<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahU>

KEwiXiqrkzNvzAhXLxYUKHWxiBSUQFnoECAQQAQ&url=http%3A%2F%2Fwww.fao.org%2Fforestry%2Fagroforestry%2F80338%2Fen%2F&usg=AOvVaw2LivBdYMzzthn8NK-sFHt5
[21] <http://www.fao.org/climate-smart-agriculture/en/>

1.2.10. LDN baselines and DSS design support for project development

Determining quality LDN baselines is a vital component in the application of the LDN conceptual framework, as the baseline will be used in determining areas for improvement, resource allocation and suitability of actions and decisions taken in the efforts to contain and reduce LD impacts.

To understand current context regarding land assessment and surveying, a brief introduction to previous survey campaigns is provided, followed by project specific baseline methods, tools and results used during the project design phase.

PREVIOUS BASELINES AND METHODS USED FOR LAND SURVEYING

National Forest and Range Land Resource Assessment Study (NFRRAS) was launched in 2004, having the main concerns to devise and implements a standardized system of periodic assessment and monitoring of forests and range land. The other objective of the study was to detect the changes in forests and range land resources of Pakistan with compare to Forestry Sector master Plan.

The study has quantified existing resources in term of cover percentage, detected temporal changes at 5 years interval and correlated these changes with socio economic conditions of the dependent communities.

In this study LANDSAT TM images were used having 30 m spatial resolution. The satellite images were digitally processed and assessed the changes occurred in forests cover and range land during 1997 and 2000. The accuracy of Land Cover maps so developed were statistically analyzed against the field data collected from more than 2000 sample plots scattered in different ecological zones of Pakistan. For field investigation, stratified random sampling techniques were applied, and can be [accessed at the following link](#).

NFRRAS reported that in Pakistan total area under forest cover is reduced from 3.60 m ha to 3.32 m ha between 1997 and 2001 at an average rate of 27000 ha per annum. In the post FSMP period, forest areas in Khyber Pakhtunkhwa, Punjab, Sindh, Balochistan and Gilgit Baltistan have been reduced, whereas it has been increased in Azad State of Jammu and Kashmir. The highest rate of de forestation was detected in northern areas (Gilgit Baltistan), where forest cover reduced to less than half in 10 years. The Govt. of Pakistan want to examine the effectiveness of the forest ban imposed in 1992 as whether the ban has achieved its objectives and to decide whether to lift the ban or not. The Swiss funded Integrated Natural resource Management Project (INRMP), a project for promoting participatory approach for the integrated management of natural resources, played a pivotal role in this process.

The Ministry of Environment (MoE) prepared and documented National Land Use Plan (NLUP), during 2004 based on Landsat-5 TM satellite images (1998-99), to determine the existing situation of different land uses and to document the changes occurred in its status so that future decisions are taken

for optimum protection and conservation of natural resources and sustainable socio-economic development of the country.

The satellite images were classified and different land cover information extracted which included forest, agriculture land, rangeland, bare soil, exposed rocks, deserts, built-up area, waste land, water bodies and snow/glaciers. The tract known as range is bound by the piedmont of the Salt Range in the north, the Indus River flood plains in the west and Jhelum and Chenab River flood plains in the east. Ecologically, it is situated in the tropical plains. The mean maximum and minimum temperatures recorded in the tract are about 44 °C and less than 00 °C respectively. The wind affects the amount and distribution of rainfall in the desert, most of which is received in monsoon. It varies from 133 mm in the southern areas to 30 mm in the northeastern region of the tract. The soils are alluvial with sandy textured sand dunes covering 50 to 60 percent of the area. Continued heavy grazing and ruthless cutting of trees and shrubs have resulted in the complete disappearance of several desirable species. The topsoil has been eroded by wind erosion and sand dunes have become unstable. The vegetative cover and forage production have declined substantially. Geo-morphologically, this area consists of sand ridges, abandoned channels and flood plains.

PROJECT LDN BASELINE ESTIMATES UNDER UNCCD DEFINITIONS

The context-specific nature of the SDG 15.3.1 indicator, which is built using 3 sub-indicators (Land Cover Change, Land Productivity Trend and Trend in Soil Organic Carbon (SOC; seen as a proxy for carbon stocks above and below ground, 30cm of the soil)?, and the complexities surrounding large scale surveys on the extent, degree and rate of LD, made establishing baselines based on previous data difficult for the project design team. This was further complicated by the many data gaps found while working at the provincial and district levels. The data that was available was often limited to small areas, or was not linked to map coordinates. The COVID19 restrictions during the PPG phase (2020-2021) also increased the complexities and logistics for field surveys on the proposed project sites, though they were conducted appropriately.

M&E

The LDN approach has largely focused on a portion of the LDN impact pathway, but it is also important to mention other relevant M&E considerations. These include Change of State/ Impact indicators that may not have enough sensitivity to capture changes in the scale and lifetime of the project (Gonzalez-Roglich et al. 2018). A recent experience in Turkey (Tengberg et al. Publication in review) suggest that *to understand progress made in achieving LDN, it is important to monitor LDN along its entire impact pathway and include: process/response indicators related to strengthening of the enabling environment, including policies and legislation, individual and institutional capacities and monitoring and information systems; stress reduction/change of pressure indicators related to land-use planning, sustainable management practices and; change of state/ impact indicators of improved land productivity, land cover, SOC, and improved socio-economic conditions.*

To develop required baselines for project monitoring and to provide guidelines for Output 1.1.2 which specifically requires the development of a Rangeland Assessment System, the project design team relied on remote sensing following recommendations from the UNCCD. The [Good Practice Guidance \(GAP\)](#) promotes the use of at minimum the SDG 15.3.1 and its sub-indicators, in addition to field surveys and grazing capacity measurements to assess current conditions and carrying capacities.

Remote sensing definitions for Land Cover classes under the UNCCD guidelines fall under 7 simplified classes, being (Tree-Covered, Grassland, Cropland, Wetland, Artificial, Other Land, Water Bodies). Measurement is typically done using one of the available land cover data sets and

recategorizing the results . Land Productivity typically relies on estimating a proxy for Net Primary Productivity (NPP) trend to locate areas of ecological disequilibrium. The SOC trend for the period normally relies on using models on Digital SOC maps and ancillary datasets. There has been some debate on the accuracy of the maps produced using global datasets for other PPG design processes conducted in Central Asia and other regions.

The default process is to calculate independently each of the sub-indicators using the Trends.Earth software and default datasets. The resulting map is divided into 3 categories of 'degraded, stable, improving' (Sims et al. 2020). If one of the 3 sub-indicators gives 'degraded' as a result, the entire area is to be considered as degraded under the GPG's one-out-all-out (1OAO) principle. Issues with the 1OAO principle have arisen and led to the recently published LDN Interpretation Matrix (Sims et al. 2020) which allows to fine tune definitions of Land Degradation by taking into account stakeholder viewpoints and management objectives. Also, beside the biases in the global datasets that affect with different intensity the different regions, the methods to produce sub-indicators also present some known-issues. For example, trends in land cover and in SOC are highly correlated and dependant because the land cover data is the principal source for temporal variation in both analyses, also the same land cover is used in the performance sub-indicator that originates the Land Productivity, all of which also contribute to propagation of biases.

To better understand and present the location and information available on LDN and natural resources at the provincial scale, **the project designers have developed an interactive app that was used during the PPG phase and will be available for use and further development during project implementation.** This allows for context specific baseline establishment at the required scales, providing data at Landscape, District, Watershed, Provincial and National scales and for individual land cover classes and cross-analysis of data.

To access the project specific LDN app, please follow the provided link:

<https://projectgeffao.users.earthengine.app/view/srm-punjab>

This application allows users to set baselines and collect/validate data for a wide range of scenarios and scales, and therefore set context specific baselines on a range of factors for diverse land units types. The App allows to perform multi-criteria analysis to select hotspot and areas of interest and thus serving as a basis for a future DSS development. The possibility to explore the dataset in a dynamic way without any GIS requirement and in an intuitive environment also facilitates that more stakeholders can evaluate the quality and usefulness of the data, which contributes to understand how to improve the LDN indicators in the future. It also can provide a range of information on project demonstration sites and their waterbasin areas, as described below.

PROJECT FIELD SURVEY RESULTS

Systematic random sampling technique was used for collecting data in order to reduce the possibility of bias, determining a valid sampling error and ensuring uniform coverage of the target area; in order to find out physical appearance and floral information in the field.

For ideal detail study of these areas there is need to have sample plots were laid out on geo-referenced maps of these district Attock and Jhelum by using a grid of 1000x1000 m. The coordinates of the centers of the sample plots shall be noted from the maps and uploaded onto GPS and navigated in the field accordingly. Beside on maps, GT sheets were also used to locate the actual position of the sampling units in the field. The plots were required permanently marked on the ground by inserting iron rods in the centre of the sample plots for verification and future monitoring. This cannot be achieved in short span of period for all three districts in 40 days, thus due to shortage time and huge work few random plots were selected while travelling through these two districts and the data for

identifying actual degradation; three nested circular plots shall be established for collecting the data. Three subplots were established within each plot for specific purposes. The outermost circular plot with radius 17.84 m was used for counting/identification of trees. The wider circular plot was ordinary laid out the help of measuring tape. The second circular plot with radius 5.64 m was used for counting/identification of shrubs and sapling; and the innermost plot with radius of 0.56 m was used for grasses as well as soil. Figure 8 shows the nested Circular Plot. In this way, a total of 75 plots were conducted, 37 in Attock, 22 in Chakwal and 19 in Jehlum.

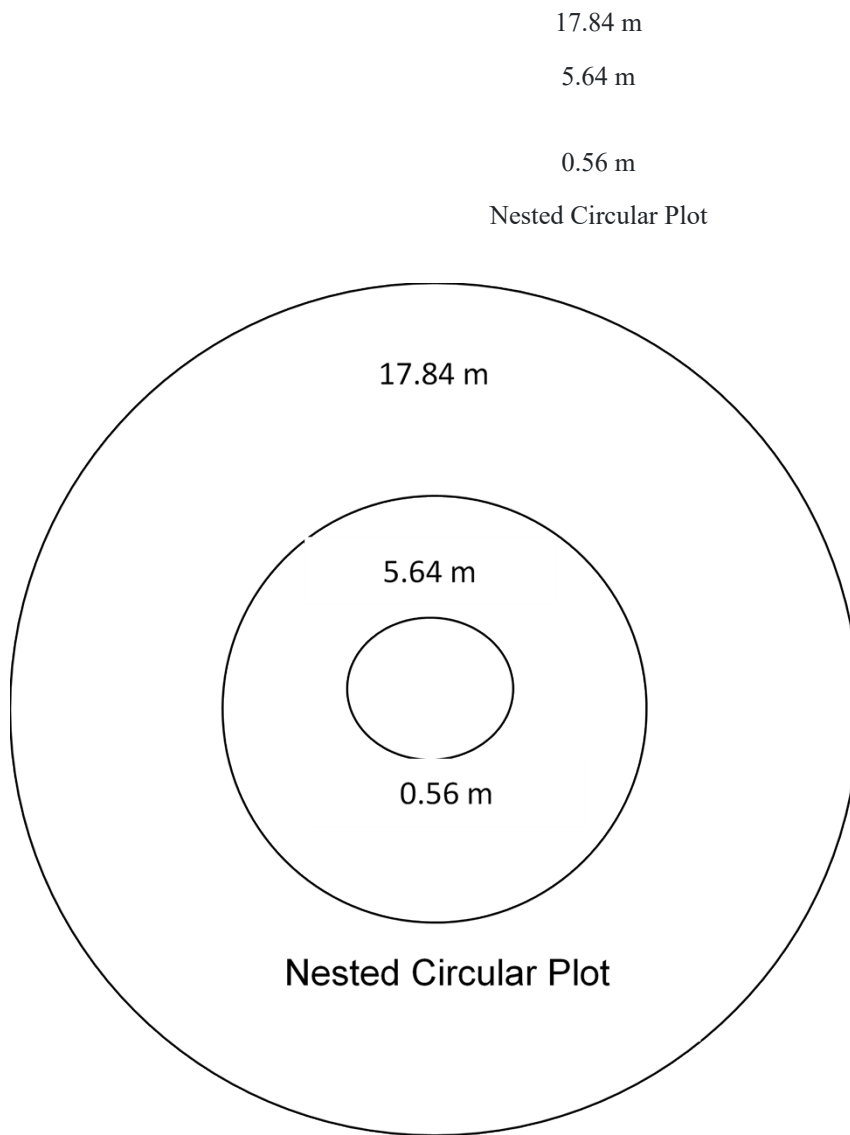


Figure 8. Outline of field survey plot used during project development phase

The above nested circular plot the following parameters were measured at selected sample plot location:

- ? **Date**
- ? **Name of Data Recorder**
- ? **Plot No.**
- ? **Location: Name of District, Forest Division, Forest Subdivision/Forest Range, Forest Block, Forest Compartment and Forest Area**
- ? **Landuse Class: Forest Land, Grass Land, Crop Land, Wetland, Settlement, Other Land**
- ? **Forest Type: Natural Forest, Plantation**
- ? **Stand Composition**
- ? **GPS Coordinates**
- ? **Elevation**
- ? **Crown cover**

Counting of trees and identification was made in 17.84 m plot while the shrubs and bushes were counted and identified in 5.64 m plot, according to the methods described in the PPG report, provided as Annex S.

The resulting hotspot areas and their estimated grass and tree coverage are provided as Figures 9, 10 and 11.

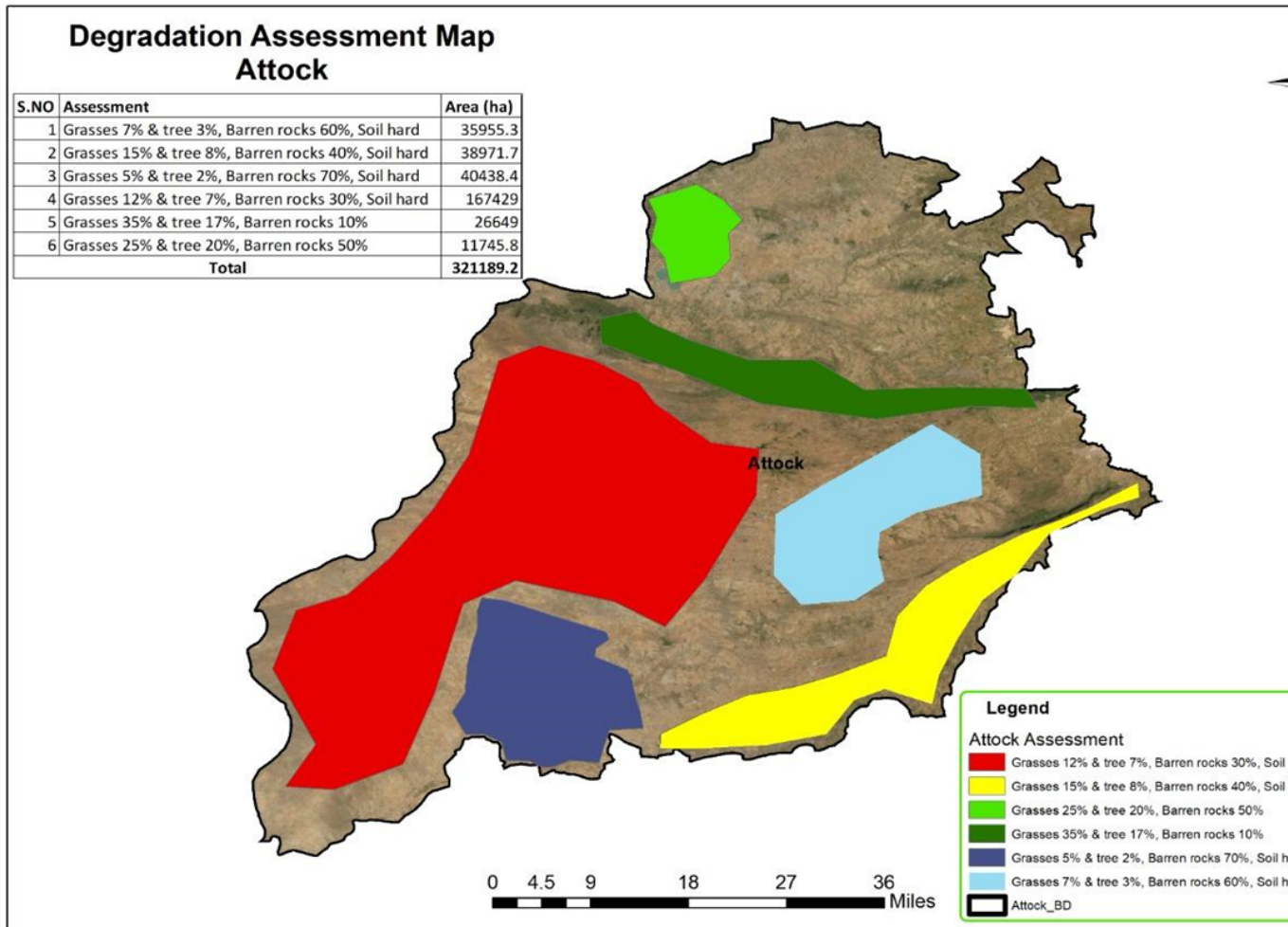


Figure 9. Estimated vegetation coverage and LD hotspots for the district of Attock

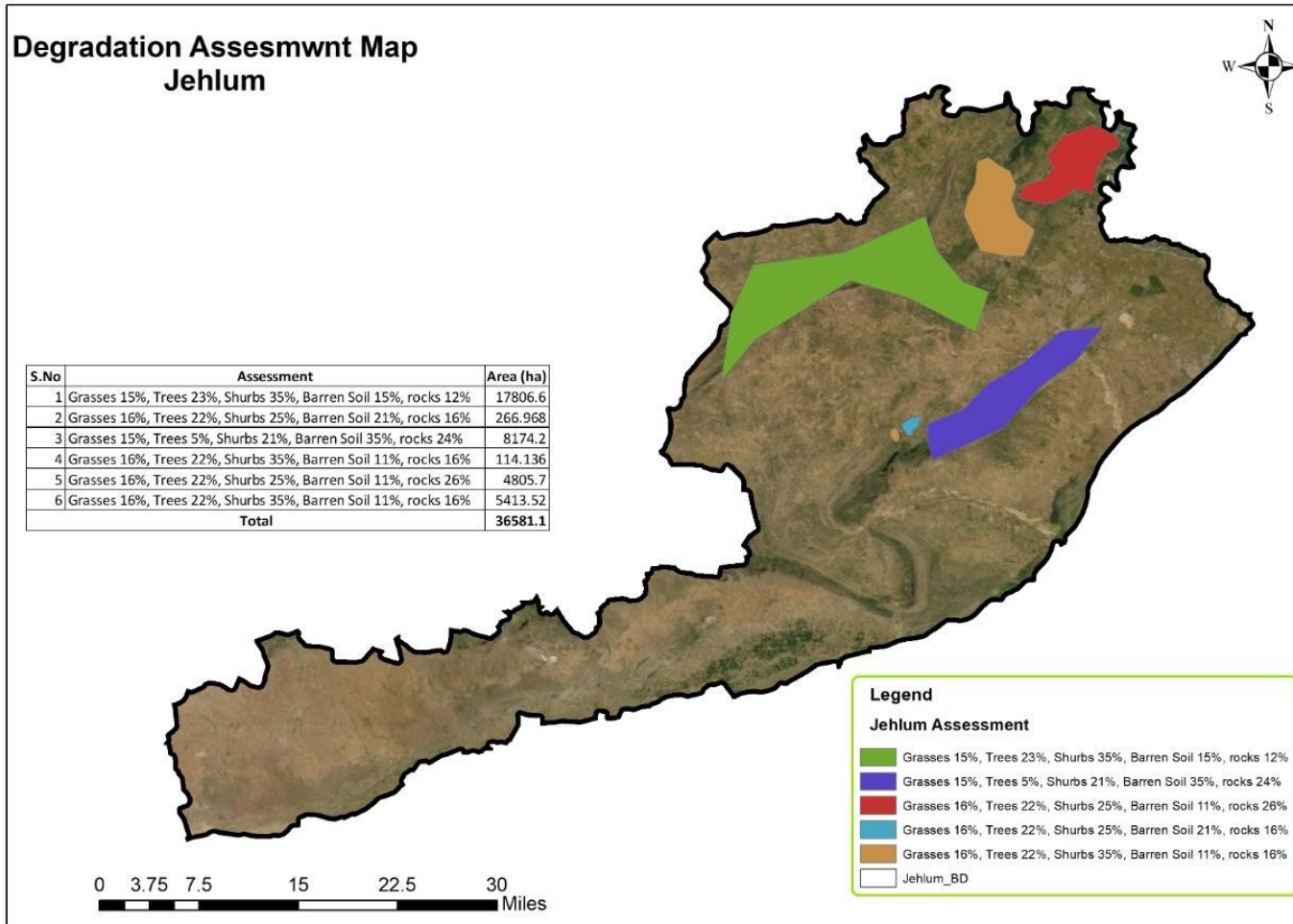


Figure 10. Estimated vegetation coverage and LD hotspots for the district of Jehlum

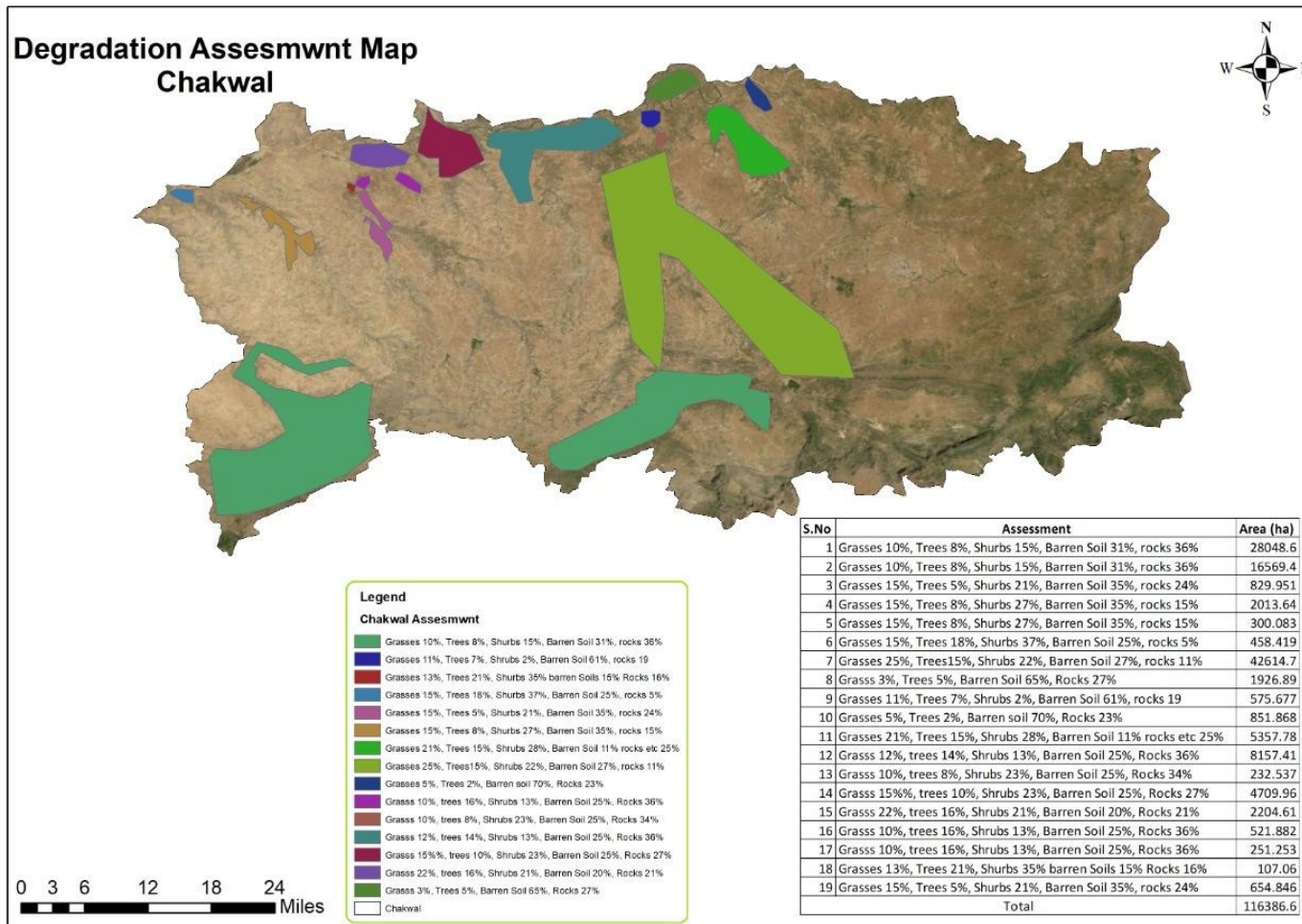


Figure 11. Estimated vegetation coverage and LD hotspots for the district of Chakwal.

Key finding of the field surveys for Attock are clear pressure on rangeland resources resulting in degradation and depletion of vegetation in the areas mentioned above in Figure 9. An overlook on vegetation study of these areas showed that vegetation inside the enclosure was 26 - 28% better in terms of coverage of trees and palatable grasses, particularly the perennial ones were only present inside the enclosure while the areas open for free grazing resulted 5-15% in terms of coverage of trees and palatable grasses. The pictures shows that at Temri reserve forest due to free grazing; the grasses has been grazed almost 80%.

The study area consists of rough broken lands of Pothwar plateau. Dry farming and livestock rearing is the main land-use. Most of the time during the year, quite a large area is kept fallow for wants of rain-fall. Wheat, rapeseed, Mustard and chick pea are the main Rabi crops, while maize, millets and sorghum are the major Kharif crops. Traditional fodder crops like berseem and lucern and guar and sesbania are grown in association with the Rabi and Kharif crops, respectively on the condition of availability of water. Most of the grass species found in these untreated area were less palatable. The species in non-treated areas was noted as *Eleusine flagellifera* (Chimber) was the dominant grass and this species alone comprised from 50% to 75% of the grasses. The remaining 25% of the grasses were

Aristida adscensionis (Lumb), *Bothriochloa pertusa*, (Pulwan), *Cenchrus ciliaris* less than 5% (Dhaman/Buffel Grass), *Cynodon dactylon* (Khabal), and *Elionurus hirsutus* (Gorkha). On the other hand, the reseeded grass (*Chenchrus ciliaris*) completely dominated the treated area like Jand Range Management Compartment.

The Agriculture land which is mostly arid; comprises of about 458,151 ha having range from 2% to 15% tree cover and less than 5% to 22% grass cover major portion land i.e. upto 60% and many plots recorded barren and having rocks which contributes to land degradation.

In Chakwal and Jhelum, grasses like *Bromus japonicus*, *Phragmites australis*, *Cynodon dactylon*, *Desmostachya bipinnata*, *Eleusine indica*, *Eragrostis minor*, *Arundo donax*, *Brachiaria ramosa*, *Sorghum bicolor*, *Panicum antidotale* and *Chrysopogon zizanioides* were noted in the area but now these have been found dominated by *Eleusine flagellifera* (Chimber) and *Prosopis juliflora*. Similarly *Acacia modesta*, *A. nilotica*, Olive at Tilla top, and *Zyziphus* are the major tree species. The maps seen in Figures 10 and 11 shows degradation patterns and hotspots for both districts.

The field samples collected in April, 2021 for PPG baselines also revealed that in Attock District air dry forage production varies on average from 431.84 kg/ha to 478.53 kg/ha in Chakwal it is 388.66 kg/ha and in Jhelum 520.70 kg/ha. In Attock forage comprised on average of 45.33% forbs, 13.33% grasses and 41.33% shrubs. Amongst forbs 13.60% species were preferred, 15.73% were palatable while the rest 16% were unpalatable. In grasses 7.60% species were preferred, 5.40% were desirable, while no specie was found unpalatable. 8% of shrubby species were preferred, 10.67% were desirable and 22.67% were unpalatable.

1.3: The proposed alternative scenario with a brief description of expected outcomes and components of the project and the project's Theory of Change.

