

Kyrgyz Republic

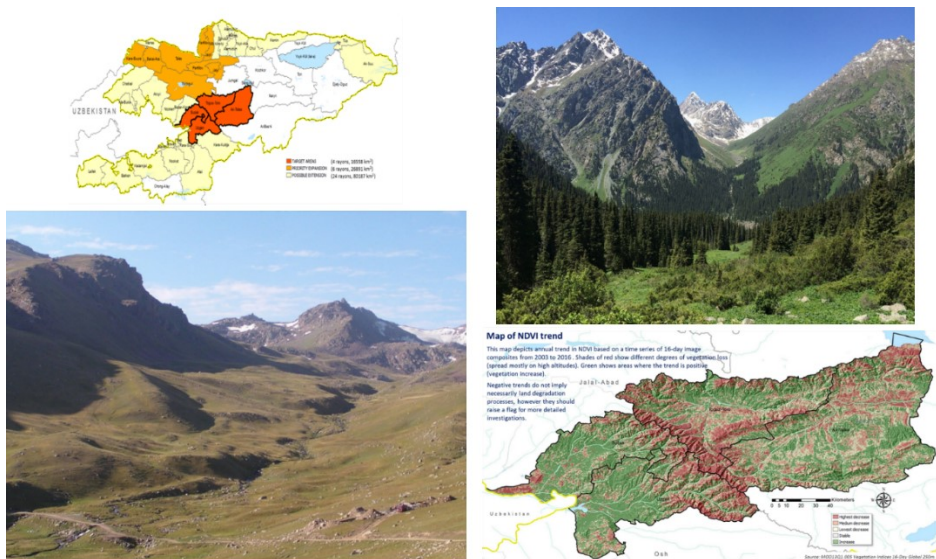
## FEASIBILITY STUDY

Annex to the FAO Funding Proposal

# CARBON SEQUESTRATION THROUGH CLIMATE INVESTMENT IN FORESTS AND RANGELANDS

## CS-FOR PROJECT

for Green Climate Fund Financing





# **CARBON SEQUESTRATION THROUGH CLIMATE INVESTMENT IN FORESTS AND RANGELANDS**

## **CS-FOR**

### **Feasibility Study**

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## Acronyms and definitions

AA	<i>Aiyl Aimak</i> : rural municipality area
ADB	Asian Development Bank
AE	Accredited Entity
AI	Artificial Insemination
AISP	Agricultural Investments and Services Project
AK	<i>Aiyl Kenesh</i> : local council of rural municipality (AA)
AKJ	Pasture User Unions “Kyrgyz Jaiyty”
AO	<i>Aiyl Okmotu</i> : local government of the Aiyl Aimak
APIU	Agricultural Projects’ Implementation Unit
APR	Annual Performance Report
ArcGIS	GIS Software for Desktop provided under license by ESRI
ARIS	Community Development and Investment Agency [ARIS is acronym of Russian name]
A/R	Afforestation/Reforestation
Asl	Above sea level
ASSP	Agricultural Services Support Project
ATM	Automated teller machine
AWPB	Annual Working Plan and Budget
CAMP	Central Asian Mountains Project
CBD	UN Convention on Biological Diversity
CBFM	Community Based Forest Management
CC	Climate Change
CCCC	Coordination Commission on Climate Change
CFC	Climate Financing Center
CFCM	Climate Finance Coordination Mechanism
CFM	Collaborative Forest Management
CLMG	Community Landscape Management Groups
CPM	Country Program Manager
CPMDP	Community Pasture Management and Livestock Development Plans
CPMP	Community Pasture Management Plan
CS-FOR	Carbon Sequestration through Climate Investment in Forests and Rangelands Project
CSO	Civil Society Organizations
CSV	Comma Separated Value
DPLF	Department of Pastures, Livestock and Fisheries
DW	Dry Weight
EbA	Ecosystem-based Adaptation
EBRD	European Bank for Reconstruction and Development
ECA	Europe and Central Asia
EE	Executing Entity
EEU	Eurasian Economic Union
ESFM	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESRI	Environmental Systems Research Institute
ESS	Environmental and Social Safeguards
EU	European Union
FAO	Food and Agriculture Organization of the UN
FE	State forestry enterprise, Leskhoz
FC	Forest Code
FGD	Focus group discussions
FSP	Financial services provider
GAO	Gross Agricultural Output
GCF	Green Climate Fund
GDP	Gross Domestic Product
GE	Google Earth
GEF	Global Environment Facility
GFDRR	Global Facility for Disaster Reduction and Recovery
GHG	Greenhouse Gas Emissions
Giprozem	Kyrgyz Land Management Institute



GIS	Geographical Information System
GIZ	<i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i>
GNI	Gross National Income
GOK	Government of Kyrgyzstan
SREGISTER	State Agency for Registration of Rights to Land and Immovable Property
GPS	Global Positioning System
GPX	GPS Exchange Format
HTML	Hypertext Markup Language
IFAD	International Fund for Agricultural Development
IFC	International Financial Corporation
IFEMP	Integrated Forest Ecosystem Management Project – WB funded
IFI	International Financial Institution
IMF	International Monetary Fund
INDC	Intended Nationally Determined Contribution
INRMCRP	Integrated Natural Resource Management and Climate Resilience Plans
IFRIS	Integrated Forest and Rangeland Management System
IPM	Integrated Pest Management
IREI	Inter- Regional Environmental Inspection
ISF	Irrigation Service Fee
IT	Information Technology
IUCN	International Union for Conservation of Nature
JC	<i>Jaiyt Committees</i> : Committees of the PUUs
JFM	Joint Forest Management
JICA	Japan International Cooperation Agency
KAFLU	Kyrgyz Association of Forest and Land Users
kg/ha	kilograms per hectare;
kg DW/ha	kilograms of dry weight of plants per hectare
KGS	Kyrgyz som
KLPRI	Kyrgyz Livestock and Pastures Research Institute
KM	Knowledge Management
KML	Keyhole Markup Language
KMZ	Keyhole Markup Language Zipped
KNAU	Kyrgyz National Agrarian University
KR	Kyrgyz Republic
KSRILP	Kyrgyz Scientific-Research Institute of Livestock and Pasture
KSRVI	Kyrgyz Scientific-Research Veterinary Institute
KyrSEFF	Kyrgyz Sustainable Energy Finance Facility
LC	Land Code
Leskhoz	State Forestry Enterprise
LFEPDFS	Local Funds of Environmental Protection and Development of Forestry Sector
LMPD II	IFAD Livestock and Market Development Programme II
LPDP	Livestock and Pasture Development Project, phases I and II (in Tajikistan)
LRF	Land Redistribution Fund
LU	Livestock Unit
m, m2	meters, square meters
M&E	Monitoring and Evaluation
MAFIM	Ministry of Agriculture, Food Industry and Melioration
masl	Meters above sea level
MES	Ministry of Emergency Situations
MFI	Microfinance institution
MoE	Ministry of Economy
MoU	Memorandum of Understanding
NAP	National Action Plan
NBKR	National Bank of the Kyrgyz Republic
NBSAP	National Biodiversity Strategy and Action Plan
NFEPDFS	National Fund of Environmental Protection and Development of Forestry Sector
NDA	National Designated Authority
NDVI	Normalized Difference Variation Index
NGO	Non-governmental Organization
N.O	No Objection
NPL	Nonperforming loans

NRM	Natural Resource Management
NSC	National Statistics Committee
NSDI MOU	Kyrgyzstan National Spatial Infrastructure Memorandum of Understanding
NSSD	National Strategy for Sustainable Development
NTFP	Non Timber Forest Product
OECD	Organization for Economic Cooperation and Development
OVOS	Russian acronym for “Assessment of Environmental Impacts”
PC	Pasture Committee (Jaiyt committee)
PD	Pasture Department under MAFIM
PCM	Project Cycle Management
PET	Potential Evapotranspiration
PMU	Project Management Unit
PLFD	Pasture, Livestock and Fishery Department
PLMIP	Pasture and Livestock Management Improvement Project (World Bank)
PMP	Pasture Management Plan
PPCR	Pilot Program for Climate Resilience
PPP	Public-Private Partnerships
PS	Performance Standards
PUP	Pasture Use Plan
PUU	Pasture Users Unions
QGIS	Quantum GIS Software for Desktop provided for free under open source license
RDF	Rural Development Fund
RKDF	Russian-Kyrgyz Development Fund
ROA	Return on assets
ROE	Return on equity
RS	Remote Sensing
RS/GIS	Remote Sensing and GIS
SAEPF	State Agency for Environment Protection and Forestry
SALSGIR	State Agency for Local Self Government and Interethnic Relations
SC	Steering Committee
SDC	Swiss agency for Development and Cooperation
SDG	Sustainable Development Goals
SFF	State Forest Fund
SFM	Sustainable Forest Management
SIVPSS	State Inspectorate for Veterinary and Phytosanitary Security
SLF	State Land Fund (area managed by MAFIM where majority of pastures are located)
SME	Small and medium-sized enterprise
SPCR	Strategic Programme for Climate Resilience
SRF	State Reserve Fund
SWOT	Strengths, Weaknesses, Opportunities and Threats
TA	Technical assistance
TDEPDFE	Territorial Division of Environmental Protection and Development of Forestry Ecosystems
t d.m.	Ton of dry matter
TNC	Third National Communication
UN	United Nations
UNCCD	UN Convention to Combat Desertification
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNFCCC	UN Framework Convention on Climate Change
USD	United States dollar
VCF	Value chains financing
WB	World Bank
WFP	World Food Programme
WP	Working Paper
WUA	Water User Associations

# Chapter 1: Country Climate Profile and Rural Context Background

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## COUNTRY DATA

**Kyrgyz Republic** (Sources: World Bank, FAOSTAT, National Statistical Committee of the Kyrgyz Republic)

<b>Land area (km<sup>2</sup>), 2016</b>	<b>199,951</b>	<b>GNI per capita (US\$), 2016</b>	<b>1,073</b>
<b>Total population (million people), 2018</b>	<b>6.256</b>	<b>GDP per capita (US\$), 2015</b>	<b>1,4</b>
<b>Population density (people/km<sup>2</sup>), 2015</b>	<b>31.1</b>	<b>Inflation, consumer prices (annual %), 2016</b>	<b>0.4</b>
<b>Local currency</b>	<b>Kyrgyz Som</b>	<b>Exchange rate, KGS for 1 USD, 2018 (NBKR)</b>	<b>68.02</b>
<b>Social Indicators</b>		<b>Economic Indicators</b>	
Population growth (annual %), 2016	2.0	GDP (million US\$), 2016	6,551
Crude birth rate (per thousand people), 2015	27	GDP growth (annual %)	
Crude death rate (per thousand people), 2015	6	2001	5.3
Infant mortality rate (per thousand live births), 2015	18	2014	4.0
Life expectancy at birth M/F (years), 2015	67/75		3.8
Human Development Index, 2015	Value: 0.664	2016	
Gender Inequality Index, 2015	Value: 0.394	Sectoral distribution of GDP, 2015	
Total labour force (million), 2016	2.595	% agriculture	15.9
Female labour force as % of total, 2014	41.4	% industry	26.9
<b>Education</b>		% manufacturing	N/A
Primary gross enrolment F/M per 100 pop., 2015	107.0/108.3	% services	57.1
Adult illiteracy rate (% age 15 and above), 2015	100	Consumption, 2015	
<b>Nutrition</b>		General government final consumption expenditure (as % of GDP)	17.5
Kilocalories per person per day, 2016	40	Household final consumption expenditure, etc. (as % of GDP)	83.8
Malnutrition prevalence, height for age (% of children under 5)	N/A	Gross domestic savings (as % of GDP)	-1.3
Malnutrition prevalence, weight for age (% of children under 5)	12.9		
2014 UNICEF		<b>Balance of Payments (US\$ million)</b>	
<b>Health</b>		Merchandise exports, 2016	1,676.00
Health expenditure, total (as % of GDP), 2014	6.5	Merchandise imports, 2016	3,963.00
Physicians (per thousand people), 2014	2.3	Balance of merchandise trade, 2014	-4,080.2
Population using improved water resources (%) 2015	90	Current account balances (US\$ million) 2015	-15.1
Population using improved sanitation facilities (%) 2015	93	before official transfers	N/A
<b>Agriculture and Food</b>		after official transfers	N/A
Food imports (% of merchandise imports), 2015	14	Foreign direct investments, 2015	521
Fertilizer consumption (kilograms per ha of arable land) 2015	26.7	<b>Government Finance</b>	
Food production index (2004-06-01=100) 2014	106.1	Cash surplus/deficit (million KGS), 2014	-2,379.3
Cereal yield (kilogram per ha), 2016	3,104	Total expense (% of GDP), 2014	-0.47
<b>Land use</b>		Present value of external debt (% of export of goods, services, primary income) 2015	104.5
Arable land as % of land area, 2014	6.7	Total debt service (% of export of goods, services, primary income) 2015	15.7
Forest area as % of total land area, 2015	5.6	Lending interest rate (%), 2017	19.819
Irrigated land as % of total agric. land, 2014	9.5	Deposit interest rate (%), 2016	2.3

## I. General

1. Kyrgyz Republic is a mountainous country, economy of which is defined at large by its altitude, terrain and location. Spread over 200,000 square kilometers along the spectacular Tian Shan and Pamir-Alai mountainous ranges capped with snow and glaciers, it has almost 90 percent of its territory at higher than 1 500 meters above sea level and almost a half of it not habitable and accessible for use by the people. Kyrgyzstan is rich with more than two thousand lakes, thirty thousand fast streams and rivers, which are fed by fertile watersheds. Mountainous ridges make one fourth of the country's territory, with the watersheds starting at the peaks at about 5 000-7 000 meters asl and stretching down to the lowland valleys. The country's population of about six million people lives mostly on 19 percent of the habitable land area along the watersheds and in the four major valleys. Mountainous rangelands (pastures) and forests make 49 percent of the total land area while arable land makes only 7 percent.<sup>1</sup> Almost all crops (90 percent) are cultivated on 1.28 million ha of this arable land. These geographic and terrain conditions make agriculture extremely vulnerable to weather and climate variations.

2. Landlocked in the heart of the Central Asia, Kyrgyzstan neighbors China on the east and southeast, Kazakhstan on the north, Uzbekistan on the west, and Tajikistan on the south. Such geopolitical situation, as well as its history define close ties with Russia and other former Soviet countries. Kyrgyzstan joined Eurasian Economic Union in August 2015.

3. The country is classified by the World Bank as a lower-middle-income country with the GNI per capita of US\$1,100 in 2016. One third or 30.4 percent of GDP comes from the remittances of almost 1 million people working abroad, mostly in Russia and Kazakhstan. The economy highly depends on the Kumtor, a gold mining and the services sector.

4. Despite a sharp decline of external public debt in 2016, expected to be followed by a further decline to 54.5 percent of GDP in 2017, the **Debt sustainability analysis (DSA) assesses the Kyrgyz Republic to remain at moderate risk of debt distress**. However, the debt outlook remains vulnerable, in particular to a sizeable exchange rate depreciation, a deceleration in real GDP growth and a deterioration of the fiscal balance, which could tilt the assessment to high risk of debt distress. In order to avoid this adverse development, the authorities need to remain cautious when contracting and guaranteeing new debt and continue fiscal consolidation (IMF Country Report No. 18/53, Feb 2018).

5. Poverty level is high, with 32.1 percent of the country's population living below minimum subsistence level in 2015 and 25.4 percent in 2016 (Figure 1). Sex of the household head is not a strong factor to influence the poverty level of the family. NSC data suggests that female-headed, one-parent families are not poorer than male equivalents (8.6 percent among female-headed families are poor compared to 18.6 percent among male-headed ones), but among the two-parent families, poverty is higher if they are headed by a woman (35.6 percent against 30.0 percent)<sup>2</sup>. Another 50 percent of the population were vulnerable to poverty, living below US\$5/day in 2015. About 74 percent of poor people live in rural settlements, but poverty is the highest in remote mountainous areas, where almost all households are poor with average per-person annual incomes there being approximately US\$82 in 2015, which is equal to minimum level for subsistence established by the Government and 1.3 times lower than in valleys (NSC data). There were 49 000 people (0.8 percent) living in extreme poverty in 2016 and 85.4 percent of them were rural residents.

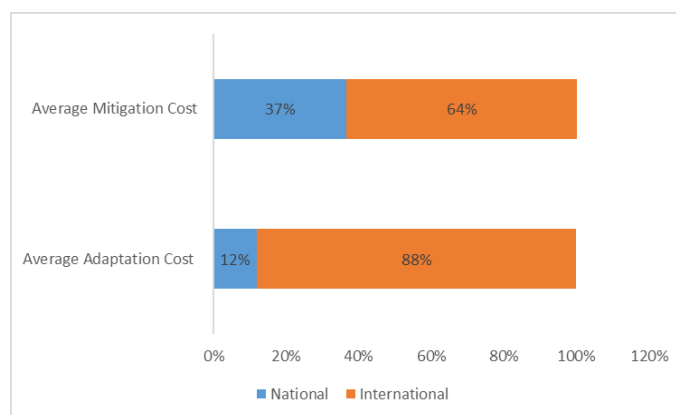
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<sup>1</sup> Data of National Statistical Committee of KR, 2017.

<sup>2</sup> NSC, Women and Men of the Kyrgyz Republic: 2010-2014, 2015, cited in FAO (2016)

## II. The Kyrgyz Republic INDC

6. The Kyrgyz Republic submitted its INDC (Intended Nationally Determined Contribution) in September 2015. Kyrgyzstan's INDC acknowledges the importance of addressing climate change and the challenges related to its impacts. The Country identified 6 main sectors with the highest vulnerability to climate change impacts and estimated the economic impact in over USD 1 billion<sup>3</sup>. The Country identifies adaptation and mitigation as main targets of its climate change strategies and identified the total cost required to adapt and mitigate in about USD 3 billion (Figure 1). The document does not report clearly if proposed targets are conditional or unconditional.

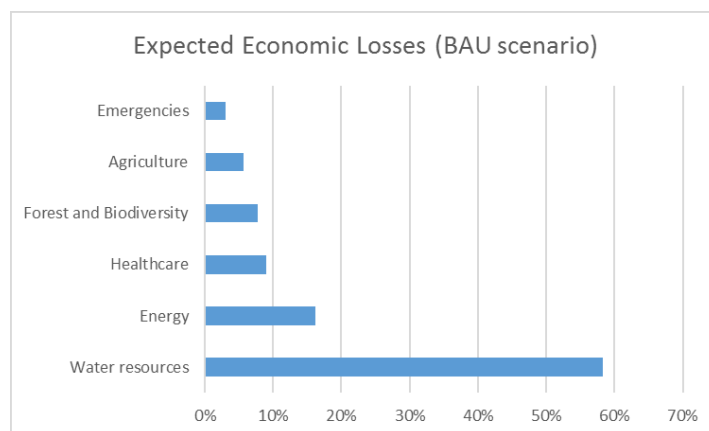


**Figure 1: Resources' needs identified with the INDC (INDC, 2015)**

7. Although Kyrgyzstan's INDC is among the ones reporting cost estimates related to adaptation and mitigation, the document provides limited information in regards of strategies and approaches established or envisaged to ensure climate change management and shift from BAU to green economy. Nonetheless, forestry and land use / land use changes appears to be among the most relevant sectors to target to secure both adaptation and mitigation targets.

### a. Adaptation targets

8. The INDC does not identify or analyze clearly adaptation targets. Figure 1 describes INDC's identified sectors and economic loss in absence of adaptation options (BAU scenario).



**Figure 2: INDC's expected Economic losses in the BAU in absence of adaptation options (INDC, 2015).**

9. According to the INDC, monitoring over implementation of the adaptation contribution will be combined with a process of regular updating of the national priorities and sectorial adaptation programs and action plans. Preparation of the updated programs and plans will be based on assessments of the

<sup>3</sup> Assessment of economic losses is the lower bound, as a result of the specific national assessment methods. The revision of the methods is envisioned (INDC, 2016).

earlier adaptation plans' outcomes. Reported plans are in the process of being processed and will constitute the initial policy framework to reach both mitigation and adaptation targets.

### b. Mitigation targets

10. To assess the potential mitigation actions to achieve the long-term GHG emissions target, three scenarios were developed (Figure 2): **Scenario 1**: low population growth / high economic growth; **Scenario 2**: average population growth/average economic growth; and **Scenario 3**: high population growth / low economic growth. It was determined that the Kyrgyz Republic's contribution to mitigation will be to reduce GHG emissions in the range of 11.49 - 13.75% below business as usual (BAU) in 2030. Under international support, the Kyrgyz Republic could implement mitigation measures to achieve total reduction in the range of 29.00 - 30.89% below BAU in 2030. Projecting to 2050, the Kyrgyz Republic will reduce GHG emissions in the range of 12.67 - 15.69% below BAU. Additionally, under international support the Kyrgyz Republic could implement the mitigation measures to achieve total reduction in the range of 35.06 - 36.75% below BAU in 2050<sup>4</sup>.

11. In terms of mitigation targets monitoring, the INDC confirms that the domestic MRV system will be developed and established as a basis for monitoring and reporting of the mitigation actions. Reporting will also be carried out in the frames of the national communications on climate change and biennial update reports. The MRV is not yet developed and there are no clear indication on its timeframe.

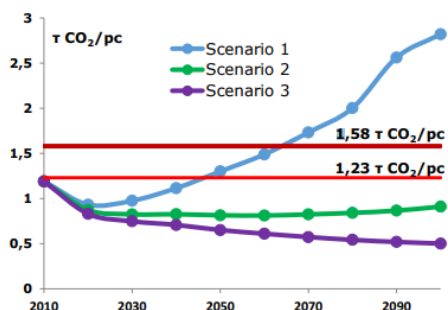
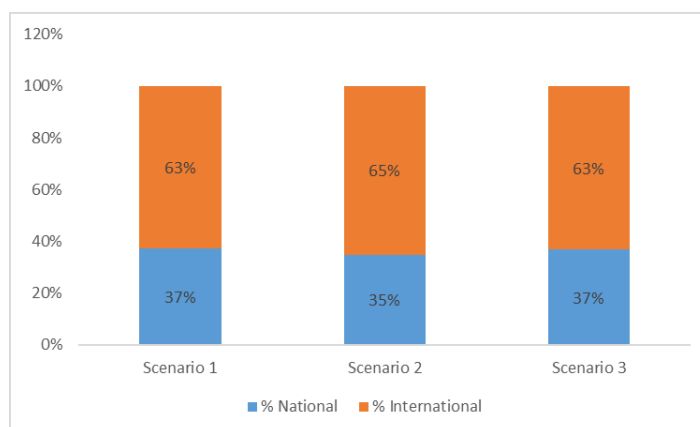


Figure 3: INDC's mitigation scenarios vs BAU and baseline. (INDC, 2015)

12. The document presents as well an estimate of mitigation's costs related to the three identified scenarios assessing total financial needs in more than USD 1.8 billion. As reported in figure 4, the mitigations targets for each of the presented scenarios are to be considered conditional to international financing.



<sup>4</sup> The Government of the Kyrgyz Republic. Intended Nationally Determined Contribution to the UNFCCC. Submitted to UNFCCC in 2015.

**Figure 4: INDC's expected resources (% of national efforts vs % of international support) required for mitigation to 2100.**

### **III. National Climate Change Policy Framework**

13. Climate change mitigation and adaptation are priority areas for Kyrgyzstan, especially as linked to the risks to people's livelihoods, the environment, the national economy, and achieving wider sustainable development goals. Adaptation to climate change has been more articulated in policy<sup>5</sup> than mitigation, although mitigation is also addressed in Kyrgyz climate change policies. In 2000, Kyrgyzstan ratified the United Nations Framework Convention on Climate Change (UNFCCC) and submitted its Intended Nationally Determined Contribution to the UNFCCC in 2015.

14. National climate change strategies and action plans have been developed for various sectors including emergency situations, biodiversity and forestry, and agriculture and water management. The "Priority Directions for Adaptation to Climate Change in the Kyrgyz Republic until 2017" was approved by the Government Decree No. 549 of 2 October 2013. These Priority Directions recognize and address the importance of developing adaptation strategies for the Kyrgyz Republic, and will be the main instrument for position-building during UNFCCC negotiations and systemization of external fundraising for the development of the national economy<sup>6</sup>. The main goal of the Priority Directions is to establish the national resource mobilization policy to minimize the negative impacts for the sustainable development of the Kyrgyz Republic. The Priority Directions also identify adaptation priorities for sectors where the risk of damage associated with climate change risks are highest, namely water, agriculture, energetics, emergency situations, health care and forest and biodiversity. Based upon these, separate sectoral strategies and adaptation plans (for water resources and agriculture; emergency situations; health care; forestry and biodiversity) have been developed by the respective ministries and agencies, and include gender-responsive assessments of the sectors' current states, vulnerability assessments and justification of adaptation measures, as well as plans to estimate the required costs of the implementation<sup>7</sup>.

15. Climate change is also addressed in other national responses to international policy, including the United Nations Convention to Combat Desertification (UNCCD) and the United Nations Convention on Biological Diversity (CBD). The National Action Plan (NAP) and its Activity Frameworks for Implementing the UNCCD in the Kyrgyz Republic for 2015-2020 has many actions on land degradation that are highly relevant – and in fact, directly linked – to climate change adaptation measures for the agricultural and livestock sectors, and particularly for pasturelands. The NAP highlights that strengthening the capacity for state management of land resources, effective land-use policies, and achievement of sustainable use of land resources will be necessary; it states that a principal condition is to maintain and increase the potential productivity of land while maintaining vital ecosystem functions of soil. Particularly relevant is the inclusion of adaptation measures to climate change in local plans for social and economic development of the regions of the country.

16. The Third National Biodiversity Strategy and Action Plan (NBSAP) of the Kyrgyz Republic was submitted to the CBD in 2003, and the Fifth National Report in 2014. Strategic Target 4.2 under the NBSAP's "Action Plan for implementation of biodiversity conservation priorities of the Kyrgyz Republic for 2014-2020" is: "Increase the resilience of ecosystems, and thus increase the contribution of biodiversity to carbon stocks, contributing to climate change mitigation and adaptation and to combating desertification". More specifically, during the period 2015-2020 the intention is to "Implement measures for sustainable development of mountain forests and land resources in the face of climate change on the area of 30.0 thousand ha."

17. The project will address the needs and strategies identified by the Kyrgyz Republic in the INDC (Mitigation) and in the NAP roadmap of 2017. Additionally, the project is in line with the national strategic framework for sustainable development, environmental and climate change policy (Kyrgyz Republic 2013-2017 National Sustainable Development Strategy) as well as with the Priority Directions for Adaptation to Climate Change in the Kyrgyz Republic till 2017, including in Program and Action plan for Adaptation to

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<sup>5</sup> e.g. Climate Change Adaptation Programme and Action Plan for 2015-2017

<sup>6</sup> The Government of the Kyrgyz Republic. Priority Directions for Adaptation to Climate Change in the Kyrgyz Republic until 2017.

<sup>7</sup> Ibid.



Climate Change for Agricultural Sector (2016-2020) Meeting held with representatives of concerned ministries and agencies confirmed that the project will be coherent and in alignment with the updated version of such frameworks covering the period 2018-2022.

18. **Forestry.** On national level, Kyrgyzstan has announced that conservation of mountain ecosystems, biodiversity and forests are the priority areas of climate action in the country. Numerous policies and specific legislations were drafted to develop and regulate the forestry sector in the Kyrgyz Republic. A Presidential Decree, "The Concept of Development of the Forestry Sector" was issued in May 1999 with the stated objective of promoting sustainable development in the forestry sector through improved management and partnerships with the private sector. In 2005, the National Forest Program for Supporting the Implementation of the Concept of the Development of the Forest Sector (2005-2015) was developed, along with the National Action Plan for Development of the Forest Sector (2006-2010), while the Forest Code was updated in 2007. Currently, the procedure for Use and Disposal of the State Forest Fund is under development. This new regulation should replace the existing Decree 482, which is governed by the majority of forestry enterprises in the Kyrgyz Republic. The Forest Code of the Kyrgyz Republic aims at guarding, protection, and regeneration of forests and hunting fund, ensure rational and sustainable forest use, proceeding from the state objectives for efficient management of forests and hunting fund, conservation of biological diversity of forest ecosystems, increase of ecological and economic forest potential, satisfaction of public needs for forest and hunting resources based on scientifically grounded and multipurpose management of forests and hunting fund.

19. **Pasture.** The Law of the Kyrgyz Republic "On Pastures" defines the basic principles of legal regulation of pasturelands. The legal norms of the law reflect fundamentally different approach in the use of pasturelands with the main objective of ensuring sustainable and efficient management of pastures and pasture resources. The Law of the Kyrgyz Republic "On Pastures" confirms the norms of the Land Code on land rights that pasture management, use and improvement activities are regulated by the Land Code of the Kyrgyz Republic and Law on Pastures, as well as other regulatory legal acts of the Kyrgyz Republic. Pasture use is under different regulatory frameworks and institutional responsibilities. The majority of 9.1 million ha of pasturelands (76%) lie in the State Land Fund (SLF) under the jurisdiction of the Ministry of Agriculture. An additional 14% of pasturelands are in the State Forest Fund (SFF) administered by the State Agency for Environment and Forests (SAEPF). Pastures in forestland are 34% of total SFF area, and have higher economic importance. [Forestry contributes only 0.05% to GDP.] They are under local control of Forestry Enterprises (Leskhozoes) but utilized by people living in villages outside the SFF lands who receive a ticket for grazing rights.

20. No mechanisms have been developed for pasture management within Leskhozoes, Lack of a management plan with pasture monitoring and carrying capacity assessment means that SFF pasture areas are overstocked and overgrazed.

#### IV. Country Sectoral Strategies

21. There is no unified vision and policy on management of lands and ecosystems in country. The National Strategy for Sustainable Development 2013-2017 states that the key principle of the improved pasture management is to ensure economic benefits of the pastures while preventing their degradation. Adoption of new technologies of pasture monitoring was declared as way to prevent degradation. The National Strategy for Sustainable Development 2040 and corresponding draft State Programme *Forty Steps* will be finalized and adopted in 2018. *Forty Steps Programme* is aiming among other tasks at preservation of forest and biodiversity ecosystems through social forestry and joint forest management, and regeneration of the natural resources. The Step 39th – Environmental Sustainability, aims at establishment of the adequate legal framework and providing state support for environmental protection, and Step 40<sup>th</sup> - Mountainous Forests, emphasizes the fragility of the mountainous forest ecosystems and need of forest protection and afforestation.

22. The state Programme for Development of Pasture Management for 2012-2015 and corresponding

Plan of Actions (Government Resolution #89) were adopted in February of 2012. The stated aims of the Programme were to improve wellbeing of the people, achieve food security and preserve environmental integrity of the pasture ecosystems. However, the Programme lacks a coherent vision and roadmap how these aims were to be achieved and which institutions should be tasked with what functions and activities. The Programme is outdated and currently MAFIM is discussing elaboration of a new Strategy and Programme for 2018-2040.

23. The Forestry Sector has not been updated from 1998. Latest forestry sector policy has been developed and approved about 20 years ago with the Presidential Decree on a New National Forest Policy (#300, October 6, 1998), the Concept of the Development of the Forest Sector through 2025, the National Forest Program to Support the Implementation of the Concept of the Development of the Forest Sector, and the National Action Plan for the Development of the Forest Sector 2006-2010 (NAP) with activities specified to implement a National Program with a subsequent Action Plan for 2011-2015.

24. This policy was based on the three pillars of “State, Man, and Forest” aiming to ensure sustainable forests management. Forests were recognized as valuable ecosystems with protective role. The Policy of 1998 aimed to decentralize management of forest resources with granting more autonomy to the *leskhoz*; to engage communities in the management through CBFM or JFM approaches; and to transfer some economic functions to the private sector. However, the policy was not implemented due to several factors: weak policy and technical capacity in the SAEPF, inadequate state funding, and finally low commitment from the SAEPF leadership.

25. The Presidential Decree of 1998 stipulated that a new Concept of the Forestry Development 2040 has to be in place in twenty years, i.e. by December 2017. The SAEPF is currently in process of finalization of this concept drafted with the support of the FAO. The Concept is accompanied with the Action Plan for 2018-2022. The new Concept is aimed at advancement of Sustainable Forest Management (SFM) for ensuring economic prosperity, social well-being, environmental safety and wellness of the nation. The six key aspects of the SFM in the Concept are the following:

- Maintenance and development of the forest ecosystems and their input into global carbon cycle;
- Maintenance of health and resilience of the forest ecosystems;
- Maintenance and strengthening of forests’ productive functions (timber and NTFP);
- Maintain, preserve and improve biodiversity of the forest ecosystems;
- Maintain and strengthen management of the protective functions of forests (soil and water);
- Support other socio-economic functions and conditions of the forest ecosystems.

26. Forestry Sector reforms and improvement in management have been supported for longer than a decade by the Swiss Development Corporation, then by the FAO, GIZ and the World Bank. Pasture management reforms have been supported mainly by the UNDP (Suusamy Valley Project), the World Bank (AISP, PMIP), IFAD (LM DP I and II), Aga Khan Foundation and the GIZ. WB Project is planning to establish joint committees for forest resources management with participation of the local communities and local government bodies.

27. Climate change initiatives are being supported primarily by UNDP, the European Bank for Reconstruction and Development (EBRD), the Japan International Cooperation Agency (JICA), the Food and Agricultural Organization (FAO), IFAD and the World Bank. Support to enhance the national hydro-meteorological service (Kyrgyzhydromet) is being provided by the World Bank.

## **V. Country Economic Background**

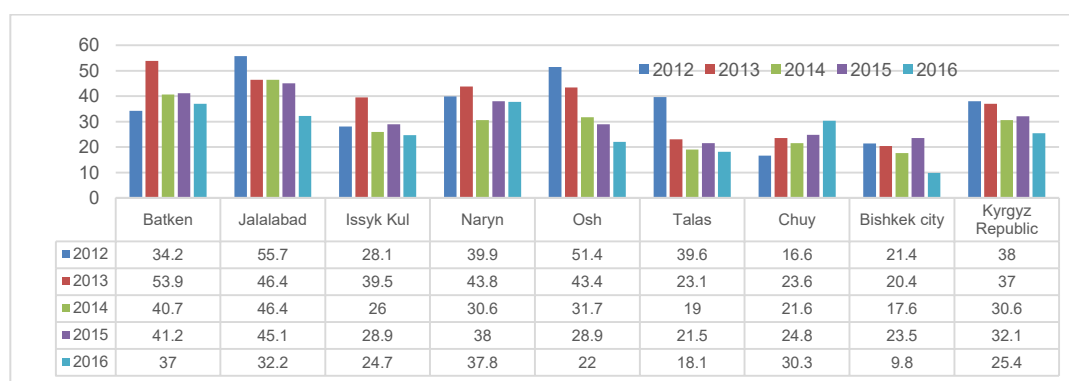
### **a. Rural poverty**

28. About three quarters of the poor live in rural settlements. Poverty is the highest in remote mountainous areas where almost all households are poor with average per-capita income of approximately US\$82 in 2015, which is equal to minimum level for subsistence established by the Government and 1.3 times lower than the average in the valleys. Scarce arable land combined with

underdeveloped irrigation, limited off-farm employment opportunities, distance and poor accessibility and inadequate market infrastructure are among the key factors that constrain economic development in rural areas. There were 49,000 people (0.8 percent) living in extreme poverty in 2016, of whom 85.4 percent were rural residents. Poverty rates vary across the regions with Naryn recording the highest in 2016 (37.8%). However, the absolute number of the poor is high in Jalalabad and Osh, which accounts for 22% and 20% of the total population, respectively. When comparing the poverty levels of female- and male-headed households, the data show that two-parent families are more likely to experience poverty, regardless of the sex of the household head. In single-parent families, households headed by men experience higher poverty levels than those headed by women<sup>8</sup>.

29. According to the World Food Programme (WFP), two out of three food insecure people live in remote valleys, 'where high altitudes, harsh winters and hot, dry summers limit livelihoods potential'<sup>9</sup>. Food insecurity is exacerbated by climate-related shocks, including floods and mudslides, which affect resilience of families and communities (see Chapter 2 for more detailed analysis on poverty – Figure 5). Livestock is the most important source of income and the primary source of nutrition for the rural poor. Animals also serve as an important asset for the poor families, which can prevent them from becoming destitute at the time of shocks (see Resilience Analysis).

**Figure 5. Poverty levels by regions (2012-2016)**



Source: NSC, 2017

## VI. Sectoral economic performance<sup>10</sup>

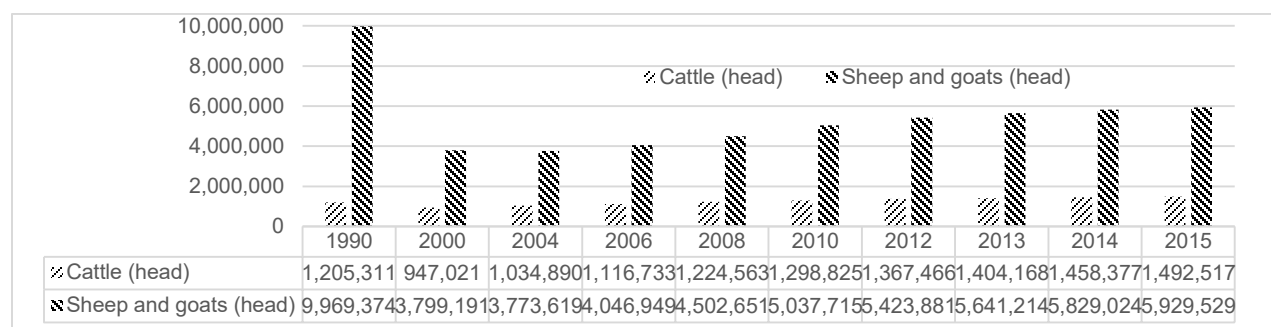
### a. Agriculture

30. Agriculture is the main source of the livelihoods in rural areas with very limited off-farm opportunities. At the same time, its productivity is quite low, with two thirds of the working women and of the working men being employed in the sector and the share of agriculture in nominal GDP accounting for only 13.2 percent in 2016 (which is 0.8 percent lower than in 2015). About half of agricultural output is accounted for in livestock production, whose role is increasing every year demonstrated by the growing number of animals. The number of cattle and sheep increased by 12 percent only within the last four years (Figure 6). Moreover, anecdotal evidence suggests that the actual number of livestock is significantly higher, at least by 20 percent. People tend to hide livestock number for several reasons, including to decrease payment for pasture use, as well as to avoid sales/income taxes.

<sup>8</sup> FAO (2016) National gender profile of agricultural and rural livelihoods (Available at: <http://www.fao.org/3/a-i5763e.pdf>)

<sup>9</sup> WFP Kyrgyzstan (<http://www1.wfp.org/countries/kyrgyzstan>), accessed in February 2018.

<sup>10</sup> Gender dimensions of each topic are provided in Chapter 2.

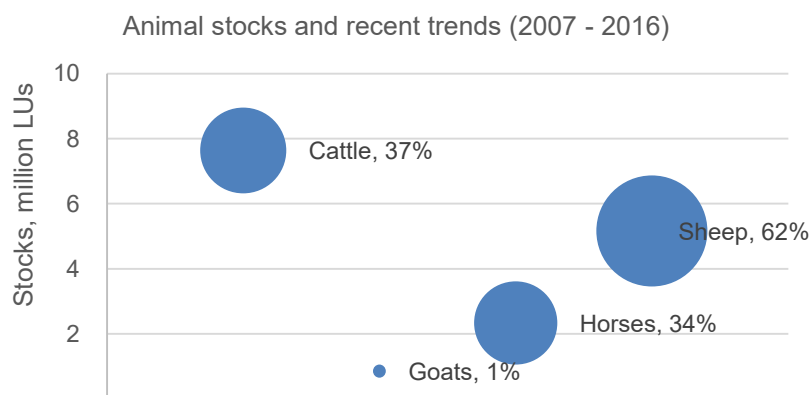
**Figure 6. Livestock number in Kyrgyzstan 1990-2015**

Source: National Statistical Committee of KR, 2017

### b. Rural context

31. **Low productivity and “saving account” perception of animals combined with non-diversified local economies resulted in exponential growth of animal inventories.** Livestock rearing is a long-standing tradition of Kyrgyz people. Before being fully settled by the Soviets in the mid-20<sup>th</sup> century, Kyrgyz mountain tribes enjoyed a pastoral lifestyle based on transhumant grazing. Traditional knowledge of sustainable transhumant grazing was lost during the Soviet times, when households were prohibited to own more than three sheep for personal purposes. After gaining independence and with more people engaged in livestock breeding, traditional livestock practices have been slowly recovering. More farmers today migrate along the rangelands not only to ensure adequate feeding for their livestock, but to preserve and allow the vegetation to regenerate. Sustainable landscape-based grazing has been a core of Kyrgyz traditional pastoral practices, which have been incorporated in recent pasture management reforms.

32. Animal husbandry has been traditionally the main source of livelihood for rural population with farming households generating 95 percent of all red meat in the country. Livestock is especially important in remote mountainous areas, where cropping is limited due to a shortage of arable land, almost non-existent irrigation, and adverse climatic conditions, such as frosts and droughts.

**Figure 7. Bubble size represents growth rate (Source: FAOSTAT)**

33. In the last ten years, animal inventories have increased by 41 percent with cattle and sheep – jointly representing 80 percent of the total stocks – spiking by 37 and 68 percent respectively (Figure 7). The main drivers of growth are low animal productivity, non-diversified economies and *low* financial literacy (as well as traditional attitudes) of rural residents who perceive livestock as both a source of cash income and a means of savings accumulation. The livestock/pasture ecosystem is trapped in a vicious cycle of productivity collapse: overgrazing and degradation cause lower levels of available forage, which reduces animal productivity, causing households to own more animals to compensate for productivity declines, which in turn increases grazing pressure and leads to more degradation.

34. Almost all livestock is grazed at pastures year-round. Daily grazing occurs in pastures near villages during the fall-winter-early spring months. During the spring-summer months, grazing follows the transhumance migration routes in the more remote alpine pastures located at altitudes of 2500 masl and above, sometimes as far as 100 km from the village. Livestock productivity is low and large seasonal variations in animal body weights indicate that animal feeding is geared towards animal survival rather than commercial production.

35. **Degraded pastures and inefficient production systems turn animal breeding non-profitable. Animal owners are trapped in intermediaries' network; relations of mistrust and difficulties to reach up the formal markets weaken the chain.** Simple calculations demonstrate that animal husbandry brings no (or negative) profit to herders who use pastures inefficiently (this is the case of the vast majority of herders, except for the most advanced PUUs that apply good pasture management techniques). High price volatility is inherent to the Kyrgyz meat market due to unorganized domestic market and aggressive speculation on prices by animal traders (intermediaries), the latter obviously aim at price growth. Small-scale production has unavoidably led to high production costs. Little to no profit on herder's side vs. generous margins of intermediaries create relations of mistrust compromising the performance of the entire chain.

36. **While heads of municipalities have powerful mandate, failure to understand national priorities and high staff turnover result in lack of action and "consumer" attitude vis-à-vis natural resources and settlement development in general.** Discussion with the local government authorities during various missions fielded for the purpose of design, revealed that the heads of municipalities (*Aiy/Okmotu*) are not fully aware and/or do not fully understand the national strategies with regards to environmental protection, climate change adaptation, agrifood industry and trade development. Line ministries commitment – and especially that of their decentralized offices – is low due to high turnover of key staff and shortage of resources. These challenges along with discontinuity in implementation compromise the positive impact of investment operations designed to address issues related to climate change and degradation of natural resources. Moreover, this leads to human capital loss and doubtful practices, including in relation to NRM. Failure to address this issue will – without doubt – lead to serious degradation of natural resources at scale.

37. **At the grass root level, female and male farmers need access to knowledge: modern and sustainable.** Farmers, especially women, and not only smallholders, have limited to no access to modern knowledge on how to improve their production practices or organization skills, which is even more severe in the case of women. Today in Kyrgyzstan advisory service provision to farmers (both, herders and growers) is largely driven by donor support. Only better off farmers, mostly men, can afford private extension services. This makes the system patchy, non-socially inclusive and non-sustainable in time.

### c. Pasture and Livestock

38. Livestock is a mainstay of households in rural mountainous areas. Households and smallholder farmers produce 98.5% of the country's Gross Agricultural Output (GAO) and almost 90 percent of total livestock output (2015). Livestock serves not only as a source of their income and food, but also as a safety and coping mechanism to be relied on in cases of unexpected shocks and needs. It is especially important in mountainous areas, where agriculture is limited due to dilapidated infrastructure, limited arable land and almost non-existent irrigation, short vegetation growth periods, and frequent climate shocks, such as frosts and droughts.

39. Productivity of livestock is generally low due to poor breeding and feeding practices. Farmers in Kyrgyzstan produce limited amounts of fodder, forage and feed grain, mostly due to shortage of arable land, lack of good quality seeds and mechanization services, but also due to heavy reliance on natural pastures. Large seasonal variations in animal body weights indicate that animal feeding is geared more towards ensuring survival of animals than for production. Almost all livestock are grazed at pastures year-round, except for cattle that may be kept in barns all winter. Daily grazing occurs at pastures near villages and on the post-harvest crop fields during 6-8 months of the fall-winter-early spring seasons, and for 4-6 spring-summer months on more remote pastures following transhumance to summer pastures. Near-village



pastures have been severely deteriorated, caused by the rise in livestock numbers, decrease in available grazing areas with enlargement of settlements, encroachment of cropping onto good pastureland, and intensive grazing in remaining near-village pasture areas. It was estimated that productivity of near-village pastures decreased from 300 kg/ha to around 170 kg/ha or less with heavy encroachment of unpalatable and weedy species. Summer pastures also experienced deterioration, though at a significantly lower scale, especially from overgrazing near roads and water sources, and the spread of weeds and unpalatable plants. Use of summer and spring pastures has increased but is still limited due to degradation of resources and dilapidated access infrastructure with increasing cases of mudslides and landslides.

#### d. Forestry

40. There are more than 20 ecosystems in Kyrgyzstan ranging from glaciers and snow-fields, to some of the most biodiversity-rich broadleaved nut and fruit forests, to arid zone deserts. Forests are represented in either full-canopy coniferous forest ecosystems (e.g. Tian Shan spruce forests in Issyk-Kul, walnut forests in Uzgen and Suzak), but more commonly in mosaics with meadows and pasturelands. Also light forests with shrubs and open- forests with stand-alone trees, juniper in high altitudes, and hawthorn in lower slopes are commonly found.

41. Total forest area in the Kyrgyz Republic is 1,116 million hectares, or 5.6% of the total area of the country. 75% of the forests are grown on State Forest Fund (SFF), and 25% on Protected Areas (PAs) under SFF. In addition, 14% of natural rangeland, or 1.2 million hectares are under SFF.<sup>11</sup> Forests are broadly classified by four major types: (i) spruce and fir forests, which are mainly located in the western and central parts of the country and occupy an area of 3,017 km<sup>2</sup> or 1.5 percent of the country's territory; (ii) walnut-fruit tree forests located mostly in the south of the country and occupying about 928.7 km<sup>2</sup> or 0.5 percent of the total land area; (iii) juniper forest covering about 2,483 km<sup>2</sup> or 1.3 percent; (iv) and riparian and riverine forests, which are characterized as forests with small-leaved (microphyllous) and broadleaved (platyphyllous) trees covering altogether about 1,124.3 km<sup>2</sup> or 0.5 percent of the total Kyrgyz territory.

42. A large area of forested land - about 3,871.9 km<sup>2</sup> or about 1.9 percent – is dominated by shrubs and bushes. About 275,500 ha of forest, mostly riparian and spruce forests, are located on the municipal or SLF lands under the management of the local governments. Almost all forest areas are located at 700 meters asl and higher altitudes. Land covered by forests is less than half of all SFF lands. A large area of the SFF is alpine and sub-alpine meadows, highland, middle and low altitude steppes and deserts.

43. Timber production is the main economic function of forest only in well-stocked and extensive spruce and fir forests in Issyk-Kul. In most regions of Kyrgyzstan forests play environmental and protective roles in natural disaster prevention, including reducing landslides, mudflows, land-slips, and snow avalanches. Their role in regulating micro-climate, retention of water and moisture, as well as carbon balance is not well researched and not yet duly recognized in the country. To overcome this, the Forest Institute named after Prof. Gan P.A. is planning to conduct more research on forests and climate change, watersheds and risks for disasters and diseases in forests. Forests are important for the livelihoods of the more than 280 rural municipalities that surround them, occupied by more than 2 million people. They are used for harvesting fuelwood and timber, collecting Non-Timber Forest Products (NTFP), and grazing livestock. They are especially important for livelihoods of the remote, mountainous communities which lack employment opportunities, lack of infrastructure and are remote from markets.

44. Forest degradation contributes to natural disasters in Kyrgyzstan. The Ministry of Emergency Situations of the Kyrgyz Republic informs that the number of floods, mudflows, landslides and avalanches has significantly increased during the last decade. The number of emergency situations in 2016 was higher than average level and natural disasters caused a total of 1.6 billion soms (USD 23 million) of economic damage.<sup>12</sup> Osh and Jalalabad regions are most prone to natural disasters frequencies, where mudslides and landslides happen along Kok-Art, Changet, It-Agar, Padysha-Ata, and Yassy watersheds. The biggest number of landslides and mudflows in 2016 was registered in Osh (landslides-152, mudflows-425) and Jalalabad oblasts (landslides-114, mudflows-261), while in other oblasts the number of landslides was no

<sup>11</sup> Resolution of Kyrgyz Republic Government from July 26, 2011 No. 407. On approval of the results of the National Forest Inventory of the Kyrgyz Republic.