The Project Objective is to conserve and restore critically important rangelands and livestock production systems and strengthen the resilience and sustainability of rangeland-dependent livelihoods in vulnerable dryland regions of northern Punjab, Pakistan. As outlined in this section, the project objective will be realized by implementing a suite of interventions organized under three interconnected components: 1) Government capacity to assess and plan for effective rangeland management; 2) Community led livestock management to reduce land degradation; and 3) Knowledge management and M&E, that together will address the identified barriers that are preventing the sustainable management and restoration of rangelands and livestock in the project area and are resulting in declining livelihoods and food security and out-migration to other parts of the country. The three components include outcomes that result in i) strengthened provincial and district policies and planning, institutional capacities, and data resources and information / decision support systems, ii) provincial and district sustainable land and resource management plans covering the rangelands of three target districts, and iii) conserved and restored grassland and scrub forest ecosystems; and improved livelihoods opportunities based on livestock raising and harvesting of forest products. Achievement of these outcomes will result, by the end of the project, in the following fundamental change: **Land degradation processes in grassland and scrub forest ecosystems in northern Punjab province, Pakistan, are prevented, mitigated and reversed, thereby conserving the ecosystem services of these arid landscapes, increasing carbon sequestration and climate resilience, strengthening local economies / livelihoods based on livestock and forest resources, and enhancing food security.**

1.3.1: Project Outcomes and Causal Pathways (CP)

Project Outcomes to be delivered are the following:

1.1: Land degradation is reduced in the in Punjab Province through strengthened provincial and district policy and planning frameworks and capacities

2.1: Community rangeland and livestock management systems in place to reduce land and water degradation and ensure sustainable production

2.2: Rangeland ecosystems, livestock production and livelihoods in three target districts benefit from sustainable management, restoration, and production activities

3.1: Effective knowledge management, communications and project M&E

To achieve these Outcomes, a set of Causal Pathways[1] (CP) have been prescribed to effectively address the barriers and transition from the baseline scenario described in the earlier sections are as follows:

CP1: Policy reform

CP2: Participatory integrated land management

CP3: Training/capacity building

CP4: R&D of SLM technologies

CP5: Sustainable value chain enhancement

CP6: Investments in energy and resource efficiency

CP7: Data collection on key performance indicators

CP8: Use of decision-making frameworks

CP9: Knowledge sharing and networking

Through supporting activities that provide for the causal pathways, it is assumed[2] that the identified beneficiaries will benefit from capacity building in knowledge, attitudes, aspirations, skills and opportunities, leading to behavioural changes and therefore improved land use planning and natural resource management.[3] It is therefore through improved landscape planning and livelihoods and equality measures that promote SLM that the project envisions achieving the objective. The role of each causal pathway are briefly described below:

CP1: Policy reform

As typically the most difficult causal pathway to influence and change, it is often where the most significant barriers, logjams and barriers to SLM and SFM are found, especially for rangelands, which are often divided among various administrative scales and mandates of governing organisations. Policy development or reform is vital to scaling of SLM and SFM practices, and plays a key role in developing incentives for increased uptake and adoption of SLM following LDN principles within a wider ILM environment.

There is insufficient policy guidelines and regulations for rangelands, to either protect them, encourage SLM practices, or monitor their productivity and address LD at a provincial level for Punjab. The project will therefore focus activities on developing studies into the issues and develop clear, concise recommendations for policy reform and development through the publication of two policy papers and associated workshops to support amendments and legislative approval of the *Punjab Provincial Rangeland Policy* which is currently in draft form.

From a CC perspective, the key adaptation measure to climate change is setting and implementing a sustainable agriculture and land use policy. Adaptation measures vary horizontally according to the agricultural subsectors and their vulnerability to climate change. However, the transition to more

resilient landscapes under CC scenarios requires a consolidated policy approach that engages sectors and stakeholders actively managing and coordinating the Punjab's landscapes.

CP2: Participatory integrated land management, supported by the LDN

Increased coordination at wider landscape levels have been shown to improve resource use efficiency and reduce costs. Examples include coordination of pesticide applications among commercial farmers to improve efficiency and reduce volumes applied, organised grazing to improve recovery times between grazing periods, construction of landscape-scale water retention infrastructures to increase infiltration and storage, planting of shelterbelts and other marginal lands to increase economic opportunities and ecosystem services, etc. To ensure that such measures do not diminish the well-being of the community or particular land users, site selection and activities require a participatory and inclusive approach that adheres to GEF guidelines and the GoP protocols and standards for managing trade-offs at scales.

Natural resource management models are not new to the country and the development of irrigation systems has meant that the capture, storage, distribution and processing of data for such resources as water have been used extensively at a multisectoral scale. The innovation that ILM (and LDN in general) brings to the process is the holistic approach that considers the landscape as more than the sum of its parts, but a self-organising system with inherent feedback loops that is capable of restoring land productivity and ecological resilience once management cycles are correct and drivers of LD are addressed.

This project not only includes multi-sector and participatory ILM planning, but provides tools, capacity strengthening, materials and incremental funding to realise action plan activities developed under the ILM plans. ILM is recommended as a causal pathway, therefore, due to its logical links to project objectives and its capacity to increase landscape productivity and resource use efficiency.

CP3: Training/capacity building

This causal pathway is often the most direct and efficient to increase knowledge and potentially behavioural change and project beneficiaries and stakeholders have demonstrated interest in increasing capacity for sustainable rangeland management within various levels of private and public spheres and have identified lack of knowledge as a key barrier to SLM practice. It is therefore a key activity of the project and project success will largely be defined by how well training and capacity building is conducted, while recognizing that a number of workshops is not directly linked to the behaviour change, but rather their focus. Other subsequent output activities related to value chains and opportunities for project sustainability are closely linked to this causal pathway.

The project budget has been properly defined to allow for planning, execution and human resource to achieve the training and capacity building targets outlined in the Project Logical Framework (Annex A1) and project partners will actively engage with existing CSO and community outreach groups, including women's groups, for training opportunities and collaborations to meet said targets. Where necessary, especially in areas of low community engagement and support organisations, Farmer Field Schools/AgroPastoral Field Schools will be established to attend to gender, youth and other socially-vulnerable groups.

CP4: R&D of SLM technologies and improved crop varieties

Research and development of SLM technologies is beneficial when the results are upscaled and have an impact on local communities. While there is a need and role for continued R&D on site-specific SLM practices, many are currently available and provide estimations on cost and labour requirements. This project will replicate those considered of interest, but will largely focus on community rangeland and restoration practices that involve wider biophysical and social context than have typically been developed and studied to date. Therefore, further research and study of integral design and circular economies using a combination of SLM and innovative livestock grazing patterns and community supported ecosystem restoration activities will be used by the project to implement change.

CP5: Sustainable value chain enhancement

Few official incentive programmes exist within project districts or at a Punjab level that support or provide for SLM practices, though economic opportunities within the private sector exist and were identified during the project development phase. SLM and SFM options are ultimately subject to economic realities, thus making value chain development and diversification another vital component for project success in achieving project outcomes. At the same time, the project needs to be realistic about what it can do given its own resource limitations. Value chain development and support are especially challenging for project developers given the role and size of the private sector.

However, there are components of the five project value chains that can be targeted and improved within project scope and resource limitations, especially those related to production issues such as forage production or post-harvest options, dairy hygiene and processing, increased efficiency and design of small holder poultry operations, improved management of Acacia forests and post-harvest options for resin and improved pollination and planting of honey-plants for beekeeping. Trainings and events also provide an invaluable access point to specific social groups and increases networking and identification of potential areas for economic development. Showcasing successful models also builds confidence which is a key requirement ahead of any successful business venture or investment.

Participants in the project design inception and validation workshops also proposed the use of holistic approaches to market opportunities and livelihoods, promoting concepts such as project funded equipment and materials that met a wide range of demands storage and chilling options for smallholders. They also expressed the role of VCs in the sustainability of the project after closure.

Therefore, VC enhancement is the causal pathway that is vital for the sustainability of project objectives and the motor of innovation and development. Project activities will ultimately be linked to supporting VCs where possible.

CP6: Investments in renewable energy and resource efficiency

Resource consistency is often a necessary element for the success of project sponsored demonstrations and investments. Loss of power or other non-planned events, such as theft, can increase the risks to the project. Therefore, project funds have been assigned for the purchase of solar powered water pumps and other equipment and power sources, as well as water saving irrigation equipment and techniques. This not only provides continuous power for project activities and increases investment sustainability, but reduces risks or loss of confidence by local stakeholders in the land management process. For instance, breakdown of a diesel pump in an isolated range area where livestock have been congregated by the project could place pressure on herders to graze recovering ranges before their time (def. of overgrazing).

Improved soil fertility management to increase SOC, reduce leaching, maintain soil cover, replace micronutrients and restore soil biological communities is assumed to lead to a reduction in fertilizer use and increase crop health and resilience, which will also increase resource efficiency and decrease production costs.

Finally, in order to showcase the potential benefits of the renewable energy use in the selected value chains, the project will support demonstration activities. The pilots will be implemented in close collaboration with local partners and contribute to the promotion and awareness-raising among farmers within the target districts and beyond of the opportunities they represent.

CP7: Data collection on key performance indicators

Measurement of specific metrics or indicators is vital to understanding the impacts of activities and management within complex socio-ecological systems. Key Performance Indicators have long been used as instruments to measure how funds were being spent and what was being achieved in real terms with these funds.[4] In this case, the focus is on measurement of production and environmental indicators not only as a stock, but of flow over time, and their spatial significance and relation to the wider landscape.

The LDN indicators (land cover change, Net primary productivity trend, and Soil Organic Carbon trend), supported by the recently developed LDN Interpretation Matrix.[5], plus the additional national *impact, process, and stress-reduction indicators* outlined in the project ToC diagram, offer a good starting point to determine status and trends, though provincial and local indicators for LD should be developed and tested. *Stress-reduction indicators* could be introduced to improve this system, as well as a means of coordinating, centralising and analysing data.

Essential to this process is LDN Principle 19. Monitoring should be viewed as a **vehicle for learning**. Monitoring provides: opportunities for capacity building; the basis for testing hypotheses that underpin the counterbalancing decisions and the interventions implemented, the LDN concept, and this conceptual framework; and knowledge to inform adaptive management?.

CP8: Use of decision-making frameworks

The data collected through project activities then needs criteria and parameters on which its analysis is to be based, though oftentimes final judgements are more value driven than technically informed. Decision frameworks facilitate and enhance decision making process by providing conceptual structures and principles for consequences and potential impact of decisions in complex environments[6], while balancing trade-offs. They generally share common elements such as: problem identification and formulation, support in identification of goals, provision of data in structured, logical formats, capacity to integrate knowledge and tools and often a clear list of alternatives presented to those responsible for decision-making, and mapping social connectivity over landscape's biophysical potential. They are also promoted as participatory, transparent processes that adapt under changing circumstances or new knowledge.

Using a holistic, contextual framework on which decisions can be tested and actions prioritized, the LDN approach hierarchy of *avoid, reduce and reverse?* allows for perspective and attention of key stakeholders and sectors on land degradation issues. It is also scalable, allowing for data and information to be captured and relevant to scales from individual farms to watersheds to larger administrative units. It provides cost effective, immediate, and long-term benefits to communities, taking into account available resources and potential options and returns on investments. It is also clearly linked to several SDGs, with socio-economic co-benefits, and other environmental co-benefits. The project will therefore promote SLM/SFM and landscapes restoration for achieving LDN commitments, through the application of the framework and supporting decision-making tools and using the landscape approach to integration across sectors and scales increases the chance of maximizing co-benefits and minimizing trade-offs.

It is important to mention that while LDN is bound to SDG target 15.3 and its indicator SDG 15.3.1 which was presented adobe (and is normally reported by the countries to the UNCCD), there is a holistic approach of considering the whole LDN impact Pathway. This entails focusing not only on SDG 15.3.1 *Change of State indicator*, but also on *Response Indicators* (linked to capacity building, mainstreaming legislation, etc.) and *Stress Reduction Indicators* (linked to SLM, good practices, etc).

Development of a DSS are integral components of conceptual decision-making frameworks, and are intended to address data inquiries on multiple issues. They also serve to understand at a spatial scale where limited resources are best employed within complex environments. DSS are often rely on digital formats, are data driven and dependent and work with spatially linked datasets, meaning the higher the quality and amount of information they contain, the better the suggested courses of action are at potentially meeting objectives. They can also be used for M&E analysis, though often the spatial scales and information is not practical for daily decision-making and monitoring. However, DSS cannot provide definitive answers, nor ramifications of potential consequences of actions. Hence the continuing need for well capacitated experts who can use the data and observations to provide analysis and recommendations, and the reliance and importance of capacity building and training for the success of this output. Resources are limited and the idea is to cover large land areas.

The interactive app developed under the project development phase in coordination with project design team is intended to be a starting point for the DSS development. It goes beyond LDN sub-indicator

analysis and includes other data layers, which should be further developed and improved on during project implementation. It is also important to define how the field and stakeholder data will be uploaded into the interactive app.

CP9: Knowledge sharing and networking

Most likely one of the most effective and efficient causal pathways to implement behavioural change and development is knowledge sharing and networking. For the most part the project will rely on multiple training and capacity building approaches, engagements of key organisations or entities, value chain interventions, field days and special events, in addition to awards ceremonies and exchange visits (farmer to farmer), to increase social interactions and sharing of ideas and business models.

The development of the online version of the interactive app will also greatly increase data sharing among anyone with internet access. To increase uptake of SLM practices among the less educated, videos and other innovative information sharing media will be developed through project activities. At the same time, more formal publications and printed materials will be provided for to ensure the results are shared among more scientific or policy-focused circles.

1.3.2: GCP/PAK/905/GFF Project Theory of Change

The Theory of Change (ToC) for the project was developed to assure quality of the intervention in the complex and multi-causal contexts. The ToC diagram (Figure 12) outlines key socio-economic drivers and challenges to Pakistan, then moves to present the current state of land resources, describes the identified barriers to SLM and beneficiaries before presenting the project Components and Outputs, Causal Pathways and finally the Global Environmental Benefits (GEBs). Indicators for monitoring are provided in the lower right-hand corner of the diagram, and below that are the assumptions provided for the ToC.

A well-defined ToC is important in that it ensures stakeholder engagement throughout the lifecycle of the project; helps define and analyze monitoring data that contribute to continuous learning through the intervention; constrains the flexibility boundaries in the project to genuine adaptability justified by thoughtful amendments to the ToC and consistent with agreed goals, rather than being a result of arbitrary deviations; frames ex post evaluation; and aids learning that informs subsequent projects[7]. The ToC follows the STAP guidelines on the scientific conceptual framework for LDN[8] and takes a phased approach adapting the DPSIR framework[9] to the project needs.

The project Theory of Change is available in the document attached, and as a Figure in the following page (Figure 12).

[1] Causal pathway: ?a backwards mapping from an intervention goal through all the long and short-term outcomes to the outputs needed to achieve it, identifying a logic arrangement of causal links between these (also called an impact pathway, outcomes chain or solution tree)?, Theory of Change Primer, A STAP document, December 2019

[2] Assumptions: ?Beliefs that are accepted as true or taken for granted in defining the causal links in the causal pathway?, Theory of Change Primer, A STAP document, December 2019

[3] Mayne, J 2015, ?Useful Theory of Change Models?, Canadian Journal of Program Evaluation / La Revue canadienne d'valuation de programme 30.2 (Fall / automne), 119?142 doi: 10.3138/cjpe.230

[4] Rozner, Steve. December 2013. Developing and Using Key Performance Indicators A Toolkit for Health Sector Managers. Bethesda, MD: Health Finance & Governance Project, Abt Associates Inc.

[5] UNCCD 2020, [A land degradation interpretation matrix for reporting on UN SDG indicator 15.3.1 and land degradation neutrality](#), in UNCCD Knowledge Hub, consulted 28 June 2021.

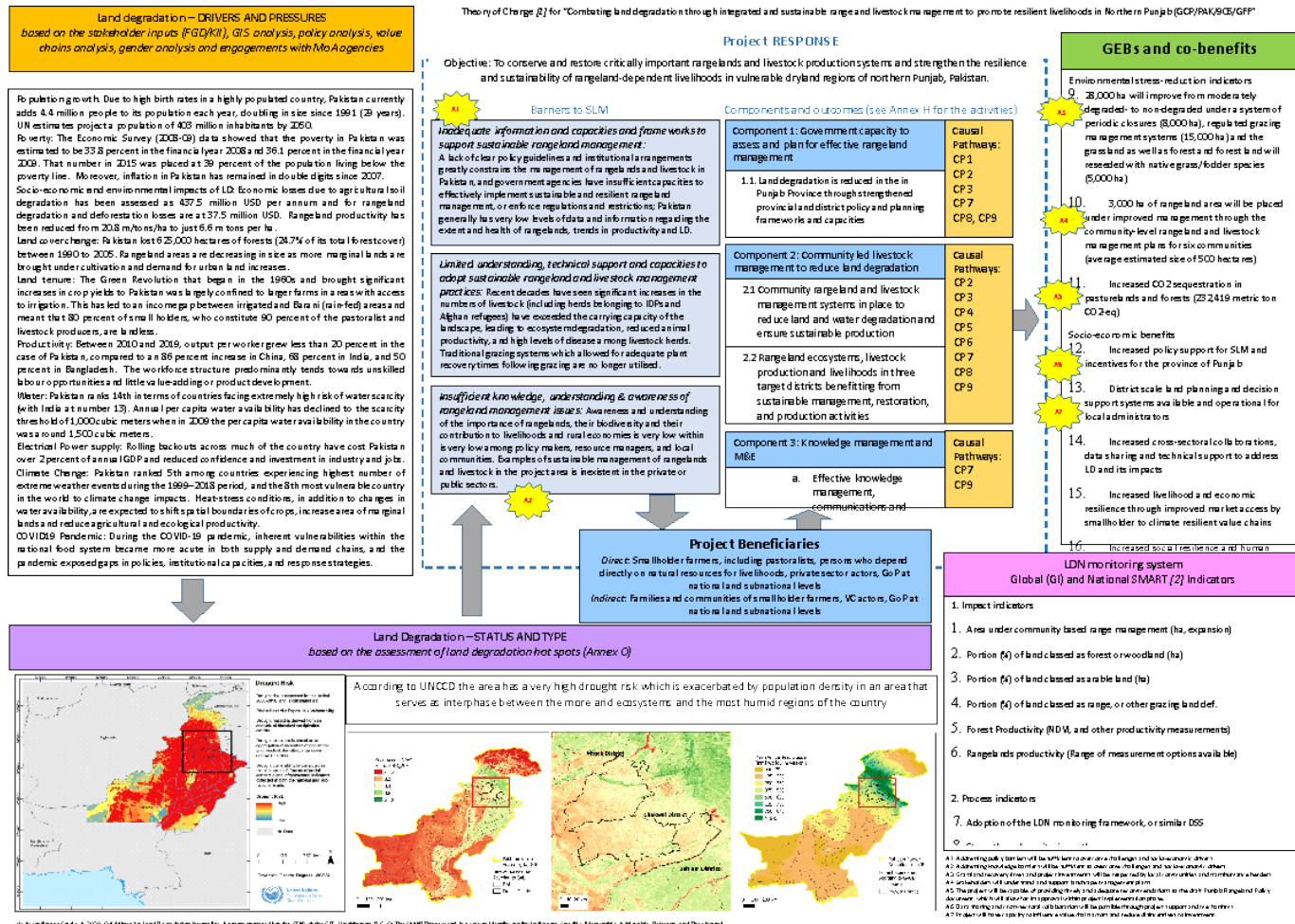
[6] <https://www.nap.edu/read/13471/chapter/6>

[7] Stafford Smith, M. 2020. Theory of Change Primer, A STAP Advisory Document. Scientific and Technical

Advisory Panel to the Global Environment Facility. Washington, D.C. Available at https://stagef.org/sites/default/files/publications/Theory%20of%20Change%20Primer_web.pdf

[8] Cowie, A. 2020. Guidelines for Land Degradation Neutrality: A report prepared for the Scientific and Technical Advisory Panel of the Global Environment Facility, Washington D.C. Available at https://stagef.org/sites/default/files/publications/LDN%20Technical%20Report_web%20version.pdf

[9] DPSIR is a causal framework for describing the interactions between society and the environment: Drivers, Pressures, State, Impact and Response of an intervention.



1.3.3: Theory of Change Description of Project Components, Outcomes and Outputs

Activities for the outputs typically follow a step-wise approach and are detailed for all project outputs in the project Indicative Workplan (Annex H), as well as being closely linked to the indicators outlined in the Project Results Framework (Annex A1).

Component 1. Government capacity to assess and plan for effective rangeland management

Outcome 1.1: Strengthened provincial and district policy and planning frameworks and capacities in Punjab province to implement rangeland management that reduces land degradation

The outcome will be attained through the following Outputs:

1.1.1. Provincial rangeland management policy developed

Activities carried out under this output will involve a review of the provincial policies structures and regulations described in the baseline section and their impacts on producers and rangeland management practices with the overall objective to mainstream LDN. This review will be conducted to map LDN policy barriers and improve on data gathering. Of particular importance for other project outputs are how policy creates disincentives or incentives for SLM and identification of opportunities for equal access to natural resources by women and other vulnerable groups.

At least two independent policy publications should then be identified that address policy barriers to SLM practices on rangeland areas. Once reviewed through inclusive stakeholder consultation process and endorsed by project stakeholders, the publication design and format should be developed in a manner that provides clear recommendations and amendments to the draft Provincial Punjab Rangeland Law. Stakeholder recommendations following the PRODOC validation meeting were for the output to review and propose the structural needs and operational functions of an independent rangeland unit within the Punjab Forest, Wildlife and Fisheries Dept., and for at least one of the policy issues to have a gender or equal opportunity focus and be directly linked to Output 2.1.3, described below. The policy will also be aligned with Pakistan's Land Degradation Neutrality (LDN) priorities and targets and support the integration of climate risks.

Findings will be shared with stakeholders through dissemination meetings, workshops and publications. The project will actively work to create an enabling environment for ratification of the Punjab Rangeland Law, while mainstreaming GEBs and LDN principles, through other support activities and participation in other events to increase awareness raising of policy issues as they affect rangeland management.

1.1.2. Comprehensive assessment of the status of all rangelands in the project area:

The project development phase has provided for adapted tools and approaches for remote sensing and field data collection through the interactive online mapping app and the field data collection system presented in the baseline section of this document (section 1.2). Therefore, the Punjab Forestry Department will be engaged at an early stage in project implementation to review these tools and provide their needs, objectives and potential range of costs/funding available for assessment system.

A recommended methodology for the rangeland assessment system is the Participatory Rangelands and Grasslands Assessment Methodology (PRAGA), developed in partnership with FAO and IUCN using GEF funding. This methodology was envisioned as a rapid, cost-effective rangeland assessment system capable of identifying, capturing and analysing information from various input sources. PRAGA facilitates stakeholder consultation processes and workshops, reinforced by participatory mapping of pasture areas and the selection of local, adapted indicator sets, which allows users of PRAGA to establish context and identify drivers at work within the system. Based on these maps and consultation results, areas for assessment are identified together with stakeholders. Field assessments then take place through the assessment team created specifically for the purpose.

The three data sources for PRAGA are summarised as follows:

? Stakeholder inputs through Focus Group Discussion (FGD), Key Informant Interviews (KII) and participatory mapping fora, where a wide range of stakeholders can publicly provide opinions and inputs on collectively managed natural resources. The PRAGA approach obtains information on the grazing area boundaries and limits through the use participatory mapping and stakeholder consultations. In addition to the land management boundaries, landuse or ecosystems are located, landscape history and trends are discussed, and stakeholders and land users are identified. The workshops and consultation exercises also allow for organisers to understand the different scales of management and the interests and motivations the different groups may have.

? Field surveys. The PRAGA methodology does not specifically outline the field data collection requirements, materials, approaches, number of sites or locations, as needs, context and access to advanced equipment can vary between countries and regions. It does encourage data gathering on the LDN indicators, national LD indicators, local stakeholder indicators, and support from socio-economic indicators to understand drivers. Practitioners are also encouraged to incorporate local contexts and Stress vs. State indicators.

? Remote sensing. Remote sensing to date within the PRAGA methodology has principally been limited to the Good Practice Guidance (GPG) endorsed by the UNCCD as the preferred method of using satellite data to identify LD extent and trends. Its capacity to provide data for large areas of land makes it an essential component of any potential assessment approach, yet care needs to be taken to correctly address false positives and ground-truth information before basing decisions on the information and results.

This information from these three sources is further supported by national maps and official/de facto land tenure status. The information is finally delivered to users in an online, interactive tool that forms part of the DSS to be developed under Output 1.1.4.

Even the US Forestry Service highlights a lack of staff and funding[1] as a barrier to correctly monitor their forest and rangeland areas. As mentioned above under the sub-section **CP7: Data collection on key Performance Indicators**, *LDN principal #19* clearly outlines this as a process of learning and encourages a consistent, yet transparent approach of trial and error, in addition to an open debate about what KPIs are truly providing a return on investment for their collection and analysis.

Before project closure, the improved methodological approach to rangeland assessments as developed by the project will be developed into a users manual and disseminated among project stakeholders through Output 3.1.2.

1.1.3. Provincial and district sustainable land and resource management plans developed and under implementation

Sustainable land and resource management plans that include concepts of land degradation neutrality will be developed for Punjab Province and for each of the three target districts (Attock, Chakwal and Jehlum) in a participatory process including various provincial and district officials and agencies, as well as community and livestock herder representatives. The provincial and district plans will be developed in the context of existing provincial and district-level planning processes, as described in the baseline section. Similar to the provincial rangeland management policy, the provincial and district plans will include provisions focused on limiting the conversion of rangelands to other uses and the adoption of integrated approaches to sustainable food production.

Project developers and staff will also work at an early stage in project development to manage the expectations that are created when describing the plans to new stakeholders. Experience has shown that expectations surrounding the definition and scope of district-scale land management plans vary among stakeholder groups, which impacts on how user groups feel project funding and activities need to be directed.

The workplan activities and budget also provide for a review of the land plans after 12 months. This allows for fine-tuning and increased resource efficiency for limited resources. It also provides an opportunity to involve those stakeholders who did not participate in the first round of planning workshops and activities.

1.1.4. Land and resource information, monitoring and decision support systems established:

The Punjab Forest Department will establish and maintain land and resource status monitoring and information systems that will incorporate the assessments carried out under output 1.1.2, as well as additional research on the impacts and cost-benefit trade-offs of rangeland management and restoration

options (e.g. controlled grazing, assisted natural regeneration, etc.). The information generated through the assessments, research and on-going monitoring will be put into the decision support systems developed by the project to enable resource managers and other stakeholders to base rangeland management decision-making (including the planning processes under Outputs 1.1.3 and 2.1.2) on up-to-date and well-organized information; this information will also support Pakistan's efforts to measure and monitor achievement of its LDN targets.

Development of a DSS are integral components of conceptual decision-making frameworks, and are intended to address data inquiries on multiple issues. They also serve to understand at a spatial scale where limited resources are best employed within complex environments. DSS are often rely on digital formats, are data driven and dependent and work with spatially linked datasets, meaning the higher the quality and amount of information they contain, the better the suggested courses of action are at potentially meeting objectives. They can also be used for M&E analysis, though often the spatial scales and information is to low a resolution to be used practically for daily decision-making and monitoring.

However, they cannot provide definitive answers, nor ramifications of potential consequences of actions. Hence the continuing need for well capacitated experts who can use the data and observations to provide analysis and recommendations, and the reliance and importance of capacity building and training for the success of this output.

It is recommended as well that the interactive mapping app created during the project PPG phase be used as the basis and foundation for DSS development. Currently there is no evaluation on the quality of the data and that would be a requisite of the DSS, because wrong layers can induce wrong decisions. The DSS should be used to assess and monitor the waterbasin areas selected for project activities using the data layers in the GIS environment, but also based on a field and participatory monitoring structure that links analysis from the various data sources. Once again, exactly how this would be conducted needs to take into account previous approaches and indicators of LD assessments carried out by the Punjab Forestry, Wildlife and Fisheries Dept., but also studying those approaches being used by other similar international counterparts, or by other LDN projects.

The current project interactive app already serves as a mean to test some of the future functionalities of the DSS, the layout is presented in the next figure (Figure 13). The system as 3 main panels: (1) Layer and Tool panel, where the user do most interactions, (2) Map view panel where cartographic responses are shown, (3) Statistic and Chart panel where information is updated according to the user choices: Charts, Figures and Tables can be zoomed and downloaded together with their data. In the Section 4 of the Tool panel, the user can choose how to query areas, either administrative areas from a list or using a specific layer to click on the map. The base layers are shown in section 5 for the user to choose, but extra layers can be found in toolboxes. The first toolbox is the multi-Criteria analysis (6) which allows to combine specific layers in order to find areas of interest (For example: Grasslands with decreasing productivity in non-mountain areas for restoration or Forest with stable or improving productivity in mountain areas to protect or avoid degradation). The tool also provides statistic on the combination of three global LDN indicators: Land Cover, Soil Organic Carbon and Land Productivity Dynamics, including reporting tables. The second toolbox is the Land Cover Transition analysis (7) where users can choose to compare changes (Gain/Loss) from different initial years. Finally the system has a Drawing tool (8) that users can use to create layers to provide feedback or submit ideas, i.e: mark areas of interest, sites undergoing important issues, map or system errors, priority sites for specific SLM, etc.

[1] Angela Safranek, Zachary Palm, Josh Voorhis, Bob Mountain and Paul Drayton, October 26, 2021, Pasture Management Planning - Conference #3,

Figure 13. Layout of the current project App and its functionalities.

It is intended that the DSS be applied to the project selected drainage basins and district areas and these limits are considered the contextual boundaries. The idea is that by addressing LD and ecosystem

service conservation at a wider landscape level, the restoration activities being realised within the project demonstration sites will be further supported and enhanced and the process will provide for learning opportunities and adaptive measures will be realised at various sectoral levels. Therefore, it is the participatory learning process itself in addition to the development of the DSS that is important and should be the focus of work within this output.

1.1.5. Capacities of provincial and district stakeholders for sustainable rangeland management strengthened.

Following the completion of a cross-sectoral capacity assessment, the project will carry out a capacity building programme to support the implementation of rangeland planning, monitoring, management and restoration for provincial and district level government agencies (forestry and livestock department staff), NGOs, CSOs, and other stakeholders. Among other areas, this output will strengthen the capacities of forestry and livestock management and extension officers in supporting animal health, improved fodder production, assisted natural regeneration of rangelands, management of water distribution systems, and strategies for climate change mitigation and adaptation. However, the primary focus of the capacity building will be focused on providing training on the tools and resources that are produced in Outputs 1.1.2, 1.1.3 and 1.1.4 to 200 people within key stakeholder groups.