<sup>12</sup> Ministry of Emergency of the Kyrgyz Republic data

more than 25 and number of mudflows no more than 84.<sup>13</sup> One of the key reasons for these disasters is degradation of the vegetation along the mountain slopes due to heavy anthropogenic pressure from livestock overgrazing, erosion of river banks, and unsustainable harvesting of timber and fuelwood.

#### e. Processing industry context

45. **Agribusiness community: small yet dynamic and export-oriented.** The Kyrgyz food industry represents only 15 percent (KGS 24 billion or USD 357 million) of the total processing industry output. Main **animal source foods** such as meat and dairy occupy a modest share of nine and 19 percent for meat dairy respectively, suggesting that most of primary output moves towards consumer through a non-corporate channel. The situation is even more contrasting in fruits in vegetables industry: processors operating in this sector barely reach one percent of the national food industry output.

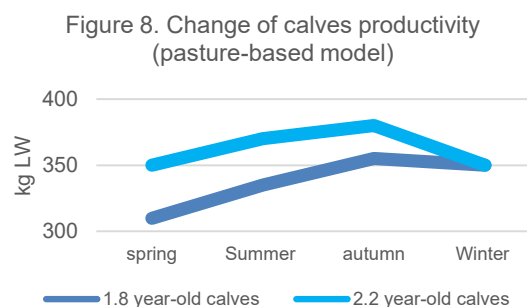
46. This having said, agrifood exports are an important contributor to country's economy generating 15 percent of the total export value or USD 99 million. It is important to keep in mind that most of non-timber forest products massively exported from Kyrgyzstan are not accounted.

47. In Kyrgyzstan, there are 326 agribusiness companies of different scale<sup>14</sup>, few are credit-worthy. A few operate in main animal source foods industries such as red meat and dairy: three meat processors, including a large slaughterhouse in Bishkek, and about 20 dairies, mainly located in Chui, Issyk-Kul and Talas Oblasts.

#### f. Market Overview

48. **Red meat and milk primary production.** The agriculture sector accounted for 13 percent of the country's GDP with the livestock sector representing some 48 percent<sup>15</sup> of gross agricultural output, with 15 percent generated from dairy and 30 from red meat sub-sectors. Industry estimates total red meat output at 35 thousand tonnes annually. Country's dairy belt is located in Chui, Issyk-Kul and Talas regions (outside core project area). Almost all farming households, including landless ones, own livestock. Livestock products represent a substantial part of the diet and as much as 20 percent of total food consumption in Kcal/per capita. Production structure is highly fragmented: over 90 percent of the livestock are owned by smallholders. A typical animal owner has on average two head of cattle and 8-9 small ruminants raised extensively. Almost 90 percent of cattle and small ruminants are sold live on traditional animal markets. Such informal marketing model is advantageous for intermediaries but leaves little income to herder and cannot guarantee adequate food safety to the consumer.

49. Almost all livestock is grazed at pastures year-round. Daily grazing occurs in pastures near villages during the fall-winter-early spring months. During the spring-summer months, grazing follows the transhumance migration routes in the more remote alpine pastures located at altitudes of 2500 m asl and above, sometimes as far as 100 km from the village. Livestock productivity is low and large seasonal variations in animal body weights indicate that animal feeding is geared towards animal survival rather than commercial production (Figure 8).<sup>16</sup>



50. Animal husbandry<sup>17</sup> brings no (or negative) profit to herders who use pastures inefficiently (this is the case of the vast majority of herders, except for the most advanced PUUs that apply good pasture

<sup>13</sup> Monitoring and forecasting of disasters and hazards on the territory of Kyrgyzstan. Ministry of Emergency, 2017

<sup>14</sup> Government of Kyrgyzstan, National Food Industry Development Programme 2017-22.

<sup>15</sup> USD 3 billion (2016 data).

<sup>16</sup> Source: Bishkek slaughterhouse "Toro"

<sup>17</sup> Except in apiculture.

management techniques). For example, the cost of production of one calf 520-kg weight is roughly 59,000 KGS, while its sales will generate just above 60,000 KGS. High price volatility is inherent to the Kyrgyz meat market due to unorganized domestic market and aggressive speculation on prices by animal traders (intermediaries), the latter obviously aim at price growth. Small-scale production has unavoidably led to high production costs. Little to no profit on herder's side vs. generous margins of intermediaries create relations of mistrust compromising the performance of the entire chain<sup>18</sup>. Strong market incentives (such as direct linkages to modern slaughterhouses) are necessary for herders to gradually move towards more efficient feeding practices ultimately resulting in more productive animals and lesser pressure on pastures.

**51. Food processing industry.** In Kyrgyzstan, food industry represents only 15 percent (KGS 24 billion or USD 357 million) of the total national processing industry output. Main animal source foods such as meat and dairy occupy a modest share of nine (for meat) and 19 percent (for meat) sub-sectors respectively, suggesting that most of the primary output moves towards consumer through non-corporate channel. The situation is even more contrasting in fruits in vegetables value chains, that jointly combine to just one percent of the food processing industry output. This having said, agri-food exports are an important contributor to country's economy generating 15 percent of the total export value or USD 99 million. In animal source foods industries five companies operate in meat industry (one slaughterhouse in Bishkek and one in Osh, and three meat processing facilities) and about 20 dairies, mainly located in Chui, Issyk-Kul and Talas provinces. To put that in context, all together there are 326 agribusiness companies of different scale in Kyrgyzstan. Industry estimates total red meat output at 35 thousand tonnes annually, of which 16 percent is illegally exported to Uzbekistan and Kazakhstan. Such traffic of live animals brought to Kyrgyz animal owners substantial losses estimated at some 300 thousand USD (value of confiscated animals).

**52. Kyrgyz red meat & export markets.** Exceptional palatability traits of Kyrgyz beef and lamb are valued by consumers from Russia, Kazakhstan, Islamic Republic of Iran, Uzbekistan, and the United Arab Emirates notwithstanding the fact that Kyrgyz lamb has rather high price tag. New markets, such as Qatar and China, will welcome Kyrgyz red meat in 2018. Kyrgyz red meat has therefore solid market potential on international market. However, export performance is significantly lower than committed quantities as organizing batches of animals sourced from a multitude of unorganized small producers is extremely challenging. Thus, out of 340 tonnes of mutton contacted by the Iranian buyers in 2017, Kirgizstan was only able to supply 11 percent. Direct linkages between farmers and agribusinesses coupled with efficiency gains through improved herd management, including intensification, are crucial to address the bottleneck on the supply side.

**53. Non-timber forest products.** In the southern Kyrgyzstan, especially in the region of Jalal-Abad, 50 percent of trees in the forests are walnut trees. NTFPs in general are an important commercial activity in this part of the country thanks to the unique Arslanbob Walnut Forests. Concerted action is needed to preserve these forests, which have grown for nearly thousand years to become the largest walnut groves on Earth, and to support the livelihood of thousands of families and communities.

**54.** In the project intervention area walnuts can be harvested on some 24 thousand hectares of forest. Fruit orchards occupy 838 ha of land with Suzak representing 51 percent, Ak-Taala 24, and Uzgen – 21 percent of the area under fruit orchards. This area is largely specialized in apricot (fresh and dried) and plum (dried). According to industry experts, only 20 percent of nuts and ten percent of other NTFP and dried fruits are marketed through the formal (corporate) channel. Intermediaries affiliated with exporters smuggle the bulk of the product creating relations of mistrust between forest leasers and the end market operators and taking away value addition beyond Kyrgyz borders.

**55.** The collection of walnuts, for example, generates additional income for families living in rural areas near forests. Mid-traders supply these walnuts to household crackers before being sorted and packed by exporters and toll processors. This traditional supply chain is archaic and inefficient as it involves many actors and compromises transparency and therefore traceability. Actors, in fact, cannot see beyond the next participant in the chain, causing lack of trust and reducing product quality and putting food safety at risk. As the trade of walnuts is often a one off deal, without long-term commitments, and no incentive is paid for good management practices, forest users do not invest in forest sustainability. Furthermore, mid-traders offer leaseholders low prices in a low season when smallholders need money, while their (mid-

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<sup>18</sup> See Working Paper on Value Chains Development for more details.



traders') margins easily reach 100% and the business is based on traded quantities, not quality with little to no market risk.

56. **Kyrgyz NTFP & export markets.** *Dried apricot* is one of the prominent value chain in the core project area. On about 10 thousand hectares of land, the country produces some 24-30 thousand tonnes of fresh apricots annually, providing income to over 400 thousand small and medium-scale farmers. Exports of *walnut* in 2017 has reached 1 253 MT, 44 percent up compared to 2016, generating USD 5.8 million. Thanks to several development initiatives launched by the donor community (e.g. <http://agrolead.org> /Fair Match Support) and the certification schemes such as Fair Trade, Organic and HACCP brought into the value chain as its critical element securing quality, sustainability and accountability, the average FOB price has doubled: from 2.6 USD/kg in 2016 to 4.6 in 2017. The main trade partners of Kyrgyzstan importing walnut include Turkey (63 percent of export), Russia (13) and EU (10 percent). Walnuts exported to Turkey are then re-exported, mainly to EU, not carrying any information on their true origin country. Only during last five years, Kyrgyz economy has “lost” USD 14 million failing to valorize its unique offer: the Arslanbob walnut. Moreover, value addition of hundreds of tons of walnut and tenths thousands of dried fruits is happening in Tajikistan and Uzbekistan generating significant value outside the country. *Walnut* industry is represented by five companies of medium scale (200-300 kg of walnut capacity), mainly located in Issyk-Kul and Jalal-Abad. Dried apricot and dried plum operators are also of similar count. Almost 40 percent of fresh apricot is exported dried (through Tajikistan and Uzbekistan for further value addition and re-export). Another 20 percent are sold abroad fresh and only two percent of fresh apricot undergo industrial drying and packaging within the country. In 2016, officially reported Kyrgyz export of tree nuts and dried fruits reached USD 8 million with Germany (29 percent, Turkey (22) and China (19) being main trade partners. Most of Kyrgyz walnuts exported to Turkey, for instance, are then re-exported labelled “Made in Turkey”, mainly to EU. Moreover, value addition of hundreds of tonnes of walnut and tenths thousands of dried fruits is happening in Tajikistan and Uzbekistan worth multimillion US dollars of lost opportunities for Kyrgyzstan only on EAEU market. Such trade schemes do not contribute to the international recognition of the country's image not to mention lost economic opportunities for Kyrgyz men and women. This is probably why the International Nut & Dried Fruit Council<sup>19</sup> that links global business community operating in this sector is unaware of the Kyrgyz offer.

57. **Global market trends.** Globally, consumers – especially in Europe and North America – are increasingly aware of, and concerned by, the origins of the products they buy and the processes that go into making them. They want to make responsible decisions about what they buy, weighing up social and environment credentials. Natural, low sugar and safe products are the main trends supporting increasing consumption of edible nuts and dried fruit. Consumption is therefore fueled by the growing demand for “healthy snacks”, natural processing methods (sun dried vs. industrial dehydration). Importantly, the role of traditionally dominating supplying countries is reducing as importers seek to diversify their sourcing options. In Kyrgyzstan, government and businesses have in general low awareness on the potential of NTFP.

58. **FSC certification to unlock niche markets.** FSC's niche is *Natural Wild Grown Product* - from responsibly/well managed forests, from smallholders, from rural areas, from high mountain areas – with a focus on story behind these products. The project will target business with strong green orientated corporate social responsibility. Confectionary and healthy snack industry is important niche: eco-healthy-natural food stores, cafes, brands using natural ingredients etc. FSC can raise awareness not only around the product itself, but on its country of origin too. For the group of forest leaseholders in Jalal-Abad certified according to FSC scheme in early 2018<sup>20</sup>, the Council is already negotiating with Body Shop, Lush, Chanel group, L'Oréal group, and other important cosmetics brands. The new business model allows participating smallholder women enjoy premium price<sup>21</sup>, develop entrepreneurial skills (and create more jobs) thanks to fair distribution of benefits along the chain. Research has shown that businesses that become FSC certified benefit from better access to international markets, have higher revenues, and see positive change to their public image.

59. **Untapped potential.** Product profile from Kyrgyzstan can open totally new niche in markets for actual eco product - from forests which are well-managed, taking into account social values (wages, equal rights

<sup>19</sup> <http://www.nutfruit.org/>

<sup>20</sup> <https://ic.fsc.org/en/news-updates/id/1386>

<sup>21</sup> For certified products, normally, the premium is 5-10% and more depending on end markets.

for both gender to participate in transparent implementation of ILO convention principles), economic (business plan and management plan for forest unit creation, alignment with local legislation), ecologic (biodiversity conservation, ecosystem services, high conservation value areas management). Combination of FSC and any of retailer preferred schemes are adding value to supply chain as well as rising image of natural products from Kyrgyzstan, which can appear later with good marketing and communication as a new face of Kyrgyz Republic. Kyrgyz NTFP have strong potential on dried fruit and tree nuts markets but also on premium markets where premium class food/cosmetics brands operate needing extra natural products and ingredients.

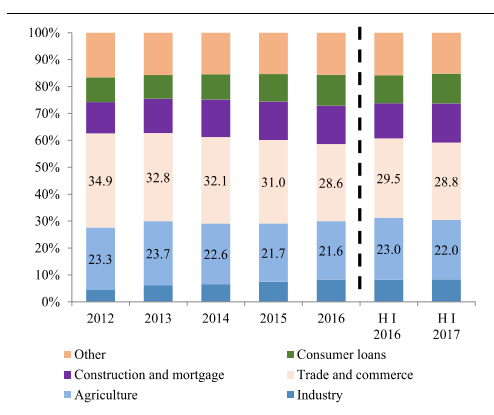
### g. Rural Finance

60. The financial sector in the Kyrgyz Republic includes commercial banks and other financial institutions (nonbank financial institutions (NBFI), insurance companies, investment and pension funds, stock exchanges). The sector<sup>22</sup> is dominated by banks that as of mid-2017, held close to 90 percent of the financial sector portfolio.

61. As of mid-2017, the assets of the banks and nonbank financial institutions constituted KGS 197.8 billion (USD 2.9 billion) or 42.0 percent of the country's gross domestic product (GDP). The total loan portfolio of the banks and nonbanking financial institutions was KGS 113.6 billion (USD 1.66 billion) or 24.1 percent of GDP.

62. The share of agriculture in the structure of the financial sector's loan portfolio has been stable over the past 6 years, ranging between 21.6 and 23.3 percent and being the second most funded economic sector after trade (Figure 9).

**Figure 9. Financial sector loan portfolio breakdown by economic sectors, 2012-mid-2017.**



Source: NBKR 2018.

63. **Banking sector.** As of mid-2017, there were 25 commercial banks in Kyrgyzstan working through 319 branches. Assets of the banking sector by mid-2017 amounted to KGS 183.8 billion (USD 2.7 billion), having increased by 5.2 percent compared with the first half of 2016. For the same period, the liabilities of the banking sector amounted to KGS 154.2 billion (USD 2.23 billion), having increased by 4.4 percent as compared to mid-2016. The growth of liabilities was primarily due to the growth of the retail and non-financial enterprises' deposit base which grew by 16.2 percent from mid-2016 to mid-2017 and amounted to KGS 103.4 billion (USD 1.5 billion). The share of retail and non-financial enterprises' deposits in the banks' liabilities amounted to 67.1 percent in June 2017.

64. The banking sector of the country is relatively stable and profitable. Between mid-2016 and mid-2017, the return on equity (ROE) of the banking sector was 0.7 percent, and the return on assets (ROA) – 4.5 percent. The net profit of the banking sector amounted to KGS 633.1 million (USD 9.3 million) over this

<sup>22</sup> Unless otherwise noted, all data in this section is based on NBKR data. See: "The Financial Sector Stability Report of the Kyrgyz Republic." November 2017.

period. The capital to risk-weighted asset ratio was 24 percent as of June 2017, remaining well above the prudential minimum threshold of 12 percent and having increased by 0.5 p.p. as compared with the first half of 2016.

65. In terms of the credit risk, the share of nonperforming loans in the loan portfolio of banks decreased from 9.0 percent in June 2016 to 8.4 percent by June 2017. The highest concentration of credit risks was still observed in the trade sector of the economy while the share of nonperforming loans in the agricultural sector remained relatively low and stable (Figure 10)<sup>23</sup>.

66. As noted above, the banking sector is heavily focused on agriculture and on reaching small and micro businesses. There is a government “Financing Agriculture” program of providing interest rates subsidies for agricultural loans issued through commercial banks at 6 to 10 percent per annum.<sup>24</sup> In 2017, about 10,000 such loans were disbursed to farmers through 6 commercial banks.<sup>25</sup> In 2018, over KGS 1 billion (USD 14.7 million) was allocated for such subsidies.<sup>26</sup>

67. The largest agricultural lender in Kyrgyzstan is **Ayil Bank**, fully owned by the government, with assets of over USD 308 million as of December 2017 and a loan portfolio of close to USD 221 million.<sup>27</sup> The bank currently has about 63 percent of its portfolio in agriculture, including leasing of agricultural machinery (Figure 11).<sup>28</sup> It works through its 190 branches all over the country (60 percent of all bank branches in the country).

Figure 10. Volume of nonperforming loans by sectors of economy, KGS million. 2012 – mid-2017

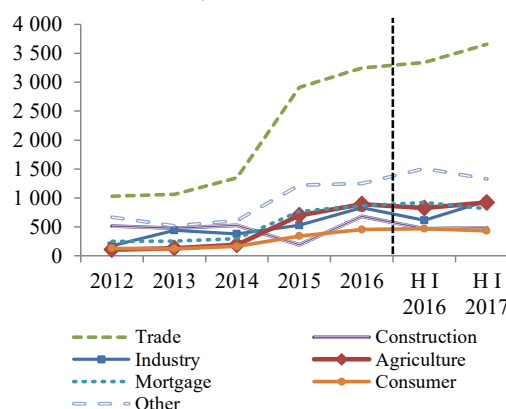
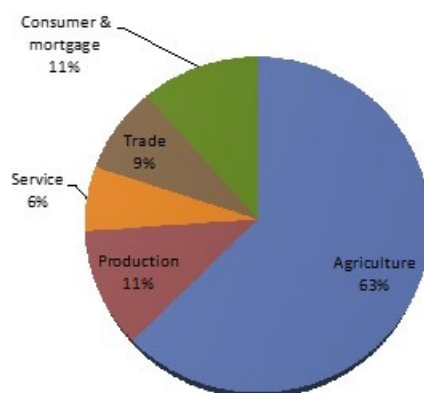


Figure 11. Ayil Bank’s portfolio breakdown by sector, December 2017.



68. Ayil Bank currently serves over 60,000 active borrowers, with the average loan amount of USD 3,539. Since 2011, the bank has leased over 1,900 units of agricultural machinery worth over USD 15 million. Ayil Bank has been an active participant in the government’s “Financing Agriculture” program providing interest rates subsidies, as noted earlier. Since 2012, Ayil Bank has disbursed subsidized loans under this program for an amount over USD 148 million (including the amount committed to disbursement in 2018).

69. Ayil Bank has also been implementing a socially responsible project for financing low-income families throughout the country, providing more than 25,000 loans annually for the total amount of over USD 13 million. The maximum loan amount for this program is USD 735, disbursed for a period of up to 12 months

<sup>23</sup> Source: NBKR 2018.

<sup>24</sup> <http://cbd.minjust.gov.kg/act/view/ru-ru/98762>

<sup>25</sup> [http://mineconom.gov.kg/index.php?option=com\\_content&view=article&id=5858&catid=63&lang=ru](http://mineconom.gov.kg/index.php?option=com_content&view=article&id=5858&catid=63&lang=ru)

<sup>26</sup> [https://24.kg/ekonomika/75022\\_subsidirovaniye\\_selskohozyaystvennoy\\_otrasli\\_kyrgyzystana\\_uvelichitsya/](https://24.kg/ekonomika/75022_subsidirovaniye_selskohozyaystvennoy_otrasli_kyrgyzystana_uvelichitsya/)

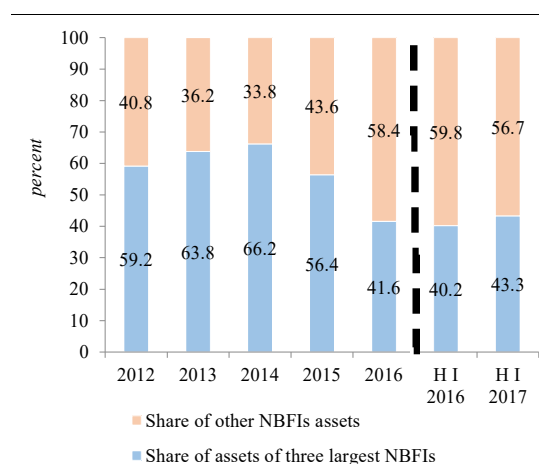
<sup>27</sup> All data on Ayil Bank is based on information provided by Ayil Bank.

<sup>28</sup> Source: Ayil Bank 2018.

at 10 percent p.a.

70. **Non-bank financial institutions (NBFI).** The non-bank lenders in Kyrgyzstan include 159 microfinance organizations (including 6 microfinance companies, 101 microcredit companies and 52 microcredit agencies) and 114 credit unions. The total assets of NBFIs in June 2017 increased by 6.2 percent and amounted to KGS 13,972.5 million (USD 206 million) due to the growth in the NBFIs' loan portfolio. The NBFI sector is heavily concentrated: there are three of the largest microfinance institutions (MFIs) that account for over 43 percent of the sector assets (Figure 12).

**Figure 12. Distribution of NBFI assets, 2012 – mid-2017.**

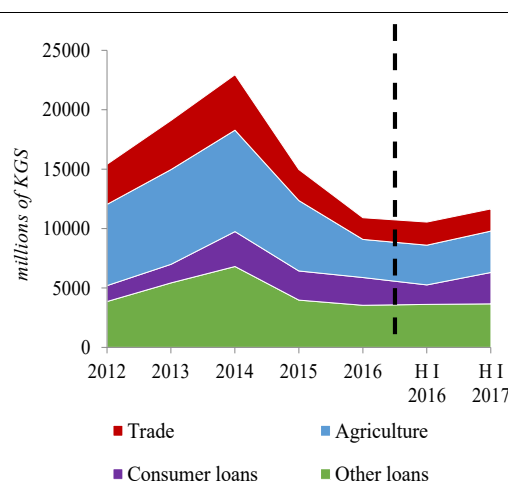


*Source: NBKR 2018.*

71. The main activity of NBFIs is lending. As of June 30, 2017, the loan portfolio of NBFIs increased by 10.5 percent as compared to the year before and reached KGS 11,648.6 million (USD 171 million). The number of NBFIs' borrowers increased by 5.4 percent compared with June 2016 and reached 238,654. Thus, the average loan balance of NBFIs amounted to about USD 716. The main oblasts where the major share of loan portfolio of NBFIs is concentrated (78.3 percent of total credit portfolio) are Bishkek city, Chui, Osh and Jalal-Abad oblasts, which is due to the highest level of business activity in these oblasts of the republic.

72. NBFIs loan portfolio is concentrated in agriculture (29.9 percent of NBFIs' total loans), trade and consumer loans (16 percent and 22.7 percent of the total loan portfolio, respectively) (Figure 13).

**Figure 13. NBFI loan portfolio breakdown by sector, 2012 – mid-2017.**

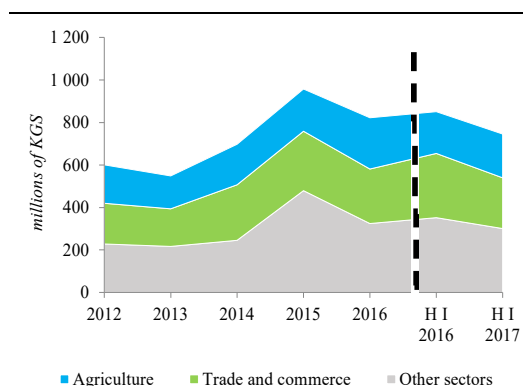


*Source: NBKR 2018.*

73. Overall, the performance of non-banks in 2015 can be characterized as moderately stable. At the end of the first half of 2017 the net profit of NBFIs increased by 7.6 percent as compared to the first half of 2016 and amounted to KGS 540.3 million (USD 7.9 million). ROA at the end of the reporting period increased by 0.9 p.p. and amounted to 4.0 percent; ROE increased by 0.5 p.p. and reached 6.3 percent.

74. The quality of the NBFIs' loan portfolio is generally higher than that of the banking sector: in June 2017 it stood at the level of 6.4 percent; within the nonperforming loans, the share of loans to agriculture grew by 4.6 p.p. compared to the year before, but still remains the smallest portion of the NPLs as compared to trade and commerce and other sectors (Figure 14).