Capacity building exercises will also provide opportunities to engage with potential users of the tools and resources developed under Component 1 to better adapt the output results to real needs.

1.1.6. Provincial and district mechanisms for cross-sectoral collaboration established and operating.

Building on the successes of the LND Working Group and the mechanism, the project will support the strengthening of an inter-departmental Working Group among key actors, including the Forestry, Environment and Wildlife Department (responsible for rangeland forest resources), the Agriculture Department (responsible for fodder production on agricultural lands), and the Livestock Department (responsible for livestock raising and health), to coordinate, supervise and monitor the implementation of rangeland extension activities in project areas, in coordination and partnership with NGOs and local stakeholders, especially private sector operators.

This group will develop recommendations on inter-sectoral coordination mechanisms to address LD and pilot various (minimum 1 per district) inter-sectoral coordination mechanisms for district or provincial contexts, with special attention on private sector value chains and incentive programmes aimed at inclusive agri-environmental benefits that increase women involvement in decision-making and economic participation.

The Output will also investigate the use of the Global Livestock Environmental Assessment Model (GLEAM). GLEAM is a GIS framework that simulates the bio-physical processes and activities along livestock supply chains under a life cycle assessment approach. The aim of GLEAM is to quantify production and use of natural resources in the livestock sector and to identify environmental impacts of livestock in order to contribute to the assessment of adaptation and mitigation scenarios to move towards a more sustainable livestock sector. The model can operate at (sub) national, regional and global scale.

GLEAM differentiates key stages along livestock supply chains such as feed production, processing and transport; herd dynamics, animal feeding and manure management; and animal products processing and transport. The model captures the specific impacts of each stage, offering a comprehensive and disaggregated picture of livestock production and its use of natural resources.

Component 2. Community led livestock management to reduce land degradation

Under this component, the project will include two Outcomes.

2.1. Community rangeland and livestock management systems in place to reduce land and water degradation and ensure sustainable production

2.1.1. Capacities of communities / community groups to implement sustainable rangeland and livestock management strengthened

This output is primarily focused on the organisation and resource development needed for the training and capacity building exercises that are necessary to address the knowledge barriers identified. It includes the collaboration with local organisations and in exceptional cases, the establishment of FFS.

The activities, indicators and targets outlined in the project Logical Framework (Annex A) and Workplan (Annex H) are based on the assumption that there are gains to be had in efficiency and project impact by establishing close lines of collaboration with existing organisations, rather than have the project create, maintain and finance FFS or other similar organisations, though that this option is provided for within the project design. Potential FFS should be considered for areas that have little social infrastructure or development capacity, as it is a viable tool for increasing women and youth involvement and gaining direct lines of communication and capacity building with key project beneficiaries. This said, each FFS is 'a project unto itself' and will most likely require consistent support from project staff. Therefore, a mix approach will most likely provide the highest return on investment of project resources.

The provision of flexibility on how the project should approach the training component of this output should not be seen as providing for a lack of compromise on key issues and promotion of GEF principals of transparency, participatory decision-making and gender equality. This approach might also suffer delays and issues to find adequate organisations with the targeted number and profiles of beneficiaries, especially under the current COVID-19 pandemic. To ensure project success, it is therefore recommended that the project develops its networks and training support systems at an early stage in project implementation, and utilise where possible the FAO and GEF guidelines on CSO, FFS and community engagement standards to ensure quality delivery on project targets.

The output has the target of training 1,500 people on Holistic Planned Grazing,[1] Agroecology, Conservation Agriculture and Climate Smart Agriculture and integrated landscape management, including support and dissemination of WOCAT practices through a range of innovative engagement and capacity building exercises that can include use of social media and other forms of media. Access to land to realise demonstrations or manage learning sites would also be provided by the host organisation where possible, though this is the principal focus of Output 2.1.2.

The project should within its capacity apply a 'no one left behind' approach by ensuring inclusive and gender-sensitive participation of beneficiaries, especially in order to provide certified training to smallholders to allow them access markets and participate in local value chains.

2.1.2. Community-level rangeland and livestock management plans developed and under implementation

Rangeland restoration is largely a question of respecting recovery times of plants following grazing applications. The community-level plans therefore need to control grazing through a mixture of management styles and mobile or fixed infrastructures. The areas selected by communities need to meet the minimal area of 3,000 ha and provide benefits to 2,500 people. Care needs to be used when approaching district authorities and local land users to manage expectations and ensure participation of marginalised land users. Care also needs to be used when navigating potential conflicts between stakeholder groups and *de jure vs. de facto* land tenure situations.

To address these needs and navigate complex situations, recommendations for land planning processes include the use of the LDN conceptual framework, project-developed interactive mapping tool and project DSS (Output 1.1.4), and the Participatory Rangelands and Grasslands Assessment Methodology (PRAGA).[2] This methodology was envisioned as a rapid, cost-effective rangeland assessment system

capable of identifying, capturing and analysing information from various input sources, including stakeholder groups.[3] Support of these processes should be informed and guided by the Voluntary Guidelines on Tenure (VGGT) and the FAO Programme Clinic.

The Voluntary Guidelines on Tenure promote secure tenure rights and equitable access to land, fisheries and forests with respect to all forms of tenure: public, private, communal, indigenous, customary and informal.[4] The Programme Clinic is part of FAO's official methodology to mainstream conflict-sensitivity into its programmes, projects and activities. FAO's Programme Clinic for Designing Conflict-sensitive Interventions is a structured participatory analysis designed to identify and integrate 'conflict-sensitive' strategies into the design and implementation of FAO interventions. This allows the project team and partners to discuss the results of the assessment and put together recommendations on implementing project activities in line with the discovered community sensitivities.

Among other approaches, the plans will promote the use of rotational grazing systems (including re-adoption of the traditional pargorh system, where practical), as well as a system of periodic closures of rangeland areas to allow for adequate plant recovery times, and commitment of livestock owners to closures and to participating in jointly planned herding systems. Similar to the provincial policy and provincial and district plans, the community plans will include pilot programmes to incentivise sustainable food production. The community plans will be aligned with the provincial and district plans developed under Output 1.1.3, and will guide the implementation of activities under Outcome 2.2.

2.1.3. Mechanisms in place to support the participation of women in rangeland and livestock management

With clear links to the results of Output 1.1.1 regarding policy barriers, the project will carry out an assessment of the existing roles and potential opportunities for women in rangeland and livestock management in Punjab Province. Based on this, the project will implement targeted capacity building activities for women in rangeland and livestock management and will establish targets for women's participation in management structures, resulting in the piloting of a minimum of 3 (1 per district) mechanisms. This information will also serve to inform the policy process and results for Output 1.1.1.

Recommendations for the mechanisms and their selection will be taken from national and international experiences and adapted to provincial, district and local contexts.

Outcome 2.2. Rangeland ecosystems, livestock production and livelihoods in three target districts benefiting from sustainable management, restoration and production activities

The outcome will be attained through the following Outputs, (all of which will be implemented within the context of the community-level rangeland and livestock management plans developed under Output 2.1.2):

2.2.1. Rangeland areas conserved through improved management / production approaches

Under this output, the project will support local communities in adopting soil conservation practices and climate smart approaches that increase productivity and ecological resilience of rangelands. A variety of approaches will be piloted to place a total of 15,000 ha of land under improved management through the causal pathways described, supporting training activities, policy incentives, community planning, payment for ecosystem services (PES), Public-Private-Producer-Partnerships (PPPP), Land Stewardship Agreements and cooperation with other existing projects and initiatives. Of vital importance to the output is the private sector.

2.2.2. Degraded rangeland areas restored and supporting improved productivity

To date, no restoration of degraded rangeland ecosystems has been attempted in the project area. The project will demonstrate approaches for assisted natural regeneration of degraded rangelands, including

the re-seeding of rangelands currently covered in non-native grasses/shrubs with native grass and fodder species (such as *Cenchrus spp*, *Quercus spp*. and native olive species) in order to increase overall vegetative cover, reduce land degradation processes, and expand areas with grass and fodder species that are palatable for livestock. Re-seeding of rangelands will be carried out collaboratively by the Punjab Forest Department and local communities, with a focus on areas of high intensity use such as riparian zones, animal resting areas, and other areas where heavy grazing is taking place.

Reseeding will be considered from more technological approaches, such as direct seeders, to more modest, cost-effective approaches, such as seed balls. The project will build upon best practices developed by the Pakistan Agricultural Research Council (PARC), including planting suitable multipurpose trees and reseeded with improved grass and legumes in areas of steep slopes; using forage grasses and legumes that have been identified as appropriate for different ecological regions of Pakistan, and applying suitable sowing methods and times.

A detailed workplan that takes a realistic look at potential gaps in human resources, materials and plant species and numbers needs to be developed in an early stage of the project in order to achieve the output target of 8,000 ha ([Annex A1](#)). Native plant species, either as seedlings or seed, are rarely available in sufficient quantities for largescale restoration activities, or are limited to a small variety of tree species.

Activities conducted to restore rangeland areas in target districts will include:

- ? Rehabilitation of degraded pasturelands and woodlands through improved grazing management and soil fertility techniques;
- ? Implementing grazing enclosures to allow for recovery times following grazing applications;
- ? Rehabilitation of riparian zones and adjacent areas, including protected areas to support biodiversity conservation and ecological connectivity;
- ? Increased use and planting of deep-rooted perennial grasses, shrubs and trees to provide green forage in drought and dry conditions, lower saline water tables, increase VC options (sustainable grazing, firewood, fruit and honey production), increase biodiversity and provide other supporting ecosystem services;
- ? Rehabilitation of livestock water points to improve distribution of grazing and allow for recovery of pasture areas as described under ILM plans (Output 2.1.2);
- ? Development of Landscape scale water-harvesting and green infrastructures described in ILM plans (Output 1.1.3) are completed using project developed resources and through collaborations with PPP and Co-financing partners.

Activities conducted to restore productivity rates within cropping or marginal lands include:

- ? Agroforestry and shelter-belt development against prevailing winds, to settle airborne particles, reduce wind speeds, reduce temperatures, lower saline water-tables and provide habitat within key agricultural landscapes;
- ? Water-harvesting development to reduce water velocities, increase infiltration and hydrate landscapes;
- ? Planting of salt-tolerant grasses, shrubs and trees to filter leached water from agricultural lands of salts and excess fertilisers and pesticides;
- ? Development of habitat areas by planting of trees and shrubs and provision of flowering plants to contribute to the Beekeeping value chain;
- ? Use of native vegetation planted in strips within the planting area or on field margins that removes contaminants from overland flow and provide biodiversity within the agricultural space.

Finally, a minimum of one WOCAT article will be produced from the experiences gained in conducting this output.

2.2.3. Productivity and health of livestock herds improved

Animal health and productivity is not easily attributable to one or two independent factors, and therefore this output takes a holistic approach to the issue, addressing water availability, trainings on animal nutrition, disease and breeding, and finally explores ethnoveterinary options by using local plant species. It also attempts to introduce new ways of presenting information that utilises local language and accessible media.

For the water availability issue, the project will select 5 sites, covering a minimum of 50 ha (minimum 1 per district) and develop water distribution schemes that increase water retention and distribution (diversion bunds; small ponds; dikes; leaky weirs) in rangeland areas, as well as livestock watering points that are spaced so as to support a more uniform distribution of livestock in the landscape and concentrate grazing and animal impacts in accordance to ecological and economic needs.

For the training exercises, a minimum of 300 producers will receive training on animal health and nutrition issues, and 5 short videos detailing animal health issues, including vaccination programmes, animal health treatments, ethnoveterinary remedies, are produced in local languages and shared over social media.

Vaccination programmes will also be conducted under this output in the 3 project districts for project beneficiaries and as a means of incentivising communities to respect grazing enclosures and other infrastructure and investments. A minimum of 340 people are direct beneficiaries of the vaccination programme.

2.2.4. Productivity and health of livestock herds improved

The project will support the planting of fodder species for livestock on both community-owned and privately operated rangeland areas. Pakistan's National Agricultural Research Centre (PARC) has tested various grass species that appear to be very suitable for the target districts, and the project will build on this experience to provide support for local residents to increase their production of grass species suitable for livestock fodder. It will do so primarily through the creation of community nurseries (2 per district) and provision of the necessary materials and technical support to ensure adequate production of plant resources for restoration works.

Through activities outlined in Output 2.2.2, contracting and support from community nurseries the project will have ensured 100 ha of agricultural farming systems are planted with perennial or annual fodder crops, 200 ha are planted with fodder trees within agroforestry demonstration sites developed on marginal lands for each district and 5,000 ha rangeland reseeded with local grass/fodder species.

The project also will work with community and private owners of rangeland areas to increase their production of fodder from appropriate tree species, with special attention to Acacia for Gum Arabic production as one of the project-selected value chains. The project will provide local residents with improved (high-yielding and climate resilient) seed / seedling varieties, as well as promote knowledge and production of native species. In addition, the project will develop and promote fodder production and packaging approaches (hay baling, feed concentrates) that meet the needs of local livestock producers, provide income opportunities for the cultivators, and pose little risk to native ecosystems.

2.2.5. Livelihood opportunities from livestock raising strengthened

In addition to strengthening opportunities for improved livelihoods and increased incomes for local inhabitants by improving livestock raising practices / health and increasing feed availability (Outputs 2.2.3 - 2.2.4), under this output the project will support the strengthening of value chains for livestock products in the three target districts. Value chains (VC) selected for this Output are Fodder (multispecies/production and packaging), Dairy and Poultry. The criteria for their selection were provided in section 1.2.9.

Value chain mapping will be conducted early in the project implementation and inform Output 2.1.3. It allows for options and opportunities to be identified for increasing incentives within local chains and increasing empowerment and agro-environmental benefits.

While the project will support the production and marketing of these specific products, it will also take a more holistic perspective regarding options for value chain strengthening activities. For instance, investments and piloting of storage and cooling systems provide producers more leverage when negotiating prices and choosing markets. Therefore, investments in renewable energies and cooling and storage equipment is provided for in the budget, in addition to a small grants programme. Increased product quality also typically translates into increased income and incentives in many cases. This output also will include a focus on training of women in business management, marketing, storage and processing activities along district-scale value chains.

2.2.6. Livelihood opportunities from sustainable harvesting of forest products strengthened

The project will support local communities in the cultivation, harvesting, processing and marketing of Gum Arabic derived from *Acacia senegal* in conserved and newly restored forest and scrubland ecosystems and increasing the diversity and biomass of flowering plants in order to increase Beekeeping livelihoods. Markets exist already in Punjab Province for these products, but many harvesters of NTFPs (which are typically poorer farmers and women) require training and equipment in order to improve their harvesting, drying, cleaning and storage practices so that the value of the NTFPs is maximized. The project will implement a training program for 400 entrepreneurs in business planning and practices, and will support them in working with traders and buyers to strengthen their respective NTFP value chains. The project will ensure that this output supports government and local initiatives for building back better for COVID-impacted households and communities as an initial priority. The project will also build local capacities to access other government and non-government programmes to mitigate COVID19 related impacts.

The small grants programme mentioned under Output 2.2.5 is also applicable under this output.

Component 3. Knowledge management and M&E

Outcome 3.1. Effective knowledge management, communications and project M&E

This outcome includes awareness raising and exchange visits, development of knowledge products and a functioning project M&E system and mid-term and final evaluation. Global environmental benefits generated by the project will also be assessed together with co-benefits and costs of SLM. It also includes the project's knowledge management and knowledge products will be widely disseminated to support out and upscaling of lessons learned. It will be generated by three outputs:

3.1.1. Increased local awareness and understanding of problems and opportunities associated with rangelands and livestock

Activities under this output will commence with a detailed plan of the communication needs and objectives for each individual output described above and in this outcome, and in line with the project GAP. In addition, a total of 400 people participate in field days to promote and raise awareness about rangeland contributions to GDP and local livelihoods, sustainable land management and other project objectives at a district level. Awareness campaigns also support the project value chain works and engage with private sector entities.

International exchange visits are also envisioned under this output, and 60 people will explore regional examples of policy and rangeland management experiences that apply under communal land use systems or leasing systems. Efforts will also be made to visit sites where livestock are being used in forestry, woodland, savannah and shrubland conditions as regenerative tools for forest and grassland regeneration.

Before project closure, an awareness campaign highlighting project-sponsored initiatives and value chain actors who are contributing to sustainable livestock production and other Sustainable Development Goals (SDG) within their localities. This is one more way this output increases visibility of these livelihoods, and provides alternative models within their respective value chains.

3.1.2. Project knowledge management plan developed and under implementation

The project will develop 7 gender-focused awareness raising and knowledge materials on project value chains, the importance of sustainable grazing management approaches, the impacts of livestock grazing on rangeland ecosystems, the ecological and economic importance of preserving ecosystem services, and the need for communal conflict resolution mechanisms to prevent or mitigate conflicts over rangeland resource use issues, in addition to disseminating the tools and approaches developed through project activities.

The project will disseminate these materials through various media, targeting sedentary, transhumant and migratory pastoralists. A communications plan will be established (Output 3.1.1) to disseminate information at both the provincial and national levels the lessons learnt and best practices from implementation of the project. Activities will include the development of project reports with lesson learnt related to SLM best practices, training modules on SLM, and data generated by the land and resource information, monitoring and decision support systems established under Component 1.

A M&E expert will be contracted to provide assistance with framing data collection systems, though each consultant will be responsible for developing and tracking key indicators for their role on project impact and results.

3.1.3. Effective project M&E plan in place

The project will develop and implement a monitoring and evaluation system to track project progress and support adaptive management. This will include monitoring of global environmental benefits generated by the project, as well as the project mid-term and final evaluations.

1.4. National Context Alignment with GEF focal area and/or Impact Program strategies

The proposed project is aligned with the following GEF focal areas and IP strategies:

? Land Degradation Focal Area Strategy Objective 1-1 ?Maintain or improve flow of agro-ecosystem services to sustain food production and livelihoods through Sustainable Land Management (SLM)?. Improved management is almost universally based on measurement of productive base and resources and monitoring for adaptive management. Likewise, technical options for LDN and increased flow of ecosystem services are only valid if they meet contextual conditions and provide for livelihoods and decent employment. This project allows monitoring of ecosystem and landscape trends to inform management decisions provide realtime data on the resource status and location.

? Land Degradation Focal Area Strategy Objective 1-3 Maintain or improve flows of ecosystem services, including sustaining livelihoods of forest-dependent people through Forest Landscape Restoration (FLR). The project will arrest land degradation, rehabilitate and improve range ecosystems, and improve institutional capacities to promote sustainable management of rangelands, thereby increasing livestock and other productive and protective services. Furthermore, the project will contribute to the sustainable use of land and water resources in production landscapes by supporting community-based natural resource management. In addition, the project will indirectly contribute to the GEF Climate Change focal area, by contributing to GHG emission reductions and by improving the climate resilience of local rangeland ecosystems and livestock production systems. In line with LD 1-3, some work will also be done to support local shrub/tree conservation and planting in the communities where the project will operate.

The project will therefore work to develop SLM options within the defined landscape contexts that increase productivity and CC resilience in key value chains for food security, rural employment and income and gender-sensitive issues. LD will be balanced through use of the LDN response hierarchy of avoid, reduce and restore in project pilot drainage basins in the Attock, Chakwal and Jehlum Districts. Innovative tools and analysis will allow data gathering to locate LD and drivers. In addition, the project will support efforts to restore productivity of degraded rangelands identified above to meet LDN targets at national and sub-national level.

1.5. Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTE, LDCF, SCCF, and co-financing

The proposed project aims at arresting land degradation, restoring degraded rangelands to improve their productivity, and improving livestock management in a sustainable manner. Without the proposed GEF intervention, rangeland landscapes in northern Punjab province will continue to become more degraded, resulting in loss of topsoil, increased sedimentation problems in aquatic ecosystems, continued out-migration from rural areas, and a reduced supply of livestock products that will negatively impact food security and industries that depend on livestock and associated raw materials. Continued degradation of the rangelands in the project target area will also contribute to carbon emissions and reduce the ability of local communities to adapt to climate change.

With support from the GEF (Table 22), the project will generate global environmental benefits in the areas of sustainable land management and climate change mitigation, including reduced land and water degradation through the establishment of provincial, district and community-level rangeland and livestock policies and plans, as well as the implementation of community rangeland - livestock management systems to sustainably manage rangeland (grassland and scrub forest) resources; the restoration of rangelands through planting of grass and tree species and improved soil conservation and water resource management, which will also contribute to carbon sequestration. The project also will build sustainable livelihoods through SLM practices and improved market value chains in partnership with local livestock and forest resource producers and private sector partners. The project will promote innovative approaches to rangeland management and restoration (rotational grazing, bioengineering, water harvesting) and strive to mainstream innovations and promote upscaling of best practices for the large-scale implementation of restoration and sustainable management of degraded landscapes, capacity development, and knowledge management and sharing. Finally, the project is aligned with and will build on both provincial and local government programs, and is positively related to the development activities of FAO.

[1] FAO 2020. "Guidelines for Grazing Management Planning: a Holistic Approach", Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project?/GCP/TUR/061/GFF.

[2] FAO/IUCN 2017, Participatory Rangeland and Grassland Assessment (PRAGA) methodology Field guide (first edition). https://www.iucn.org/sites/dev/files/media-uploads/2018/12/prmp_methodology_021118.pdf

[3] Onyango et al 2021, Land degradation neutrality: A rationale for using participatory approaches to monitor and assess rangeland health. Rome, FAO and Gland/CH, IUCN. <https://doi.org/10.4060/cb6131en>

[4] <https://www.fao.org/tenure/voluntary-guidelines/en/>

Table 22. Incremental cost reasoning and the expected contributions from the baseline, the GEF financing and co-financing for each component.

Project component	Baseline scenario	With-project scenario
<p>Component 1. Government capacity to assess and plan for effective rangeland management</p>	<p>Neither at a national level or a provincial level are rangeland policies in place to structure land use under grazing production systems or to organise the rangeland users under a shared framework of laws, obligations and user rights. Lack of policy frameworks not only contribute to LD, they deprive the local administrators of the means to manage and conserve rangeland resources. Lack of policy also contributes to a lack of accurate, real-time information and assessments of range resources and health. Finally, lack of policy and data limit administrative planning capacities coordination and collaboration across sectors and between agencies.</p> <p>The country does not have any LDN monitoring or DSS system and as such, will be unable to measure advancement toward the country's voluntary LDN commitments by 2030.</p>	<p>GEF funds will be invested through a bottom-up approach to integrate landscape management principles into sector strategies and ensure strong linkages between agencies to generate environmental and socio-economic benefits, as well as to engage multiple stakeholders at national to local scales, as per LDN requirements.</p> <p>GEF support will strengthen capacities at national and sub-national level to develop meaningful and efficient policies regarding rangelands, establish protocols for rangeland assessment and monitoring, develop district scale rangeland management plans which build on the LDN conceptual framework, pilot a DSS for informed and transparent decision-making, build technical capacities among potential users and trial mechanisms for increased sectoral and multisectoral coordination and collaboration.</p>

<p>Component 2. : Community led livestock management to reduce land degradation</p>	<p>Knowledge and cultural barriers were identified during the project development phase as obstacles to SLM and sustainable rangeland management practices.</p> <p>Communities rarely organise or take collaborative action to manage commonly-held or utilised natural resources, and livestock are often herded in small groups and are not grazed systematically.</p> <p>Extension services or outreach groups are present in the area, but rangeland management and ILM concepts are not typically taught to local communities or considered during land planning exercises.</p> <p>Livestock and nomadic herders suffer from cultural biases, and women are not traditionally allowed to participate in decisions regarding rangeland areas.</p> <p>Field surveys conducted both historically and during the project development phase has shown that current biomass levels are 7 times less than what was originally calculated in the project district areas</p> <p>There is limited capacity and knowledge on LDN, and the role that SLM can play in strengthening resilience of farmland and landscapes to CC. Drought and extreme weather events are increasing and inadequate use of natural resources is decreasing land productivity. The observed land degradation trends, especially erosion and desertification, will lead to further loss of ecosystem services and global environmental goods and loss of socio-economic opportunities for local communities.</p> <p>There is also no systematic effort to strengthen value chains and access to rural finance, and strengthen local public-private partnerships and private sector engagement, in support of sustainable production.</p>	<p>The GEF project will make targeted investments in capacity building, planning and implementing ecological restoration through climate resilience SLM.</p> <p>28,000 ha will improve from moderately degraded- to non-degraded under a system of periodic closures (8,000 ha), regulated grazing management systems (15,000 ha) and the grassland as well as forest and forest land will reseeded with native grass/fodder species (5,000 ha).</p> <p>3,000 ha of rangeland area will be placed under improved management through the community-level rangeland and livestock management plans for six communities (average estimated size of 500 hectares).</p> <p>Increased CO₂ sequestration in rangeland, woodlands and forests will equate to 232,419 metric ton CO₂-eq.</p> <p>Thousands of beneficiaries receive support to transition to more sustainable rangeland management systems through trainings, capacity building exercises, piloting of mechanisms to increase participation of women and other vulnerable groups in decision-making.</p> <p>Animal productivity (estimated 175,000 head) will increase under vaccination programmes, improved animal nutrition, development of water points and value chain development for forage crops, dairy, poultry, Gum Arabic and beekeeping.</p> <p>Food security will be improved through increased landscape productivity and delivery of ecosystem services</p> <p>The GEF supported SLM/SFM measures will also enhance the resilience of the community watersheds to climate-change induced stress and shocks.</p> <p>It is anticipated that the improved practices and restoration interventions will generate significant land degradation GEBs and deliver climate change mitigation and substantial socio-economic co-benefits.</p>
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<p>Component 3. Knowledge management and M&E</p>	<p>In the baseline, the Ministries, universities and research organizations, international organization, and other actors, are contributing to knowledge creation and exchange with regard to SLM within the country and at the producer level using the regional platforms. There is, however, very little focus by these groups or awareness in society on the contributions that rangeland systems provide economically, culturally and ecologically. effort to share knowledge and coalesce action towards the LDN.</p> <p>Few projects or initiatives under development address these issues and there is a clear need for support of this sector.</p>	<p>GEF investments will fund the incremental costs of systematic information and knowledge sharing at local, sub-national, and national levels. Furthermore, regular meetings and exchanges will be organized under the PSC, to ensure that lessons learned are compiled, shared, and used to inform policies at the national and sub-national levels. Project inception workshops, project completion workshop, and project related monitoring and evaluation will be funded.</p> <p>Results from process will inform and be promoted through the Sustainable Forest Management Impact program on Dryland Landscapes (DSL IP) http://www.fao.org/gef/dryland-sustainable-landscapes/en/</p>
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1.6. Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)

The project will generate a range of global environmental benefits in the land degradation focal area with co-benefits related to climate change mitigation through improved land use and land restoration. The global environmental benefits include:

- ? 28,000 ha will improve from moderately degraded- to non-degraded under a system of periodic closures (8,000 ha), regulated grazing management systems (15,000 ha) and the grassland as well as forest and forest land will reseeded with native grass/fodder species (5,000 ha)
- ? 3,000 ha of rangeland area will be placed under improved management through the community-level rangeland and livestock management plans for six communities (average estimated size of 500 hectares)
- ? Increased CO2 sequestration in pasturelands and forests (232,419 metric ton CO2-eq)

The project also will contribute to socioeconomic benefits to 10,000 persons (of which a minimum of 5,000 are women) through the support provided to improving their rangelands and supporting environmentally friendly value chains for their products. The support from the project on improving rangeland and wider ecosystem management is also expected to contribute to strengthened resilience of local landscapes to climate variability and change; as well resilience of local livelihoods.

1.7. Innovativeness, sustainability, potential for scaling up and capacity development[1] ?

Innovation: The project will contribute to designing and testing innovative rangeland rehabilitation approaches such as Holistic Planned Grazing, bioengineering (e.g. check dams made from stone and mud and planted with vegetation), reseeded using seed balls and water spreading and surface water harvesting methods that will be tailored and upscaled directly at the provincial level through institutional partners and policies, and indirectly at the national level through sharing information and best practices. Furthermore, the project will introduce an integrated approach that combines sustainable range and livestock management activities with natural and assisted rangeland restoration at the landscape level, resulting in increased and more secure food production and reduced land degradation.

Furthermore, it will introduce and provide demonstrable evidence that livestock and ruminant animals are vital components of grassland, steppe, savannah and rangeland environments and when managed correctly, they contribute to biodiversity, soil fertility and natural regeneration.

Sustainability: By developing and supporting implementation of a new provincial rangeland management policy and district-level rangeland management plans, the project will help to establish the policy and planning mechanisms that will direct provincial and local institutions to continue sustainable rangeland management post-project, as well as to provide support for community-based rangeland management plans (Output 2.1.1) and mechanisms to support the participation of women in rangeland and livestock management (Output 2.1.3). On-going management of the land and resource status monitoring and information systems established under the project (Outputs 1.1.2 and 1.1.3) will be carried out and supporting capacity building will be conducted for forestry and livestock department staff, extension officers, NGOs, CSOs, etc. (Output 1.1.5) that will facilitate replication and up-scaling throughout Punjab Province and other provinces facing similar challenges. Furthermore, project interventions in partnership with local communities (Outcome 2.2) will be gradually taken over by graziers and local communities and hence will be sustained and replicated after the project ends, particularly those project activities such as improving livestock and fodder production and strengthening markets for project value chains, which are intended to sustain livelihoods and increase incomes for local communities, who will therefore find adequate incentives to continue these activities over the long-term.