**Figure 14. Structure of NBFIs nonperforming loans by sectors of economy, 2012 – mid-2017**



Source: NBKR 2018.

## VII. Environmental Context

### a. Introduction

75. Within the framework of its assistance to the Kyrgyz Republic and for the purposes of this project, FAO approached the preparation of the present climate scenario analyzing results deriving from the four following inputs:

- Comprehensive literature review;
- FAO Geospatial analysis of forests / natural resources<sup>29</sup>;
- Data review with the Kyrgyz Republic Meteorological Centre (Hydromet); and
- 'Ground-truthing' of climate variables with representative focus groups in target areas.

76. Additionally, data have been collected both at national and local levels, including to determine current exposure of ecosystems and communities to understand vulnerability to climate change. The following chapters will highlight and summarize main findings at national, local and target areas level. Details, maps, as well as metadata are available in the Baseline Atlas<sup>30</sup> (ref: Annex to the Feasibility Study).

### b. Literature Review

77. FAO and NDA teams collected and analyzed over 250 publications. Of these, priority was given to: (i) national communications/reporting to UNFCCC, UNCCD, CBD and others; (ii) national action plans and

<sup>29</sup> For the purposes of this project, FAO has developed a new application that allow access to and elaboration of the main international databases on remote sensing and climatic data.

<sup>30</sup> Available at the following link: <https://www.dropbox.com/s/jilh8s0tj0vr5en/CS-FOR%20Baseline%20Atlas.pdf?dl=0>.

strategies; **(iii)** national legal frameworks, **(iv)** UN assessments and reports; **(v)** publications from national institutions, academia (national and international) and CSO; **(vi)** national media; and **(vii)** bilateral donors' reports. References are quoted in the document and listed in Annex to the Feasibility Study (Repository of references for climate scenarios). Each quoted reference is available online and the link to it is embedded in the reference itself.

### **c. FAO GeoSpatial Analysis**

78. As part of its mandate to support member countries, FAO developed a set of tools and methodologies to allow rapid and tailored geospatial analysis in support to project cycle management. One result of such efforts is Earth Map, an open source application that allows for the interpretation of large remote sensing datasets in near real time as an open source. Earth Map is an innovative tool that facilitates and empowers users in performing historical and current climate-environmental analysis for a given area (regional, inter-regional, national, district, and sub-district) through a graphical interface that has been developed by FAO thanks to its partnership with Google. The tool ensures an objective evidence-based approach not only to support project design but to be accessible in future for monitoring and evaluation activities, as well.

79. FAO deployed Earth Map in Kyrgyzstan (among other countries), jointly with targeted and precise GIS elaborations, in order to ensure evidence-based project cycle management and to guarantee strategic target area identification based on clear climate risk and vulnerability evidence. The application, using available data published from internationally accredited organizations and research institutes<sup>31</sup>, allowed for a clear understanding of Kyrgyz climatic patterns, trends and anomalies. The tool also allows to look, with high accuracy, at local realities and determine vulnerability and risk of each target pasture, forest or community identified in target areas.

80. Additional details on Earth Map methodology and sources of data is available in Annex to the Feasibility Study. Results of the combined approach of GIS and spatial analysis is reported in Annex to the Feasibility Study – Project' Baseline Atlas. KML/KMZ files (Google Earth Pro) will be made available to project at start-up.

### **d. Data review with the Kyrgyz Republic Meteorological Centre (Hydromet)**

81. Data and analysis produced by FAO experts and deriving from the literature review and spatial analysis have built on and have been verified with the Kyrgyz Republic Meteorological Centre (a partner of this project). Thanks to data provided by the Kyrgyz Republic Hydromet, FAO mapped the meteorological network of the country and built the climate risk assessment that supported the selection of the project's target areas. The climate risk assessment is summarized in the next chapters while the full analysis is available in Annex to the Feasibility Study.

### **e. 'Ground-truthing' of climate variables with representative focus groups in target areas**

82. As part of the national engagement process / national ownership and given the importance of community participation in the project, FAO hired a specialized Kyrgyz NGO<sup>32</sup> with longstanding experience with international organizations such as IFAD, WB, ADB and others to undertake a household socio-economic and climatic survey. Results of the survey allowed the project not only to understand climate change perceptions among target and control communities but also to evaluate their adaptation deficit. Results will be summarized in the next sections and fully available in Annex to the Feasibility Study – Project' Baseline Atlas.

### **f. Environmental Context**

83. Kyrgyzstan is landlocked, with many tall mountains, glaciers, and high-altitude lakes. 93% of the country is mountainous dominated by the Tien Shan range. It mostly lies on land situated at elevations

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<sup>31</sup> Earth Map uses only peer reviewed and internationally accepted models and algorithms to run queries and process data.

<sup>32</sup> Rural Development Fund



between 1,000 meters and 7,400 meters, with more than 40% of the country above 3,000 meters, and three-quarters of that under permanent snow or glaciers. Mountains in the central part of the country effectively isolate the northern and southern populations of Kyrgyzstan, especially in the winter, when snow closes many of the roads.

84. There are over 20 ecosystems in Kyrgyzstan ranging from glaciers and snow-fields to deserts, with rangelands covering over half the country's territory. Forest cover is relatively small, making about 5% of the total land area. The predominant vegetation types found in the mountains are desert, semi-desert, and steppe on all the lower slopes and foothills and in some of the outlying ranges and major basins. Patches of riverine woodland exist in a few low altitude places. At higher altitudes, steppes are dominated by various species of grasses and herbs, while shrub communities are widespread in the lower altitude steppe zones. Spruce forests, the only coniferous forest type, occur on the moist northern slopes of the Tien Shan, while open juniper or “*archa*” forest occurs widely between 900 and 2,800 masl. Subalpine and alpine meadows occur in the western part of the mountains, from 2,000 to 4,000 masl and above. At the highest and coldest elevations, there is limited vegetation cover with cushion plants, snow-patch plants, and tundra-like vegetation.

#### **g. Biodiversity**

85. The varied geography and climate of Kyrgyzstan account for its high biodiversity – while the country makes up only 0.13% of global landmass, it hosts approximately 1% of the world's flora and fauna. The mountain ecosystems of the Kyrgyz Republic are also particular in that they support unique plants and animals, with a high degree of concentration of biodiversity not only at the ecosystem, but also at the species level.

86. According to the Third National Biodiversity Strategy and Action Plan of the Kyrgyz Republic (submitted in 2016), entitled “Biodiversity conservation priorities of the Kyrgyz Republic till 2024”<sup>33</sup>, Kyrgyzstan is home to around 166 viruses and bacteria, 3676 species of fungi and other lower plants, 3,869 species of higher plants, 101 species of protophyte, 14,600 insects and other arthropods, over 1,500 other invertebrates, 75 species of fish, 4 amphibians, 33 reptiles, 390 birds and 84 mammals. The invertebrate fauna is not fully explored. The Red Book of the Kyrgyz Republic (2007) includes 53 species of birds, 26 species of mammals, 2 species of amphibians, 8 species of reptiles, 7 species of fish, 18 species of arthropods, and 89 species of higher plants, 6 species of fungi are included<sup>34</sup>.

87. Plant genetic resources are important in Kyrgyzstan for both ecological reasons and economic potential, as they include over 200 species of medicinal plants, but also crop wild relatives (e.g. licorice (*Glycyrrhiza glabra*), barberry (*Berberis*), barnyardgrass leafless (*Anabasis aphylla*), Fergana spurge (*Euphorbia ferganica*), thyme (various types) (*Thymus*)). The unique walnut forests ecosystem in the south of the country are especially valuable; the Vavilov center of origin of walnuts is in Central Asia. Walnut forests are home to 49 endemic species of invertebrates and 12 species of plants. Areas of this ecosystem are located in the south-eastern slopes of the Chatkal and south-western macroslope of the Fergana ranges. Walnut forests are a source of genetic resources, including wild relatives of walnuts, apples, pears, grapes, plums. More specifically, wild fruit plants of the Kyrgyz Republic include walnut (*Juglans regia*), apple Sievers (*Malus sieversii*), Sogdian plum (*Prunus sogdiana* Vass.) And its subspecies, Korzhinskii pear (*P. korzhinskii*), Regel pear (*P. regelii*), Tien Shan cherry (*Cerasus tianschanica*), cherry magalebская (*C. mahaleb*), barberry (*Berberis oblonga*), types of almond (*Amygdalus* spp.), pistachio plain (*Pistacea vera*), species of hawthorn (*Crataegus* spp.). Most of these plants are closely related to the walnut-fruit forests of southern Kyrgyzstan<sup>35</sup>.

88. Although the genetic resources of the Kyrgyz Republic (medicinal plants, wild relatives of cultivated plants, etc.) are extremely rich and varied, they are not fully studied; there are 1600 species of plants of wild flora. The largest number of useful species include: Poaceae (grass) – 224 species; Fabaceae (legumes) – 222; Asteraceae (bitmap) – 80; Brassicaceae (cabbage) – 73; Rosaceae (rose) – 50; Alliaceae

<sup>33</sup> <https://www.cbd.int/doc/world/kg/kg-nbsap-v3-en.pdf>

<sup>34</sup> Fifth National Report on Conservation of Biodiversity of the Kyrgyz Republic. 2013. State Agency on Environment Protection and Forestry Under the Government of The Kyrgyz Republic. <https://www.cbd.int/doc/world/kg/kg-nr-05-en.pdf>.

<sup>35</sup> Ibid.

(onion) – 49 species; etc. The following plants are considered to be especially valuable: rue smelly (*Thalictrum foetidum*), types of aconite (*Aconitum* spp.), Nard leaved (*Inula macrophylla*), Turkestan motherwort (*Leonurus turkestanicus*), thermopsis Turkestan (*Thermopsis turkestanica*), St. John's Wort (*Hypericum perforatum*), mother-and -macheha ordinary (*Tussilago farfara*), oregano (*Origanum vulgare*), sea buckthorn (*Hippophae rhamnoides*), horsetail ephedra (*Ephedra equisetina*), hellebore Lobel (*Veratrum lobelianum*) and many others<sup>36</sup>. According to the IUCN Red List, the following are “threatened”: 5 mammals, 15 birds, 3 reptiles, 3 fish, 4 other invertebrates, and 14 plants. Table 1 gives more specific information for plants and animals.

Table 1: Kyrgyzstan Red List Categories (IUCN, 2018)

IUCN Category	Plant	Animal
Critically Endangered	6	1
Endangered	6	7
Vulnerable	2	22
Near Threatened (including Lower Risk/near threatened)	3	24
Data Deficient	16	11
Least Concern (includes Lower Risk/conservation dependent)	165	415

#### h. Protected Areas

89. Kyrgyzstan has a relatively well-established, centralized system of protected areas with 87 Protected Areas, falling under 4 IUCN categories, and making up 6,7% of the country's territory. According to the National Law on Special Protected Natural Territories of the Kyrgyz Republic (#18, 2011), these areas fall under the following categories: State Natural Reserves; State Natural Parks; State Preserves; State Natural Monuments; State Botanical, Dendrological Gardens, Zoological Parks; Biosphere Territories or Biological Reserves; and Transboundary Protected Areas of International Importance<sup>37</sup>. Chapter 3 of the Law on Special Protected Natural Territories of the Kyrgyz Republic provides for a distinction amongst zones, and in State Natural Parks, distinctions include “ecological stabilization,” which states that in that zone any economic and recreational activities are prohibited with the exception of regulated ecological tourism and *the carrying out of measures for the restoration of disturbed natural complexes and objects*, including for forest enrichment planting with native species.

#### i. Vegetation

90. The predominant vegetation types found in the mountains are desert, semi-desert, and steppe on all the lower slopes and foothills and in some of the outlying ranges and major basins. Patches of riverine woodland exist in a few, low altitude places. At higher altitudes, steppe communities, dominated by various species of grasses and herbs occur, while shrub communities are widespread in the lower steppe zone. Spruce forests, the only coniferous forest type, occur on the moist northern slopes of the Tien Shan, while open juniper or “*archa*” forest occurs widely between 900 and 2,800 masl. Subalpine and alpine meadows occur in the western part of the mountains, from 2,000 to 4,000 masl, and above. At the highest and coldest elevations, there is limited vegetation cover, with cushion plants, snow-patch plants and tundra-like vegetation.

#### j. Forests

91. Over one million people (>17%) live in or near forests, and rely on forest products, such as berries, fruits, nuts, mushrooms, medicinal plants, timber and firewood, for a number of uses including food, heating and cooking, construction materials, and sources of income. Riparian forests play an important regulation function along the shores of rivers and lakes reducing – when present and in good state – exposure of

<sup>36</sup> Ibid.

<sup>37</sup> Action Plan for Implementing the Programme of Work on Protected Areas of the Convention on Biological Diversity. Submitted by the Kyrgyz Republic to the Secretariat of the Convention on Biological Diversity on 2012.06.08.



communities and livelihood to extreme events.

92. The forests of the Kyrgyz Republic are State property and form a unified State Forest Fund (SFF), which includes forests and lands that are not covered with forest but earmarked for future forestry activities. In 2003, the total area of the State Forest Fund lands was reported to be 3.3 million ha. According to the Forest Code of the Kyrgyz Republic, forest lands include: forested land, including land covered with forest vegetation as well as scattered forest stands, plantations, nursery gardens, glades, burned-out forest, open woodlands and vacant plots; and non-forest land but which is part of the forest ecosystem, including agricultural and other land plots as well as lands where forest were removed for construction/utility purposes<sup>38</sup>. In the Kyrgyz Republic, almost all forests are state owned. According to the Forest Code of the Kyrgyz Republic, forest lands include: forested land, including land covered with forest vegetation as well as scattered forest stands, plantations, nursery gardens, glades, burned-out forest, open woodlands and vacant plots; and non-forest land but which is part of the forest ecosystem, including agricultural and other land plots as well as lands where forest were removed for construction/utility purposes<sup>39</sup>. Forests of Kyrgyzstan are divided into three typical forest vegetation types: **Spruce forests** of the northern mountainous region; **Walnut forest** of southwest; and **Juniper forest** towards the southern border of Tajikistan. In addition, the willows and gummy forests have been distributed throughout as **shrub and riparian forests**.<sup>40</sup>

93. **Walnut forests** occupy the northern and north-eastern slopes of the Fergana valley. The formation of certain forests depend on site conditions: the walnut forest stands use the most favorable habitats, i.e. the sites with the most moistened and fertile soils; in areas with severe conditions (dry soils of poor fertility) there grow shrubs and partly hawthorn and juniper stands, in the better forest growth conditions – maple forests.

94. **Juniper forests** occupy large tracts representing zones of coniferous tree vegetation. They are located mainly on steep slopes and have a very important ecological role. They grow under arid conditions or in very high altitudes up to 3,500 masl. in the very south of the country and dispersed over the country. These forests are typically open stands, formed by tree and crawling forms of Juniper.

95. **Spruce forests** occur in the west, in the center of the country and in the higher parts of the ranges north of the Fergana valley, mainly in altitudes between 1,700 and 3,000 m asl. Small areas of stands with the endemic species can be found in the very west of the country. In the area of their distribution, the spruce forests grow on the slopes in a mosaic-like pattern. The spruce trees are grouped in strips and small arrays interspersed with glades, debris, and rocks. The spruce forest stands occupy, mainly, the slopes of the northern expositions (shadowed), while on the sunny slopes they grow only when there is additional moisture supply resulting from the condensation of moisture received from the nearby rocks.

96. About 90% of all forests grow at altitudes between 900 and 2500 m above sea level. Although forests form a relatively small proportion of the country's total territory, they are highly diverse with major biodiversity, livelihood and economic importance - main mountain forest types include spruce, juniper, walnut and floodplain/riverside forests. Almost one million ha of forestland are used for grazing livestock. The Kyrgyz Forest Service stated a long-term objective of increasing forest cover to 6% by 2025-2030. While not covering a large area of Kyrgyzstan, forests play an important role in performing important water regulation and water conservation functions, as well as hazard risk mitigation – especially those found on steep slopes, which prevent soil erosion and mud- and landslides, which have been the cause of severe disasters and devastation. Furthermore, the degradation of the mountain vegetation is accompanied by the progressive aridization of the slopes and overall climate aridization<sup>41</sup> potentially altering the landscape long-term unless mitigation measures will be taken.

#### k. Pastures

97. Pastures in Kyrgyzstan cover almost half of the country, and constitute about 80% of agricultural

<sup>38</sup> <http://www.fao.org/forestry/30655-067a616376e5bf5ebac056446ec010d1f.pdf>

<sup>39</sup> <http://www.fao.org/forestry/30655-067a616376e5bf5ebac056446ec010d1f.pdf>

<sup>40</sup> Source: 2008 Grisa E. Forest typology in the Kyrgyz Republic (<http://msri-hub.ucentralasia.org/node/4483>)

<sup>41</sup> Zholdosheva, Elnura. Review of the existing information, policies and proposed or implemented climate change measures in Kyrgyzstan. Food and Agriculture Organization (FAO). <http://www.fao.org/docrep/014/k9589e/k9589e10.pdf>

land; they play a key role in the country's economy, society and culture. Pastures play an important role in livelihoods of rural livestock communities for grazing of animals, collecting medicinal and aromatic herbs, berries and mushrooms, timber and dung for heating and cooking, as well as being recreational areas for hunting and tourism. Kyrgyzstan's extremely mountainous terrain makes it suitable for grazing at different times of the year at different altitudes, which hence naturally supports pastoral herding.

98. Pastures of Kyrgyzstan lie between 600 and 4000 m above sea level over a distance of several tens of km. Each elevation zone is associated with regular changes in vegetation dependent on the specific climatic conditions. The ecosystems have a complex compositional structure containing groups of species with different ecological requirements.

99. Traditionally, Kyrgyzstan was a pastoralist society, which practiced transhumance. In the past, Kyrgyz tribes would spend winters in encampments in valleys and lower areas with no snow cover, then move with their herds to spring pastures at medium altitudes, and then further move to summer pastures, only to return via autumn pastures to their encampment. This way of life is still integral to the culture, and although a sedentary lifestyle and collectivized livestock production was introduced during the Soviet period, transhumance is still practiced but with a marked overexploitation of winter pastures. Livestock-rearing systems for sheep and goats and for a major proportion of cattle, include seasonal transhumance to intermediate and high-mountain pastures. Temporary migration begins in April/May and finishes in September/October. Pasture resources are considered for summer (higher altitudes; further away from inhabited areas), spring/autumn (middle altitudes), and winter (closest to inhabited areas).

100. Pasture use is referenced under different regulatory frameworks and institutional responsibilities. The majority of 9.1 million ha of pasturelands (76%) lie in the State Land Fund (SLF) under the jurisdiction of the Ministry of Agriculture. An additional 14% of pasturelands are in the State Forest Fund (SFF) administered by the State Agency for Environment and Forests (SAEPF). SFF's pastures are 34% of total SFF's area, and have relatively higher economic importance. [Forestry contributes only 0.05% to GDP.] They are under local control of Forestry Enterprises (Leskhoz), but utilized by people living in villages outside the SFF lands who receive a ticket for grazing rights. No mechanisms have been developed for pasture management within Leskhoz.

101. In Kyrgyzstan, the essential features of pastureland degradation are: 1) the composition and structure of vegetation are depleted; 2) plant community diversity is diminished; 3) erosion increases, and soil quality and depth are reduced. These changes are associated with decline in plant production and forage availability, all of which threaten the ability of ecosystems to function properly and limit the ability of natural vegetation to adjust to climate change. Risks to environmental integrity and household economic viability escalate. Livestock play a critical role in protecting communities against the negative effects of contingencies such as crop failure and unforeseen financial crises. The problem of pasture degradation is one of the more important environmental problems throughout Central Asia and the Caucasus, and is closely linked to the social and economic well-being of the populations. Pastures serve as a strategic resource for economic development in pastoral areas and the basis for food and environmental security in rural villages.

## I. Water<sup>42</sup>

102. The Kyrgyz Republic holds 30% of the total water resources of Central Asia, mainly stocked in rivers, glaciers, and snow massifs, but also in lakes and groundwater. The world's second-largest high-mountain lake, Issyk-Kul, is in Kyrgyzstan. Kyrgyzstan can be divided into two hydrological zones: (i) the flow generation zone (mountains), covering 171,800 km<sup>2</sup>, (or 87% of the territory); and (ii) the flow dissipation zone of 26,700 km<sup>2</sup> (or 13% of the territory). In Kyrgyzstan most rivers are fed by glaciers and/or snow melt. Peak flows occur from April to July, with 80–90 % of the flow in about 120–180 days extending into August or September. There are six main river basin groups (from the largest to the smallest):

- Syr Darya river basin covers 55.3 % of the country
- Chu, Talas and Assa river basins, cover 21.1 % of the country

<sup>42</sup> Source: WWF / HydroSHE. <http://www.hydrosheds.org/page/overview>; ASTER GDEM;

- Southeastern river basins cover 12.9 % of the country
- Lake Issyk-Kul internal and interior basin, cover 6.5 % of the country
- Amu Darya river basin covers 3.9 % of the country
- Lake Balkhash basin covers 0.3 % of the country

103. The annual average volume of water totals 2,438 km<sup>3</sup> including 50 km<sup>3</sup> of surface river runoff, 13 km<sup>3</sup> of potential reserves of ground water, 1,745 km<sup>3</sup> of lake water and 650 km<sup>3</sup> of glaciers. Most of the rivers of the country have a snow-and glacier-type alimentation; increasing temperatures (which have been observed over the last decade) will increase their flow. During the period from 1973 to 2000 the total river flow increased by 6.3% compared to the preceding period, and in the next 20 years a further increase in flow of 10% has been forecasted. In the longer term, largely due to the rapid melting of glaciers, water supply is at major risk not only for Kyrgyzstan's population, but additionally as a critical supplier to the Central Asia region.

#### m. Land

104. According to the Kyrgyz State Design Institute of Land Management, "Kyrgyzgiprozem," large areas of agricultural land are in poor condition, and are affected by land degradation (an estimated 50-80%). This includes erosion, salinization and alkalization, water logging of arable soils, trampling and contamination of pasture vegetation (mainly unpalatable plants) and organic soil carbon content that has declined from 3% to 1.5% – which, cumulatively, lead to a reduction of soil fertility and soil depletion.

105. Some estimates by the Land Registry place the total area of land subject to erosion at 6.4 million ha; 700,000 of which arable land. 11.2 million ha of land (of which 1.3 million irrigated), are prone to wind and water erosion; 1.2 million ha (of which 146,600 irrigated), are saline; 480,200 (of which 98,800 irrigated) are alkalized<sup>43</sup>. Inappropriate tillage practices have eroded soil and led to poor soil fertility on an estimated 770,000 ha of arable land. These factors have damaged soil ecosystem services (chemical, biological, hydrological) and led to reduced ecosystem functions, which are critical for resilient agriculture, especially in light of climate change.

### VIII. National Climate Scenario, Vulnerability, Resilience and DRR

#### a. Climate

106. Kyrgyzstan lies in a zone of dry continental climate. However, a number of regions with their own microclimate occur in Kyrgyzstan. These are governed by altitude and their position relative to the larger climatic zones. Lake Issyk Kul, which does not freeze, exerts a local influence on the climate of the adjacent regions. Climatic zones change with altitude. At lower altitudes the microclimate is drier, showing the typical characteristics of continental climate with marked contrasts between the summer and winter seasons. With increasing altitude, temperatures are lower and humidity increases so that diurnal variations and differences between the summer and winter seasons are less marked.

**Figure 15: Map of Climatic Zones (FAO 2018)**

<sup>43</sup> The Ministry of Agriculture and Melioration of the Kyrgyz Republic. 2014. The National Action Plan (NAP) and the Activity Frameworks for Implementing the UNCCD in the Kyrgyz Republic for 2015-2020.



107. As described in Figure 15, the territory of Kyrgyzstan is divided into four climatic zones:

**1. The northern and north-western part, including the Chui, Talas and Kemin valleys. They are surrounded by the Talas, Kyrgyz and Cho-Kemin mountain ranges:**

- A relatively humid climate with mean annual temperature between 5 – 10°C.
- A mean temperature in July of +20 to +25°C, and in January -10 to -5°C. The temperature reaches -30°C to -34°C, and the maximum is around 35°C.
- Atmospheric precipitation in the northern part of the Chui valley averages around 370 mm a year, whereas in the upper part of the valley precipitation increases to 425 – 500 mm and can exceed 1 000 mm/year on mountain slopes.

**2. South-western Kyrgyzstan, i.e. margins of the broad Fergana valley, the Chatkal and Alai valleys and the adjacent mountain ranges.**

- Relative to other climatic zones, this is the warmest and most humid with maximum rainfall in winter.