Potential for Scaling Up: The project approach related to land assessment and scaling up of investments on SLM/SFM will be integrated into the Punjab Province policies and programmes as well as include monitoring systems that will ensure its sustainability from an institutional perspective. The project will seek to improve value chains to develop self-sustaining business models that will ensure the sustainability of project investments. Capacity development and training of policy-makers as well as technical staff in implementation and monitoring of LDN and sustainable rangeland management will further support the sustainability of the project approach and have strengthened capacities and participation at the sub-national level of extension staff and local communities. Connection between inter-agency Working Groups, agricultural outreach services and collaborative initiatives with NGOs, educational and research centres will be developed by the project to support the studies on rangeland management and value chain development to ensure long-term sustainability of the project results.

The project's ToC (see section 1.3. *Project strategy and Theory of Change*) is integral to guiding longer-term scaling of impact. **Scaling up** to national level will be supported by policy and institutional strengthening as well as effective monitoring, knowledge management and capturing of best SFM and SLM practices and lessons learned. **Scaling up** will also be supported by development of a resource mobilization strategy and of transformative LDN and rangeland restoration proposals (Component 2).

For **scaling out** strategy a Similarity Analysis should be conducted during project implementation to support the dissemination of lessons learnt on appropriate SLM technologies. This requires the collection of SLM technologies and approaches applied in the field and data on their result and site-specific characteristic to evaluate the biophysical ranges on which they can be applied. This should be accompanied by a landscape characterization to produce the Similarity Analysis. Landscapes in the region of interest should be delimited and characterized via multivariate analysis and clustering base on biophysical characteristics, LD status and Socioeconomic characteristics. This, combined with the inputs from a participatory network of technical staff and producers, then allows for recommendations on SLM technologies for similar biophysical and climatic conditions.

Capacity building: As one of the Causal Pathways utilised by the project to increase impact and behavioural change, the outputs under Components 1 and 2 will require capacity building and training at various community, district, provincial and national levels to introduce new tools and concepts, and to organise communities and livestock producers under shared areas of understanding. The stakeholder groups that go through capacity building exercises also will be viewed as a project resource, as they

will have the base knowledge on which to make observations and recommendations and potentially constitute the end users of said approaches and technologies. Therefore, engagement with them and capacity building needs to be a two way flow of information that also allows project tools and knowledge products to be tested and improved under real conditions by those who will potentially be the beneficiaries and end users.

1.8. Summary of changes in alignment with the project design with the original PIF

Changes between the original PIF and the current Logical Framework can be seen in the table below (Table 24). Primarily outcomes and outputs stayed the same, with some redistribution of the targets and indicators outlined in the PIF.

Table 24. Modifications from PIF to current project design

Original PIF	Current Logical Framework
<p>Outcome 1.1:</p> <p>Strengthened provincial and district policy and planning frameworks and capacities in Punjab province to implement rangeland management that reduces land degradation</p> <p>Indicators:</p> <ul style="list-style-type: none"> ? Rangeland Management Policy for Punjab ? New Provincial (1) and district (3) sustainable land and resource management plans include concepts of land degradation neutrality ? 1 provincial and 3 district mechanisms (forums) in place for cross sectoral collaboration to implement / support sustainable land and resource management plans ? Local expertise in place to support and monitor climate-sensitive sustainable management of rangelands (a minimum of 200 staff of government agencies, NGOs and CSOs have with skills in sustainable rangeland monitoring, management planning and restoration) 	<p>Outcome 1.1:</p> <p>Land degradation is reduced in the in Punjab Province through strengthened provincial and district policy and planning frameworks and capacities</p> <p>Targets:</p> <ol style="list-style-type: none"> 1. One provincial policy for Punjab endorsed covering all rangeland in the province 2. Three district sustainable land and resource management plans developed through cross sectoral collaboration to implement / support sustainable land and resource management plans linked to the provincial policy 3. A minimum of 200 staff of government agencies, NGOs and CSOs have with skills in sustainable rangeland monitoring, management planning and restoration)

<p>Outcome 2.1:</p> <p>Community rangeland - livestock management systems in place to reduce land and water degradation and ensure sustainable production</p> <p>Indicators:</p> <ul style="list-style-type: none"> ? 6 community rangeland and livestock management plans covering 3,000 ha mainstream land degradation neutrality principles ? 8,000 ha of moderately degraded grasslands managed under a system of periodic closures ? 15,000 ha of rangeland under regulated grazing management systems (pargorh[2]) 	<p>Outcome 2.1:</p> <p>Community rangeland and livestock management systems in place to reduce land and water degradation and ensure sustainable production</p> <p>Targets:</p> <ol style="list-style-type: none"> 1. A total of 1500 beneficiaries have been trained in community rangeland and livestock management systems 2. Three (1 per district) community rangeland management plans are developed. 3. Sustainable food production is scaled to 3,000 ha under a range of diverse production contexts 4. A minimum of three Mechanisms are piloted to support the participation of women in rangeland and livestock management
<p>Outcome 2.2:</p> <p>Rangeland ecosystems, livestock production and livelihoods in three target districts benefitting from sustainable management, restoration, and production activities</p> <p>Indicators</p> <ul style="list-style-type: none"> ? 50 ha (5 sites) supported by new water distribution systems ? 175,000 livestock with improved health through provision of quality fodder and feed supplementation ? 100 ha of agricultural farming systems planted with fodder crops ? 200 ha planted with fodder trees ? 5,000 ha rangeland reseeded with local grass/fodder species ? 1,000 direct beneficiaries with improved livelihoods from livestock raising or sustainable harvesting of forest products (of which a minimum of 300 are women) 	<p>Outcome 2.2:</p> <p>Rangeland ecosystems, livestock production and livelihoods in three target districts benefitting from sustainable management, restoration, and production activities</p> <p>Targets:</p> <ol style="list-style-type: none"> 1. 15,000 ha are under improved management systems, 2. 8,000 ha of moderately degraded grasslands managed under a system of systematic closures. 3. 50 ha (5 sites) supported by new water distribution systems 4. 400 producers (200 women) are trained in animal nutrition, CC impact on animal health and ethnoveterinary species and their preparation and use, 5. 175,000 head of ruminant livestock with improved health and productivity 6. 100 ha of agricultural farming systems are planted with perennial or annual fodder crops / 200 ha planted with fodder trees 7. 5,000 ha rangeland reseeded with local grass/fodder species 8. 3 essential livestock-related Value Chain components have been strengthened through project support 9. 400 beneficiaries (of which at least 200 are women) are trained in forestry VCs, increasing livelihoods from sustainable harvesting of forest products

<p>Outcome 3.1:</p> <p>Effective knowledge management, communications and project M&E</p>	<p>Outcome 3.1:</p> <p>Effective knowledge management, communications and project M&E</p> <p>Targets:</p> <ol style="list-style-type: none"> 1. 400 members of different participant organisations, community members, and FFS participate in field days and exchange visits to innovative, sustainable business initiatives based on project selected VCs. 2. Total of 7 Knowledge Products developed 3. Project midterm and final review process conducted
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1b. Project Map and Coordinates

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

1.9. Project Geo-Coordinates, Map and Interactive mapping tool

Geographic coordinates of the three district forestry divisions are provided, followed by the project district map (Figure 14).

- ? Attock Forest Division: 33.7660° N and 72.3609° E
- ? Chakwal Forest Division: 32.9328° N and 72.8630° E
- ? Jehlum Forest Division: 32.9425° N, and 73.7257° E

[1] System-wide capacity development (CD) is essential to achieve more sustainable, country-driven and transformational results at scale as deepening country ownership, commitment and mutually accountability. Incorporating system-wide CD means empowering people, strengthening organizations and institutions as well as enhancing the enabling policy environment interdependently and based on inclusive assessment of country needs and priorities.

? Country ownership, commitment and mutual accountability: Explain how the policy environment and the capacities of organizations, institutions and individuals involved will contribute to an enabling environment to achieve sustainable change

? Based on a participatory capacity assessment across people, organizations, institutions and the enabling policy environment, describe what system-wide capacities are likely to exist (within project, project partners and project context) to implement the project and contribute to effective management for results and mitigation of risks.

? Describe the project's exit / sustainability strategy and related handover mechanism as appropriate.

[2] Rotational grazing and resting of rangeland

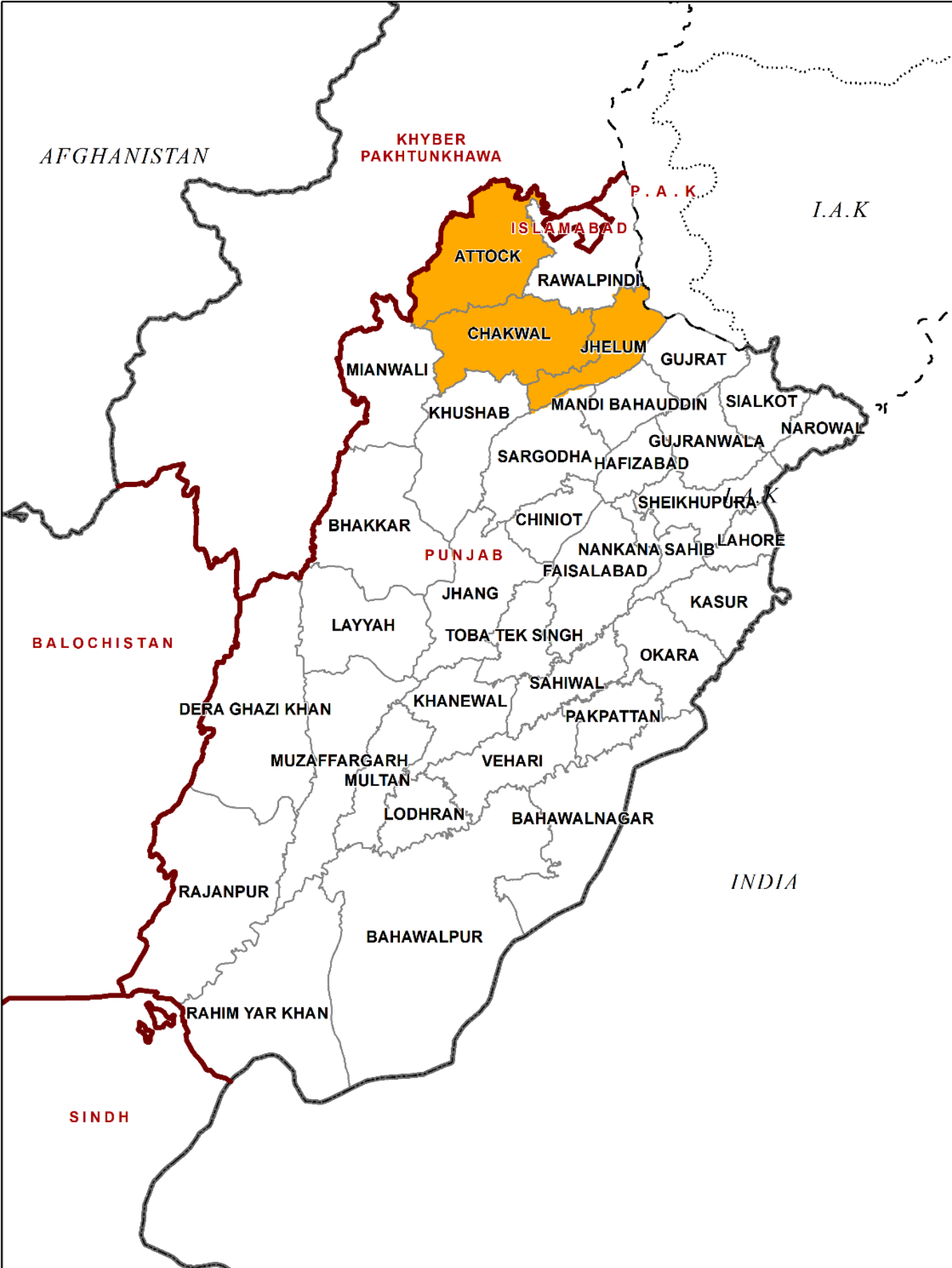


Figure 14. Project Provincial and District map.

For all information regarding the project demonstration sites, project waterbasins and Governate boundaries, please follow the provided link:

<https://projectgeffao.users.earthengine.app/view/srm-punjab>

1c. Child Project?

If this is a child project under a program, describe how the components contribute to the overall program impact.

N/A

2. Stakeholders

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

Civil Society Organizations Yes

Indigenous Peoples and Local Communities

Private Sector Entities

If none of the above, please explain why:

2.1. Stakeholder consultations for project development

Stakeholder engagements to inform project development took place from February 2021 to September 2021. The timing of the PPG work coincided with the Covid-19 pandemic in the year 2021. Nonetheless, the overall approach and subsequent results met with expectations from different stakeholders and does provide a basis on which to inform the project development and design.

Although talks and conversations had been maintained with key stakeholders from the PIF stage, field missions for the PPG stage of project development were conducted intermittently from March to August of 2021. With the support of key Ministries and Institutions, regional workshops, FGDs and KII were conducted in the three project districts in three workstreams, a Socio-Economic and Gender work stream, a Land Degradation and SLM solutions workstream and a value chains workstream. Results and a description of the approaches and data collection methods used are available as Annexes (P, Q, R and S).

The early results and project proposals were presented in a virtual Project Inception Workshop on the 9th of July 2021 and included over 50 participants from a wide range of institutions and sectors. Further field work and missions following this workshop allowed project developers and national staff to improve on original proposals. Finally, the PRODOC details were presented in the validation workshop held in Islamabad on the 29th of October 2021 which was attended by the Pakistan Secretary Forests, Chief Conservator, Conservator and 10 divisional forest officers, plus colleagues from PFI, PARC, ICIMOD, FAO and other key stakeholder groups. as attended by the Secretary Forests, Chief Conservator, Conservator and 10 divisional forest officer. Colleagues from PFI, NARC, ICIMOD. as attended by the Secretary Forests, Chief Conservator, Conservator and 10 divisional forest officer. Colleagues from PFI, NARC, ICIMOD. as attended by the Secretary Forests, Chief Conservator, Conservator and 10 divisional forest officer. Colleagues from PFI, NARC, ICIMOD.

For more information on this process, please consult the document provided in Table 25 below.

This section provides an overview of the stakeholder engagement methodologies and consultations during the project development phase (Table 25) in addition to those that will be applied during project implementation (Table 26).

Table 25. Stakeholders engagement during project development and design.

Stakeholder	Stakeholder Type	Stakeholder Profile	Consultation Methodology	Consultation Findings	Consult. Dates	Engagement in the project
Given the length and detail of this table, it has been included in Annex 12 .						

Please provide the Stakeholder Engagement Plan or equivalent assessment.

2.2. Stakeholder Engagement Plan for project implementation

In addition to the stakeholder information provided in the document and the conflict programme clinic and other participatory and gender and socially vulnerable inclusive methodologies, the following stakeholder groups will be consulted through the process using the following methodologies, as seen in Table 26.

Table 26. Stakeholder Consultations outlined for project implementation.

Stakeholder Name	Stakeholder Type	Stakeholder profile	Consultation Methodology	Expected timing	Comments
Ministry of Climate Change	Co-financing partner Chair of PSC	<i>Local Government Institution/body</i>	--	--	<i>Chair of PSC and Executing Partner</i>
Punjab Forest, Wildlife and Fisheries Dept.	Co-financing partner Co-execution partner	<i>Provincial Government Institution body</i>	--	--	<i>Executing Partner</i>
Ministry of National Food Security & Research	Co-financing partner	<i>National Government Institution body</i>	PSC Joint Planning Meetings and workshops Project Workshops Technical meetings	<i>Trimesterly</i>	<i>Key to develop and scale project Outcomes at national level</i>

Punjab Livestock and Dairy Development Department	Co-financing partner	<i>District Government Institution body</i>	Joint Planning Meetings and workshops Project Workshops Technical meetings	<i>Trimesterly</i>	<i>Key to develop and scale project Outcomes at District scale and key collaborator on activities in Outcome 2.2</i>
Punjab Environment Protection Dept.	Co-financing partner	<i>National Government Institution body</i>	Project Workshops Technical meetings	<i>Semesterly</i>	<i>Collaboration on issues relating environmental policy, biodiversity and rangeland assessment</i>
International Centre for Integrated Mountain Development (ICIMOD)	Co-financing partner PSC	<i>Non-Governmental Organization</i>	PSC Project Workshops Technical meetings	<i>Semesterly</i>	<i>International collaborator can provide knowledge sharing platform and inter-regional scaling opportunities</i>
FAO	Co-financing partner PSC	<i>International Government Institution/body</i>	PSC Joint Planning Meetings and workshops Project Workshops Technical meetings	<i>Trimesterly</i>	<i>Scaling and knowledge sharing partner</i>
Grazier Organizations	Co-financing partner PSC	<i>Civil Society Organization</i>	Meetings and workshops Focus groups discussions KII Project Workshops Technical meetings	<i>Semesterly</i>	<i>Potential beneficiaries and partners for scaling results</i>
District authorities of Attock, Chakwal, and Jehlum	Co-financing partner PSC	<i>Local Government Institution/body</i>	Joint Planning Meetings and workshops Project Workshops Technical meetings	<i>Semesterly</i>	<i>Key partner on ILM and other land planning processes</i>

Beneficiary groups (small scale farmers)	Direct Beneficiaries	<i>Local Community</i>	Meetings and workshops Focus groups discussions	<i>Trimesterly</i>	<i>Key partners and beneficiaries of project investments and capacity building exercises</i>
Private Sector	Direct Beneficiaries	<i>Other</i>	Meetings and workshops Focus groups discussions KII	<i>Semesterly</i>	<i>Key partners and beneficiaries of project investments and value chain support</i>
NGOs / CSOs	Indirect Beneficiaries	<i>Non-Governmental Organization</i>	Meetings and workshops Focus groups discussions KII	<i>Semesterly</i>	<i>Key stakeholder for scaling and promotion of SLM and LDN principles</i>

Please

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

Select what role civil society will play in the project:

Consulted only; Yes

Member of Advisory Body; Contractor; Yes

Co-financier; Yes

Member of project steering committee or equivalent decision-making body; Yes

Executor or co-executor; Yes

Other (Please explain)

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

The Gender Assessment presented below was conducted to meet the FAO requirements, and was developed based on FAO gender policy standards, to eliminate all forms of discrimination against women, ensure that access to resources is more equal and that agricultural policies and programs are

gender-aware, and make women's voices heard in decision-making at all levels. The consultations helped to identify constraints/barriers in women's participation, their opportunities and prioritize the areas of capacity building to mainstream gender in the future activities of the project.

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

Yes

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

Improving women's participation and decision making Yes

Generating socio-economic benefits or services or women Yes

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

Yes

4. Private sector engagement

Elaborate on the private sector's engagement in the project, if any.

Rangeland resource provide a significant contribution to national GDP through the sale and consumption of meat, milk and other livestock based, fuel wood and other non-timber forest products. The Punjab Growth Strategy 2018 identifies 'private enterprise development to optimally realize potential of livestock assets' as one of five key drivers for growth of the livestock sector. Key private sector actors will be mobilized to participate in the project and support various objectives related to sustainable rangeland management.

Private sector traders and purchasers of livestock and livestock products will participate in the strengthening of information exchanges and market linkages with livestock herders, so that herders can more effectively access markets and ensure that they meet market standards for quality (e.g. in terms of animal health; colour; milk quality; fodder packaging; etc.). The project also will establish improved linkages between farmers and livestock herders so that fodder availability for livestock is improved, in particular during times of drought when livestock losses may otherwise increase. In addition, the project will support community-based entrepreneurs in the NTFP marketplace by assisting them with collecting, processing (drying, cleaning, storage, etc.), branding and packaging of their products, and by establishing market linkages between these entrepreneurs and potential buyers along relevant value chains.

The project also will partner with the Women's Business Incubation Centers (WBIC) and 'One-Stop' platforms for women-led businesses being established by the Women's Development Department of the Government of the Punjab in order to identify and strengthen opportunities for women to play an active role in private sector activities along the livestock product and NTFP value chains. Finally, the project will work with the provincial government and private sector partners to jointly implement strategies identified in the Punjab Growth Strategy 2018 to improve the functioning of livestock markets, namely: streamline regulations in the livestock sector to enable higher growth; improve the functioning of livestock markets to the benefit of farmers; and rationalize relevant laws and regulations, including: cattle market rules (such as removing inefficient price caps on meat and milk; improving the auction process; certifying livestock health; etc.); develop standards for milk and meat quality, and provide a framework that will ensure the monitoring of this quality; and work with the private sector to strengthen the market of livestock semen production and supply. In the early implementation phase, the project partners will engage with private sector actors (grazier organizations, market buyers, and others along the livestock and NTFP value chains) to ensure that they have a significant role in the

project once it starts; this will include the organization of private sector forums, the hiring of an expert to address private sector engagement, and other outreach to these actors.

Of those private sectors engaged, smallholder producers and those who depend on natural ecosystems for their livelihoods are central to project activities and processes. These producers often interact with various value chains and drive LD through inadequate land management practices.

Wider community actors and private entities who are not directly involved in agricultural production but who are affected by landscape processes, such as drought, flooding or other climatic extremes, are also to be subject of capacity building and awareness campaigns. Land planning needs to incorporate these groups who benefit from ecosystem services and can support and appropriate practices in different sectors of the economy, yet may not know of how natural systems work or how they can improve ecosystem health and productivity in their area.

Within these groups will be sectors who indirectly benefit from sustainable agriculture and landscape restoration. Tourism industry and those livelihoods depends on cultural and landscape aesthetics and gastronomies increase their economic realities when water is available, forest fires are controlled and natural areas are vibrant and conserved.

5. Risks to Achieving Project Objectives

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

Risk management is a structured, methodical approach to identifying and managing risks for the achievement of project objectives. The risk management plan will allow stakeholders to manage risks by specifying and monitoring mitigation actions throughout implementation. Part A of this section focuses on external risks to the project and Part B on the identified environmental and social risks from the project.

5.1. Risks to the Project

The table below (Table 27) presents risks **to the project**, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.

Table 27. Risks to Project implementation and objectives.

Description of risk	Impact	Probability of occurrence	Mitigation actions	Responsible party within project
Weak incentives for stakeholders, farmers and local communities to cooperate due to time lag for fruition of results, may reduce stakeholder engagement and participation	M	L	Pilot activities will be participatory in nature and use marginal reaction test to identify actions that yield immediate benefits for Communities in terms socio economic livelihoods and community enhancements, awareness, preparedness, skill development and income generation activities. This will be emphasized during inception phase.	MoCC

Failure to involve adequate representation of vulnerable social groups including landless pastoralists, nomads, women-led households and those in poverty, resulting in failed ownership of the project at the community level of project sites.	H	L	The capacity building component and value chains activities will ensure engagement of vulnerable groups and women and will adopt a gender-sensitive approach, as guided by the project GAP and supported the M&E and Gender and Community Engagement Consultants. The project will adopt a two way communication approach to create community ownership and buy-in of the project intervention. The development of land management plans will be undertaken in a participatory manner, encouraging input from all relevant stakeholders. Mitigation measures will also include a conflict-sensitive approach, and conflict-sensitive programming consultations, as recommended under the FAO Programme Clinic.	MoCC
A significant increase in the number of nomads or refugees entering the Project area, in addition to their livestock.	M	L	Involvement of refugees or nomadic leaders in capacity building and training activities, through targeted training groups or value chain capacity building exercises and increased capacity of landscape to produce fodder and provide for livestock needs.	MoCC
Lack of close cooperation between key institutional stakeholders	M	L	This risk will be mitigated under Component 1, Output 1.1.6 of the project that will strengthen the inter-sectoral coordination mechanism to enhance cooperation and data-sharing.	Provincial Departments with support of GoP Ministries
Low participation of women/ limited benefits to women	M	L	The GAP contains a full list of measures and actions to minimize risks and maximize benefits to women and men, as well as youth.	Punjab Forestry Dept. with support of district authorities and community reps.
Climate change risks, which include increased frequency and severity of droughts and extreme temperatures, resulting in increased aridity and shortages of fodder and water for livestock.	M	M	Project interventions will increase the resilience of rangeland ecosystems and production systems to climate change impacts by increasing vegetative cover, redistributing grazing pressure in more natural cycles, and providing increased capacity to produce fodder and capture and retain water resources. Recommendations from climate risk screening have been integrated into project design and will be further elaborated during full proposal development stage.	Provincial Departments with support of GoP Ministries

<p>Conflicts over resource use rights and practices in open access rangelands (i.e. conflicts between different groups of graziers over rangeland use, and between graziers and rangeland owners over fees for rangeland use)</p>	<p>H</p>	<p>M</p>	<p>Conflicts over rangeland resource use may involve access, fees, seasonal restrictions, etc. However, such conflicts are uncommon in areas with well-established land settlement / tenure systems. In addition, traditional community structures such as local Punchats (groups of elders with responsibility at the village level to approve local programs/activities), will help to prevent and resolve these conflicts. Nevertheless, the project will support conflict resolution mechanisms, social mobilization, awareness raising and capacity building of communities to further mitigate these issues, including use of the FAO Programme Clinic.</p>	<p>Punjab Forestry Dept. with support of district authorities and community reps.</p>
<p>Impacts on project implementation from restriction measures established by national and local authorities related to the COVID-19 pandemic</p>	<p>M</p>	<p>L</p>	<p>In response to the Covid-19 pandemic, the project will develop measures to increase the flexibility of project management, taking account of the possible continuation (or reinstatement) of Covid-19 containment measures. The project will work with growing data and information sharing networks to realise online training and knowledge sharing to reduce the need for physical training sessions, large groups or unnecessary travel.</p> <p>The project-selected value chains are often utilised as economic refuge sectors for smallholders and rural households, and local production is becoming more important for food security. The project is well positioned therefore to be a positive factor under the current pandemic situation.</p> <p>The project will also seek to collaborate with planned and existing Government of Pakistan, FAO, and UN systems programmatic responses to Covid 19 (see baseline for details).</p> <p>Finally, the project design will include contingency planning for the possibility of changes in baseline and/or co-financing resources due to Covid-19 impacts on the budgets of project partners.</p>	<p>Provincial Departments with support of GoP Ministries</p>

[1] H: High; M: Moderate; L: Low. Overall economic growth in Pakistan contracted to (-) 0.47 percent in 2019-20 when it already had a weak economic growth of just 1.9 percent in the prior year. The COVID-19 further compounded long-standing challenges, especially in the industrial and services sector. The real GDP growth is also likely to slow down by around 3 percent for FY2019-20 primarily through a slowdown in the services and manufacturing sectors. The agriculture sector will also be impacted in case the lockdown continues and disrupts the transportation, logistical support, labour for harvest and transport, and access to inputs for the next planting season. As the country is emerging from a macroeconomic crisis, the government has limited fiscal buffers to actively respond to the pandemic.

In the current context, the following groups are particularly vulnerable: i) nearly half of all households in the country rely on agriculture and livestock as their primary and/or secondary source of livelihood; ii) some 22 percent are dependent on wage labour (skilled/unskilled non-agricultural labour, forestry workers); iii) around 62 percent of households in the poorest wealth quintile rely on farm labour and daily wage as livelihood strategies (33 percent on farming - small/medium/large farming, livestock, fishing and agricultural labour) and 29 percent on wage labour (skilled and unskilled non-agricultural work). In addition to these, vulnerable people include those who are experiencing disruption in the provision of essential services. For example i) nearly 42 million school children are not being able to attend their school; ii) almost 17 million children under age 5 are at-risk due to delay or complete miss of their immunization; iii) around 47 pregnant women are not properly getting pre-and post-natal care; iv) an additional 2.45 million people, in addition to existing 40 million, who are food insecure; v) around 12 million children who are malnourished and stunted.

The fact that the COVID-19 crisis will continue, at least until a safe and accessible vaccine is available to everyone, will oblige the project team and partners to define alternative measures regarding: (i) the collection of information and consultations with the stakeholders involved, (ii) the organization of teamwork, working meetings, workshops, training, and visits to / from other countries involved in the program, (iii) the provision of technical assistance from national and international experts, and (iv) the community-based participation and relationships among members of local communities, and among members of producer organizations, market-based platforms, etc. In this sense, the project team and its partners should define strategies that best adapt to the conditions of Covid19 during the inception workshop.

In accordance to the information provided in the early sections of the document, the project area in north-western Pakistan is particularly vulnerable to the impacts of climate change, as it is primarily arid and semi-arid and livelihoods are predominantly agro-pastoral. Furthermore, overall aridity and the frequency of recurrent droughts have increased, resulting in higher rates of crop failures and less ground cover and grazing biomass for livestock. If the process of land degradation and crop failures cannot be arrested and reversed, it is feared that the practice of subsistence agriculture will continue to diminish, and pastoralism will increase, leading to further deterioration of depleted rangelands, and the possibility of climate-forced migration.