**3. North-eastern Kyrgyzstan with Lake Issyk Kul and the Kungey Ala-Too and Terskey Ala-Too mountain ranges.**

- This zone is affected by Lake Issyk-Kul which lies at an altitude of 1 609 m above sea level and does not freeze during the winter. The lake therefore has a stabilizing influence on the local climate, giving:
  - Mild winters, relatively warm summers and smooth fluctuations of annual temperatures;
  - Mean annual temperatures at the level of the lake are 6 to 8°C, in January -3 to -7°C and in July 17 to 23°C; and
  - Precipitation in the central part of the basin ranges from 250 to 300 mm/year, whereas in the eastern part it can be as much as 400 mm a year with up to 800 mm a year falling on the mountain slopes.

**4. The system of the Central Tien-Shan**

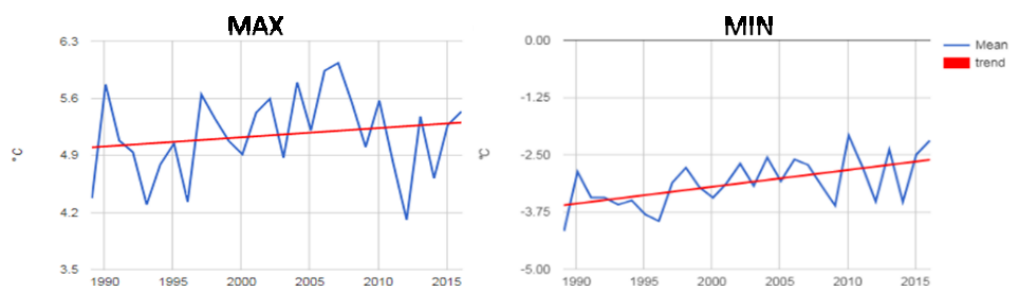
- This forms a closed climatic zone bounded by adjacent mountain ranges. It is characterized by low precipitation, and a marked continental climate with distinctive local contrasts.
- Annual mean temperature varies from about 9°C at an altitude of 1 000 m above sea level down to - 10°C at altitudes exceeding 4 000 m above sea level with minima reaching - 56°C and maxima at the altitudes mentioned above of 37°C and 22°C.

108. According to the Third National Communication (TNC) of the Kyrgyz Republic under the UNFCCC, average annual temperatures over the period 1885-2010 showed a statistically significant increase, particularly in recent decades; although the average annual temperature growth rate over the entire period of observation was 0.0104°C/year across the country, it more than doubled during 1960-2010 reaching 0.0248°C/year, and reaching 0.0701°C/year in 1990-2010. The highest warming rate was observed for the winter months, and the lowest monthly temperatures get “warmer” much faster than the highest ones; the

duration of the warmer periods in 1991-2010 compared to the baseline period (1961-1999) at altitudes up to 1,000 m decreased by 9 days, from 152.7 to 143.5 days<sup>44</sup>. Annual precipitation slightly increased over the total period of observations (1885-2010) (0.847 mm/year), but the growth rate decreased significantly over the last 50 years (0.363 mm/year) - a slight downward trend was observed in the last 20 years (-1.868 mm/year). Relative changes in the annual precipitations are not statistically significant.

109. More specifically, in addition to the findings of the IPCC (AR5-2014) and confirming what was reported in three communications of the Kyrgyz Republic to UNFCCC (UNFCCC 2003, 2009, 2017) as well as in the Kyrgyz Republic's INDC and recent studies (IFC/IEH/IFAD 2013, ADB 2016 and WB 2017, FAO 2018) report the following:

- Maximum temperatures are expected to increase throughout this century. By mid-century, under RCP4.5<sup>45</sup> increases would reach between 2°C (in the east) and 2.8°C (in the north). Under RCP8.5 temperature would rise between 2.6°C (east) and 3.8°C (north). Minimum temperature is also expected to continue to increase (between 0.5° and 1°C). Trends analyzed by FAO confirm that temperatures (MIN and MAX) are increasing as reported in Figure 16.



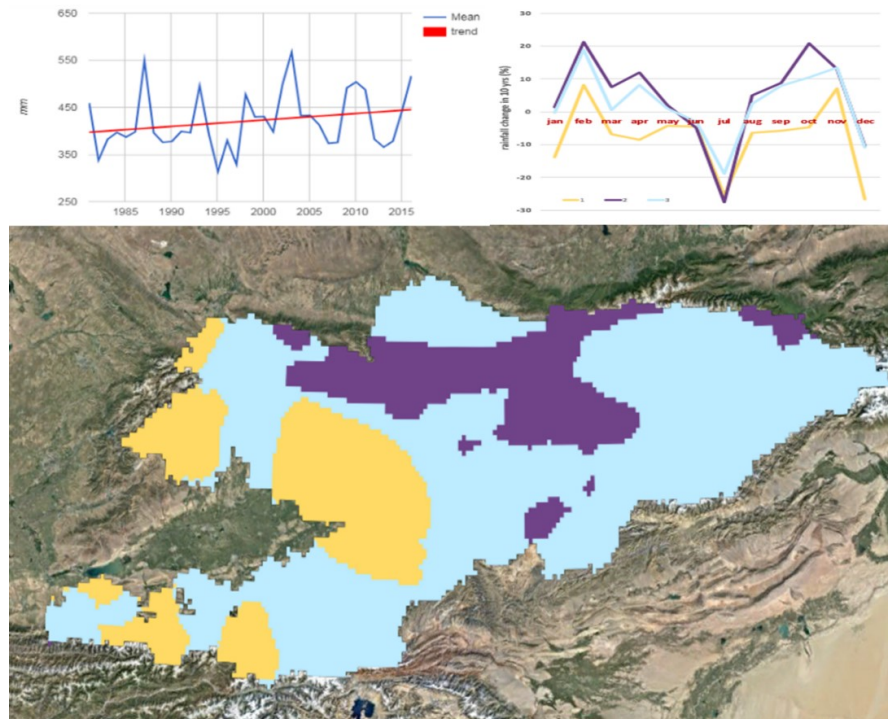
**Figure 16: MAX-MIN temperature distribution 1989-2016**

- Regarding seasonal changes, the results of the intermediate RCP4.5 show that increases could be between 2°C (east) and 3°C (north) in winter and autumn; between 2°C and 2.7°C in summer, and between 1.7°C and 2.6°C in spring.
- Projections about precipitation should be viewed with caution due to poorer verification and validation results. By mid-century, the increase in accumulated rainfall could be between 12% (west) and 18% (northeast) under RCP4.5. For RCP8.5 the relative change could be between 20% (west) and 28% (north). Annual and monthly rainfall trends analyzed by FAO show a diverse scenario where overall precipitations are increasing with the exception of project's target areas where trends report a significant decrease of rainfall. Monthly rainfall trends show a clear shift, with increased rainfall during autumn and winter, and a marked reduction in summer (Figure 17).

<sup>44</sup> To note is that when comparing the mean monthly temperatures for the periods 1961-1990 and 1991-2010, the greatest increase in temperature (at all altitudes) was observed during the cold months - February, March, October and November, while in summer the temperature increase was the lowest. Perhaps, this is the reason for a significant reduction in the mean duration of the heating period. (Climate profile of the Kyrgyz Republic – Sh. Ilyasov, O. Zabenko, N. Gaydamak, A. Kirilenko, N. Myrsaliev, V. Shevchenko, L. Penkina. - B.2013 – 99 pages. (UNDP Project: "Climate Risk Management in Kyrgyzstan")

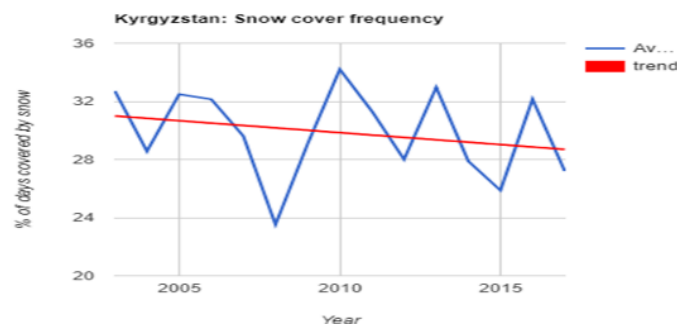
<sup>45</sup> Representative Concentration Pathways





**Figure 17: Rainfall annual and monthly trends 1986-2016 (FAO 2018). The map shows three different situations recorded.**

110. Analysis of the snow cover frequency indicates changes in percentage of days covered by snow with a decrease in areas above 1,500 masl and a slight increase in areas below 1,500 masl (Figure 18).



**Figure 18: snow cover frequency (2000-2017)**

111. An analysis of future climate conditions in Kyrgyzstan was also conducted for the formulation of the IFAD Livestock and Market Development Programme II (LMDP II). Based on different climate change scenarios, the analysis found that overall, there would be shorter winters and earlier springs – this will have an impact on pastureland which will be more productive, but at the same time, these resources could be more intensively exploited by the livestock sector. At the first level of altitude (below 1500 masl) the main factor regarding vulnerability will be heat stress in summer; average maximum temperatures will increase by 2.5°C. Middle altitudes (1500-2500masl) are considered of low vulnerability because increases in maximum temperatures in summer will not reach 30°C, so the vegetative activity will not be negatively affected, and in general livestock will not suffer heat stress. Milder winters will benefit pastures and livestock. Rainfall could increase in spring, autumn and winter, and remain stable in summer. With these changes, pastures and livestock will have better conditions, despite the increasing likelihood of water deficits in summer at certain locations.

### **b. Exposure, Vulnerability, Resilience and DRR**

112. The ND-GAIN Country Index summarizes a country's vulnerability to climate change and other global challenges in combination with its readiness to improve resilience. According to the ND-GAIN Index<sup>46</sup>, Kyrgyzstan's Country Index Rank is 81<sup>47</sup>. Its vulnerability is 0.390, and its readiness is 0.391. Adaptation challenges still exist, but Kyrgyzstan is well positioned to adapt, especially considering national level commitment. Kyrgyzstan is the 65th least vulnerable country and the 87th least ready country. Nonetheless, forests and pastures, already under stress due to anthropogenic pressure, are among the most sensitive resources being impacted by climate change; the lack of intervention in this regard is among the main causes of increased exposure of the Country to climate induced natural disasters. Extreme events like flash floods and mudslides have increased in frequency and intensity in large areas of the country where forests have historically provided protection and pastures have been the main, if not the only, source of livelihood for communities. Climate change, coupled with a transforming set of Natural Resource Management practices that suffered radical changes in the past 20 years, is now not only threatening key ecosystems but also Kyrgyz cultural heritage and development opportunities.

113. Hazards such as drought, land and mudslides, avalanches, squalls, downpours, icing, frosts, breakthrough of glacial lakes, floods, river erosion and earthquakes are all common occurrences in Kyrgyzstan. The vast majority of the population lives in the valleys and foothills of the mountains, where vulnerability to these events is particularly high. According to OSCE (2014) and the National Platform for Disaster Risk Management (2017), the correlation between climate change and unsustainable management of natural resources is reflected by the following:

- 400 various types of natural hazards every year.
- During the past 20 years the number of hazards increased by 6 times.
- About 70 % of natural hazards occur in the South Eastern regions of the country where most of the models and studies identify the higher exposure and vulnerability.

114. As reported by GFDRR (2010) and confirmed by the MES, there are more than 5,000 active landslides on the territory of the Kyrgyz Republic, of which 3,500 (70%) are located in the southern regions. During the past decades, over 8,500 residential homes were destroyed as the result of disasters caused by landslide processes. The map<sup>48</sup> in Figure 19 shows the location and level of climate-related hazards. In addition to landslides, avalanches occur frequently in the Kyrgyz Republic.

115. There are around 3,900 mudflow and flood prone river basins on the territory of the Kyrgyz Republic with the lengths of 10km and more. Mudflows were registered in 1,153 settlements, which resulted in various damages. Also, there are around 2,000 high altitude lakes, of which 330 have unsustainable water dams and are included in the catalogue of water outburst-prone lakes. During the hot season, due to melting of moraine and glacial dams, these lakes pose a risk of a catastrophic outburst of large volumes of water in the river basins.

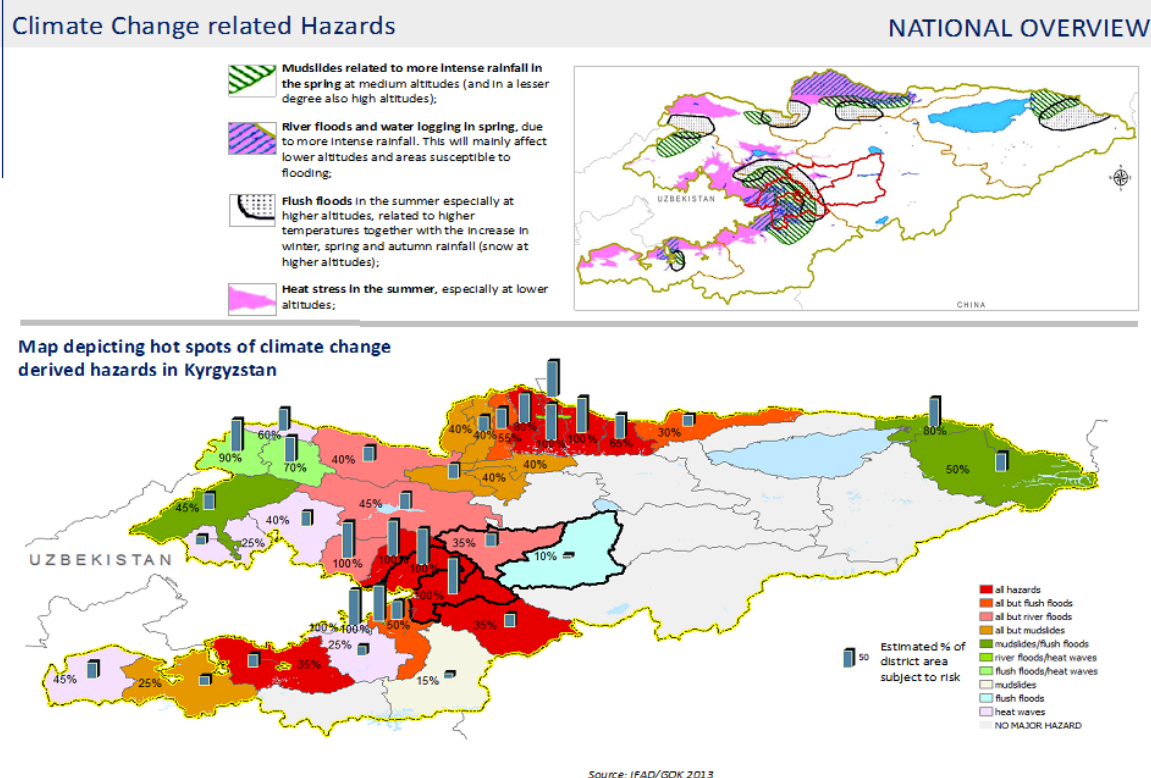
116. The frequency and severity of floods (and associated river bank erosion) and droughts are projected to increase as a result of increasing temperatures and reduction of snowfall. In particular, river floods and water logging in spring, heat stress in summer, mudslides and flash floods and snow melting in summer will increasingly be experienced; the intensity of rain and snowfall is expected to increase, together with the frequency of heat waves.

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<sup>46</sup> A country's ND-GAIN index score is composed of a vulnerability and readiness score. Readiness measures a country's ability to leverage investments and convert them into adaptation actions. ND-GAIN measures overall readiness by considering three components: economic, governance and social readiness.

<sup>47</sup> <https://gain-new.crc.nd.edu/country/kyrgyzstan>

<sup>48</sup> The UN International Strategy for Disaster Reduction (UNISDR). In-depth Review of Disaster Risk Reduction in the Kyrgyz Republic. 2010.



**Figure 19: Map of levels of vulnerability to climate change in Kyrgyzstan (IFAD 2013)**

117. The reported changes will have repercussions mostly on forests and pastures (IFAD 2013, WB 2013, FAO 2018), increasing their exposure and vulnerability. Recent studies funded by IFAD, the Asian Development Bank and the World Bank as well as FAO analysis of available data agree that future hazards related to climate change will correspond to direct impacts on livelihoods, because there will be less access to healthy pastures, damages in infrastructures and impacts on agriculture/forestry, and overall loss of productivity and potential income generation with every recovery process.

### c. Impacts of climate change on agriculture

118. Because over 90% of Kyrgyzstan is made of mountains, arable agriculture is only possible on about 5-7% of the land with 75% of it depending on irrigation; an estimated 65-82% is classified as pasture. The main crops grown are wheat, barley, maize (for grain and silage), potatoes, melons, oilseed crops and different types of vegetables. Fodder crops are also grown, especially lucerne (on the better irrigated land) and sainfoin (on the less well irrigated hill slopes)<sup>49</sup>.

119. Agriculture is the leading sector of the economy and at the same time the most vulnerable to climate change. Major events that threaten to reduce agriculture productivity include extended summer drought, hailstorms, windstorms, late spring and early fall frosts, and winter thaws. According to Lipka (2017) described changes will have impacts on every crop and mostly on livestock.

120. According to a recent study funded by the World Bank, the projected impact of described changes in temperature, rainfall and snow cover frequency on crop productivity varies by crop and by region. The productivity of wheat, maize, and sugar beets will fall, while the productivity of cotton, tobacco, rice, potatoes, and melons will rise. Batken and Chui will be hurt by falling crop productivity, while Naryn, Talas, Jalalabad, and Osh will benefit from rising productivity, leading to widespread changes in the composition of crops. Additionally, the reported increase in temperatures associated with climate change will improve breeding conditions for agriculture pests such as locusts increasing both the potential costs of damage and

<sup>49</sup> Fitzherbert. Country Pasture/Forage Resource Profiles – Kyrgyzstan. <http://www.fao.org/ag/agp/agpc/doc/counprof/kyrgi.htm>



the costs of control. Consequently, climate change will also have important implications for agriculture risk management in that (i) it will change the context in which the sector operates in, and (ii) it will likely change the patterns of the risks that have occurred in the past in terms of frequency and impact.

121. The depletion of water resources could lead to an increase of arid and semi-arid desert areas from current 15% to 23-49% in 2100. This entails the danger of future, greater shortages and potential disputes over water resources in Central Asia, which might have a serious impact on the regional geopolitical balance. The projected change of annual runoff is 0.261; projected change of annual groundwater recharge is 0.354<sup>50</sup>. Water shortages occur during the growing season, and are especially problematic in the southern region (Batken, Jalal-Abad and Osh provinces). This limited water supply can cause crop and small harvest losses (decrease in yields of around 15-20%<sup>51</sup>), especially in home gardens and household plots, which could lead to conflict over water use.

#### d. Impacts of climate change on forestry and pastures

122. Forests and pastures - already under pressure due to human-driven activities - are among the most sensitive resources being impacted by climate change. Reduced productivity of low altitude pastures and decreased resilience of forest ecosystem are increasing the vulnerability of communities and negatively impacting rural livelihoods; changes in weather impact the livestock sector (and hence livelihoods), mainly in terms of pasture health and availability as well as animal health.

123. **Forests:** Over the last thirty years, however, it was estimated that forest cover has been reduced by at least 50%, threatened by logging, forest clearing to create pasture and crop land, and intensive livestock grazing.

124. Since early 2000 FAO has identified a series of impacts triggered by climate change and that will contribute to: (i) the altitudinal advance of the desert band's upper border by 400 m, (ii) the steppe band will advance by 250 m, the forest and glade band will advance by 150 m; and (iii) the sub-alpine band will advance by 100 m. This will undoubtedly affect flora biodiversity. The loss of some herbivorous animals is expected if certain plants disappear from the ecosystem. The range of many plant types and the main forest-forming species will change.

125. Due to the increased soil moisture content requirements, the lower border of the European walnut is expected to rise by 100–150 m, conditioned by the increase in the active temperature and by the humidity increase and the extension of the growing period by 30 days. In this ecological niche typical of the lower sub-band of the walnut forest, the proportion of drought-resistant bushy types such as rosehip, hawthorn and honeysuckle will change. Ninety-four species that can adapt to the increased temperatures (pistachio, almond and jujube) are expected to move up by 100–200 m. There will be increased degradation of lands in the vicinity of populated areas, with increased possibility of landslides, caused by excessive livestock grazing on the pastures near the villages.

126. **Pastures:** Pasture degradation is a severe issue in Kyrgyzstan, where pastures are degraded to varying degrees. Degradation is responsible for a decrease in species diversity and ecological flexibility to respond to climate change, severe erosion in places, and declines in forage production. Species composition of pastures adjusts to both wet and dry years and along the elevation gradient. High species diversity facilitates adaptation to livestock grazing pressure and ensures ecosystem resilience to climate change.

127. According to a specific study of impacts of climate change on pastures (IFAD, 2013), at the first level of altitude (below 1500masl) the main vulnerability factor will be heat stress in summer. North of Chui Oblast and east of Talas Oblast are considered areas of very high vulnerability, as average maximum temperatures will increase by 2.5°-3°C, reaching more than 30°C (pastures and livestock will face harsher conditions). The Fergana Valley is classified as a high vulnerability area, because average maximum temperatures (also reaching over 30°C) will increase less, from 1.5°C to 2°C. Main hazards at this level are also related to heat stress in summer. Areas at middle altitude (1500-2500masl) are considered of low vulnerability because increases in maximum temperatures in summer will not reach 30°C, so the vegetative activity will

<sup>50</sup> <https://gain-new.crc.nd.edu/country/kyrgyzstan>

<sup>51</sup> Ibid.

not be negatively affected, and in general livestock will not suffer heat stress. Milder winters will benefit pastures and livestock. Rainfall could increase in spring, autumn and winter, and remain stable in summer. With these changes, pastures and livestock will have better conditions, despite the increasing likelihood of water deficits in summer at certain locations (more detailed water balance studies are required). The most important hazards are river floods, mudslides and water logging in spring, and snow melting in summer. Areas at high altitude (above 2500masl) are regarded as of very low vulnerability, because general increases in temperatures will benefit pastures and livestock, especially in summer and the likelihood of relevant droughts will probably be low even in summer. Flush floods and snow melting in summer are the main hazards at this altitude.

128. The essential features of land, and hence pasture, degradation are: 1) the composition and structure of vegetation are depleted; 2) plant community diversity is diminished; and 3) erosion increases and soil quality and depth are reduced. These changes are associated with decline in plant production and forage availability, all of which threaten the ability of ecosystems to function properly and limit the ability of natural vegetation to adjust to climate change. Risks to environmental integrity and household viability escalate. Due to climate change, decreased summer precipitation may significantly reduce the productivity of highland pastures in several parts of the country. Furthermore, livestock (dependent on pastures) are highly dependent on climate and weather, and early frosts and droughts often cause devastating impacts to livelihoods in the area.

129. Pasture vegetation ecosystems have a complex compositional structure containing groups of species with different ecological requirements. In cold and wet years moisture-loving species predominate and in dry and warm years the vegetation is dominated by species tolerant of dry conditions. Thus, sharp climatic fluctuations do not cause major shifts in overall pasture productivity. But this equilibrium in forage production is possible only if the pastures retain their natural species diversity and structure. If they are degraded as a result of overgrazing they cannot react to different climate scenarios of wet and dry years. Degradation causes not only a steady decline in productivity but in species diversity as well, and therefore a decline in ecosystem resilience to climate change. Riverine plains and riparian zones have suffered from excessive agricultural activity. Riparian zones are ecological disaster areas that require collaborative community interventions to achieve rehabilitation.

## **IX. National GHG Accounting**

130. In the Kyrgyz Republic, the TNC used data from 1990 (just before independence) to compare with greenhouse gas (GHG) emissions in 2010<sup>52</sup>. In 2010, total GHG emissions in the Kyrgyz Republic were only 45.4% of 1990 emissions. Also in 2010, the contribution of the country to total global GHG emissions from fossil fuel combustion was 0.023%, while the population was 0.079% of the world's total population – thus, the per capita GHG emissions was less than one-third of the world average (about 2.2 tons CO<sub>2</sub>-eqv per capita in 2010).

131. The emission reduction by sector in 2010 (as compared with 1990 levels) was: energy (-66.8%); industrial processes (-41.8%); agriculture (-23.1%); and waste (-14.6%)<sup>53</sup>. While agriculture is generally a major emitter of GHGs, the historical trends of agricultural growth (or decrease) in Kyrgyzstan are such that today, emissions are still relatively low.

132. To meet its development needs the Kyrgyz economy is expected to grow and so will GHG emissions; the increase in GHG emissions is expected to be much faster than in developed countries. According to the Kyrgyz Republic's Intended Nationally Determined Contribution (INDC) to the UNFCCC, the long-term GHG emissions target is: "Limiting the per capita GHG emissions to maximum of 1.23 t/CO<sub>2</sub>, or 1.58 t/CO<sub>2</sub> in 2050 to achieve the below 2°C objective, with a probability of 66% and 50% respectively".