CC mitigation is one of the principal outcomes of this project, as project activities are aimed at increasing land productivity, maintaining current land cover type, as well as increasing or at least conserving current SOC levels in soils. By increasing soil coverage, photosynthesis and soil organic moisture contents, surface temperatures are reduced and water retention is increased, thus limiting the impacts of anthropological and natural drought impacts. Recovery of riparian vegetation will also decrease temperatures and water evaporation from river and streams, providing climatic refuges for people and wildlife. The established nurseries and ecosystem restoration plans are principally focused on recovering and using native species that are best adapted to current and future CC scenarios. SLM activities and approaches chosen by stakeholders and verified by previous projects described in the

baseline fall under either CCA approaches, or are specifically designed to address future climate scenarios. Grazing planning and management will be aimed at increasing distribution of manure and other animal dropping to increase the 'Carbon Pump' and microbacterial activity and soil fertility, providing for negative feedback loops for GHG. From a landscape perspective, water saving and water harvesting infrastructures, their placement in the landscape and their strength and impact or retention thresholds will be calculated with CC risks and threats in mind to ensure they withstand increased temperature, increasing intensity of flooding and drought events.

5.2. Environmental and Social risks from the project

Environmental and Social Risk Classification: low risk ? **moderate risk X** high risk ?

For low risk projects, please provide a short explanation of the low risk classification, a summary of the due diligence made and, when relevant, potential risks that may arise and that may require special attention during implementation.[2]

The project was classified as of moderate risk. Table 28 below summarizes the risks identified and the measures proposed for their mitigation.

Table 28. Environmental and social risks of the project.

<u>Description of risk</u>	<u>Risk classification</u>	<u>Mitigation actions</u>	<u>Indicators / Mean (s) of Verification</u>	<u>responsible party (ies)</u>
<u>2.1. Would this project be implemented within a legally designated protected area or its buffer zone?</u>	Low	<u>In order to deal with land degradation, the project will work closely in Punjab province to strengthened provincial and district to address conflicts over rangeland resource use (access, fees, seasonal restrictions, etc) although conflicts are uncommon in areas with well-established land settlement / tenure systems. In addition, traditional community structures such as local Punchats (groups of elders with responsibility at the village level to approve local programs/activities), will help to prevent and resolve these conflicts. Nevertheless, the project will support conflict resolution mechanisms, social mobilization, awareness raising and capacity building of communities to further mitigate these issues, including use of the FAO Programme Clinic. The project intervention activities will be done with full consensus of the community</u>	<u>- Number of provincial Rangeland Management Policy publications -Number of district sustainable land and resource management plans that include concepts of land degradation neutrality - Ha impacted through project activities (disaggregated by land cover/use class) -Number of ha and sites supported by new water distribution systems -Number of ha of agricultural farming systems planted with fodder crops and fodder trees -Number of ha of rangeland reseeded with local grass -Ha covered under improved management approaches or systems</u>	<u>Punjab Forestry Dept. with support of district authorities and community reps, PMU and FAO oversight</u>

<p>7.2. Would this project operate in sectors or value chains that are dominated by subsistence producers and other vulnerable informal agricultural workers, and more generally characterized by high levels of poverty??</p>	<p>Low</p>	<p>Food insecurity and poverty remain challenges in the project areas and communities where many households suffering from poverty, or transient poverty due to seasonal incomes or external economic support. Only 0.05 percent of the households own greater than 2 ha of land in Punjab. Farmers are dependence on natural resources for livelihoods that are susceptible to climate change. Dependence on rain fed crops and systems was included, including dependence on rain fed pastures and rangelands. The project will implement climate smart agriculture / livestock tailored action to assist livestock farmers in project communities to improve their crop and livestock productivity, adapting and building resilience to climate change risk.</p>	<ul style="list-style-type: none"> - Number of potential direct and indirect beneficiaries of plans (disaggregated by sex) -Number of participant actors and beneficiaries (sex disaggregated) -No of people receiving project training and practical experience Number of plans developed -Number of mechanisms piloted -Number of ha and sites supported by new water distribution systems -Number of producers trained in animal nutrition, CC and health -Participatory Impact Monitoring (PIM) -Number of participants in international exchange visits Number of independent audits conducted -Mid-term and final evaluation conducted - Percentage increase in food security status (FIES, FCS, HDDS) - Percentage increase in Resilience Capacity Index (RCI) 	<p>PMU, FAO and MoCC external reviewers</p>
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<p>7.3. Would this project operate in situations where youth work mostly as unpaid contributing family workers, lack access to decent jobs and are increasingly abandoning agriculture and rural areas?</p>	<p>Low</p>	<p>As mentioned above that the project areas will be working in in areas where poverty, youth and unemployed are high. This high incidence of poverty in rural areas can be linked to inadequate infrastructure, lack of opportunities and resources. The project will tailor some interventions and set up business plan to assist young livestock farmers in project communities to access trainings and apply their knowledge to improve their crop and livestock productivity, adapting and building resilience to climate change risk. In addition the project will tailor some interventions and set up business plan to ensure its actions are rewarding and for youth</p>	<ul style="list-style-type: none"> - Number of potential direct and indirect beneficiaries of plans (disaggregated by sex) --Number of participant actors and beneficiaries (sex disaggregated) -No of people receiving project training and practical experience Number of plans developed -Number of mechanisms piloted -Number of ha and sites supported by new water distribution systems -Number of producers trained in animal nutrition, CC and health -Participatory Impact Monitoring (PIM) -Number of participants in international exchange visits Number of independent audits conducted -Mid-term and final evaluation conducted - Percentage increase in food security status (FIES, FCS, HDDS) - Percentage increase in Resilience Capacity Index (RCI) 	<p>PMU, FAO and MoCC, external reviewers</p>
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[1] H: High; M: Moderate; L: Low.

[2] Detailed FAO guidance is <http://www.fao.org/3/a-i4413e.pdf>

6. Institutional Arrangement and Coordination

Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

6.1. Institutional arrangement for project implementation

From an operational perspective, the project will be comprised of the following components:

- ? **Project Steering Committee (PSC)**
- ? **Project Management Unit (PMU)**
- ? **Project Support Staff and Consultants**
- ? **Project Partners and Co-financiers**

The Ministry of Climate Change (MoCC) will have the overall executing and technical responsibility for the project, working at a Provincial level through the Punjab Forest Department, with FAO providing oversight as GEF Agency, according to the outline provided below in this section. The MoCC will act as the lead executing agency and will be responsible for the day-to-day management of project results entrusted to it in full compliance with all terms and conditions of the Operational Partnership (OP) Agreement signed with FAO. As OP of the project, the MoCC is responsible and accountable to FAO for the timely implementation of the agreed project results, operational oversight of implementation activities, timely reporting, and for effective use of GEF resources for the intended purposes and in line with FAO and GEF policy requirements. *Disclaimer: It should be noted that the identified Operational Partner(s) or OP, results to be implemented by the OP and budgets to be transferred to the OP are non-binding and may change due to FAO internal partnership and agreement procedures which have not yet been concluded at the time of submission.*

The government will designate a **National Project Director (NPD)**. Located in the MoCC, the NPD will be responsible for coordinating the activities with all the national bodies related to the different project components, as well as with the project partners, in particular with the Punjab Forest Department at the provincial scale. S/he will also be responsible for supervising and guiding the Project Coordinator (see below) on government policies and priorities.

The NPD (or designated person from lead national institution) will chair the Project Steering Committee (PSC) which will be the main governing body of the project. The PSC will approve Annual Work Plans and Budgets on a yearly basis and will provide strategic guidance to the Project Management Team and to all executing partners. Members and roles of the PSC will be comprised as follows (Table 29).

Table 29. Members and roles within the PSC.

Organisation	Role
Ministry of Climate Change (Secretary)	Chair
Deputy Inspector General of Ministry of Climate Change	National member
Punjab Forest Dept.	National member
Punjab Wildlife Dept.	National member
Punjab Environment Protection Dept.	National member
Punjab Chief Conservator of Forests	National member
FAO	Member

The members of the PSC will each assure the role of a Focal Point for the project in their respective agencies. Hence, the project will have a Focal Point in each concerned institution. As Focal Points in their agency, the concerned PSC members will: (i) technically oversee activities in their sector; (ii) ensure a fluid two-way exchange of information and knowledge between their agency and the project; (iii) facilitate coordination and links between the project activities and the work plan of their agency; and (iv) facilitate the provision of co-financing to the project.

The **National Project Coordinator** (see below) will be the Secretary to the PSC. The PSC will meet once per year to ensure: i) Oversight and assurance of technical quality of outputs; ii) Close linkages between the project and other ongoing projects and programmes relevant to the project; iii) Timely availability and effectiveness of co-financing support; iv) Sustainability of key project outcomes, including up-scaling and replication; v) Effective coordination of governmental partners work under this project; vi) Approval of the six-monthly Project Progress and Financial Reports, the Annual Work Plan and Budget; vii) Making by consensus, management decisions when guidance is required by the National Project Coordinator of the Project Management Unit.

The **Project Management Unit** (PMU) will be co-funded by the GEF grant and established within MoCC. The main functions of the PMU, following the guidance of the Project Steering Committee, are to ensure overall efficient management, coordination, implementation and monitoring of the project through the effective implementation of the annual work plans and budgets (AWP/Bs). The PMU will be composed of a National Project Coordinator (NPC) who will work full-time for the project lifetime. In addition to the NPC, the PMU will include an administrative/finance staff, technical specialists (District Gender and Community Development Expert, Rangeland Experts) and a M&E specialist.

The **National Project Coordinator** (NPC) will oversee daily implementation, management, administration and technical supervision of the project, on behalf of the Operational partner and within the framework delineated by the PSC. S/he will be responsible, among others, for:

- ? Coordination with relevant initiatives;
- ? Ensuring a high level of collaboration among participating institutions and organizations at the national and local levels;
- ? Ensuring compliance with all Operational Partners Agreement (OPA) provisions during the implementation, including on timely reporting and financial management;
- ? Coordination and close monitoring of the implementation of project activities;
- ? Tracking the project's progress and ensuring timely delivery of inputs and outputs;
- ? Providing technical support and assessing the outputs of the project national consultants hired with GEF funds, as well as the products generated in the implementation of the project;
- ? Reviewing policies and regulations related to rangelands as divided among the various legal definitions and land use categories at provincial and district level with special attention to land planning and climate change legislation and targets (component 1);
- ? Developing land planning strategies that utilize policy incentives for private lands and increased access and temporary tenure rights for community managed and restored lands (component 1);
- ? Developing recommendations on inter-sectoral coordination mechanisms to address land degradation through the Rangeland Working Group (component 1);
- ? Organizing introductory meetings with representatives of potential participant organizations and presentation of project objectives and activities (component 2);
- ? Developing standards for estimating adherence to minimum criteria regarding quality of services, development, gender equality and transparency (component 2);
- ? Conducting participatory workshops with local decision-makers and land-users for project to gather feedback, validate approach and priorities and identify and support value chain opportunities through land-use plans (component 2);
- ? Contributing to project resource mobilization for a total of 15,000 ha of land under improved management through a variety of mechanisms, including regulation, incentives, community planning, PES, PPP and cooperation with existing projects and initiatives (component 2);
- ? Using the restoration techniques outlined in the SLM options section of the document, outline in a concise work plan for this output, including the mechanisms, human resources, materials and plant species and numbers needed to realise project target of 8,000 ha. Identify missing gaps and allocate resources from other key outputs by having a coordinated approach and capacity to supervise and manage restoration areas (component 2);

- ? Developing extension material, success stories, brochures for awareness raising about the project objective and strategies (component 3);
- ? Providing technical support in rangeland intervention, ensuring community participation at all levels.
- ? Monitoring financial resources and accounting to ensure accuracy and reliability of financial reports;
- ? Ensuring timely preparation and submission of requests for funds, financial and progress reports to FAO as per OPA reporting requirements;
- ? Maintaining documentation and evidence that describes the proper and prudent use of project resources as per OPA provisions, including making available this supporting documentation to FAO and designated auditors when requested;
- ? Implementing and managing the project's monitoring and communications plans;
- ? Organizing project workshops and meetings to monitor progress and preparing the Annual Budget and Work Plan;
- ? Submitting the six-monthly Project Progress Reports (PPRs) with the AWP/B to the PSC and FAO;
- ? Preparing the first draft of the Project Implementation Review (PIR);
- ? Supporting the organization of the mid-term and final evaluations in close coordination with the FAO Budget Holder and the FAO Independent Office of Evaluation (OED);
- ? Submitting the OP six-monthly technical and financial reports to FAO and facilitate the information exchange between the OP and FAO, if needed;
- ? Informing the PSC and FAO of any delays and difficulties as they arise during the implementation to ensure timely corrective measure and support; Ensuring implementation of the Gender Action Plan;
- ? Liaison with other related projects and ensuring complementarity
- ? Providing other technical and administrative supports as request by the project lead technical officer

A **Project Finance & Administrative Assistant (full-time)** will be hired with GEF funds and will be seated in MoCC. The Assistant will be responsible for the financial management, contract and day-to-day operations of the project activities implemented by the project and in project meetings, workshops and other events related to project. The position will also provide other support such as preparing/typing documents and meeting arrangements. S/he will be responsible for procurement and financial actions as well as their documentation and preparation of financial reports. S/he will be responsible for the timely delivery of inputs needed to produce results.

The PMU will be supported by a **Gender and Community Development Expert** who will work on cross-cutting issues, community engagement and ensure the operability of the GAP provided in [section 3](#). The position will also actively organise and provide logistical support for district and community level training sessions and capacity building exercises. When required, they will be on hand as a resource person in workshops and trainings, especially where gender issues and vulnerable populations are involved. They will also support other key consultancies from an inclusive and gender sensitive perspective, though their role is closely linked to the Rangeland Management Experts.

Supporting the project in all matters relating to agropastoral best practices and serving as the project's principal master trainers and FFS facilitators, in addition to all technical training, demonstration site development and capacity building relating to Component 2, are the **three Rangeland Management Experts**. They will also act as a resource person for workshops, and provide support to the development of technical manuals, WOCAT articles and other knowledge products.

FAO will be the GEF Implementing Agency (IA) for the Project, providing project cycle management and support services as established in the GEF Policy. As the GEF IA, FAO holds overall accountability and responsibility to the GEF for delivery of the results. In the IA role, FAO will utilize

the GEF fees to deploy three different actors within the organization to support the project (see Annex J for details):

- ? The Budget Holder, which is usually the decentralized FAO office, will provide oversight of day to day project execution;
- ? The Lead Technical Officer(s), drawn from across FAO will provide oversight/support to the projects technical work in coordination with government representatives participating in the Project Steering Committee;
- ? The Funding Liaison Officer(s) within FAO will monitor and support the project cycle to ensure that the project is being carried out and reporting done in accordance with agreed standards and requirements.

FAO responsibilities, as GEF agency, will include:

- ? Administrate funds from GEF in accordance with the rules and procedures of FAO;
- ? Oversee project implementation in accordance with the project document, work plans, budgets, agreements with co-financiers, Operational Partners Agreement(s) and other rules and procedures of FAO;
- ? Provide technical guidance to ensure that appropriate technical quality is applied to all activities concerned;
- ? Conduct a minimum of one supervision mission per year; and
- ? Reporting to the GEF Secretariat and Evaluation Office, through the annual Project Implementation Review, the Mid Term Review, the Terminal Evaluation and the Project Closure Report on project progress;
- ? Financial reporting to the GEF Trustee.

The PMU is supported by a range of experts and consultants. This includes the **Intl. Rangeland/ILM Policy Expert** as well as the **National ILM and Agriculture Policy Expert** and the **National LDN and LD Monitoring Expert**. Their role is to translate the GEF core targets for the project into practical systems that provide results on the ground, within an enabling environment, in order to achieve the transition to sustainable rangeland management practices and policies. They will be supported by an international and national GIS Experts who will provide support on a range of remote sensing issues, as well as update and maintain the digital project support system which is a component of the DSS.

A **Data Management Expert (M&E)** will provide support to reporting system development, selection of key indicators, support for data collection and reporting on project results and lessons learnt.

The project will also rely on a independent experts in their field, including VC development experts and other technical positions, such as the national GIS expert. They are available to support FFS training, provide inputs on marketing opportunities and value adding, as well as support in cropping, rangeland management or animal husbandray questions and issues.

For further information on these positions, including a brief overview of potential responsibilities, please see [Annex N](#).

Responsibilities for individual Outputs is outlined in the following table (Table 30).

Table 30. Responsibilities for specific project Outputs.

Output	Lead Responsible Institution	Supporting Institutions or Beneficiaries of tools/approaches
Output 1.1.1 - Provincial rangeland management policy developed	MoCC	? Punjab Forest, Wildlife and Fisheries Dept. ? Punjab Livestock and Dairy Development Department ? Punjab Environment Protection Dept. ? Private sector (smallholders, pasture users, non-residents)

<p><u>Output 1.1.2:</u> Comprehensive assessment of the status of all rangelands in the project area</p>	<p>MoCC</p>	<p>? Punjab Forest, Wildlife and Fisheries Dept. ? Punjab Environment Protection Dept. ? Private sector (smallholders, pasture users, non-residents)</p>
<p><u>Output 1.1.3:</u> Provincial and district sustainable land and resource management plans developed and under implementation</p>	<p>MoCC</p>	<p>? District authorities ? Punjab Forest, Wildlife and Fisheries Dept. ? Punjab Environment Protection Dept. ? Private sector (smallholders, pasture users, non-residents)</p>
<p><u>Output 1.1.4:</u> Land and resource information, monitoring and decision support systems established</p>	<p>MoCC</p>	<p>? District authorities ? Punjab Forest, Wildlife and Fisheries Dept. ? Punjab Livestock and Dairy Development Department ? Punjab Environment Protection Dept. ? Private sector (smallholders, pasture users, non-residents)</p>
<p><u>Output.1.1.5:</u> Capacities of provincial and district stakeholders for sustainable rangeland management strengthened</p>	<p>MoCC</p>	<p>? Punjab Forest, Wildlife and Fisheries Dept. ? Punjab Livestock and Dairy Development Department ? Punjab Environment Protection Dept. ? District authorities ? Private sector (smallholders, pasture users, non-residents)</p>
<p><u>Output.1.1.6:</u> Provincial and district mechanisms for cross-sectoral collaboration established and operating</p>	<p>MoCC</p>	<p>? Punjab Forest, Wildlife and Fisheries Dept. ? Punjab Livestock and Dairy Development Department ? Punjab Environment Protection Dept. ? District authorities</p>
<p><u>Output 2.1.1:</u> Capacities of communities / community groups to implement sustainable rangeland and livestock management strengthened</p>	<p>MoCC</p>	<p>? Punjab Forest, Wildlife and Fisheries Dept. ? Punjab Livestock and Dairy Development Department ? Punjab Environment Protection Dept. ? CSO, NGOs, Pasture users groups, Grazier development groups, FFS ? Private sector (smallholders, pasture users, non-residents)</p>

<p><u>Output 2.1.2:</u> Community-level rangeland and livestock management plans developed and under implementation</p>	<p>MoCC</p>	<p>? Punjab Forest, Wildlife and Fisheries Dept. ? Punjab Livestock and Dairy Development Department ? Punjab Environment Protection Dept. ? District authorities ? CSO, NGOs, Pasture users groups, Grazier development groups, FFS, informal community groups ? Private sector (smallholders, pasture users, non-residents)</p>
<p><u>Output 2.1.3:</u> Mechanisms in place to support the participation of women in rangeland and livestock management</p>	<p>MoCC</p>	<p>? Punjab Forest, Wildlife and Fisheries Dept. ? Punjab Livestock and Dairy Development Department ? Punjab Environment Protection Dept. ? District authorities ? CSO, NGOs, Pasture users groups, Grazier development groups, FFS ? Private sector (smallholders, pasture users, non-residents)</p>
<p><u>Output.2.2.1:</u> Rangeland areas conserved through improved management / production approaches</p>	<p>MoCC</p>	<p>? Punjab Forest, Wildlife and Fisheries Dept. ? Punjab Environment Protection Dept. ? CSO, NGOs, Pasture users groups, Grazier development groups, FFS ? Private sector (smallholders, pasture users, non-residents)</p>
<p><u>Output 2.2.2:</u> Degraded rangeland areas restored and supporting improved productivity</p>	<p>MoCC</p>	<p>? Punjab Forest, Wildlife and Fisheries Dept. ? District authorities ? CSO, NGOs, Pasture users groups, Grazier development groups, FFS, informal community groups ? Private sector (smallholders, pasture users, non-residents)</p>
<p><u>Output 2.2.3:</u> Productivity and health of livestock herds improved</p>	<p>MoCC</p>	<p>? Punjab Livestock and Dairy Development Department ? CSO, NGOs, Pasture users groups, Grazier development groups, FFS ? Private sector (smallholders, pasture users, non-residents)</p>
<p><u>Output 2.2.4:</u> Increased availability of sustainably grown fodder for livestock production</p>	<p>MoCC</p>	<p>? Ministry of National Food Security and Research ? Punjab Livestock and Dairy Development Department ? National Research Centres and Universities ? Private sector (smallholders, pasture users, non-residents)</p>

<u>Output 2.2.5:</u> Livelihoods opportunities from livestock raising strengthened	MoCC	? CSO, NGOs, Pasture users groups, Grazier development groups, FFS, informal community groups ? Private sector (smallholders, pasture users, non-residents)
<u>Output 2.2.6:</u> Livelihoods opportunities from sustainable harvesting of forest products strengthened	MoCC	? Punjab Forest, Wildlife and Fisheries Dept. ? Punjab Environment Protection Dept. ? District authorities ? CSO, NGOs, Pasture users groups, Grazier development groups, FFS, informal community groups ? Private sector (smallholders, pasture users, non-residents)
<u>Output 3.1.1:</u> Increased local awareness and understanding of problems and opportunities associated with rangelands and livestock	MoCC	? Punjab Forest, Wildlife and Fisheries Dept. ? Punjab Environment Protection Dept. ? Punjab Livestock and Dairy Development Department ? District Authorities ? CSO, NGOs, Pasture users groups, Grazier development groups, FFS ? Private sector (smallholders, pasture users, non-residents)
<u>Output 3.1.2:</u> Project knowledge management plan developed and under implementation	MoCC	? Punjab Forest, Wildlife and Fisheries Dept.
<u>Output 3.1.3:</u> Effective project M&E plan in place	MoCC	? Punjab Forest, Wildlife and Fisheries Dept.

The following figure (Figure 15) below provides for a graphic overview of how the arrangements will work.

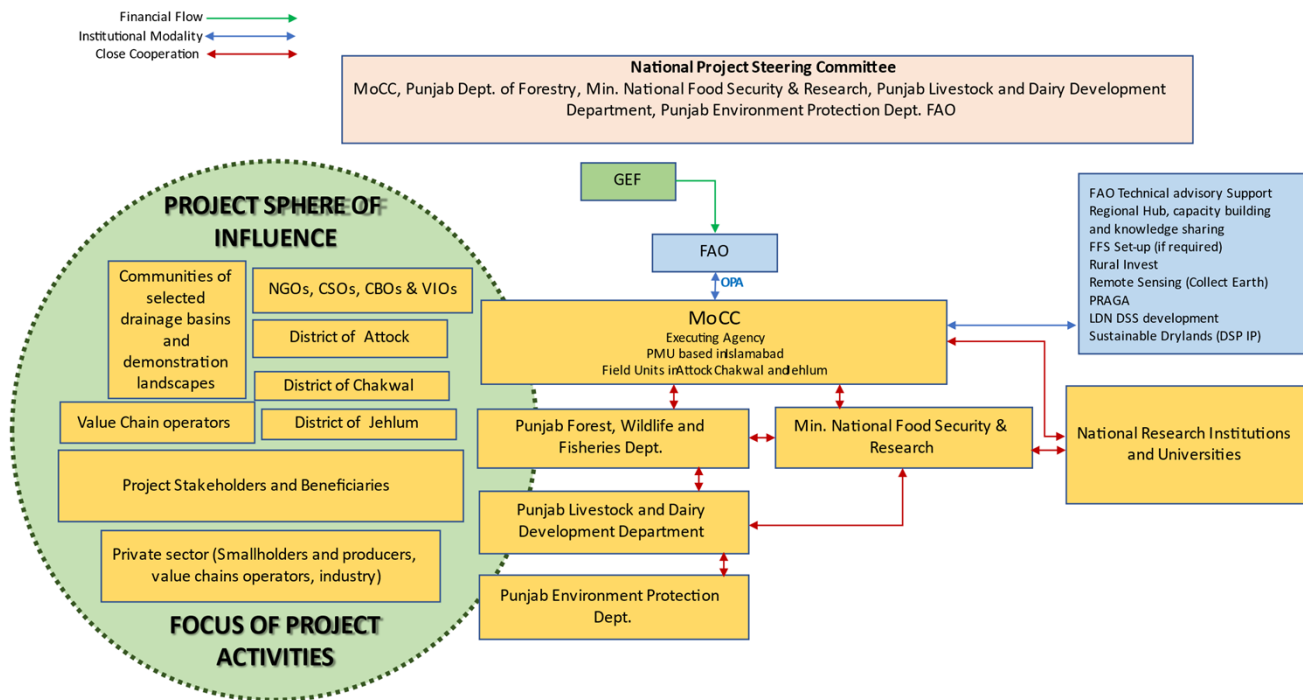


Figure 15. The project organization structure.

6.2. Coordination with other relevant GEF-financed projects and other initiatives

Please see section 2.1.1 for coordination and collaboration with other GEF-funded initiatives and projects.

7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

The project is aligned with the priorities of the UNCCD and SDG targets 2.4, 12.2 and 15.3, as well as Pakistan's National Action Programme under the UNCCD (2002). The project is aligned as well with the following Strategic Objectives for implementation of the UNCCD NAP in Pakistan, as detailed in the country's 2018 Report to the UNCCD: Strategic objective 1: To improve the condition of affected ecosystems, combat desertification/land degradation, promote sustainable land management and contribute to land degradation neutrality; Strategic objective 2: To improve the living conditions of affected populations; and Strategic objective 3: To mitigate, adapt to, and manage the effects of drought in order to enhance resilience of vulnerable populations and ecosystems. In addition, the project is aligned with and supports the achievement of a number of Pakistan's voluntary LDN targets, as shown in the table below:

Relevant National LDN Targets	Aligned Project Activities / Targets
-------------------------------	--------------------------------------

Target 1.1: Attain Land Degradation Neutrality in at least 30% of degraded forest	? 200 ha planted with fodder trees
Target 1.3: Attain Land Degradation Neutrality in at least 6% of degraded grassland (rangeland)	? 5,000 ha rangeland reseeded with local grass/fodder species ? 8,000 ha of moderately degraded grasslands managed under a system of periodic closures ? 15,000 ha of rangeland under regulated grazing management systems (pargarh)
Target 3: Converting Other lands (Bare lands) into croplands and productive lands to avoid soil loss / erosion and reverse land degradation	? 50 ha (5 sites) supported by new water distribution systems
Target 5: Enforcement of Land Use Plans and sustainable management practices	? New Provincial (1) and district (3) sustainable land and resource management plans include concepts of land degradation neutrality ? 6 community rangeland and livestock management plans covering 3,000 ha mainstream land degradation neutrality principles
Target 7: Shift to Green Economy through Social Enterprise and Businesses	? 1,000 direct beneficiaries with improved livelihoods from livestock raising or sustainable harvesting of forest products (of which at least 300 are women)

The proposed project is in line and is supportive of existing national strategies and priorities. The project is in line with the National Conservation Strategy (NCS; 1992), which remains the primary document guiding the management and development of natural resources in Pakistan. The proposed project will directly contribute to two of three primary objectives of the NCS, namely: 1) Conservation of natural resources; and 2) Improved efficiency in the use and management of resources. The project directly contributes to the 5th of the 14 Programme Areas for Priority Implementation i.e. "Restoring Range Lands and Improving Livestock", which recommends periodic closures of rangelands for restoration through community self-management. The NCS also recommends addressing the issues of overstocking, overgrazing and over harvesting so that rangelands are not degraded.

The draft National Rangeland Policy recognizes the essential need to have baseline data on the extent and location of rangelands, as well as information on prevailing trends and conditions and analysis of underlying factors. The policy also calls for significant programs to rehabilitate and improve management of rangeland resources through the active involvement of local communities. The proposed project will support these objectives of the draft National Rangeland Policy in the three target districts of Punjab province.

Other relevant policy documents that will guide the development and implementation of this project include the National Forest Policy (2017), the National Climate Change Policy (2012), the Green Growth Initiative (2014), and the Clean and Green Pakistan Initiative (2019).

8. Knowledge Management

Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.

The project Knowledge Management (KM) approach follows FAO's Knowledge Management Strategy[1] and relies on sound knowledge management practices throughout the project cycle. Proposed SLM measures for project implementation have been tested in similar natural and climatic conditions within the framework of various projects and were common among the various stakeholders. In addition to those cited by national and subnational stakeholders, the SLM Global Database of WOCAT[2] provides free access to the documentation of field-tested SLM data including SLM practices and maps from around the world, including techniques and approaches well adapted to dryland and semi-arid conditions such as those found within the Punjab Province.

The activities implemented under Component 3 - Effective Knowledge Management (KM) through Result Based Management (RBM), will be supported in scaling by the scaling approach described in the earlier section for nearby districts. The project knowledge management system will contribute to this scaling and replication using various types and media to produce and disseminate knowledge products produced including thematic case studies, evaluation and learning reports and briefs; strategic papers, educational and informational materials in printed and digital forms.

More specifically, under the Logical Framework (Annex A1), the project will develop the following quantities and types of knowledge products as seen in Table 31:

Table 31. Project Knowledge Products

[1] [FAO's Knowledge Management Strategy](#) requires formulators and implementers to consider sound knowledge management practices throughout the project cycle.

[2] <https://qcat.wocat.net/en/wocat/>

Output	Type and quantity of Knowledge Products
Output 1.1.1: Provincial rangeland management policy developed	*2 Policy papers
Output 2.2.2: Degraded rangeland areas restored and supporting improved productivity	*1 WOCAT article is published based on output results
Output 3.1.2: Project knowledge management plan developed and under implementation	*1 user manual for Rangeland Assessment Methodology and subsequent DSS (Output 1.1.2) *1 knowledge product outlining improved SLM and grazing man. practices, including grazing planning and monitoring worksheets (Output 2.1.1) *5 knowledge products will be developed for the Forage, Dairy, Acacia Resin, Poultry and Beekeeping value chains

In addition to these products, numerous reports, analysis, assessments and policy papers for stakeholder information and use, to build, awareness materials and other document formats will be produced over the duration of the project. The project's broad participation process on key LDN issues.

Component 3 and specifically the Communication Strategy will strengthen existing networks for sharing lessons with national, regional and international partners. The online platform created under the communications strategy and funded under the project budget will offer the interactive mapping tool and provide access to project results, recommendations, materials and tools.

Internationally, FAO's relevant platforms (Sustainable Forest Management Impact Program on Dryland Sustainable Landscapes (DSL-IP), Pastoralist Hub, Global Agenda for Sustainable Livestock, Global Farmer Field School Platform, **WOCAT Global Database**) will be used for lessons sharing.

All KM products will explicitly include gender dimensions, and the Project will also produce gender-specific KM products. Key deliverables and a timeline for KM can be found in Annex H Work Plan, and relevant KM budget can be found in the project budget.

9. Monitoring and Evaluation

Describe the budgeted M and E plan

The project will ensure transparency in the preparation, conduct, reporting and evaluation of its activities. This includes full disclosure of all non-confidential information, and consultation with major groups and representatives of local communities. The disclosure of information shall be ensured through posting on the project online platform, GoP and FAO websites and dissemination of findings through knowledge products and events. Project reports will be broadly and freely shared, and findings and lessons learned made available.

The monitoring and evaluation of progress in achieving the results and objectives of the project will be based on targets and indicators in the Project Results Framework (Annex A). Project monitoring and the evaluation activities are budgeted at **109,156 USD** (see Monitoring & Evaluation Summary Table 32 at the end of this section). Monitoring and evaluation activities will follow relevant FAO and GEF policies and guidelines. The monitoring and evaluation system will also facilitate learning and

replication of the project's results and lessons in relation to the integrated management of natural resources.

Oversight and monitoring responsibilities

The monitoring and evaluation roles and responsibilities specifically described in the Monitoring and Evaluation table (see Table 32 below) will be undertaken through: (i) day-to-day monitoring and project progress supervision missions; (ii) technical monitoring of indicators (PMU and LTU in coordination with partners); and (iii) monitoring and supervision missions (FAO).

At the beginning of the implementation of the GEF project, the PMU will establish a system to monitor the project's progress. It is recommended that each project Consultant (Annex B, Budget) present individual M&E indicators and systems that provide data to the established project M&E system. Participatory mechanisms and methodologies to support the monitoring and evaluation of performance indicators and outputs will be developed and realised by project staff and consultants, and be overseen by the project coordinator, and a M&E consultant hired periodically for evaluation purposes.

During the project inception workshop, the tasks of monitoring and evaluation will include: (i) presentation and explanation (if needed) of the project's Results Framework with all project stakeholders; (ii) review of monitoring and evaluation indicators and their baselines; (iii) preparation of draft clauses that will be required for inclusion in consultant contracts, to ensure compliance with the monitoring and evaluation reporting functions (if applicable); and (iv) clarification of the division of monitoring and evaluation tasks among the different stakeholders in the project.

The M&E and Communications Expert will jointly prepare a draft monitoring and evaluation matrix that will be discussed and agreed upon by all stakeholders during the inception workshop. The M&E matrix will be a management tool for the PC and the Project Partners to: i) six-monthly monitor the achievement of output indicators; ii) annually monitor the achievement of outcome indicators; iii) clearly define responsibilities and verification means; iv) select a method to process the indicators and data.

The **M&E Plan** will be prepared by the M&E and Communication Specialist together with local communities in the three first months of the PY1 and validated with the PSC. The M&E Plan will be based on the M&E summary (Table 32) and the M&E Matrix. It will include: i) the updated results framework, with clear indicators per year; ii) updated baseline, if needed, and selected tools for data collection (including sample definition); iii) narrative of the monitoring strategy, including roles and responsibilities for data collection and processing, reporting flows, monitoring matrix, and brief analysis of who, when and how will each indicator be measured. Responsibility of project activities may or may not coincide with data collection responsibility; iv) updated implementation arrangements, if needed; v) inclusion of data collection and monitoring strategy to be included in the final evaluation; vi) calendar of evaluation workshops, including self-evaluation techniques.

The day-to-day monitoring of the project's implementation will be the responsibility of the PC and will be driven by the preparation and implementation of an AWP/B followed up through six-monthly PPRs. The preparation of the AWP/B and six-monthly PPRs will represent the product of a unified planning process between main project stakeholders. As tools for results-based management (RBM), the AWP/B will identify the actions proposed for the coming project year and provide the necessary details on output and outcome targets to be achieved, and the PPRs will report on the monitoring of the implementation of actions and the achievement of output and outcome targets. Specific inputs to the AWP/B and the PPRs will be prepared based on participatory planning and progress review with all stakeholders and coordinated and facilitated through project planning and progress review workshops. These contributions will be consolidated by the PC in the draft AWP/B and the PPRs.

An annual project progress review and planning meeting should be held with the participation of the project partners to finalize the AWP/B and the PPRs. Once finalized, the AWP/B and the PPRs will be submitted to the FAO LTO for technical clearance, and to the Project Steering Committee for revision and approval. The AWP/B will be developed in a manner consistent with the Project Results Framework to ensure adequate fulfilment and monitoring of project outputs and outcomes.

Following the approval of the project, the PY1 AWP/B will be adjusted (either reduced or expanded in time) to synchronize it with the annual reporting calendar. In subsequent years, the AWP/Bs will follow an annual preparation and reporting cycle.

Reporting schedule

Specific reports that will be prepared under the monitoring and evaluation program are: (i) Project inception report; (ii) Annual Work Plan and Budget (AWP/B); (iii) Project Progress Reports (PPRs); (iv) Annual Project Implementation Review (PIR); (v) Technical reports; (vi) Co-financing reports; and (vii) Terminal Report. In addition, the GEF-7 Core Indicator Worksheet will be completed and will be used to compare progress of project Core Indicator 3: 'Area of land restored?', Core Indicator 4: 'Area of landscapes under improved practices?', as well as Core Indicator 11: 'Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment?' with the baseline established during the preparation of the project.

Guidance will be provided by the international and national consultants, in close collaboration with the MoCC, Punjab Forestry, Wildlife and Fisheries Dept., PARC and ICIMOD to define 'restoration?', in addition to parameters for 'avoid, reduce and restore?' for LDN actions and activities.

Project Inception Report. After FAO internal approval of the project, an inception workshop will be held. Immediately after the workshop, the PC and SCF will prepare a project inception report in consultation with the FAO Representation in the Pakistan and other project partners. The report will include a narrative on the institutional roles and responsibilities and coordinating action of project partners, progress to date on project establishment and start-up activities and an update of any changed external conditions that may affect project implementation. It will also include a detailed first year AWP/B and the M&E Matrix. The draft inception report will be circulated to, FAO, the PSC and for review and comments before its finalization, no later than three months after project start-up. The report will be cleared by the FAO BH, LTO and the FAO/GEF Coordination Unit. The BH will upload it in FPMIS.

Annual Work Plan and Budget(s) (AWP/Bs). The PC will present a draft AWP/B to the PSC no later than 10 December of each year. The AWP/B should include detailed activities to be implemented by project Outcomes and Outputs (including from the Gender Action Plan) and divided into monthly timeframes and targets and milestone dates for Output and Outcome indicators to be achieved during the year. A detailed project budget for the activities to be implemented during the year should also be included together with all monitoring and supervision activities required during the year. The FAO Representation in the Pakistan will circulate the draft AWP/B and will consolidate and submit FAO comments. The AWP/B will be reviewed by the PSC and the PIU will incorporate any comments. The final AWP/B will be sent to the PSC for approval and to FAO for final no-objection. The BH will upload the AWP/Bs in FPMIS.

Project Progress Reports (PPR). The PPRs are used to identify constraints, problems or bottlenecks that impede timely implementation and take appropriate remedial action. PPRs will be prepared based on the systematic monitoring of output and outcome indicators identified in the Project Results Framework (Annex A), AWP/B and M&E Plan. Each semester the Project Coordinator (PC) will prepare a draft PPR, and will collect and consolidate any comments from the FAO PTF. The PC will submit the final PPRs to the FAO Representation in Pakistan every six months, prior to 10 June (covering the period between January and June) and before 10 December (covering the period between July and December). The July-December report should be accompanied by the updated AWP/B for the following Project Year (PY) for review and receive no-objection by the FAO PTF. The Budget Holder has the responsibility to coordinate the preparation and finalization of the PPR, in consultation with the PIU, LTO and the FLO. After LTO, BH and FLO clearance, the FLO will ensure that project progress reports are uploaded in FPMIS in a timely manner.

Annual Project Implementation Review (PIR). The PC, under the supervision of the LTO and BH and in coordination with the national project partners, will prepare a draft annual PIR report covering the period July (the previous year) through June (current year) no later than July 1st every year. The LTO will finalize the PIR and will submit it to the FAO-GEF Coordination Unit for review by July 10th. The FAO-GEF Coordination Unit, the LTO, and the BH will discuss the PIR and the ratings. The LTO is responsible for conducting the final review and providing the technical clearance to the PIR(s). The LTO will submit the final version of the PIR to the FAO-GEF Coordination Unit for final approval. The FAO-GEF Coordination Unit will then submit the PIR(s) to the GEF Secretariat and the GEF Independent Evaluation Office as part of the Annual Monitoring Review of the FAO-GEF portfolio. The PIR will be uploaded to FPMIS by the FAO-GEF Coordination Unit

Technical reports. The technical reports will be prepared as part of the project outputs and will document and disseminate lessons learned. Drafts of all technical reports must be submitted by the

Project Coordinator to the PSC and FAO Representation in Pakistan, which in turn will be shared with the LTO for review and approval and to the FAO-GEF Coordination Unit for information and comments before finalization and publication. Copies of the technical reports will be distributed to the Liaison Committee and the PSC and other project stakeholders, as appropriate. These reports will be uploaded in FAO FPMIS by the BH.

Co-financing reports. The PC will be responsible for collecting the required information and reporting on in-kind and cash co-financing provided by all the project co-financiers and eventual other new partners not foreseen in the Project Document. Every year, the PC will submit the report to the FAO Representation in Pakistan before July 10th covering the period July (the previous year) through June (current year). This information will be used in the PIRs.

Core Indicators worksheet. In compliance with GEF policies and procedures, at project mid-term and completion, Agencies report achieved results against the core indicators and sub-indicators used at CEO Endorsement/ Approval.

An independent **Final Evaluation (FE)** will managed by the FAO Office of Evaluation (OED) and be carried out five months prior to the terminal report meeting. The FE will aim to identify the project impacts, sustainability of project outcomes and the degree of achievement of long-term results. The FE will also have the purpose of indicating future actions needed to expand on the existing Project in subsequent phases, mainstream and up-scale its products and practices, and disseminate information to management authorities and institutions with responsibilities in food security, conservation and sustainable use of natural resources, small-scale farmer agricultural production and ecosystem conservation to assure continuity of the processes initiated by the Project. The FE will pay special attention to outcome indicators and will be aligned with the GEF7 Core Indicators 3, 4, 6 and 11. The GAP progress will be explicitly assessed.

Final Report. Within two months prior to the project's completion date, the Project Coordinator will submit to the PSC and FAO Representation in Pakistan a draft final report. The main purpose of the final report is to give guidance to authorities (ministerial or senior government level) on the policy decisions required for the follow-up of the project, and to provide the donor with information on how the funds were utilized. Therefore, the terminal report is a concise account of the main products, results, conclusions and recommendations of the Project, without unnecessary background, narrative or technical details. The target readership consists of persons who are not necessarily technical specialists but who need to understand the policy implications of technical findings and needs for ensuring sustainability of project results. Work is assessed, lessons learned are summarized, and recommendations are expressed in terms of their application to the integrated landscape management in the three pilot sites, as well as in practical execution terms. This report will specifically include the findings of the final evaluation. A project evaluation meeting will be held to discuss the draft final report with the PSC before completion by the Project Coordinator and approval by the BH, LTO, and FAO-GEF Coordination Unit.

Table 32. Summary of the main monitoring and evaluation reports, parties responsible for their publication and time frames.

M&E Activity	Responsible parties	Time frame/ Periodicity	Budget
Inception workshop in Islamabad	PC; MoCC and Punjab Forestry Dept; FAO Representation in Pakistan (with support from the LTO and FAO-GEF Coordination Unit)	Within two months of project startup	USD 1,251
Inception workshops in Attock, Chakwal and Jehlum Districts	PC and district staff; MoCC and Punjab Forestry Dept; FAO Representation in Pakistan (with support from the LTO and FAO-GEF Coordination Unit)	Within two months of project startup	USD 3750 (3x1,250)
Project Inception Report	PC and district staff; M&E Expert; MoCC and Punjab Forestry Dept; FAO Representation in Pakistan	Immediately after the workshops	MOCC and Punjab Forestry Dept. time

Project Steering Comm. meetings	PC; MoCC and Punjab Forestry Dept; FAO Representation in Pakistan (with support from the LTO and FAO-GEF Coordination Unit)	As described in Section 6	USD 3000 (3x1000)
Field-based impact monitoring	PC and district staff; M&E Expert; MoCC and Punjab Forestry Dept; project partners, local organizations	Continuous	Through LDN and component 1
Supervision visits and rating of progress in PPRs and PIRs	Punjab Forestry Dept, PC; FAO-GEF Coordination Unit may participate in the visits if needed	Annual, or as needed	FAO visits will be borne by GEF agency fees Project Coordination visits shall be borne by the project's travel budget
Project Progress Reports (PPRs)	MoCC and Punjab Forestry Dept, PC, FAO Representation in Pakistan with stakeholder contributions and other participating institutions	Six-monthly	MOCC and Punjab Forestry Dept. staff time
Project Implementation Review (PIR)	Drafted by the PC, with the supervision of the LTO and BH. Approved and submitted to GEF by the FAO-GEF Coordination Unit	Annual	FAO staff time financed though GEF agency fees. PC time covered by the project budget.
Co-financing reports	PC with input from other co-financiers	Annual	PC staff time
Technical reports	PC; FAO (LTO, FAO Representation in Pakistan)	As needed	GEF Agency fees
Independent mid-term review	The BH will be responsible for the decentralized independent MTR in coordination with PC and PMU; FAO Representation in Pakistan; FAO-GEF; FAO technical staff not participating in project implementation	Midpoint of year 3 of project	USD 30,000
District Completion Workshops	PC; MoCC and Punjab Forestry Dept; FAO Representation in Pakistan (with support from the LTO and FAO-GEF Coordination Unit)	3 months before project closure	USD 3000 (3x1,000)
National Project Completion Workshop	PC; MoCC and Punjab Forestry Dept; FAO Representation in Pakistan (with support from the LTO and FAO-GEF Coordination Unit)	3 months before project closure	USD 1,275
Final Evaluation	External consultant, FAO Independent Evaluation Unit in consultation with the project team, including the FAO-GEF Coordination Unit and others	To be launched within six months prior to the actual completion date (NTE date)	USD 60,000

Terminal Report	PC; FAO (FAO Representation in Pakistan, LTO, FAO-GEF Coordination Unit, Business Development and Resource Mobilization (PSR) Reporting Unit)	Two months prior to the end of the project.	USD 6,880
Total budget			USD 109156

10. Benefits

Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCE/SCCF)?

The project promotes full and productive employment and decent work in rural areas, aiming at the progressive realization of their right to Decent Rural Employment[1]. Strengthening of key value-chains and introduction of target SLM measures will lead to improved income generation opportunities and more diversified livelihoods for around 20,000 people (50% women) in the target districts and landscapes. Additional socio-economic benefits include the following and will be calculated during initial stages of project implementation:

- ? Increased policy support for SLM and incentives for the province of Punjab
- ? District scale land planning and decision support systems available and operational for local administrators
- ? Increased cross-sectoral collaborations, data sharing and technical support to address LD and its impacts
- ? Increased livelihood and economic resilience through improved market access by smallholder to climate resilient value chains
- ? Increased social resilience and human well-being (Gender equality, access to information, participatory decision-making) of 20,000 beneficiaries (Women 10,000; Men 10,000)
- ? Improved food security through increased productivity and delivery of ecosystem services (project contribution defined, but not monitored)

[1] Specific guidance on how FAO can promote the Four Pillars of Decent Work in rural areas is provided in the [Quick reference for addressing decent rural employment](#) (as well as in the full corresponding [Guidance document](#)). For more information on FAO's work on decent rural employment and related guidance materials please consult the FAO thematic website at: <http://www.fao.org/rural-employment/en/>.

11. Environmental and Social Safeguard (ESS) Risks

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

Overall Project/Program Risk Classification*

PIF	CEO Endorsement/Approva I	MTR	TE
Low	Medium/Moderate		

Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

<u>Description of risk</u>	<u>Risk classification</u>	<u>Mitigation actions</u>	<u>Indicators / Mean (s) of Verification</u>	<u>responsible party (ies)</u>

<p><u>2.1. Would this project be implemented within a legally designated protected area or its buffer zone?</u></p>	<p>Low</p>	<p><u>In order to deal with land degradation, the project will work closely in Punjab province to strengthened provincial and district to address conflicts over rangeland resource use (access, fees, seasonal restrictions, etc) although conflicts are uncommon in areas with well-established land settlement / tenure systems. In addition, traditional community structures such as local Punchats (groups of elders with responsibility at the village level to approve local programs/activities), will help to prevent and resolve these conflicts. Nevertheless, the project will support conflict resolution mechanisms, social mobilization, awareness raising and capacity building of communities to further mitigate these issues, including use of the FAO Programme Clinic. The project intervention activities will be done with full consensus of the community</u></p>	<p><u>- Number of provincial Rangeland Management Policy publications</u> <u>-Number of district sustainable land and resource management plans that include concepts of land degradation neutrality</u> <u>- Ha impacted through project activities (disaggregated by land cover/use class)</u> <u>-Number of ha and sites supported by new water distribution systems</u> <u>-Number of ha of agricultural farming systems planted with fodder crops and fodder trees</u> <u>-Number of ha of rangeland reseeded with local grass</u> <u>-Ha covered under improved management approaches or systems</u> <u>-</u></p>	<p><u>Punjab Forestry Dept. with support of district authorities and community reps, PMU and FAO oversight</u></p>
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<p>7.2. Would this project operate in sectors or value chains that are dominated by subsistence producers and other vulnerable informal agricultural workers, and more generally characterized by high levels of working poverty??</p>	<p>Low</p>	<p>Food insecurity and poverty remain challenges in the project areas and communities where many households suffering from poverty, or transient poverty due to seasonal incomes or external economic support. Only 0.05 percent of the households own greater than 2 ha of land in Punjab. Farmers are dependence on natural resources for livelihoods that are susceptible to climate change. Dependence on rain fed crops and systems was included, including dependence on rain fed pastures and rangelands. The project will implement climate smart agriculture / livestock tailored action to assist livestock farmers in project communities to improve their crop and livestock productivity, adapting and building resilience to climate change risk.</p>	<ul style="list-style-type: none"> - Number of potential direct and indirect beneficiaries of plans (disaggregated by sex) --Number of participant actors and beneficiaries (sex disaggregated) -No of people receiving project training and practical experience Number of plans developed -Number of mechanisms piloted -Number of ha and sites supported by new water distribution systems -Number of producers trained in animal nutrition, CC and health -Participatory Impact Monitoring (PIM) -Number of participants in international exchange visits Number of independent audits conducted -Mid-term and final evaluation conducted - Percentage increase in food security status (FIES, FCS, HDDS) - Percentage increase in Resilience Capacity Index (RCI) 	<p>PMU, FAO and MoCC external reviewers</p>
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<p>7.3. <u>Would this project operate in situations where youth work mostly as unpaid contributing family workers, lack access to decent jobs and are increasingly abandoning agriculture and rural areas?</u></p>	<p>Low</p>	<p><u>As mentioned above that the project areas will be working in in areas where poverty, youth and unemployed are high. This high incidence of poverty in rural areas can be linked to inadequate infrastructure, lack of opportunities and resources. The project will tailor some interventions and set up business plan to assist young livestock farmers in project communities to access trainings and apply their knowledge to improve their crop and livestock productivity, adapting and building resilience to climate change risk. In addition the project will tailor some interventions and set up business plan to ensure its actions are rewarding and for youth</u></p>	<ul style="list-style-type: none"> - <u>Number of potential direct and indirect beneficiaries of plans (disaggregated by sex)</u> --<u>Number of participant actors and beneficiaries (sex disaggregated)</u> -<u>No of people receiving project training and practical experience</u> <u>Number of plans developed</u> -<u>Number of mechanisms piloted</u> -<u>Number of ha and sites supported by new water distribution systems</u> -<u>Number of producers trained in animal nutrition, CC and health</u> -<u>Participatory Impact Monitoring (PIM)</u> -<u>Number of participants in international exchange visits</u> <u>Number of independent audits conducted</u> -<u>Mid-term and final evaluation conducted</u> - <u>Percentage increase in food security status (FIES, FCS, HDDS)</u> - <u>Percentage increase in Resilience Capacity Index (RCI)</u> 	<p><u>PMU, FAO and MoCC, external reviewers</u></p>
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Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
Environmental and social risks	CEO Endorsement ESS	
FAO ES Screening Checklist	Project PIF ESS	

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Responsible for data collection
Objective: To conserve and restore critically important rangelands and livestock production systems and strengthen the resilience and sustainability of rangeland-dependent livelihoods in vulnerable dryland regions of northern Punjab, Pakistan							
Impact: Improved food security and resilience of men and women stakeholders in northern Punjab who sustainably manage rangeland resources	Percentage increase in food security status (FIES, FCS, HDDS) Percentage increase in Resilience Capacity Index (RCI)	To be determined (TBD) TBD	TBD TBD	TBD TBD	Impact evaluation Reports (household baseline, midline and endline surveys)	Socio-political situation of Pakistan will remain stable	MoCC
Component 1: Government capacity to assess and plan for effective rangeland management							

<p>Outcome 1.1: Land degradation is reduced in the Punjab Province through strengthened provincial and district policy and planning frameworks and capacities</p>	<p>1. Number of provincial Rangeland Management Policy publications</p> <p>2. Number of district sustainable land and resource management plans that include concepts of land degradation neutrality</p> <p>3. Number of Local expertise developed in place to support and monitor climate-sensitive sustainable management of rangelands</p>	<p>No rangeland specific policy or planning strategy exists at the Provincial nor District level, nor is data on rangeland status, productivity or degradation extent collected in a systematic manner in accordance with UNCCD recommendations</p>	<p>Outcome related activities and programmes have led to clear policy recommendations and capacity development in key institutions has established foundations on which to realise change and strengthen institutional responses.</p>	<p>1. One provincial policy for Punjab endorsed covering all rangeland in the province</p> <p>2. Three district sustainable land and resource management plans developed through cross sectoral collaboration to implement / support sustainable land and resource management plans linked to the provincial policy (CI 11)</p> <p>3. At least 200 staff of government agencies, NGOs and CSOs have with skills in sustainable rangeland monitoring, management planning and restoration (CI 11)</p>	<p>1. Copy of policy publications</p> <p>2. Copy of resource management plans</p> <p>3. Training reports/list of participants</p>	<p>Project objectives are well aligned with the current National Forest Policy, Livestock Products Export Strategy and other recent legislation and regulations pending</p> <p>Policy frameworks will include incentive measures for SLM, rather than difficult to enforce regulatory policies or punitive measures</p> <p>Increased fodder production from both crop and rangeland areas will lead to reduced pressure on natural resources and reduce Land Cover Change in pilot water basins</p>	<p>MoCC</p>
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<p>Output.1.1 .1: Provincial rangeland managem ent policy developed</p>	<p>-Policy papers produced - Amendmen ts presented to draft provincial rangeland law for Punjab</p>	<p>No approved rangeland policy exists for the Punjab Province, including project districts, nor does the LDN conceptual framework currently inform policy decisions</p>	<p>2 policy papers that incentivise land use planning and map LDN integration into current land managem ent policy structures are developed, validated, and endorsed by key provincial and local stakeholder s, and are disseminat ed through project communica tion channels at project mid-term</p>	<p>By project closure, project amendment s to the draft provincial rangeland law have been officially presented in a participator y workshop, based outcomes of policy papers and other project outputs and recommen dations</p>	<p>- Copy of Policy papers -Publications associated with policy papers and recommended amendments to provincial draft Rangeland man. law - Event reports and financial statements</p>	<p>The current draft law is of sufficient quality so as to be amended and is aligned with project outcomes Project has sufficient political support to influence political process at Provincia l scale</p>	<p>MoCC</p>
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<p>Output 1.1.2: Comprehensive assessment of the status of all rangelands in the project area</p>	<p>-Ha covered in assessment</p> <p>-Institutions and beneficiaries (sex disaggregated data) involved in assessment process</p>	<p>The rangelands of the proposed project are neither systematically studied nor there is any land-based data or trends to inform management policies</p> <p>-0 ha covered in assessment</p> <p>-0 participants</p> <p>-0 assessment cycles</p>	<p>Building on land assessment processes and tools developed during project development phase (PPG), a systematic rangeland monitoring protocol is piloted in collaboration with key stakeholders and beneficiaries to assess rangeland status and set project baselines</p>	<p>Rangeland assessment system has been piloted for a minimum of 2 assessment and data gathering cycles, resulting in adaptations and improvements based on lessons learnt. The system is captured in a users manual, developed under Output 3.1.2.</p> <p>1 year before project closure, a sustainability plan is developed to maintain the project assessment system active. It is endorsed by PSC by project closure</p>	<p>-Reports outlining preliminary approach, baselines and lessons learned produced</p> <p>-Rangeland Assessment reports outlining key findings and recommendations</p> <p>-Sustainability plan report and financial projections</p> <p>- Event reports and financial statements</p>	<p>Global advancements made in LDN M&E at national, sub-national and local scales will meet stakeholder and project objectives and be relevant to local contexts</p> <p>The assessment system will be cost-effective and provide for clear returns on investment, ensuring sustainability after project closure</p>	<p>MoCC</p>
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<p>Output 1.1.3: Provincial and district sustainable land and resource management plans developed and under implementation</p>	<p>-Ha covered under plans</p> <p>-Number of plans developed</p>	<p>No provincial or district level land or resource management plans exist.</p> <p>-0 ha covered under planning process</p> <p>-0 plans developed</p>	<p>Project staff in close collaboration with key stakeholders have developed ILM planning procedures, based on FAO tools and methodologies, LDN mapping and the preliminary results from Output 1.1.2. Participatory engagement processes with community administrators and beneficiaries have provided inputs and recommendations for land plan investments and technical/material support</p>	<p>Final provincial and district level management plans have been endorsed at various administrative and social contexts and awareness campaigns on the plans have been conducted, providing demonstrable benefits to 14,500 livestock producers</p>	<p>-Survey report</p> <p>-Community ILM plans and associated documents and supporting materials</p> <p>-Event reports and financial statements</p> <p>-PIM</p>	<p>There is a shared consensus on the definition, objectives and capacities of land management plans at the provincial and district scale</p> <p>Participatory planning processes are capable of objectively identifying and removing key constraints and incentivising SLM through planning and investments</p> <p>Funding support required ministries and institutions for plan activation will be timely and sufficient</p> <p>Elite capture will be mitigated</p>	<p>MoCC</p>
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<p>Output 1.1.4: Land and resource information, monitoring and decision support systems established</p>	<p>-Number of DSS developed</p>	<p>No DSS exists that allows for contextualised decision making based on LD and productivity trends at the provincial, district or community level</p> <p>-0 DSS developed</p>	<p>-Based on initial PPG digital project support system, a context adapted DSS is developed that incorporates the LDN and other rangeland indicators is piloted for the 3 project districts of Attock, Chakwal, and Jehlum</p>	<p>-Results and lessons learnt from initial trials and Output 1.1.2 are used to modify and improve DSS, leading to improved sectoral planning and decision-making to increase rangeland productivity by the Punjab Forestry Dept.</p> <p>-The DSS is expanded to cover the whole of the Punjab province by project closure</p>	<p>-Technical reports on LDN-DSS results and adaptation following piloting/testing</p> <p>-LDN-DSS Technical Description and user's manual</p> <p>-Inputs and feedback by users of DSS, to be captured in draft report</p> <p>- Event reports and financial statements</p>	<p>-Clear, short channels of communication will exist between data collection and decision-makers</p> <p>-Upper level administrators will understand and utilise the results from DSS process in planning processes</p>	<p>MoCC</p>
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<p>Output 1.1.5: Capacities of provincial and district stakeholders for sustainable rangeland management strengthened</p>	<p>-Total number of people trained/participant in workshops and sessions (sex disaggregated data) -Number of GoP staff trained in LDN principles and framework application</p>	<p>No LDN or rangeland management or landscape approach capacity building programmes or data collection systems currently exist in the Punjab Province, or within selected project districts -0 trained or having received capacity building</p>	<p>100 key stakeholders and policy makers (minimum of 15 provincial technical staff members from each project district (3x15=45)) are trained or participate in project workshops that present initial tools and resources that are produced in Outputs 1.1.2, 1.1.3 and 1.1.4, as well as outline the LDN framework, rangeland man. issues and policy, the landscape approach and CC projections and impacts on local ecosystems, including gender perspectives and issues.</p>	<p>A total of 200 people from diverse stakeholder groups (minimum participation of 90 PoK staff) participate in training or participate in project workshops aimed at building practical capacity on the final versions of the tools and resources that are produced in Outputs 1.1.2, 1.1.3 and 1.1.4 and on the project experience applying the LDN framework</p>	<p>-Course curriculum and materials -Course reports and participant lists -Event reports and financial statements/participant list</p>	<p>Increased awareness of LDN principles and framework will facilitate intersectoral coordination and data collection and sharing Staff trained will have authority to introduce changes to apply LDN principals and DSS</p>	<p>MoCC</p>
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<p>Output 1.1.6: Provincial and district mechanisms for cross-sectoral collaboration established and operating</p>	<p>-Number of GoP institutions involved in coordination mechanisms for rangeland monitoring</p>	<p>No LD or rangeland specific intersectoral coordination mechanisms currently exist, either at local, regional or national levels.</p> <p>-0 of GoP piloting cross-sectoral collaboration and data-sharing mechanisms</p>	<p>Building on the initial results of Output 1.1.1, baselines for intersectoral mechanisms are established, gaps and opportunities analysed, and recommendations are developed</p>	<p>A minimum of 3 intersectoral coordination mechanisms (1 per district), with special attention on data sharing and planning, are piloted within GoP institutions, with results being captured at local, district and provincial scales</p>	<p>-Reports detailing baseline findings, analysis and recommendations</p> <p>-Reports detailing results from mechanism pilot programmes tests and final recommendations</p>	<p>Intersectoral coordination is a need and a demand by relevant institutions</p> <p>Political motivation exists to collaborate and share information between institutions</p>	<p>MoCC</p>
<p>Component 2: Community led livestock management to reduce land degradation</p>							