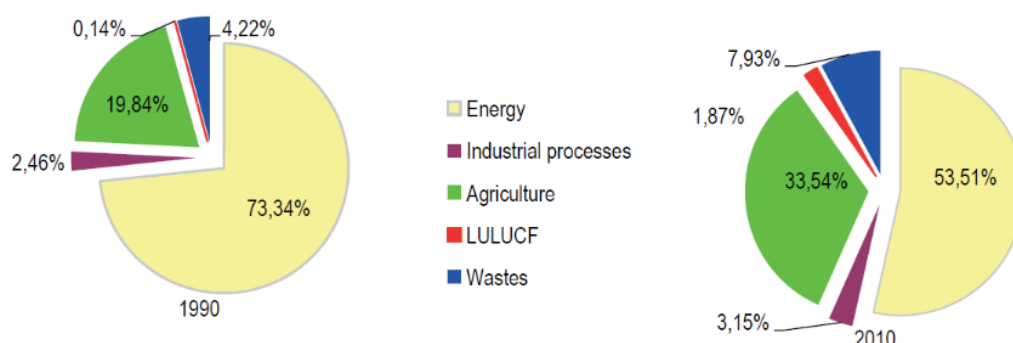
133. One of the main factors determining the emissions from the agriculture sector is the number of

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<sup>52</sup> It should be noted that the TNC does not use most recent data – only up to 2010. Presumably, this is because more recent data was unavailable.

<sup>53</sup> The Kyrgyz Republic Intended Nationally Determined Contribution (UNFCCC).

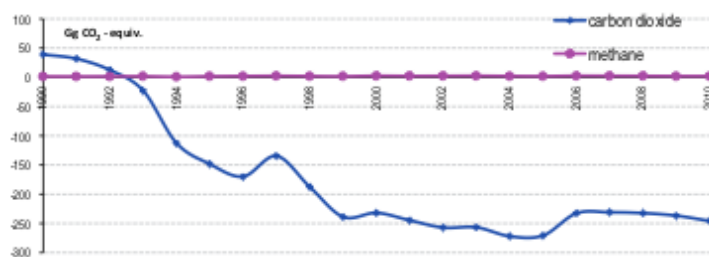
livestock and poultry. Since 1995, there has been a consistent increase in numbers of all categories of livestock except for pigs. The exceptional growth of poultry is notable, with a sharp rise seen in 1997. In terms of methane emissions from the Enteric Fermentation and Manure Storage Systems categories, in 2010 there was a significant increase in emissions from dairy cattle and a decrease in those of sheep and goats, as compared to 1990 (figure 20). Methane emissions increased from 56.6% in 1990 to 63.8% in 2010, while nitrogen oxides emissions also decreased, from 43.4% in 1990 to 36.2% in 2010<sup>54</sup>.



**Figure 20: Comparative distribution of GHG emissions in the key sectors in 1990 and 2010 (TNC 2017)**

134. For the land use, land-use change, and forestry (LULUCF) sector, carbon dioxide, methane and nitrous oxide were considered as well as precursor gases (nitrogen oxides and carbon monoxide). For this sector, carbon dioxide was considered both in terms of CO<sub>2</sub> emissions into the atmosphere from the soil, and the flow of CO<sub>2</sub> back into the soil. The following source categories were included: woody biomass stock and emissions and sinks from soil. Emissions were considered for both managed and unmanaged forests.

135. The main emission observed is for CO<sub>2</sub>. Its contribution was 96.11% in 1990 and by 2010 increased to 99.15% due to a growth in CO<sub>2</sub> net emissions. Methane and nitrous oxide emissions are small. In 1990 they accounted for 3.58% and 0.785%, and in 2010, 0.308% and 0.0675%, respectively. Figure 21 below shows emission trends by GHG, with the exception of nitrous oxide, as these emissions are negligible.



**Figure 21: Emission trends by selected GHG in the LULUCF sector (TNC 2017)**

136. For precursor gases, there is a serial emission growth however the levels are very low as compared to total emissions in the sector.

## X. CS-FOR Target Areas

137. Data and analysis reported in the previous sessions allowed the identification of the proposed target areas according to the following criteria: a) exposure of ecosystems and communities to natural hazards

<sup>54</sup> Ibid.

triggered by (or made worse by) climate variability and change; b) vulnerability of ecosystems and communities to climate change; c) mitigation potential in terms of forest and pasture rehabilitation; d) high dependency of communities from natural resource exploitation; and e) socio-economic vulnerability of communities. Given the five criteria reported above, participants of the national engagement process, the NDA and the FAO convened that the areas with the higher monitorable exposure and vulnerability are the four contiguous districts of Ak-Talaa in Naryn region, Toguz-Toro and Suzak in Jalalabad region, and Uzgen in Osh region (Figure 11). Table 2 briefly reports the most relevant elements for each of the five reported criteria.

**Table 2: Brief description of selected target areas**

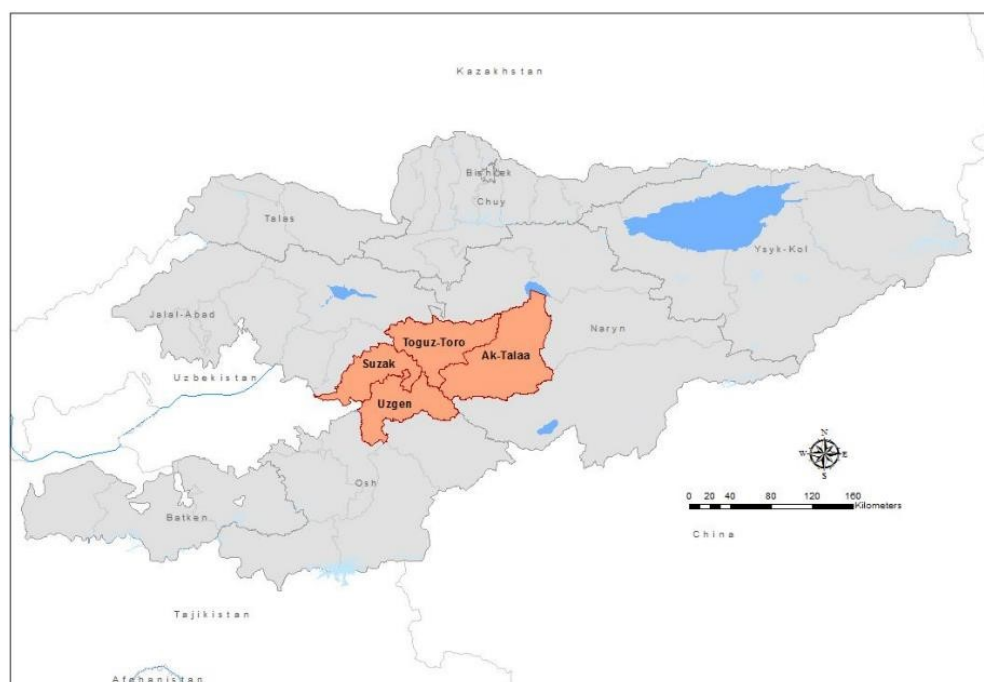
District	Criteria				
	a	b	c	d	e
<b>Ak-Talaa</b>	High Exposure to Landslide, Mudslides, Avalanches, Floods and Flash Floods	Fragile mountain ecosystems characterized by pastures and limited spruce forests	Availability of land suitable for forest and pasture restoration investments	Dependency of communities from natural resource exploitation is high (livestock)	53% of families located in the lowest income percentile
<b>Suzak</b>		Relevant presence of pasture and of walnuts forests (biodiversity hot spot) currently exposed changes of main climatic variables		Dependency of communities from natural resource exploitation is high (livestock, NTFP, Agriculture). Forests in Suzak district provide income to most of the local population	43% of families located in the lowest income percentile
<b>Toguz-Toro</b>		Fragile mountain ecosystems characterized by pastures and limited spur forests.		Dependency of communities from natural resource exploitation is high (livestock)	42% of families located in the lowest income percentile
<b>Uzgen</b>		Presence of pistachios and juniper forests currently decreasing due to climate change		Dependency of communities from natural resource exploitation is high (livestock, NTFP, Agriculture). Forests in Uzgen district provide income to around 70% of local population	12% of families located in the lowest income percentile

138. As reported in the introduction, data and analysis related to climate and environment have been organized in the form of an Atlas that presents the rationale behind areas' selection and that form the main part of the baseline in terms of distribution, density, status and vulnerability of target ecosystems (forests and pastures) and communities. The Atlas presents key information such as climate variables, including trends, demography, agriculture productivity, infrastructures' distribution, pasture user associations grazing areas, forest fund lands and others. The ensemble of presented data constitutes the context generating the assessed needs as well as the context into which the validity of the paradigm shift will be objectively demonstrated.

139. Within the four districts selected, the project has identified priority areas (hot spots) where, according to the referenced criteria, investments on forest and pasture restoration will have the higher potential impact: a) relevance of ecosystem services such as those provided by pastures and forests (i.e. protection, livelihood, water) benefitting communities; b) potential sustainable use of products and resources for local communities; c) availability of public land of at least 1,000 hectares; and d) agreement of communities for reducing pressure on identified areas.

## **XI. Description of Target Areas**

140. As reported in the previous sections, the project will operate in the four districts of Ak-Talaa in Naryn region, Toguz-Toro and Suzak in Jalalabad region, and Uzgen in Osh region (Figure 22).



**Figure 22: Map of Selected Target Areas**

141. Communities in the four districts are distributed in 261 villages organized in 50 *ayil aimaks* (AA / Municipalities). Table 3 reports the distribution of target population in target areas and highlights

**Table 3: Population and Numbers of Rural Municipalities and Villages in Target Area (2016)**

District	Region	No of rural municipalities	No of villages	No of rural households	Total Rural Population <sup>55</sup>
Ak-Talaa	Naryn	13	18	8,274	38,008
Toguz-Toro	Jalal-Abad	5	13	5,456	24,942
Suzak	Jalal-Abad	13	125	51,713	272,096
Uzgen	Osh	19	102	40,143 <sup>1/</sup>	205,517
<b>TOTAL</b>		<b>50</b>	<b>258</b>	<b>105,586</b>	<b>540,563</b>

Source: NSC data (2017)

Note: 1/ extrapolated by the average of the other three, where data on household numbers is available.

142. As showed in figure 12, the highest percentage of land in the four districts is under grassland (54%) followed by cropland (17%) and forests (13%). Described availability of resources has *de facto* shaped livelihood strategies of communities that are heavily dependent on forest and pasture ecosystems (FAO, 2018, IFAD 2013, WB 2013).

<sup>55</sup> Estimates for 2016 (NSC).

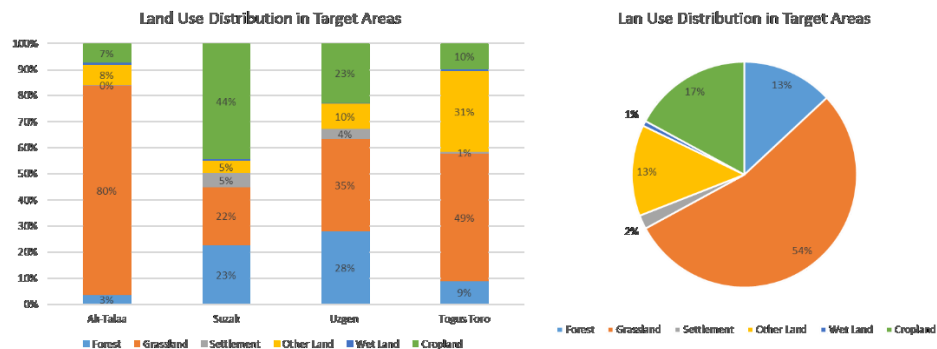
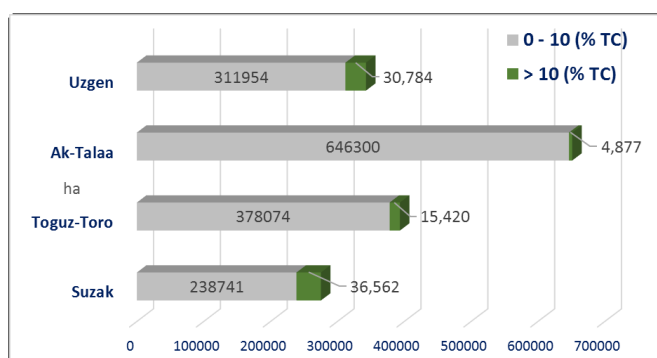


Figure 23: Land Use Distribution in Target Areas (FAO 2016)<sup>56</sup>

143. There are five *State Forest Agencies* (Ak-Talaa, Uzgen, Toguz Toro, Kara Alma, and Ortok), one forestry unit (Urumbash), two National Parks (Saimaluu Tash and Kara Shoro) and a nursery in the four targeted pilot districts. More than 395,000 people live in 39 AA near these forest areas. The total land area of *State Forest Agencies* and national parks in the target districts is about 262,000 ha, with more 40% of the total land area used as grassland pastures for grazing livestock of neighboring communities. Forest covered areas make up less than a third of all *State Forest Agencies* territories (Figure 23).

Figure 24: Forest Cover (Tree Cover (TC) > 10%)<sup>57</sup>



144. The target *State Forest Agencies*<sup>58</sup> have various types of forests: coniferous with mostly spruce trees; forest areas covered with shrubs; and nut and fruit tree forests (Figure 24). The type of dominant trees in the forest influences the livelihoods of the neighboring communities. For example, coniferous forests serve mostly as a source of timber and fuelwood for local communities; nut and fruit forests serve as a source of income from selling NTFPs.

<sup>56</sup> Data on land use originated from FAO [Collect Earth](#) survey executed in Kyrgyzstan in 2014 and 2015.

<sup>57</sup> Source: Forest Cover Change [https://earthenginepartners.appspot.com/science-2013-global-forest/download\\_v1.4.html](https://earthenginepartners.appspot.com/science-2013-global-forest/download_v1.4.html)

<sup>58</sup> For reference, see Box below.



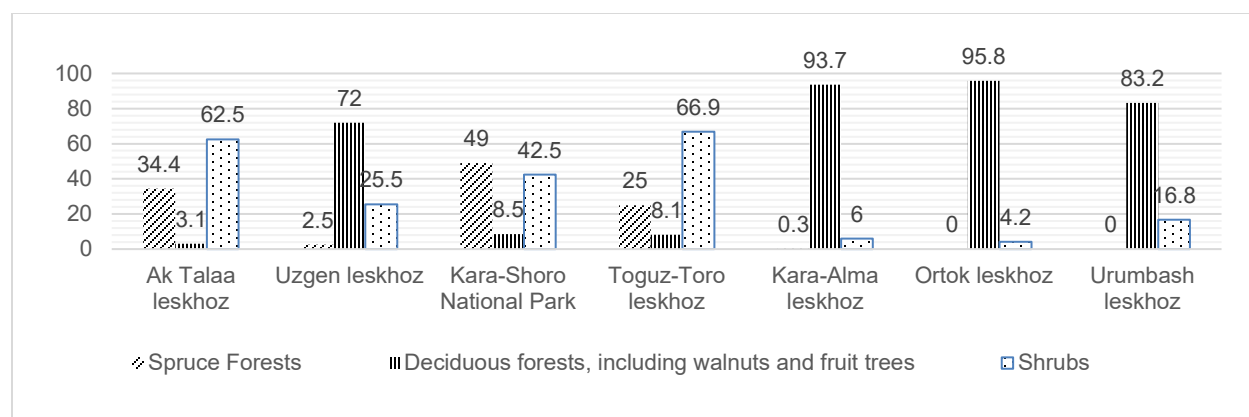


Figure 25: Forest type in target State Forest Agencies and national park. Source: SAEPF, 2017

145. In addition to forests under State Forest Fund management, the analysis performed by FAO identified distribution of forests within pasture areas in each of the four selected districts (Figure 25).

146. **Ak-Talaa district** in Naryn region has an area of 7,266 km<sup>2</sup> with a population density of 4.4 people per 1 km<sup>2</sup>. It is located along the watersheds of the Tian Shan mountain range and Naryn river with several inflows -- Terek, Jaman-Davan, Konorchok, and Kurtka. It is estimated that 86 % of the lands in this district are at risk of landslides and mudflows. The area is a high altitude forest meadow zone. There is one Ak-Talaa *State Forest Fund Agency (lezkhoz)* in the district with an area of 81 769.7 ha, of which 23 % is covered with coniferous forest.<sup>59</sup> Meadows are covered with tall grasslands used for grazing livestock in the summer. Villages are located far from each other at 1,600 masl and higher, and less than 3 % of the land in the region is arable. More than 50 % of the land is not accessible to people and another 50 % is used as pastures. The livelihood of the residents of this district is mostly livestock-based, with an estimated 111,523 ruminants and 11,853 cattle in 8,226 households (an average of 1.4 cattle and 13 ruminants per household). The livestock rearing here highly depends on climate and weather, and early frosts and droughts often cause devastating impacts to livelihoods in the area.

147. **Suzak** is a very large district located in Jalalabad region. It has an area of 3,091 km<sup>2</sup> and a population of 277,500 people with a density of 92 people per 1 km<sup>2</sup>. It is composed of 13 AA and 129 villages. Most of the district is situated at 1,600 masl, with the highest point at 3,900 meters. Main rivers are Kara-Darya, Kok-Art, Kara-Alma and Changet. Nearly 90% of the district is at highly exposed to disasters such as floods, landslides and mudflows. In 1998, a catastrophic flood of the river Kok Art destroyed around 1,000 dwellings in Suzak. There are two *State Forest Fund Agencies* – Kara Alma and Ortok – a nut farm (*orekhosovkhoz*), Urumbash forestry unit and the Kara-Darya nursery in Suzak district. The population of Kara Alma AA resides directly within the *State Forest Fund* area. It has no agricultural land except for home gardens, of less than 0.1 ha per household. People rely on forestlands not only for non-timber purposes, but also for livestock grazing. Other *municipalities* of Suzak rayon have borders with the Urumbash forestry unit, Kara-Alma and Ortok *State Forest Fund*. Around 11 % of *State Forest Fund*'s area are lands used for grazing and 25 % of *leskhoz*'s income comes from pasture users renting forest pastures for grazing purposes.

148. **Toguz-Toro** is a small district in Jalalabad region neighboring Ak-Talaa district along the Naryn and Kok Irim rivers. It has a land area of 3,816 km<sup>2</sup> and less than 4,000 people, for a population density of less than 7 people per 1 km<sup>2</sup>. It is a very remote and mountainous area, situated between 1,150 and 4,351 masl. More than 85% of the area (MES 2018), especially along the rivers, is at risk of natural disasters, such as landslides and mudflows. There is one Toguz-Toro *State Forest Fund Agency* protecting coniferous forests which make up 6% of a total *leskhoz* area of 57,964.7 ha. The population of Toguz-Toro used to be engaged in gold mining, an industry still functioning but on a small scale. Livestock is the main production system in an area with limited arable land and even less irrigated.

149. **Uzgen** district in Osh region has a large area of 3,308 km<sup>2</sup> with a population of around 256,000 people. This district is the most densely populated among all targeted areas, with 77.5 people per 1 km<sup>2</sup>. There are 99 villages and small cities in 19 AA, which have 37,205 households. Main rivers are Kara-Darya,

<sup>59</sup> Data provided by the SAEPF, 2017

Yassi, and Kurshab. The area is extremely vulnerable to climate change marked by a significant decrease in the amount of precipitation that falls as snow, and an increase in rain, which affects glacier melting. More than 75 % of the district's area is under the risk of mudflows and landslides. Massive landslides in 2017 took the lives of 24 people in the area. Forests in Uzgen district provide income to about 70 % of the local population, who sell non-timber forest resources and conduct other types of activities on forestry territories, such as livestock grazing and tourism. Uzgen *State Forest Fund Agency* has a large territory of 49,282 ha (28% of the *State Forest Fund Agency* is covered with forests of which 10% is walnut, 40% of its lands are used for grazing). Almost all AAs of the district lie on the borders with Uzgen leskhoz, while several settlements are surrounded by the forest.

**Box: Forest enterprises (Leskhozoes)**

Leskhozoes are Forest enterprises in charge of the local management of State Forest Fund territory. They are administered by the SAEPF, and depend on it for the resource allocation. The territory under their control includes forested land, buffer zones and land for future afforestation. The land classified under the latter is often used as grazing areas, and its use is transferred on seasonal basis through agreements between individual users and leskhozoes with fees based on the extension of the area. Such mechanism differs from the one promoted by the Pasture Law since 2009 (whereby the use of State Land Fund for grazing is under the control of local communities – Pasture Users Unions, with fees depending on the herd size), and is one of the elements of inconsistency on which the project will work to ensure harmonization of the regulatory frameworks on forests and rangeland use (reference: Component 1).

In the project areas there are five State Forest Enterprises, one Forestry Unit, and two National Natural Parks which make up the core target area. A detailed profile of the Leskhozoes in the project areas (and in the pre-identified possible expansion area), including forest / rangeland coverage, is provided in the CS-FOR WP "Forestry" in Annex 9, and their climate change related challenges is in the Project ATLAS (Annex 6.b). The major strength of the leskhozoe staff is their generally thorough understanding and knowledge of the local forest resources (trees, nuts, fruits and shrubs for planting). However they have often weak capacities (especially when it comes to new technologies and georeferencing tools, which are a critical element of the project's led shift towards evidence based planning and management), and suffer from limited staff availability, insufficient to ensure the required planning and management of forest. Also, the leskhozoes do not have full financial autonomy (resource allocations are decided at the national level). The implementation of CS-FOR will depend on the collaboration and coordination with the other local institutions leveraged by the project's facilitation (i.e., for the planning and implementation and monitoring of the integrated NRM community resilience plans). Among the opportunities for the project's approach is that several leskhozoes started the introduction of new methods in management of forests, such as public private partnerships, outsourcing forestry activities to private sector. The vicinity to the local communities and institutions is also an asset, creating opportunities for bottom-up "pull" elements towards joint management of state forest fund resources.

## **XII. Climate Scenario, Vulnerability, Resilience and DRR in Target Areas**

150. The four target districts are part of two climatic zones: the South-western, which includes margins of the broad Fergana valley, the Chatkal and Alai valleys and the adjacent mountain ranges. Relative to other climatic zones, this is the warmest and most humid with maximum rainfall in winter; and the Inner Tien-Shan, which is a closed climatic zone bounded by adjacent mountain ranges. It is characterized by low precipitation, and a marked continental climate with distinctive local contrasts.

151. Climate in the area is heavily affected by topography: (i) the valley-sub-mountain zone (from 900-1,200 m) experiences hot summers, snowless and temperate winters, and low precipitation; (ii) the mountain zone (from 900–1,200 to 2,000–2,200 m) is characterized by a temperate climate, which has warm summers and cold, snowy winters; (iii) the high-mountain zone (from 2,000–2,200 to 3,000–3,500 m) is cooler in the summer and has relatively cold, snowless winters, with temperatures ranging from well

below zero to 16 °C; and (iv) the nival belt zone (from 3,500 m and higher) has a polar climate and is covered by numerous snowfields and glaciers. Detailed analysis of the main climatic variables and main impacts on PET, NDVI and LDP are reported in the Baseline Atlas (Target Areas Analysis).

152. **Precipitation:** Data from national meteorological stations and remote sensing analysis clearly a tendency in reduction in rainfall reduction on the west side of the four Rayons, fully involving Uzgen and Suzak, with a hot spot in North Suzak (reduction up to 8 mm/year and more). The East part of target areas shows a tendency towards increased rainfall, in the order of 1 to 10 mm/year. With regards to snow cover, frequency trends show a slight reduction of days with snow cover above 2,500 m and a general increase of days with snow cover below that altitude (Figure 26).

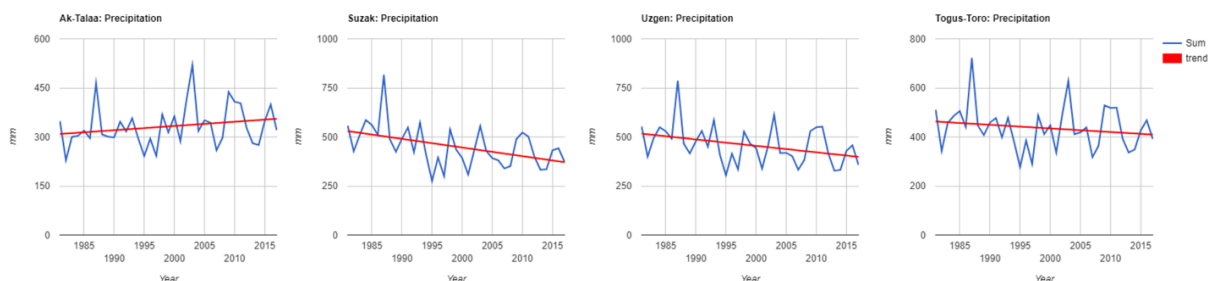


Figure 26: Rainfall distribution in target areas 1989-2016

153. **Temperature:** Recorded trends in absolute MAX temperatures (°C) per year based on historical (1989-2016) time series show a variation in the order of a fraction of a degree distributed from West (increase) to East (stable or decrease). Considering 27 years of observations, the total change in the period is from 1°C decrease to 1.5°C increase or more. The variation is almost only in increasing values from West to East in the order of a fraction of a degree, with slightly higher increases in the Western Rayons and the Southern area of Ak-Talaa (Figure 27).