<p>Outcome 2.1: Community rangeland and livestock management systems in place to reduce land and water degradation and ensure sustainable production</p>	<ol style="list-style-type: none"> 1. Number of people receiving project training and practical experience 2. Number of community rangeland and livestock management plans 3. Number of ha under sustainable livestock production 4. Number of mechanism piloted that increase gender equality in rangeland and livestock management decisions 	<p>Productivity gains to date have largely occurred on large, private land holdings through improved water harvesting and irrigation. Communal ly managed rangelands have not been managed under a systematic, community driven approach to date. Knowledge has been identified as a key barrier to SLM adoption.</p>	<p>Sustainable and inclusive fodder cropping and rangeland management systems based on Holistic Planned Grazing, Agroecology, Conservation Agriculture and Climate Smart Agriculture are demonstrated within an integral landscape approach, with 750 people trained in these techniques</p> <p>300 beneficiaries participate in field days, exchange visits</p>	<ol style="list-style-type: none"> 1. A total of 1500 beneficiaries have been trained in community rangeland and livestock management systems (CI 11) 2. Three (1 per district) community rangeland management plans are developed. (CI 11) 3. Sustainable food production is scaled to 3,000 ha under a range of diverse production contexts (CI 4.3 + CI 11) 4. A minimum of 3 Mechanisms are piloted to support the participation of women in rangeland and livestock management (CI 11) 	<ol style="list-style-type: none"> 1. Training reports/ participant list 2. Copy of rangeland management plans 3. Project documents/assessment report 4. Project document 	<p>Component 1 will provide timely policy opportunities that allow for increased investments and upscaling of sustainable agricultural production for fodder and rangeland systems</p>	<p>MoCC</p>
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<p>Output 2.1.1: Capacities of communities / community groups to implement sustainable rangeland and livestock management strengthened</p>	<p>-Number of participant organisations in training/capacity building and/or FFS</p>	<p>-0 participants have been engaged or receiving training or support</p>	<p>Through a mix of partnerships with existing organisations and the creation of FFS in areas of strategic value, 750 people receive training in SLM practices, including Holistic Planned Grazing, Agroecology, Conservation Agriculture and Climate Smart Agriculture and integrated landscape management, including support and dissemination of WOCAT practices</p>	<p>The mixed organisational approach and FFS developed are operational, having provided training to a total of 1.500 people through a range of innovative engagement and capacity building exercises</p>	<p>-Course curriculum and attendance sheets -Course facilitator or trainer records and reports -Sex disaggregated data of participants and beneficiaries/list of participants -Event financial statements -Project M&E, which includes minimum standards for FFS operation and monitoring, applicable to participant organisations -Participatory Impact Monitoring (PIM)</p>	<p>There are sufficient numbers of existing organisational structures and producer groups to meet core beneficiary targets, and/or the project will be capable of creating and operating those needed Working in close collaboration with existing CSO and NGO is more efficient and is preferred to the project creating and operating FFS In those situations where CSO or NGO are not active in the area, or in those areas where women and youth are not engaged in CSO/NGO, FFS will be created</p>	<p>MoCC</p>
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<p>Output 2.1.2: Community-level rangeland and livestock management plans developed and under implementation</p>	<p>-Ha covered under plans</p> <p>-Number of potential direct and indirect beneficiaries of plans (disaggregated by sex)</p> <p>-Number of plans developed</p>	<p>No community level rangeland or grazing plans exist at a community level in the project selected districts.</p> <p>-0 ha covered under plans</p> <p>-0 beneficiaries</p> <p>-0 plans developed</p>	<p>Project staff, in close collaboration with key stakeholders and institutions through support of Output 1.1.6, have developed community -level ILM planning procedures, based on FAO tools and methodologies, LDN mapping and the preliminary results from Output 1.1.2. ILM plans have been presented and endorsed by relevant stakeholders and participant communities</p>	<p>Three (1 per district) community ILM plans covering a minimal area of 3,000 ha have been established and are actively developed through project and stakeholder support, providing direct benefits to 2,500 people</p>	<p>-Community ILM Planning protocols developed and endorsed by key stakeholders</p> <p>-Community ILM plans and associated documents and supporting materials</p> <p>-Event reports and financial statements</p> <p>-PIM</p>	<p>An enabling environment exists at a community level that will allow for ILM plans developed through Output activities to be established</p> <p>Sufficient resources are available in communal land tenure areas to allow for land plans to meet local demands and expectations</p>	<p>MoCC</p>
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<p>Output 2.1.3. Mechanisms in place to support the participation of women in rangeland and livestock management</p>	<p>-Number of mechanisms piloted</p>	<p>Although women are typically assigned the social role and responsible for animal husbandry, feeding, milking and other livestock and grazing, they do not have decision-making power over income generated and have limited access to natural resources.</p> <p>-0 mechanisms piloted</p>	<p>Building on gender-responsive M&E framework based on logframe and GAP and initial results from Output 1.1.1, pilot a minimum of 3 (1 per district) gender-sensitive mechanisms within participant communities, with links to Output 2.1.2 as practical example and resource base for pilot procedures.</p>	<p>Annual data collection and PIM reporting are used to determine success of 3 pilot mechanisms and provide materials and data sufficient to develop a publication to inform scaling at Provincial, National and Regional scales.</p>	<p>-Project reports and publications -Event reports and financial statements -PIM</p>	<p>The project will be successful in overcoming cultural obstacles to implement empowerment within local participant communities</p>	<p>MoCC</p>
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<p>Outcome 2.2: Rangeland ecosystems, livestock production and livelihoods in three target districts benefitting from sustainable management, restoration, and production activities</p>	<ol style="list-style-type: none"> 1. Number of ha of rangeland under regulated grazing management systems (pargorh) 2. Number of ha of moderately degraded grasslands managed under a system of periodic closures 3. Number of ha and sites supported by new water distribution systems 4. Number of producers trained in animal nutrition, CC and health 5. Number of livestock with improved health through provision of quality fodder and feed supplementation 6. Number of ha of agricultural farming systems planted with fodder crops and fodder trees 7. 	<p>Ecosystem services and land degradation avoidance/reduction/reversal programmes are not coordinated within ILM context in project districts, leading to a reduction in ecosystem services and agricultural productivity</p>	<p>At project midterm: -7,000 ha are under improved management systems. -3,000 ha are systematically closed to increase ground cover and allow for natural regeneration. --3 water distribution systems are developed, improving an area of 30 ha -1 knowledge product on animal nutrition supplementary feeding and use of mineral licks/other mineral sources to maintain body condition and productivity -1 collaborative study and resulting knowledge product on ethnoveterinary species, preparation and doses recommendations developed -6 community-based nurseries (2 per district) have been developed -3 essential livestock-</p>	<p>At project closure: 15,000 ha are under improved management systems (CI 3.1 + CI 6.1) 8,000 ha of moderately degraded grasslands managed under a system of systematic closures. (CI 3.1 + CI 6.1) 50 ha (5 sites) supported by new water distribution systems 400 producers (200 women) are trained in animal nutrition, CC impact on animal health and ethnoveterinary species and their preparation and use (CI 11) 175,000 head of ruminant livestock with improved health and productivity (CI 11) 100 ha of agricultural farming systems are planted with perennial or annual</p>	<p>As per outputs PIRs, PPRs Midterm Review and Final Evaluation 4. Training reports/ participant list 5. Procurement records/post distribution report 9. Training reports/ participant list</p>	<p>As per outputs</p>	<p>MoCC</p>
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<p>Output.2.2.1: Rangeland areas conserved through improved management / production approaches</p>	<p>-Ha covered under improved management approaches or systems</p>	<p>-0 ha covered under improved management approaches or systems</p>	<p>Project activities and capacity building have allowed for 7,000 ha of land to be placed under improved management systems that ensure grassland recovery times after grazing and increases in ground cover and leaf surface area</p>	<p>Through project activities and resources mobilised, at total of 15,000 ha of land are placed under improved management through a variety of mechanisms, including regulation, incentives, community planning, PES, PPP and cooperation with existing projects and initiatives.</p>	<p>-Output reports on field activities -GPS coordinates siting project activities and boundaries of grazing areas and grazing calendars -Land-based indicators and remotely sensed data from assessment methodology developed under Output 1.1.2 -PIM</p>	<p>Ecosystem restoration will be based on addressing socio-economic root causes of poor management and not only address symptoms of LD</p>	<p>MoCC</p>
<p>Output 2.2.2: Degraded rangeland areas restored and supporting improved productivity</p>	<p>-Number of beneficiaries impacted (sex disaggregated data) -Ha showing increased productivity and biomass</p>	<p>Please see project mapping app for provincial, district and local scale LD rates and trends</p>	<p>Project activities and capacity building programmes have allowed for community support and collaboration to conduct a series of systematic closures on 3,000 ha</p>	<p>8,000 ha of moderately degraded grasslands managed under a system of systematic closures to increase ground cover and grassland species regeneration 1 WOCAT article is published based on this work</p>	<p>-Output reports on field activities/1. participant list -GPS coordinates siting project activities and boundaries of grazing areas and grazing calendars -Land-based indicators and remotely sensed data from assessment methodology developed under Output 1.1.2 -PIM</p>	<p>Periodic closures will be sufficient to increase ground cover and restore ecosystem services over large areas, though other outputs will support process at site specific locations</p>	<p>MoCC</p>

Output 2.2.3 ? Productivity and health of livestock herds improved	-Number of water distribution, storage and drinking trough systems rehabilitated or created	-0 Water points developed -0 producers trained -0 livestock impacted through project activities	At project midterm: -3 water distribution systems are developed, improving an area of 30 ha -170 people benefit from vaccination programme -1 collaborative study and resulting knowledge product on ethnoveterinary species, preparation and doses recommendations developed	At project closure: -50 ha (5 sites) supported by new water distribution systems -340 people benefit from vaccination programme -300 producers (250 women) are trained in animal nutrition, CC impact on animal health, basic veterinary skills and ethnoveterinary species and their preparation and use -5 short videos detailing animal health issues and home remedies are produced in local languages and shared over social media Vaccination campaign benefits a minimum of 340 people. This activity and other project Outputs have demonstrated	-Output reports on water distribution system proposals and implementation -1. Training reports/ participant list/Output knowledge products -Course curriculum and attendance sheets -Course facilitator or trainer records and reports -Sex disaggregated data of participants and beneficiaries -Event financial statements -Participatory Impact Monitoring (PIM)	Knowledge is a key barrier to improved animal health	MoCC, with support of local Universities and technical institutions
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<p>Output 2.2.4. Increased availability of sustainably grown fodder for livestock production</p>	<p>-Ha impacted through project activities (disaggregated by land cover/use class)</p>	<p>-0 ha of cropland or grazing land impacted through project activities</p>	<p>By project midterm, 6 community-based nurseries (2 per district) have been developed to produce native and improved fodder crops for a variety of cropping and rangeland situations and conditions</p>	<p>6 developed community nurseries have led to 100 ha of agricultural farming systems planted with perennial or annual fodder crops, 200 ha planted with fodder trees within agroforestry demonstration sites developed on marginal lands for each district and 5,000 ha rangeland reseeded with local grass/fodder species</p>	<p>-Output reports on field activities and nursery development</p> <p>-GPS coordinates siting project activities and demonstration site boundaries</p> <p>-Participatory Impact Monitoring</p> <p>-Increasing fodder reserves measured by land-based M&E system produced under Output 1.1.2 and 1.1.4</p>	<p>-Course curriculum and attendance sheets</p> <p>-Course facilitator or trainer records and reports</p> <p>-Sex disaggregated data of participants and beneficiaries</p> <p>-Event financial statements</p> <p>Participatory Impact Monitoring (PIM)</p> <p>EX ACT</p>	<p>MoCC</p>
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<p>Output 2.2.5. Livelihood opportunities from livestock raising strengthened</p>	<p>-Number of participant actors and beneficiaries (sex disaggregated)</p>	<p>-0 participants have been engaged or receiving training or support</p>	<p>Building on the PPG VC report, 3 essential livestock-related Value Chains (1 is gender sensitive) are mapped at district scale and recommendations for project funding and activities to strengthen them is endorsed by key stakeholders results in increased market access for project beneficiaries (1 gender sensitive)</p>	<p>3 essential livestock-related Value Chain components have been strengthened through project support that demonstrate results in increased market access</p>	<p>-VC mapping results and recommendations - Event reports and financial statements -PIM</p>	<p>Pandemic has cast light on importance of local production and value chains for food security, and GoP will support project scaling and investments through further funding programmes Project partnerships and networks will act as an enabling environment for business creation and partnerships Project activities will create private sector development opportunities and enterprises that are social inclusive of women and youth</p>	<p>MoCC</p>
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<p>Output 2.2.6 ? Livelihood opportunities from sustainable harvesting of forest products strengthened</p>	<p>-Number of participant actors and beneficiaries (sex disaggregated)</p>	<p>-0 participants have been engaged or receiving training or support</p>	<p>Building on the PPG VC report, 2 forest product Value Chains (1 is gender sensitive) are mapped at district scale and recommendations for project funding and activities to strengthen them is endorsed by key stakeholders results in increased market access for project beneficiaries</p> <p>-1 knowledge product on forestry-based VC is developed</p>	<p>400 beneficiaries (of which a minimum of 250 are women) are trained in forestry VCs, increasing livelihoods from sustainable harvesting of forest products</p>	<p>-Forestry VC mapping results and recommendations</p> <p>-Output knowledge products</p> <p>-Course curriculum and attendance sheets</p> <p>-Course facilitator or trainer records and reports</p> <p>-Sex disaggregated data of participants and beneficiaries</p> <p>-Event financial statements</p> <p>-Participatory Impact Monitoring (PIM)</p>	<p>Increasing demand and value of forestry VCs will allow for sustainable harvesting</p> <p>Sustainable harvesting and management of forest systems will be balanced by increased land tenure security and options for local communities</p>	<p>MoCC</p>
<p>Component 3: Knowledge management and M&E</p>							

<p>Outcome 3.1: Effective knowledge management, communications and project M&E</p>	<ol style="list-style-type: none"> 1. Number of participants in project sponsored field events and exchange visits 2. Number of Knowledge Products developed 3. Number of independent audits conducted 	<p>NA</p>	<p>6 months after project implementation, the Project Man. Unit has outlined the M&E strategy and indicators. Each consultant has developed a sub-M&E data collection process and contributes annually to M&E framework</p>	<ol style="list-style-type: none"> 1. 400 members of different participant organisations, community members, and FFS participate in field days and exchange visits to innovative, sustainable business initiatives based on project selected VCs. (CI 11) 2. Total of 7 Knowledge Products developed 3. Project midterm and final review process conducted 	<p>As per outputs</p> <p>PIRs, PPRs Midterm Review and Final Evaluation</p>	<p>As per outputs</p>	<p>MoCC</p>
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<p>Output.3.1.1: Increased local awareness and understanding of problems and opportunities associated with rangelands and livestock</p>	<p>-Number of awareness campaigns conducted</p> <p>-Number of participants in awareness raising and field events</p> <p>-Number of participants in international exchange visits</p>	<p>-0 awareness campaigns conducted</p> <p>-0 participants in awareness raising events or field days</p> <p>-0 participants in international exchange visits</p>	<p>Project communications programme is developed at an early stage and adapted for each individual Output needs, providing for timely deliver of project findings and information, sharing of online mapping tools and other awareness campaigns, publications, and media.</p> <p>A minimum of 200 members of different participant organisations, community members, and FFS participate in field days and exchange visits to innovative, sustainable business initiatives based on project selected VCs.</p>	<p>Another 200 members of different participant organisations, community members, and FFS participate in field days and exchange visits to innovative, sustainable business initiatives based on project selected VCs.</p> <p>Final project awareness campaign is conducted to award prizes for innovation in gender sensitive livelihoods and showcasing of best practice models</p>	<p>- Communications strategy</p> <p>-Participatory impact monitoring</p> <p>-Printed and audio-visual materials</p> <p>-Event reports and financial statements</p>	<p>Knowledge is a key barrier to SLM mainstreaming and investment</p>	<p>MoCC</p>
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<p>Output 3.1.2: Project knowledge management plan developed and under implementation</p>	<p>-Number of knowledge products developed *1 users manual for Rangeland Assessment Methodology and subsequent DSS (Output 1.1.2) *1 knowledge product outlining improved SLM and grazing man. practices, including grazing planning and monitoring worksheets (Output 2.1.1) *5 knowledge products will be developed for the Forage, Dairy, Acacia Resin, Poultry and Beekeeping value chains</p>	<p>No locally adapted knowledge products or sources of information exist on rangeland management, animal nutrition, ethnoveterinary methods or forestry management/ value-adding. -0 Knowledge Products developed</p>	<p>By project mid-term, 3 knowledge products will be developed for the Forage, Acacia Resin and Poultry value chains, 1 knowledge product will be produced outlining improved SLM and grazing man. Practices.</p>	<p>By project closure, 2 additional knowledge products for the Dairy and Beekeeping value chains and 1 users manual for Rangeland Assessment Methodology and subsequent DSS (Output 1.1.2) have been developed and disseminated.</p>	<p>-Knowledge products and publications -Printed and audio-visual materials</p>	<p>Project developers will adapt and innovate on traditional knowledge product approaches, keeping in mind the main sources of information that project beneficiaries use</p>	<p>MoCC</p>
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Output 3.1.3: Effective project M&E plan in place	-Mid-term and final evaluation conducted	NA	Project M&E system delivers expected reports and informs project management. Informed and systematic data collection increases capacity and speed of mid-term review Mid-term review is conducted	Project M&E system delivers expected reports and informs project management, allowing for adaptation to changing context and social environments Final review and report concluded	-M&E reports/documents -Indicator data (GEF Tracking Tools) -PIRs PPRs, -Midterm Review and Final Evaluation	PMU functioning and adequate funding allocated to M&E	MoCC
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[1] PPG reports, Annexes M, N, O

[2] PPG report, Shah T 2021, Draft report to inform the Project Document on issues related to Rangeland Management and Land Degradation, GCP/PAK/905/GFF

[3] idem

[4] FAO 2020. 'Guidelines for Grazing Management Planning: a Holistic Approach', Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project//GCP/TUR/061/GFF.

[5] FAO 2020. 'Guidelines for Grazing Management Planning: a Holistic Approach', Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project//GCP/TUR/061/GFF.

[6]

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

Responses to the comments

Comment	Government of Pakistan and FAO response
STAP	

<p>To sustainably manage climate change risks, STAP recommends identifying explicitly such risks ? including increased stress on feed and water resources, and risks to livestock health and community livelihoods. Identifying and addressing these risks in the theory of change, will assist in reaching the project objective.</p>	<p>To be drafted after discussions with the climate expert in the field</p> <p>This said, the project will be aiming to develop a landscape that takes into account new climatic realities, providing shade structures and forest that act as temperature refuges for livestock, wildlife and herders, increasing water retention capacities of the landscape to make rainfall infiltration into the soil more efficient, to increase SOC rates to increase soil water retention, to improve water distribution in the landscape and reduce the ?sacrificial areas? and overgrazing that takes place near these sites, to increase use of drip irrigation and other water-saving technologies, and lastly to increase ILM planning that optimises resource use within scarcity.</p>
<p>STAP recommend the theory of change and risk analysis to include the impact to the project and planned interventions that may arise from socio-political factors mentioned in the proposal (internally displaced persons and refugees).</p>	<p>Thank you. This point has been raised by national stakeholders as well and has been incorporated into the ToC, as well as being addressed specifically in the Risks section (Section 5).</p>
<p>Additionally, STAP recommends defining one, or two, simple scenarios for mapping plausible futures. It is likely that the project may require developing and analyzing more than one plausible trajectory to deal with long-term changes, such as climate change, and population changes resulting from an influx of refugees and internally displaced persons.</p>	<p>While specific scenarios are not outlined in the project, project design has provided a degree of flexibility regarding what tools and approaches are used to meet individual targets. Tools and approaches are cited and recommended but project developers will have the capacity to understand the causal pathways being applied and adapt them to local context and changing social-political environments.</p>
<p>As the project developers consider rehabilitation and restoration opportunities, STAP recommends pursuing a land potential assessment as part of the preparatory activities for achieving outcome 1.1; and that interventions designed for this project are articulated with existing land use planning strategies of the Region, so that it is clear what must be maintained or improved, and ?where? interventions can occur.</p>	<p>Land Potential estimates were not fully developed though the field surveys and other supporting data collection systems did point to the biomass loads being 7 times below their historic trends and potential. The interactive mapping and stakeholder consultations supported and validated these claims.</p> <p>Land Potential will be further studied through the Rangeland Assessment and Monitoring system developed under Output 1.1.2 and will inform both producers and administrative decision makers on the state of land resources and estimates on potential productivity.</p>

<p>Paying close attention to land tenure and governance arrangement will also be important to achieve LDN.</p>	<p>Land Tenure is a complex issue in the area, and the majority of livestock producers do not enjoy land tenure rights or obligations in the areas they graze their animals. Given the nature of the project, its potential to influence and enact change at upper political levels needs to be carefully considered before attempting to address land tenure issues at local or national scales. The project will keep in mind its sphere of influence during implementation, but will also utilise the tools developed by FAO and other GEF Agencies to tackle such problems. These include the FAO Programme Clinic and the Voluntary Guidelines on the Responsible Governance of Tenure (VGGT) which are cited in the project document.</p>
<p>Furthermore, it is recommended the identification of local indicators of LDN and associated metrics that can reflect locally relevant ecosystem services not covered by the SOC, NPP or land cover change indicators (in relation to output 1.1.4).</p>	<p>Thank you. The Theory of Change proposes additional relevant indicators to be considered under the LDN Monitoring Framework.</p>
<p>STAP recommends early thinking on best practice and technologies for 'knowledge management and sharing' (outcome 3.1). Knowledge needs to be 'shared' and instruments (e.g. advisory services, peer to peer, use of ICT) that best suit local context deserve early attention to ensure success of this expected outcome.</p>	<p>Table 20 details the description of the SLM technologies identified by stakeholders during project development. As well, there are specific recommendations and activities that will diversify the range of knowledge product formats and media, as well as development of an online project platform that will host the interactive mapping tool and provide agendas and lessons learnt.</p> <p>The landscape approach to planning and the role of 'management' as a restorative tool that can be applied under grazing situations and current livelihood strategies are innovative and allow for various SLM technologies to come together under a unified holistic framework.</p> <p>Links will also be made with other FAO IPs and FAO knowledge hubs</p>
<p>Output 1.1.4: develop local indicators and associated metrics that can reflect locally relevant ecosystem services not covered by the SOC, NPP or land cover change indicators</p>	<p>Provided for in the ToC and ratified in various stakeholder engagements, including the PRODOC validation meeting.</p>

<p>2.1.1 consider building capacity of communities through peer to peer, consider gender and cultural issues in designing tools for capacity building</p>	<p>Mention and use of the FFS methodology requires a significant amount of resources and capacity building at a range of socio-political levels. Creation of FFS, or AgroPastoral Field Schools (APFS), are therefore recommended only in justified cases in the project.</p> <p>This does not mean that vital elements of the methodology, such as peer to peer, on-demand educational services cannot be integrated into a leaner, more targeted training and extension outreach services that utilise local CSO or informal ?community? groupings.</p> <p>Project design and funding allows for this mixed approach, supported by sufficient elements that allow for transition of any project groupings into community-led Grazier organisations or private sector entities.</p>
<p>Consider market instruments such as microfinance for women. Coppock et al 2011 highlight the success of building capacity in impoverished rangelands using collective action, microfinance, and participatory education. Do not under estimate the power of participatory processes to design training and capacity building interventions. A good synthesis is provided in Badstue et al 2018</p>	<p>Well noted, and it is a key component that links to the majority of other project activities.</p>
<p>Output 3.1: knowledge needs to be ?shared?, not only managed. Search for novel ways of sharing knowledge that can be suitable to the intervention context (e.g. peer-to-peer as mentioned in Kiptot and Franzel 2015). Considering the target stakeholders a good analysis is needed of the ?various media? (pg 28) to be used to disseminate knowledge and build capacity. Dissemination alone is not enough, advisory services (see Kingiri 2020) and the guidance on ?how to? are equally important. Given COVID, what use of multimedia could be done that suits the stakeholders culture and social practices?</p>	<p>Please see above regarding knowledge management and sharing approaches. Both the Sustainable Forest Management Impact Program on Dryland Sustainable Landscapes (DSL-IP) and the Dryland Restoration Initiative Platform (DRIP) could provide for further integration and information sharing opportunities for dryland areas across the globe.</p>

<p>Some additional resources the project developers may find useful include: Badstue, Lone, Diana E. Lopez, Anja Umantseva, George Williams, Marl?ne Elias, Cathy R. Farnworth, Anne M. Rietveld et al. "What drives capacity to innovate? Insights from women and men small-scale farmers in Africa, Asia, and Latin America." (2018). Coppock, D. Layne, Solomon Desta, Seyoum Tezera, and Getachew Gebru. "Capacity building helps pastoral women transform impoverished communities in Ethiopia." Science 334, no. 6061 (2011): 1394-1398. Kiptot, E. and Franzel, S., 2015. Farmer-to-farmer extension: opportunities for enhancing performance of volunteer farmer trainers in Kenya. Development in Practice, 25(4), pp.503-517. Khaila, Stanley, Frank Tchuwa, Steven Franzel, and S. Simpson. The farmer-to-farmer extension approach in Malawi: a survey of lead farmers. No. 189. ICRAF Working Paper, 2015.N. Kingiri, A., 2020. Agricultural advisory and extension service approaches and inclusion in reaching out to Kenyan rural farmers. African Journal of Science, Technology, Innovation and Development, pp.1-10</p>	<p>Well noted with many thanks.</p>
<p>Are the global environmental benefits/adaptation benefits likely to be generated? the reasoning is not clear behind the 20 years for the duration of carbon accounting, neither the data or evidence used to argue that indicator 11 will benefit 10,000 women and 10,000 men. The team could account for other beneficiaries like youth as well. It is not clear the origin of the 3000 ha of restored land (indicator 3).</p>	<p>Please see the Table provided in the introductory section on page #13 to see the breakdown of land and beneficiary targets and specific outputs to meet them.</p>
<p>Are the barriers and threats well described, and substantiated by data and references? It will be important to build-in these barriers and threats (e.g. climate change risks) to the outcomes to ensure the interventions are feasible. Additionally, consider enablers of, or opportunities for change. This includes opportunities, or motivations, for enabling actions that improve livelihoods while strengthening pro-environmental behaviours.</p>	<p>Thank you. The ToC incorporates the comment.</p>
<p>Is the baseline identified clearly? Partly. The PIF includes a narrative baseline, describing on-going and future initiatives primarily on afforestation. Recommend listing additional initiatives on sustainable land management, and rangeland management.</p>	<p>Ongoing and recent projects and initiatives are well described within the project Baseline (Section 1.2), though rangeland issues and projects have not been conducted previously in the region and little to no data exists for mainly fragmented and short value chain structures.</p> <p>Field data and rangeland assessments have not been systematically carried out for the project districts and watersheds.</p> <p>The PPG process has attempted to provide some tools and baselines for project implementation, but these will need to be tested extensively before the data could be considered valid.</p>