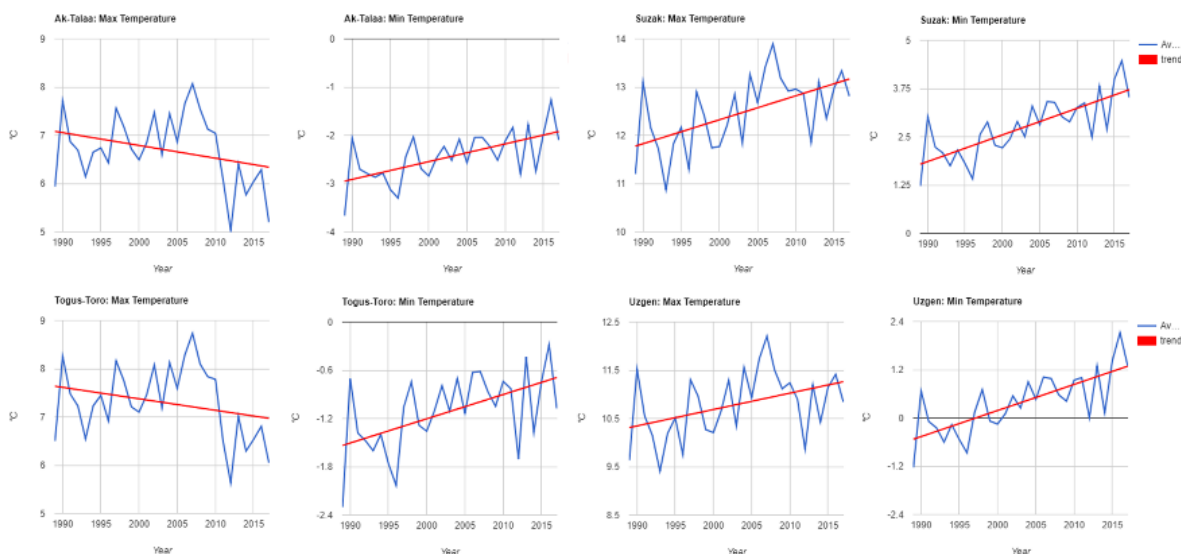


Figure 27: Distribution of Temperatures (MIN-MAX) in target areas 1989-2016

154. **Snow Cover Frequency:** Snow cover frequency in target areas appears to be in contrary to national trends where from 2002 to 2016 the percentage of days covered by snow appears to be reduced by about 17%. Target districts, with the exception of Ak-Talaa shows increasing trends as reported in Figure 28.

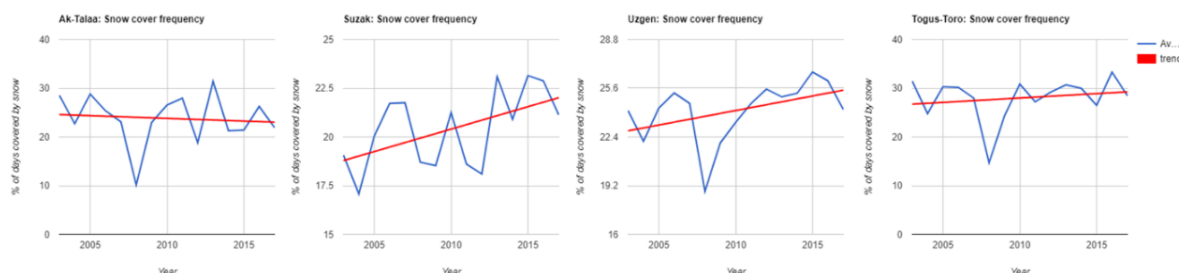


Figure 28: Distribution of snow cover frequency in target areas 2000-2016

#### a. Exposure, Vulnerability, Resilience and DRR

155. The Ministry of Emergency Situations of the Kyrgyz Republic reported that the number of floods, mudflows, landslides and avalanches in target areas has significantly increased during the last decade. The number of emergency situations in 2016 was higher than average, and natural disasters caused a total of 1.6 billion KGS of economic damage.<sup>60</sup> Osh and Jalalabad regions are most prone to natural disasters, with mudslides and landslides occurring along Kok-Art, Changet, It-Agar, Padysha-Ata, and Yassy watersheds. The largest number of landslides and mudflows in 2016 was registered in Osh (152 landslides, 425 mudflows) and Jalalabad regions (114 landslides, 261 mudflows), while in other parts of the country the number of landslides were no more than 25 and the number of mudflows no more than 84<sup>61</sup>.

156. An analysis of trends in disasters was conducted on the number of emergencies since 1990<sup>62</sup>. Results show that Osh and Jalal-Abad regions are the most prone to landslides. Jalal-Abad region is also the most prone to avalanches. Jalal-Abad is also the region most vulnerable to mudflows and floods; the least vulnerable is the Naryn region. Lastly, Jalal-Abad is also the region most prone to rainstorms.

Table 4: Summary results on variability in the number of Emergency Situations (ES) per year as a percentage of the mean annual number of ES/year (in CS-FOR target area regions)<sup>63</sup>.

Emergency Situation (ES)	Jalal-Abad	Naryn	Osh
Landslides	6.1	22.3	0.8
Avalanches	17.1	13.5	18.4
Mudflows and floods	8	20.3	21.5
Flooding	n/a	n/a	n/a
Heavy rains	-11.7	-9.1	-19.3
Hurricane winds	-1.9	-6.6	13.8
Hail	n/a	n/a	n/a
Snowstorms	n/a	n/a	n/a
<b>Total</b>	<b>7.5</b>	<b>11.9</b>	<b>12.3</b>

#### b. Impacts on Forests and Pastures

157. **Forests:** Literature confirms the correlation between described climate changes and forest cover, with particular relevance on walnut and juniper stands in Suzak and Uzgen. By using a geo-referenced version of the layer available at the Kyrgyzstan's REACH Mapping Tool for Kyrgyzstan<sup>64</sup>, the 45 SFF territories and two large national reserves falling in the 4 target Rayons have been digitized and used to extract the total area of state forests and the proportion of forests according to the Hansen's Global Forest 2016 database<sup>65</sup> (Tree cover > 10%). Findings of the geospatial analysis (Land Productivity Dynamics,

<sup>60</sup> Ministry of Emergency of the Kyrgyz Republic data

<sup>61</sup> Monitoring and forecasting of disasters and hazards on the territory of Kyrgyzstan. Ministry of Emergency of the Kyrgyz Republic, 2017

<sup>62</sup> Climate profile of the Kyrgyz Republic – Sh. Ilyasov, O. Zabenko, N. Gaydamak, A. Kirilenko, N. Myrsaliev, V. Shevchenko, L. Penkina. - B.2013 – 99 pages. (UNDP Project: "Climate Risk Management in Kyrgyzstan")

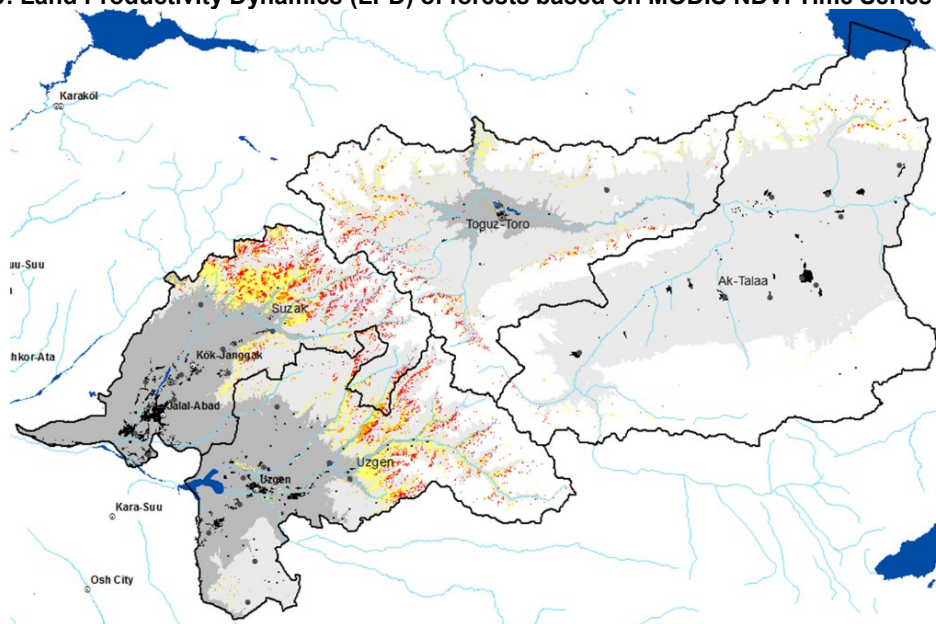
<sup>63</sup> Ibid

<sup>64</sup> <http://reach-initiative.kg/>

<sup>65</sup> [https://earthenginepartners.appspot.com/science-2013-global-forest/download\\_v1.4.html](https://earthenginepartners.appspot.com/science-2013-global-forest/download_v1.4.html)

LPD<sup>66</sup> 2001-2017- Figure 18) run by FAO (2018) confirms a diffuse stress of forest resources with declining trends in over 40% of forested areas. Reported data are still under evaluation and additional details will be provided once 'ground truthing-truthing' of each forest stand will be concluded.

**Figure 29: Land Productivity Dynamics (LPD) of forests based on MODIS NDVI Time Series 2001/2017.**



**Table 5: Land Productivity Dynamics (LPD) –classification of forests based on MODIS NDVI (2001-2017)**

Degradation class <sup>67</sup>	Ak-Talaa	Suzak	Toguz-Toro	Uzgen	Grand Total (%)
Extremely degraded	14.8%	27.3%	26.7%	22.2%	24.7%
Moderately degraded	4.3%	15.3%	17.2%	16.6%	15.5%
Not degraded	80.8%	57.5%	56.2%	61.2%	59.8%
unclassified	0.0%	0.0%	0.0%	0.0%	0.0%
Grand Total	100.0%	100.0%	100.0%	100.0%	100.0%

158. Looking at the data, the following may be summarized:

- The negative NDVI trends seem to be concentrated in areas with low vegetation and steep slopes.
- Forests are mainly detected on slopes exposed to North.
- The NDVI mean and max in the area suggest that the greenness production averaged in the area is not high and is associated also with a substantial overall negative trend in NDVI.
- The NDVI time series analysis between 2003 and 2016, which is also the period from which the map is generated, shows a stable trend and limited interannual variability in accumulated annual greenness ( $\sum \text{NDVI} > 0.2$ ).
- Precipitations are reducing and the NDVI trend seems not affected by interannual rainfall variability.
- Because of the overall reduction in precipitations, the risk heavy rainfall is assessed as low.

159. **Pastures:** Overall, 40 PUUs were identified, covering 73.4% of the total target area. Toguz Toro, Ak-

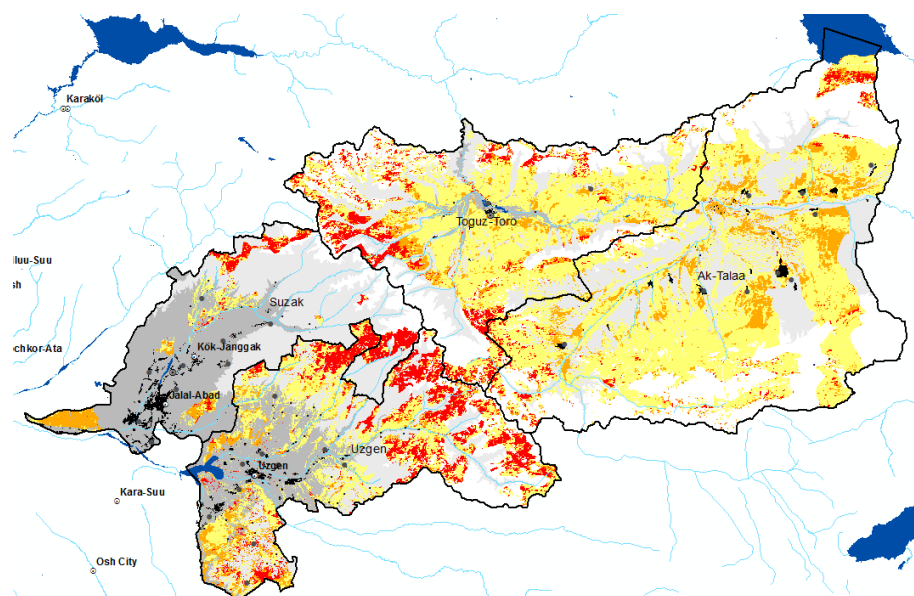
<sup>66</sup> LPD classification's methodology is described at this link: [https://docs.google.com/document/d/1MA6HUHXBLMpicCC\\_Q2LAOdY7HWBW2QS-rqE-kNn\\_l1w/edit?usp=sharing](https://docs.google.com/document/d/1MA6HUHXBLMpicCC_Q2LAOdY7HWBW2QS-rqE-kNn_l1w/edit?usp=sharing).

<sup>67</sup> The degradation classes are based on LPD classification (see methodology [here](#)), as follows: **Extremely degraded** corresponds to LPD "declining productivity"; **Moderately degraded** combines the two LPD classes "Early signs of decline" and "Stable but stressed"; and **Not degraded** corresponds to "Stable but not stressed" and "Increasing productivity".



Talaa and Uzgen areas cover between 80 and 90%, while Suzak covers nearly 25%<sup>68</sup>. Pastures in different PUUs have been combined with classes of altitude and slope to identify 165 unique areas for further climatic and vegetation condition analysis. The geospatial analysis (NDVI and LPD 2001-2017 – Figure 30) run by FAO (2018) confirms a diffuse stress of pasture resources with declining trends of land productivity in over 32% of pastures. Reported data are still under evaluation and additional details will be provided once 'ground truthing-truthing' of each PUU will be concluded.

**Figure 30: Land Productivity Dynamics (LPD) of pastures based on MODIS NDVI Time Series 2001/2017**



**Table 6: Land Productivity Dynamics (LPD) –classification of pastures based on MODIS NDVI (2001/2017)<sup>69</sup>**

Degradation class <sup>70</sup>	Ak-Talaa	Suzak	Toguz-Toro	Uzgen	Grand Total (%)
Extremely degraded	5.2%	27.0%	16.6%	24.4%	15.5%
Moderately degraded	16.9%	20.2%	15.7%	16.1%	17.0%
Not degraded	76.3%	52.9%	67.6%	58.8%	66.8%
unclassified	1.6%	0.0%	0.1%	0.7%	0.8%
	100.0%	100.0%	100.0%	100.0%	100.0%

160. Pastures, elevation classes, slope and trend NDVI have been combined in a spatially enabled model to produce a classified map of pasture areas, stratified per topography and PUU, based on mean NDVI trend. The following interpretation of the data can be made:

- The NDVI time series analysis shows a negative trend in accumulated annual greenness ( $\Sigma \text{NDVI} > 0.2$ ) between 2003 and 2016. The negative trend seems correlated with higher altitude.
- The average mean and max NDVI indicate that the greenness productivity is high, which might be related to both grass cover and substantial presence of shrub/tree vegetation in the pasture areas.
- Temperatures tend to increase, as generally detected in the area.
- Precipitations trend is quite strongly decreasing, with a 3.5 mm of rain annually lost in the last 35 years of observations.

<sup>68</sup> The process to complete the coverage of PUUs in the 4 target Rayons is on going.

<sup>69</sup> The areas assessed as non degraded are lands where NDVI trends are positive but where the amount of potential biomass availability is very low due to previous degradation processes that cannot be captured by the LPD and NDVI analysis.

<sup>70</sup> The degradation classes are based on LPD classification (see JRC methodology [here](#)), as follows: **Extremely degraded** corresponds to LPD "declining productivity"; **Moderately degraded** combines the two LPD classes "Early signs of decline" and "Stable but stressed"; and **Not degraded** corresponds to "Stable but not stressed" and "Increasing productivity".



- Years of particularly low precipitation appears to affect the greenness production of the same year or the following.
- The number of snowy days increased during the observation period, from 86 to 100.

### c. Households' Perception of Climate Change (precipitation/temperature)

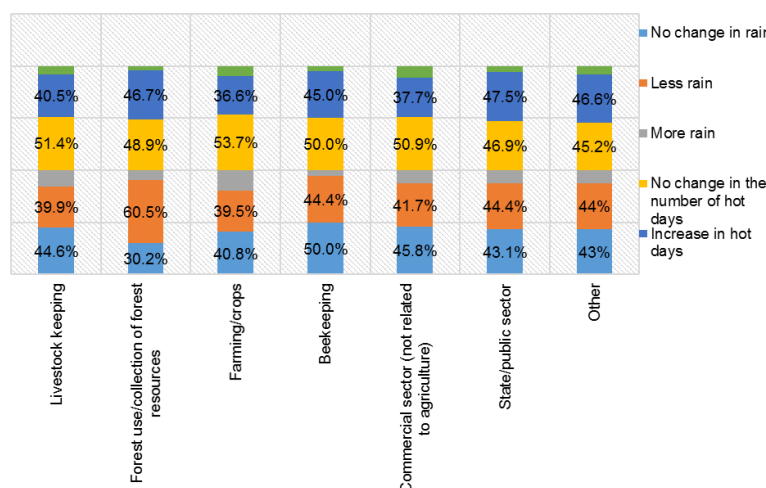
161. The present section summarizes the findings of the household survey run in the 4 target districts and in 6 control ones. The household survey was conducted in the pilot areas where project interventions are anticipated, as well as in control areas that are not in the designated area of the Project but share similar characteristics. Each presented result is disaggregated per district, community and sex.

162. As reported in the previous sections, Ak-Talaa, Toguz-Toro, Uzgen and Suzak districts are the most vulnerable to disasters, specifically to losses from mudflows and landslides. Many villages of these districts<sup>71</sup> are in the red zone, where the risks associated to soil instability is considered by the MES the higher in the Country.

163. **About half of the households interviewed noted changes in precipitation.** According to observations, 56.7% of the sample reported changes in rainfall patterns. Of these: 73.6 % reported a decrease in rainfall while 26.4% reported an increase. **Slightly less than half of households interviewed reported a frequent lack of rainfall over a long period.** 51.1% of households noted that drought had increased in the last 5 years, while 48.9% noted that drought had become more frequent. In the context of different categories of households, the intensification of drought was noted mostly by households engaged in collection of forest resources. The increase in the frequency of floods was noted mostly by those households whose welfare depends on beekeeping.

164. **Half of the respondents interviewed noted an increase in heat.** 50.2% of households noted that in the last 5 years there was no increase in the number and intensity of hot days while 41.8% noted an increase in the number of hot days; 7.9% noted a decrease in the number of hot days (Figure 31).

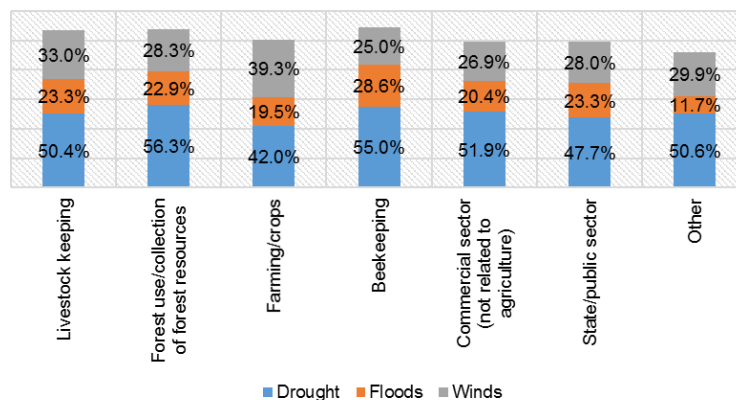
Figure 31: Climate changes - rain and heat, by household groups, N = 903, %



165. **More than half of the respondents believe that winds did not become more intense.** 32.1% believes that winds have intensified and become destructive, while the majority (67.9%) of respondents from surveyed households believe wind intensity is the same and that there have not been changes over the last 5 years (Figure 32).

<sup>71</sup> All the communities where the baseline survey was conducted are in the red zone established by the Ministry of Emergency Situations.

**Figure 32: Climate changes – drought, flood, wind, by household groups, N=903, %**



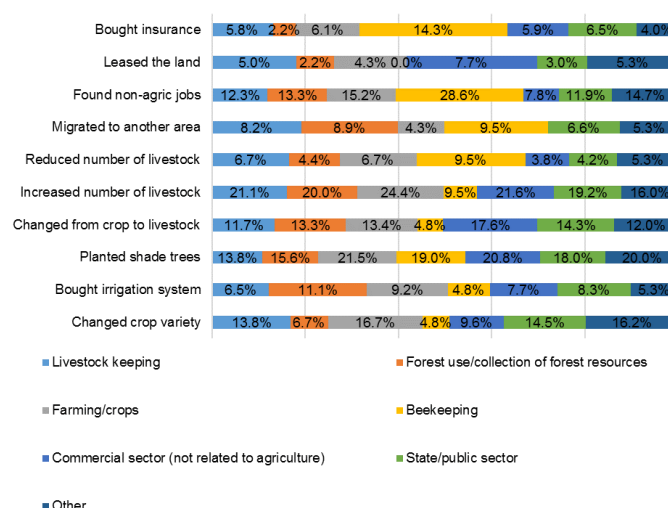
166. In the context of households with different livelihood, changes in climate were noted mostly by households engaged in collection of forest resources, which answered that the amount of precipitation became less. Among those households that believe that there is more rainfall, most are households whose welfare depends on agriculture. The increase in the number of hot days is noted by users of forest resources and households whose welfare is supported by income from work in the public sector.

#### d. Household Adaptation Strategies

167. In cases of temperature/rainfall changes, **13.9%** of households shifted to different crops. **7.5%** of households bought an irrigation system while **17.2%** of households planted trees to create shade. The highest value of shade trees is for households dependent on agriculture, while lowest value is for households dependent on livestock. **12.8%** move from crop production to livestock. Relatively to other groups, this strategy was chosen more by households engaged in commercial activities, the lowest values for households engaged in beekeeping. **20.6%** of households increased the number of heads of livestock. More specifically, with respect to other groups, this strategy was chosen by households engaged in agriculture and households involved in commercial activities. **5.9%** of households reduce the number of heads of livestock. In general, values for all groups are not high, but more than other groups, this strategy was chosen by households engaged in beekeeping.

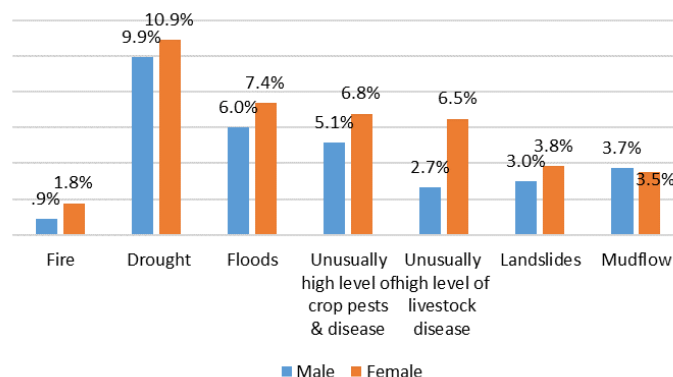
168. **6.5%** left for other regions. In more ways than other groups, this strategy was chosen by households engaged in livestock, beekeeping and households that depend on forest resources. **13.2%** of households are looking for other work not related to agriculture. Relative to other groups, this strategy was chosen more by households engaged in beekeeping. **4.4%** rented their agricultural land. Relative to other groups, this strategy was chosen more by households engaged in commercial activities. Finally, **5.9%** got insurance. Relative to other groups, this strategy was chosen mainly by households engaged in beekeeping (Figure 33).

**Figure 33: Household Adaptation Strategies - drought, flood, wind, N = 903, % of positive answers (yes/no)**



169. It is interesting and relevant to mention that while in general perception of climate changes is similar between male and female respondents that is not the case when reporting on shocks perception. In this specific case women appear to be more attentive and prone in reporting on climate triggered shocks as reported in figure 34.

**Figure 34: HH Survey Positive Answers disaggregated per sex**



#### e. Households' Resilience<sup>72</sup>

170. Data from the household survey (target and control areas) supported the construction of the resilience index identified for the project (<http://www.fao.org/3/a-i5665e.pdf>). RIMA is an innovative quantitative approach that allows explaining why and how some households cope with shocks and stressors (i.e. natural hazards and climate change) better than others do.