<p>Does it provide a feasible basis for quantifying the project's benefits? Yes, possibly. In addition to the GEF core indicators, suggest identifying indicators to monitor rangeland sustainability and the targeted livelihoods ? that is, a combination of environmental and social indicators.</p>	<p>Well noted and incorporated. A solid Participatory Impact Monitoring programme to support M&E is also provided for in Component 3.</p>
<p>Is the baseline sufficiently robust to support the incremental (additional cost) reasoning for the project? Yes, the baseline is sufficiently robust at this stage. However, recommend identifying environmental and social indicators (when developing the theory of change) that complement the GEF's core indicators, and which track progress towards achieving sustainable rangeland management.</p>	<p>Well noted.</p>
<p>how did these lessons inform the design of this project? Lessons from past or on-going initiatives need to be described in the baseline section. This information appears missing in the PIF.</p>	<p>Relevant lessons learned are summarized in Table 8. They can be summarised, however, as being principally beneficial for private land owners with access to irrigation.</p> <p>Rangelands and landless graziers contribute immensely to GDP and food security, but until now have been largely ignored.</p>
<p>The ToC can be improved by adding the ?stakeholders? and associated activities that are needed to deliver the set outputs. Thinking of activities is also important to anticipate whether the assumptions hold, and what external (refugees, IDP) and internal factors may act in support (or against) the set assumptions. A good example is activities associated with Barrier #2 (periodic closures and regulated grazing); that level of activity thinking is not evidence for Barrier #1 or Barrier #3.</p>	<p>Well noted. This has been incorporated into the new version of the ToC.</p>
<p>Is there a recognition of what adaptations may be required during project implementation to respond to changing conditions in pursuit of the targeted outcomes? No. Given the increased stress on water and agricultural (and feed) resources in the target area, STAP recommends building one, or two, simple scenarios for plausible futures. This process entails having stakeholders think through whether any long-term changes (e.g. climate change, population changes, such as increased number of refugees or internally displaced persons) pose risks to the project, and to its outcomes being enduring. Refer to STAP's theory of change primer (table 2) and RAPTA for guidance on developing pathways, and more than one scenario: https://www.stapgef.org/theory-change-primer https://www.stapgef.org/rapta-guidelines Additionally, the following paper may assist in describing further the project context in relation to the effects of land use and land cover changes on climate in the region of Punjab in Pakistan: https://link.springer.com/article/10.1007%2Fs11356-020-08984-x</p>	<p>The SLM technologies and management approaches would remain largely the same in probable socio-economic or climatic scenarios, and have been taken from a range of stakeholder consultations and previous project lessons learnt.</p> <p>Water retention should be a prime objective under all probable scenarios.</p> <p>The district and community scale ILM plans take into account the landscape approach, which is recognised as one of the vital tools in CC mitigation and adaptation.</p> <p>Community-led nurseries also allow locals to estimate what plants can survive the new climatic norms, and which provide a return on investment for multiplication and care.</p>

<p>In component 1, project developers are encouraged to use STAP's LDN guidelines to develop SLM plans. https://www.stagef.org/guidelines-land-degradation-neutrality Systems thinking should be used when characterizing the problem and its context. It also will be important to develop SLM plans based on stakeholders' values, norms, and other social attributes (culture, gender, power dynamics) influencing their motivations and decisions. Land tenure also should be considered when designing the project, as individual, and collective, land tenure rights (and systems) are integral to pursuing LDN. Additionally, it will be valuable to rely on stakeholder consultations to verify the monitoring information, and decision systems. The following paper also may be valuable for establishing baseline information on soils and land productivity in the Chakwal project site: http://www.econ-environ-geol.org/index.php/ojs/article/view/443</p>	<p>Well noted with thanks. These recommendations have been incorporated into project activities and design, and the tools provided for different output objectives integrate participatory stakeholder methodologies.</p>
<p>In component 2, as written, the PIF assumes that capacity building on community rangeland management will contribute to outcome 2, and the project objective. To validate this assumption, STAP recommends identifying the behavioral change assumptions linked to this component/outcomes in the theory of change. Given that drought is increasing in the target areas, STAP recommends planning for climate-resilient measures in the project design. This includes identifying drought risks in the theory of change, supporting these risks with data and references, and defining strategies to address these risks. The project developers may wish to refer to UNCCD's drought assessment toolbox: https://knowledge.unccd.int/drought-toolbox/page/monitoring-and-early-warning Planning for climate risks is essential to achieving outcome 2 ? focused on livestock health, fodder productivity, and improved livelihoods.</p>	<p>Drought data and indexes are provided for in the project ToC, thank you.</p>
<p>In addition to monitoring and evaluating progress, and generating knowledge, component 3 should also look to foster reflection and innovation for scaling and transformational change. Refer to STAP's primer (table 2) for guidance on addressing barriers and enablers of change, including scaling, and for guidance on learning. Also, the theory of change should be linked to the monitoring system described in component 3.</p>	<p>Scaling is supported through various elements and activities in the project. However, most importantly is the institutional arrangements and actual needs of project beneficiaries regarding rangeland management issues</p> <p>There is a real need and demand for the project and scaling will be largely a result of the significant interest the project has raised at various national and sub-national levels.</p>

<p>Is the scale of projected benefits both plausible and compelling in relation to the proposed investment? Possibly. Recommend developing a theory of change with various causal pathways to encourage adaptability to change, including long-term drivers such as drought, and population changes (e.g. increased influx of refugees and internally displaced persons). STAP recommends the PPG includes a clearer articulation on how upscaling could occur (mechanisms) is needed.</p>	<p>Risks are well outlined and considered in Section 5 of the project, and the risks mentioned are cited and mitigation options provided for.</p> <p>Regarding upscaling, please see the previous response above as to scaling opportunities. This said, the Punjab Provincial authorities have asked for specific tools and policy recommendations in order to organise grazing of communal lands and for policy recommendations to support and outline the development of a rangeland unit within the Punjab Forestry, Wildlife and Fisheries Dept. Scaling of project technologies and tools would then have access to organisational mechanisms and outreach programmes. This is especially important for holistically addressing drivers that often span various sectors or administrative divisions.</p>
<p>In addition to the GEF's core indicators, STAP encourages the use of UNCCD's three land-based indicators and associated metrics, related to LDN: land cover (assessed as land cover change), land productivity (assessed as NPP) and carbon stocks (assessed as SOC). The monitoring process should include local monitoring systems. Additionally, identify indicators of success for each outcome in the theory of change.</p>	<p>Well noted and addressed within project design.</p>
<p>The PIF states that communities' capacities on climate resilient measures will be strengthened. STAP recommends describing further these activities in the project document.</p>	<p>The activities are more detailed in the project document, but activities are described in such a way as to allow for local socio-economic contexts and biophysical attributes to be considered and accounted for.</p>
<p>Is there a clearly-articulated vision of how the innovation will be scaled-up, for example, over time, across geographies, among institutional actors? Partially. There is an assumption that strengthening capacity on rangeland approaches (e.g. rotational grazing, bioengineering, water harvesting) will lead to innovation and scaling. Recommend defining the important assumptions behind the adopting of each approach ? for example, will behavior change be required? If so, how does the project intend to shift behaviors based on stakeholders' social structures? (e.g. values, norms, culture, agency, power dynamics, among other) Additionally, STAP recommends relying on the theory of change, and its monitoring, to identifying opportunities for scaling and transformative change. The theory of change also should be used to address barriers, and enablers, of scaling.</p>	<p>Behavioural change is expected and needed, and will be channelled through the causal pathways identified in the ToC section (Section 1.3).</p> <p>This will include many aspects of livestock management, but will rely principally on the capacity of communities to plan grazing applications so that grazing efficiency increases and a plant recovery time is permitted to allow for leaf and root growth to recover.</p>

<p>Will incremental adaptation be required, or more fundamental transformational change to achieve long term sustainability? It is likely that incremental adaptation, and, or, transformational change may be needed due to climate stressors (e.g. drought), other long term drivers (population influx), and from COVID-19. Suggest developing several pathways to reach the project goal, testing their assumptions, and asking which pathway will be necessary and sufficient to address long-term changes resulting from climate, COVID-19 and other long-term drivers.</p>	<p>Much will depend on how fast project activities get underway and how quickly learning cycles happen among different stakeholder groups.</p> <p>For instance, if the rangeland assessment system developed under Output 1.1.2 is tested in the first year of the project, and frequently repeated, it is expected that the system will evolve to take in new learning and results.</p> <p>Likewise, if a rangeland area is 'enclosed' meaning no grazing is taking place and rains allow for a quick and full recovery process, it is expected that locals will quickly understand potential benefits for applying at larger scales. However, if local contexts require long negotiation processes and interventions to select project interventions and investments, then learning may not have the opportunity to become incremental.</p>
<p>The key stakeholders have been identified. Suggest reflecting whether there are other stakeholders that need to be involved during the project development, and implementation. Suggest elaborating further on stakeholders' roles, particularly at the outcome level.</p>	<p>Stakeholders and beneficiaries are clearly defined within the document and their roles and responsibilities have been accepted and welcomed by their representatives.</p>
<p>The PIF describes the gender differences of livestock and natural resource management in the project areas. The PIF also states that it will ensure that women form part of training activities and forums. STAP suggests conducting a gender analysis for the design of the project. STAP also suggests describing a gender strategy plan (inclusive of approaches, tools, and strategies) for implementing the project.</p>	<p>The project-specific gender analysis and action plan have been developed during the PPG.</p>
<p>The PIF describes a series of risks to the project, including: climate change risks, COVID-19 risks, conflict due to increased pressure on land, among other environmental and social risks which are detailed in a separate document. STAP recommends for these risks to be defined in the theory of change so they are explicitly dealt with and managed. Not acknowledging the risks will undermine the causal logic of the interventions. Risk analysis should be in place for increased migration and internal displacements in case of conflicts.</p>	<p>Risk assessments and ToC assumptions are well defined in various sections of the document and have taken into account current global and regional realities.</p>
<p>Yes, the project will build on the knowledge of other GEF projects. Suggest identifying non-GEF initiatives in the target areas, and describing how they will contribute to this GEF project</p>	<p>The initiatives are detailed in Table 8.</p>

<p>The PIF identifies several knowledge management efforts and approaches the project will rely on. As the project stakeholders develop the knowledge management plan, consider indicators of success. Additionally, suggest linking the theory of change to component 3 as both will be needed to manage knowledge and learning.</p>	
<p>The PIF states that the project will disseminate its knowledge on rangeland restoration. In the project document, suggest assigning indicators of success to knowledge management. Additionally, the project team may consider disseminating lessons to UNCCD's knowledge portal, WOCAT and other rangeland platforms.</p>	<p>These indicators have been provided for in the project Logical Framework (Annex A1), and through project activities.</p> <p>Many thanks for the comments.</p>

COUNTRY COMMENTS AND RESPONSES:

COUNTRY	COMMENTS	AGENCY RESPONSE
<p>Comment by Kordula Mehlhart, GEF Council Member, Head of Division on Climate Finance, BMZ, Council, Germany made on 1/7/2021 Comment:</p>	<p>Considering the environmental and socio-economic conditions in the Northern Punjab region of Pakistan, combating land degradation through sustainable and integrated rangeland and livestock management becomes pivotal. Germany welcomes this project proposal, because there are no other relatable projects which cover the issues of rangeland restoration through effective livestock management.</p>	<p>Thank you. The point raised that ?no other relatable projects cover the issues of rangeland restoration through effective livestock management? was confirmed during the PPG stage and senior Pakistan officials repeatedly stressed the need and importance for such a project.</p>
	<p><u>Germany requests that the following requirements are taken into account during the design of the final project proposal:</u></p>	<p>--</p>
	<p>? Nevertheless, to develop and successfully execute inter-sectoral policies and regulations, it is crucial to specify and convince all relevant stakeholders in this field. Germany therefore requests to specify all stakeholders to fully clear their commitment to the project. Germany suggests depicting how exactly the community will be engaged in livestock management in order to become the main driver of change.</p>	<p>The project has put considerable efforts to correctly identify and engage relevant stakeholder institutions, CSOs and beneficiaries in the project design and development stage. They are described and their roles provided in sections 1.2, 2 and 6. They range from national and international institutions to provincial, district and local representatives and groups.</p>

<p>Additionally, Germany suggests specifying the local actors (NGO, CSO, grazier organizations, local businesses etc.) to better focus on local participation.</p>	<p>This has been attempted though has met challenges. Grazier organisations are nonexistent in the project district areas and local value chains are short and highly fragmented. Grazing takes place on rangelands without formal or informal organization of users who come from a range of backgrounds and have different seasonal needs and demands. A range of approaches has therefore been provided for in the described output activities and budget lines to actively engage value chain actors, increase beneficiary capacities and options and provide for provincial policy development.</p>
<p>Germany requests to include key companies in the stakeholder analysis to support private sector involvement to improve existing value chains around livestock produce</p>	<p>Most of the project beneficiaries are engaged with short, fragmented value chains, or sell directly to middlemen. Private sector engagement is primarily focused on value chain support and is described in section 4 of the project proposal.</p>
<p>Germany further suggests, to additionally involve the ?Ministry of Planning, Development and Special Initiatives? as the overall project is focused on planning processes. To reduce pressure on rangeland resources, expanded stall feeding is considered a solution. However, newly arising challenges from solutions, e.g. nitrogen accumulation, should be taken into consideration</p>	<p>Ministerial stakeholders are presented in section 1.2 .4. Stakeholder Mandates and roles/responsibilities in project implementation, and have been selected through a thorough negotiation process with key governmental stakeholders.</p>
<p>Finally, global benefits for Pakistan in terms of climate change appear rather limited according to their presentation. In terms of mitigation, the benefits are marginal compared to the national projections (a share should be displayed, either based on a sectoral approach or on a provincial approach). The main benefits are in terms of adaptation; thus, it should be defined how newly restored land will benefit the overall climate change objectives of Pakistan.</p>	<p>It is true that rangeland environments typically have limited carbon sequestration potential per ha due to low precipitation rates and the fact that vegetation is often further degraded due to improper grazing management within these areas in Pakistan. However, this limited capacity at small scales can be offset by the vast areas they cover.</p> <p>Therefore, as a project, it is only through scaling and demonstration of sustainable and regenerative land management that CC benefits could be achieved. This potential for CC adaptation and mitigation is increased by the role of the Ministry of Climate Change in the project and links to LDN and land monitoring that will be tested through the project for application at provincial and potentially national scales.</p>

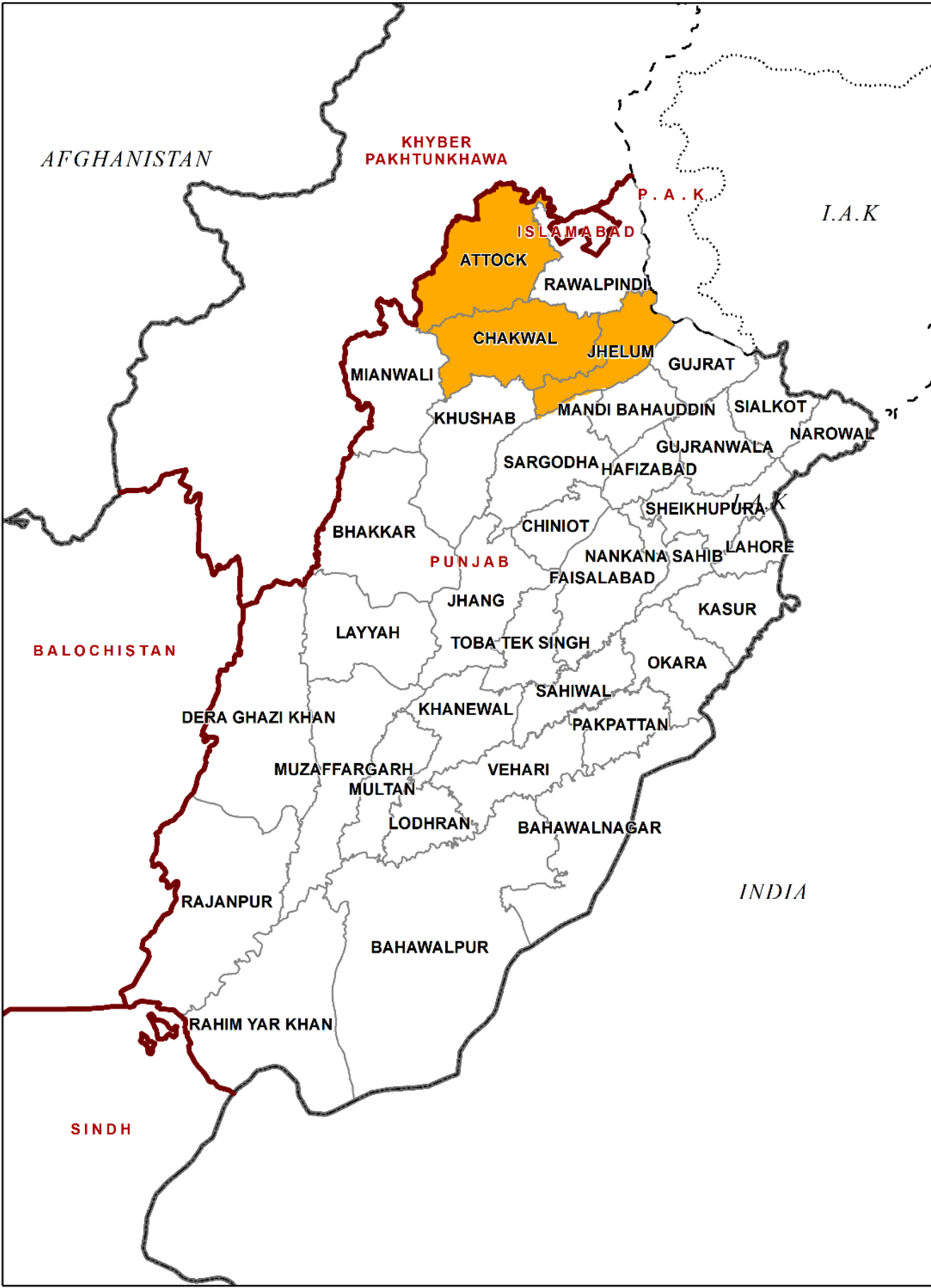
ANNEX C: Status of Utilization of Project Preparation Grant (PPG).
(Provide detailed funding amount of the PPG activities financing status in the table below:

<u>PPG Grant Approved at PIF: ?????</u>			
<u>Project Preparation Activities Implemented</u>	<u>GETF/LDCF/SCCF Amount (\$)</u>		
	<u>Budgeted Amount</u>	<u>Amount Spent To date</u>	<u>Amount Committed</u>
<u>Salaries Professional?????</u>	<u>5,000?????</u>	<u>0?????</u>	<u>?????</u>
<u>Consultants</u>	<u>75,700</u>	<u>21,190</u>	<u>47,657</u>
<u>Contracts</u>	<u>5,000</u>	<u>0</u>	<u>-</u>
<u>Travel</u>	<u>2,000</u>	<u>5,022</u>	<u>7,142</u>
<u>Training</u>	<u>7,800</u>	<u>3,510</u>	<u>8,000</u>
<u>Expendable Procurement</u>	<u>0</u>	<u>479</u>	<u>-</u>
<u>General Operating Expenses</u>	<u>4,500</u>	<u>0</u>	<u>7,000</u>
<u>Total</u>	<u>100,000</u>	<u>30,201</u>	<u>69,799</u>

ANNEX D: Project Map(s) and Coordinates

Please attach the geographical location of the project area, if possible.

- ? Attock Forest Division: 33.7660° N and 72.3609° E
- ? Chakwal Forest Division: 32.9328° N and 72.8630° E
- ? Jehlum Forest Division: 32.9425° N, and 73.7257° E



ANNEX E: Project Budget Table

Please attach a project budget table.

FAO Cost Categories	Unit	No. of units	Unit cost	Component 1 Total	Component 2 Total	Component 3 Total	M&E	PMC	MoCC executed	FAO Support Services	Total GEF
1 5011 Salaries professionals											
2											
3 5011 Sub-total salaries professionals											
4 5012 GS Salaries											
5											
6 5012 Sub-total GS salaries											
7 5013 Consultants											
8 Intl. Rangeland/ILM Policy Expert	days	60	400	21,600	-	2,400			24,000		24,000
9 Intl. GIS specialist (LDN DSS)	days	20	350	6,300	-	700			7,000		7,000
10 Sub-total international Consultants				27,900	-	3,100			31,000		31,000
11 Core team in Islamabad											
12 Project Coordinator	months	47	3,500	33,636	67,271	33,636		29,957	164,500		164,500
13 Project Finance & Administrative Assistant (cost-sharing)	months	15	1,200	-	-	-		18,000	18,000		18,000
14 Core team at district level											
15 Gender & Community Engagement Specialist	months	30	2,000	6,000	48,000	6,000			60,000		60,000
16 National Rangeland Management Experts	months	90	1,700	15,300	122,400	15,300			153,000		153,000
17 National ILM and Agriculture Policy Expert	months	24	2,500	54,000	-	6,000			60,000		60,000
18 National LDN and LD Monitoring Expert	days	120	180	15,120	4,320	2,160			21,600		21,600
19 Data Management Expert (M&E)	days	120	200	-	-	24,000			24,000		24,000
20 District level VC development Experts	days	60	180	-	9,720	1,080			10,800		10,800
21 (Experts for specific tasks)											
22 Communications specialist (cost-sharing)	days	30	180	-	540	4,860			5,400		5,400
23 National GIS Expert (cost-sharing)	days	30	180	2,700	1,350	1,350			5,400		5,400
24 Sub-total national Consultants				126,756	253,601	94,386		47,957	522,700		522,700
25 5013 Sub-total consultants				154,656	253,601	97,486		47,957	553,700		553,700
26 5650 Contracts											
27 Knowledge Products	Each	7	4,000	-	-	28,000			28,000		28,000
28 5 short videos on animal health and nutrition	Each	5	2,000	-	8,000	2,000			10,000		10,000
29 Online Project Platform creation and maintenance	Contract	1	4,000	-	-	4,000			4,000		4,000
30 Renewable Energy installation for Water distribution or VC support	Contract	3	8,000	-	24,000	-			24,000		24,000
31 Livestock watering point and water distribution materials and works	Contract	5	12,000	-	60,000	-			60,000		60,000
32 Agro-Forestry development and improvement activities	Contract	3	10,000	-	30,000	-			30,000		30,000
33 Water-Harvesting infrastructure and development activities	Contract	3	16,100	-	48,300	-			48,300		48,300
34 Rangeland / Community grazing land enclosure and management infrastructure, earthworks and soil amendments	Contract	3	25,000	-	75,000	-			75,000		75,000
35 Project Awareness raising events	Contract	6	3,000	5,400	10,800	1,800			18,000		18,000
36 Mid Term review	Contract	1	30,000	-	-	-	30,000			30,000	30,000
37 Final Evaluation	Contract	1	60,000	-	-	-	60,000			60,000	60,000
38 Terminal report	Contract	1	6,880	-	-	-	6,880			6,880	6,880
39 OPIM Spot checks	Contract	4	4,000	-	-	-	-	16,000		16,000	16,000
40 OPIM Audits	Contract	4	7,000	-	-	-	-	28,000		28,000	28,000
41 5650 Sub-total Contracts				5,400	256,100	35,800	96,880	44,000	297,300	140,880	438,180
42 5021 Travel											
43 (Lump sum) International travel (incl. international exchange visits)	Lumpsum	1	55,500	8,048	7,770	39,683			55,500		55,500
44 (Lump sum) National travel (incl. staff exchange visits)	Lumpsum	1	71,000	8,875	17,750	44,375			71,000		71,000
45 5021 Sub-total travel				16,923	25,520	84,058			126,500		126,500
46 5023 Training & Workshops											
47 National Inception workshop	Each	1	1,251	-	-	-	1,251		1,251		1,251
48 District Inception workshops	Each	3	1,250	-	-	-	3,750		3,750		3,750
49 National Rangeland Policy related workshops related to Output 1.1.1	Each	2	3,000	6,000	-	-			6,000		6,000
50 District Rangeland assessment & status workshops related to Output 1.1.2	Each	6	2,000	12,000	-	-			12,000		12,000
51 National LDN mapping and DSS Workshops (GIS and SDG 15.3.1 indicator capacity building) related to Outputs 1.1.2 & 1.1.4	Each	2	3,000	6,000	-	-			6,000		6,000
52 District level workshops under Output 1.1.3, to develop Provincial and district sustainable land and resource management plans	Each	6	2,000	12,000	-	-			12,000		12,000
53 District level and community leaders/rep. training sessions as described under Output 1.1.5	Each	9	2,500	22,500	-	-			22,500		22,500
54 Inter-departmental Rangeland Working group sessions and workshops (Output 1.1.5)	Each	12	300	3,600	-	-			3,600		3,600
55 Training sessions under Output 2.1.1	Each	90	60	-	5,400	-			5,400		5,400
56 Community rangeland plan formulation, control and assessment workshops for Output 2.1.2	Each	6	1,700	-	10,200	-			10,200		10,200
57 Workshops for piloting mechanisms to increase participation of women in rangeland and livestock management (Output 2.1.3)	Each	6	1,700	-	10,200	-			10,200		10,200
58 Practical training workshops for livestock producers on animal health and nutrition, as under Output 2.2.3	Each	12	1,700	-	20,400	-			20,400		20,400
59 Value Chains Trainings and Workshops related to Outputs 2.2.5 and 2.2.6	Each	9	1,700	-	15,300	-			15,300		15,300
60 District level native seed collection, multiplication and nursery development workshops	Each	6	1,700	-	10,200	-			10,200		10,200
61 Staff exchange visits	Persons	60	240	-	-	14,400			14,400		14,400
62 Demonstration site open field days	Each	6	2,000	-	-	12,000			12,000		12,000
63 International exchange visits	Persons	12	1,544	-	-	18,528			18,528		18,528
64 Project Steering Committee meetings	Each	3	1,000	-	-	-	3,000		3,000		3,000
65 Regional Project Completion Workshop	Each	3	1,000	-	-	-	3,000		3,000		3,000
66 National Project Completion Workshop	Each	1	1,275	-	-	-	1,275		1,275		1,275
67 5023 Sub-total training				62,100	71,700	44,928	12,276		191,004		191,004
68 5024 Expendable procurement											
69 Rangeland reseeding of 5,000 ha	Contract	5,000	24	-	120,000	-			120,000		120,000
70 Training tools, equipment and water storage and distribution materials for training demonstration sites and FFS	lumpsum	15	10,000	-	150,000	-			150,000		150,000
71 Native forest and forage nursery materials (x2 per district)	lumpsum	6	9,000	-	54,000	-			54,000		54,000
72 Mobile livestock infrastructure and exclusion materials, including fencing, shade, livestock watering and feeding materials, sheds, yards, etc. (per district)	lumpsum	3	25,000	-	75,000	-			75,000		75,000
73 GPS and spatial data collection equipment, including tablets, cameras, etc.	lumpsum	1	1,621	-	1,621	-			1,621		1,621
74 Rangeland Monitoring site materials	lumpsum	3	200	-	600	-			600		600
75 Publications	lumpsum	2	5,250	-	10,500	-			10,500		10,500
76 Forage VC support materials	lumpsum	3	25,000	-	75,000	-			75,000		75,000
77 Dairy VC support materials	lumpsum	3	22,000	-	66,000	-			66,000		66,000
78 Poultry VC support materials	lumpsum	3	20,000	-	60,000	-			60,000		60,000
79 Acacia Resins VC support materials	lumpsum	3	20,000	-	60,000	-			60,000		60,000
80 Beekeeping VC support materials	lumpsum	3	18,000	-	54,000	-			54,000		54,000
81 Vaccinations and animal health products	lumpsum	3	45,000	-	135,000	-			135,000		135,000
82 5024 Sub-total expendable procurement				-	861,721	-			861,721		861,721
83 6100 Non-expendable procurement											
84											
85											
86											
87											
88 6100 Sub-total non-expendable procurement											
89 5028 GOE budget											
90 Communication expenses (internet/phone subscriptions)	Lumpsum	1	12,000	-	-	-		12,000	12,000		12,000
91											
92											
93 6300 Sub-total GOE budget								12,000	12,000		12,000
94 TOTAL				239,078	1,468,642	262,271	109,156	103,957	2,042,225	140,880	2,183,105

	PPG	PIF
SUBTOTAL Comp 1	239,078	450,000
SUBTOTAL Comp 2	1,468,642	1,459,148
SUBTOTAL Comp 3	262,271	170,000
M&E	109,156	5,000%
Subtotal	2,079,147	103,957.35
Project Management Cost (PMC)	103,957	5
TOTAL GEF	2,183,105	2,183,105

16,225

ANNEX F: (For NGI only) Termsheet

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

N/A

ANNEX G: (For NGI only) Reflows

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agency is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

N/A

ANNEX H: (For NGI only) Agency Capacity to generate reflows

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies' capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).

N/A