171. Findings of the analysis<sup>73</sup> present a scenario of where resilience is highly influenced by communities' adaptive capacity, followed by access to basic services. The analysis points out the importance to increase resilience through education and the diversification of the income portfolio, followed by access to credit. In target areas, the most resilient districts are Ak-Talaa and Toguz Toro while the least resilient district is Uzgen. The resilience structure matrix (RSM) shows heterogeneity among districts with the following

<sup>72</sup> The definition of resilience adopted in this report is the following "the household capacity that ensures stressors and shocks do not have long-lasting development consequences" (RM-TWG, 2014).

characteristics:

- a. **Ak-Talaa:** It is the most resilient of the intervention groups and is the one showing the least climatic sensitivity and least exposure to climatic change related risks. Despite the limited access to basic services, households in this district diversify their income portfolio and farming strategies more than the other districts. The level of education of the household heads is the highest among the districts; 57.45% of household heads have a secondary diploma and 26.7% a university degree.
- b. **Toguz Toro:** It is the second most resilient district of the intervention groups; climate sensitivity is relatively higher with respect to Ak-Talaa. **Changes in temperature are negligible**, while the coefficient of variation of rain is higher with respect to Ak-Talaa. Notwithstanding the higher Gini coefficient and the higher headcount poverty ratio, communities are still able to manage extreme climatic events thanks to high adaptive capacity as found by the analysis.
- c. **Suzak:** This district shows a higher exposure to climatic risks as well as higher vulnerability to natural hazards, such as landslides and mudslides. According to data obtained from the household survey the main coping strategy of communities is migration and establishment of social safety nets. Training and education are also considered relevant tools to increase resilience.
- d. **Uzgen:** It is the least resilient district. The average household climate sensitivity is the highest, with a high exposure and vulnerability. The district is subject to frequent landslide and floods. The great majority of household are livestock keepers (64%), There is lower (or even no) assistance from the government and also informal transfers are rare; access to credit is still limited. Given the fact that they are more specialized in livestock, households so far do not diversify their income portfolio.

### XIII. GHG Emissions in Target Areas

172. Following Bishkek, the next largest contributors of GHG emissions are the Chui, Jalal-Abad, Osh, Batken, Issyk-Kul, Naryn oblasts, Osh city and the Talas oblast. The significant contribution of the agricultural sector is characteristic for all oblasts – of the three target regions, agriculture contributes more than other sectors.

**Table 7: Regional distribution of GHG emissions / capita as well as precursor-gases emissions (TNC 2017).**

Region	GHG, tCO <sub>2</sub> -eq./person	Precursor gases, kg/person				
		NOx	CO	NM VOC	SO <sub>2</sub>	Total
Jalal-Abad	1.46	1.60	10.93	2.02	0.60	15.15
Naryn	2.89	2.02	13.07	2.05	4.59	21.74
Osh	1.32	0.98	7.61	1.60	1.71	11.90

**Table 8: Regional emissions per 1 km<sup>2</sup> (TNC 2017)**

Region	GHG, tCO <sub>2</sub> -eq./1 km <sup>2</sup>	Precursor gases, kg/1 km <sup>2</sup>				
		NOx	CO	NM VOC	SO <sub>2</sub>	Total
Jalal-Abad	44.33	48.55	331.91	61.21	18.30	459.97
Naryn	16.58	11.61	74.98	11.78	26.35	124.72
Osh	50.58	37.36	291.17	61.37	65.64	455.54

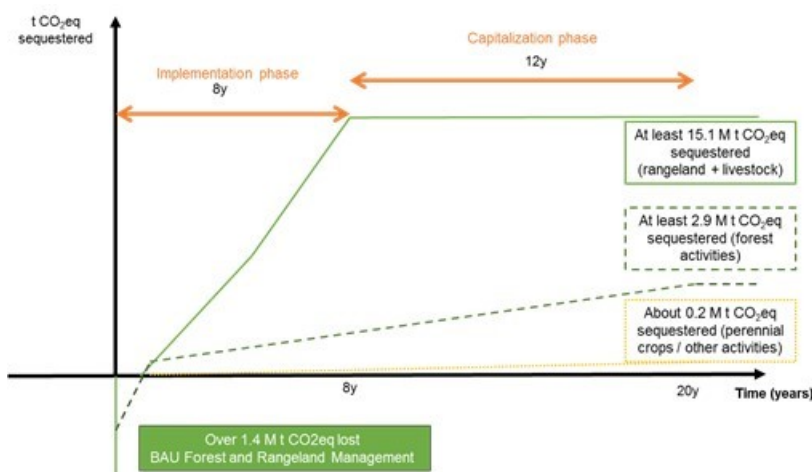
173. In the agriculture sector, the highest GHG emissions in the sector are accounted for the Osh oblast - 932.4 Gg CO<sub>2</sub> -eq. or 19.6% of total emissions, followed by the Batken oblast - 917.5 Gg CO<sub>2</sub> -eq. or 19.6%, the Jalal-Abad oblast - 893.7 Gg CO<sub>2</sub> -eq. or 18.8%, the Issyk-Kul oblast - 595.0 Gg CO<sub>2</sub> -eq. or 12.5%, the Chui oblast - 574.5 Gg CO<sub>2</sub> -eq. or 12.1%, the Naryn oblast - 522.6 Gg CO<sub>2</sub> -eq. or 11.0% and the Talas oblast - 288.1 Gg CO<sub>2</sub> -eq. or 6.1%. The contributions of Bishkek and Osh cities into the total GHG emissions of the sector are insignificant.

174. Anticipated results of CS-FOR investment,<sup>74</sup> the total national emissions in 2010 [source: TNC] were

<sup>74</sup> reference: Chapter 9 of the Feasibility Study.

**13,046 Gg CO<sub>2</sub>eq / year**, with a reported share of agricultural emissions in 2010 [TNC] of 33.54% (or **4,375 Gg CO<sub>2</sub>eq / year**). **The CS-FOR sequestration potential is estimated at 19.8 m t CO<sub>2</sub>eq (over 20 yrs), or 0.99 m t CO<sub>2</sub>eq / year, which correspond to about 22.6% of the 2010 total agricultural sector portion of emissions.** Moreover, with a 20 yrs life cycle (ie by 2038), the project will contribute to a total sequestration of 19.8 m t CO<sub>2</sub>eq, or 0.99 m t CO<sub>2</sub>eq/year. With a low pop increase scenario (ie 6.872 m people in 2050, source: INDC, TNC), this corresponds to about 0.14 t CO<sub>2</sub> eq / year / capita (corresponding to 11.7% of the 1.23 t CO<sub>2</sub> per capita, or 9.1% of the 1.58 t CO<sub>2</sub> per capita targets).

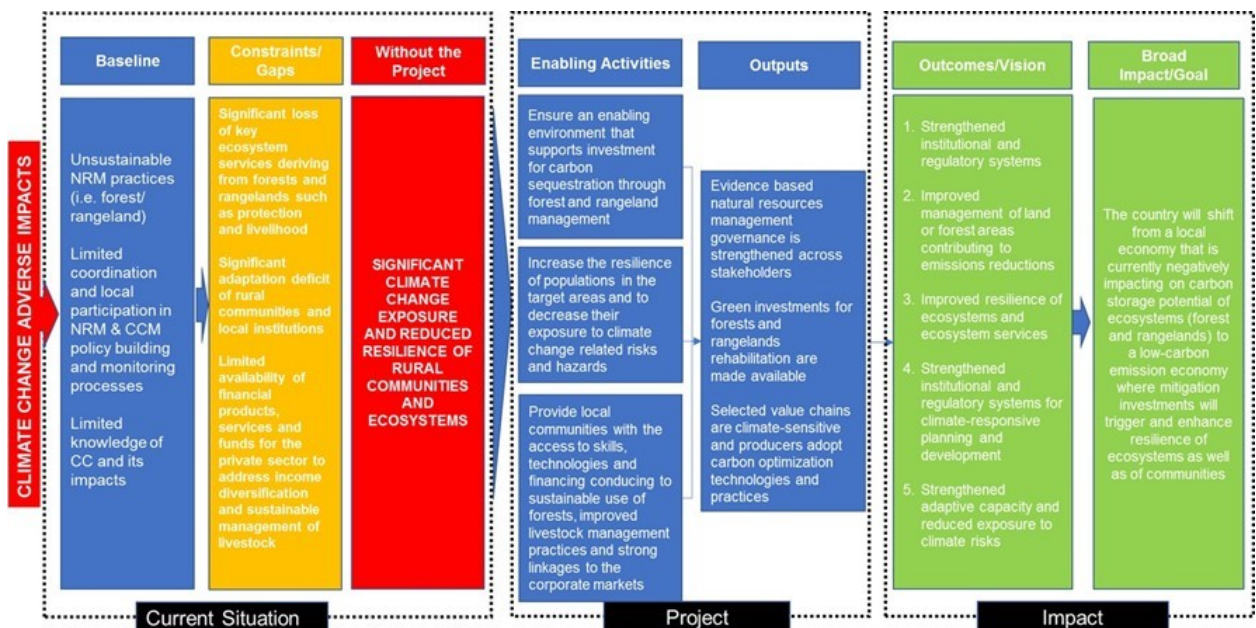
**Figure 35: Graphic representation of carbon sink potential of CS-FOR<sup>75</sup>**



175. The chart shows that the current level of forest degradation under BAU scenario generates an estimated net loss of 1.5 m tCO<sub>2</sub>eq in 20 years; through the combined effect of the various interventions, the project will be able to avoid the mentioned losses and to generate an additional over 18 m t CO<sub>2</sub>e sequestration (15.1 rom rangeland and livestock, 2.9 from forest activities and 0.2 from other agricultural activities), for a net effect of 19.8 m tCO<sub>2</sub>e sequestered. Such expected sequestration (4.2m t CO<sub>2</sub>eq) is composed of: **(i)** 0.7 m t CO<sub>2</sub>eq from afforestation and reforestation, and forest enrichment; and **(ii)** 3.5 m t CO<sub>2</sub>eq from improved forest management of the existing forests. The EX-Act LUC calculations are based on current degradation trends, showing 25% of the forest as largely degraded, 15% as moderately degraded and 60% as non degraded. The potential net sequestration calculation is based on the current trends (showing substantial degradation). Theory of change of the Project is summarized in the following charts.

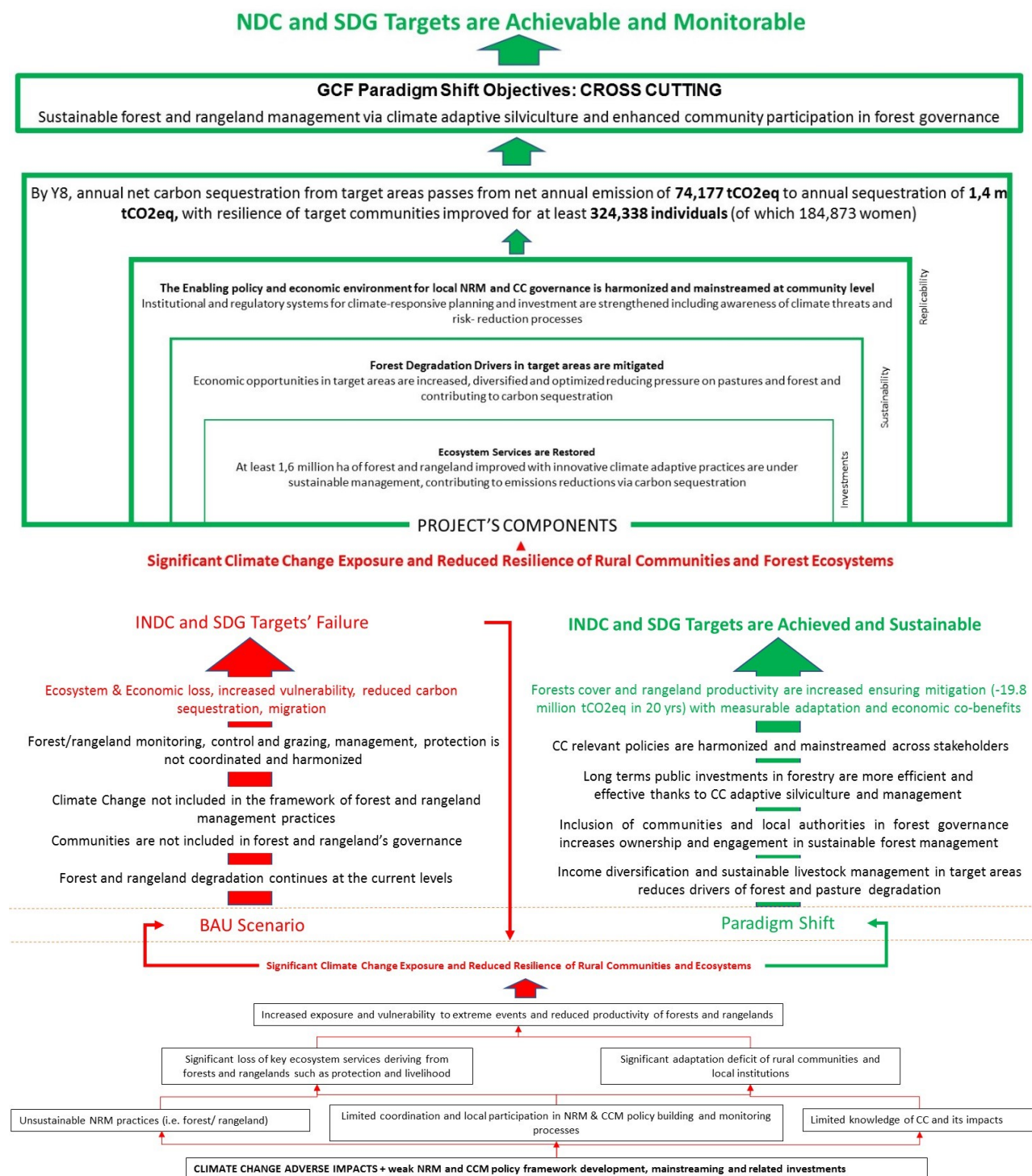
<sup>75</sup> See also the Carbon Accounting Chapter in the Feasibility Study – linked in the last page of this document.

### Summary diagram of theory of change for the CS-FOR project





## Problem tree and objective tree for the CS-FOR project



## Chapter 2: Poverty, targeting and gender

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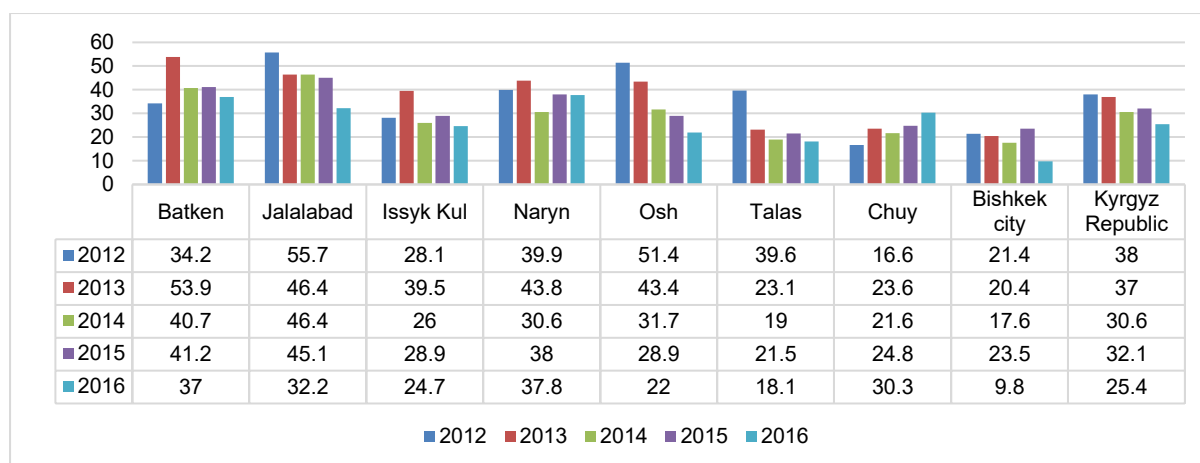
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## A. National Context of Poverty

1. The Kyrgyz Republic is a lower-middle-income country with the GDP per capita of US\$1,073 in 2016<sup>76</sup>. The economy relies on worker remittances (equivalent to 30% of GDP in 2011-2015) and a gold mine, Kumtor (about 10% of GDP), and hence highly vulnerable to external shocks.

2. Poverty level is high with 32.1 percent of the population living below minimum subsistence level in 2015 and 25.4 percent in 2016 (Figure 1), according to the National Statistical Committee (NSC) data. Another 50 percent of population were living below US\$5/day in 2015. About three quarters of the poor live in rural settlements. Poverty is the highest in remote mountainous areas where almost all households are poor with average per-capita income of approximately US\$82 in 2015, which is equal to minimum level for subsistence established by the Government and 1.3 times lower than the average in the valleys. Scarce arable land combined with underdeveloped irrigation, limited off-farm employment opportunities, distance and poor accessibility and inadequate market infrastructure are among the key factors that constrain economic development in rural areas. There were 49,000 people (0.8 percent) living in extreme poverty in 2016, of whom 85.4 percent were rural residents. Poverty rates vary across the regions with Naryn recording the highest in 2016 (37.8%). **However, the absolute number of the poor is high in Jalalabad and Osh, which accounts for 22% and 20% of the total population, respectively.**

Figure 1: Poverty Incidence by Region 2012-2016



Source: National Statistical Committee, 2017

3. Agriculture is the main source of the livelihood in rural areas where off-farm opportunities are limited. Agricultural productivity is quite low: the sector employs two thirds of the working women and working men but the share of agriculture in nominal GDP accounts for only 13.2 percent in 2016 (which is even 0.8 percent lower than in 2015). About a half of the total agricultural output comes from livestock production. Livestock productivity is low and large seasonal variations in animal body weights indicate that animal feeding is geared towards animal survival rather than commercial production. Farmers produce a limited amount of fodder and feed grain mostly due to the heavy reliance on natural pastures. Almost all livestock is grazed at pastures year-round.

4. Vulnerability to national disasters also contributes to low productivity of agriculture. With a geographical position and orography that contribute to making it one of the most vulnerable countries to the impacts of climate change in Central Asia, Kyrgyzstan suffers from drought, land and mudslides while flooding events and river banks erosion are set to increase in frequency and intensity. Maximum and minimum temperatures across Kyrgyzstan are expected to increase gradually over the course of this century, according to various reports. The intensity of rain and snowfall is expected to increase, together with the frequency of heat waves.

<sup>76</sup> World Bank, Country Snapshot: An overview of the World Bank's work in the Kyrgyz Republic, April 2017.

5. The Ministry of Emergency Situations of the Kyrgyz Republic reports that the number of floods, mudflows, landslides and avalanches has significantly increased during the last decade. The number of emergency situations in 2016 was higher than average, and natural disasters caused a total of 1.6 billion KGS of economic damage.<sup>77</sup> Osh and Jalalabad regions are most prone to natural disasters, with mudslides and landslides occurring along Kok-Art, Changet, It-Agar, Padysha-Ata, and Yassy watersheds. The biggest number of landslides and mudflows in 2016 was registered in Osh (152 landslides, 425 mudflows) and Jalalabad oblasts (114 landslides, 261 mudflows), while in other parts of the country the number of landslides were no more than 25 and the number of mudflows no more than 84.<sup>78</sup> One of the key reasons for these disasters is the degradation of vegetation along mountain slopes, caused by heavy anthropogenic pressure from livestock overgrazing, erosion of river banks, and unsustainable harvesting of timber and fuelwood.

6. **Human Development.** In 2015 the value of Kyrgyz Republic's Human Development Index (HDI) was 0.664, ranking the country at 120 out of 188 countries in total<sup>79</sup>. The score is above the average of countries in the medium human development group (0.631), but below the regional average of Europe and Central Asia (0.756). The rise of HDI values was attributable to the steady improvements of social indicators. Between 1990 and 2015 the country's life expectancy at birth increased by 4.5 years, mean years of schooling increased by 2.2 years and expected years of schooling increased by 1.2 years.

7. **Food Security and Nutrition.** Malnutrition remains a problem as evidenced by the fact that 13 percent of children under five suffer from stunting<sup>80</sup>. Micronutrient deficiencies, including vitamin and minerals, are also evident as 43% of children under five and 39% of women of reproductive age are affected by anemia. According to the World Food Programme (WFP), two out of three food insecure people live in remote valleys, 'where high altitudes, harsh winters and hot, dry summers limit livelihoods potential'<sup>81</sup>. Food insecurity is exacerbated by climate-related shocks, including floods and mudslides, which affect resilience of families and communities. Livestock is the most important source of income and the primary source of nutrition for the rural poor. Animals also serve as an important asset for the poor families, which can prevent them from becoming destitute at the time of shocks.

8. The risk of food insecurity varies, depending on such factors as the season, harvest, income from remittance, food costs and even intra-household decision-making<sup>82</sup>. Those farming households depending on home grown products for their own consumption in particular may face serious food insecurity and malnutrition risks in the face of climate changes. Households experiencing food shortages resort to such coping strategies as consuming cheaper and less preferred foods, borrowing food from friends or relatives, increasing the number of household members who migrate for work and reducing healthcare expenditures. These coping measures would have longer time negative impacts on the family's overall welfare and the members' health, particularly that of women and children.

9. **Social Protection.** Social protection system in Kyrgyzstan is complex with a mixture of programmes inherited from the Soviet time and new ones introduced after independence<sup>83</sup>. Non-contributory programmes include cash transfer schemes, energy compensations and discounts, early retirement and pension top-ups, and scholarships, whereas social insurance program. The Monthly Benefit to Poor Families with Children (MBPF) is targeted to the poorest families, and provides cash benefits to children living in poverty. A 2014 World Bank review, however, questions effectiveness of the social assistance system in protecting the poor against shocks by pointing out the low coverage of the poor<sup>84</sup>.

## B. Gender Mainstreaming and Social Inclusion Assessment

<sup>77</sup> Ministry of Emergency of the Kyrgyz Republic data

<sup>78</sup> Ministry of Emergency, Monitoring and Forecasting of Disasters and Hazards on the Territory of Kyrgyzstan, 2017.

<sup>79</sup> UNDP, Briefing note for countries on the 2016 Human Development Report: Kyrgyzstan, 2016.

<sup>80</sup> Data from WHO/World Bank Group Joint Child Malnutrition Estimates 2017, cited in Global Nutrition Report, 2017 Nutrition Country Profile: Kyrgyzstan, 2017.

<sup>81</sup> WFP Kyrgyzstan (<http://www1.wfp.org/countries/kyrgyzstan>), accessed in February 2018.

<sup>82</sup> FAO, National Gender Profile of Agricultural and Rural Livelihoods: Kyrgyz Republic (Country gender assessment series), 2016. Available at: <http://www.fao.org/3/a-i5763e.pdf>

<sup>83</sup> World Bank, Kyrgyz Republic Public Expenditure Review Policy Notes: Social Assistance, 2014.

<sup>84</sup> Ibid.

# Carbon Sequestration through Climate Investment in Forests and Rangelands (CS-FOR) in Kyrgyzstan

## Gender Assessment

### Overview of gender inequalities in rural areas of Kyrgyzstan

10. FAO conducted a gender assessment in 2016, titled 'National gender profile of agricultural and rural livelihoods: Kyrgyz Republic'<sup>85</sup>. The assessment has informed the formulation of this project, including this section, as it will inform as well its implementation.

11. Prior to its independence in 1991, about three quarters of women of Kyrgyzstan were in the official labour force, including those who worked in the state and collective farms<sup>86</sup>. During the period of transition to the market economy Kyrgyz women lost much economic, social and political power. By 2002 the official employment rate for women decreased by half. The period also saw weakening and disappearance of public services available during the Soviet time for working women, such as daycare centers, kindergartens, extended maternity leave, and access to basic health care. The loss of such services meant that women's shouldering of the responsibilities to care children and the elderly increased.

12. The Kyrgyz Republic ranked 90 out of 159 countries on Gender Inequality Index (GII). GII reflects gender-based inequalities in three dimensions (reproductive health, empowerment, and economic activity), and the higher the GII value the more unequal the country from the gender point of view. Kyrgyzstan's gender inequality, with GII score of 0.394, is higher than neighboring Tajikistan (0.322) and Uzbekistan (0.287). While Kyrgyzstan fares well in terms of political representation and education attainment, it lags behind the two countries on maternal mortality ratio and adolescent birth rate (see Table 3).

**Table 3: Gender Inequality Index of Kyrgyzstan and Selected ECA Countries**

	GII value	GII rank	Maternal mortality ratio	Adolescent birth rate	Female seats in parliament (%)	Population with at least some secondary education (%)		Labour force participation rate (%)	
						Female	Male	Female	Male
Kyrgyzstan	0.394	90	76	39.6	19.2	100.0	99.9	49.4	77.1
Tajikistan	0.322	65	32	38.1	14.7	98.1	88.2	59.4	77.5
Uzbekistan	0.287	57	36	17.7	16.4	99.9	99.9	48.3	76.2
ECA	0.279		24	26.6	19.0	78.1	85.7	45.4	70.5

Source: *Human Development Report 2016*, UNDP

13. Kyrgyzstan's legal framework guarantees women's equality. Its constitution mandates equality between women and men and prohibits gender-based discrimination. Civil, penal, labour and family codes guarantee equal rights for men and women. In 2008 the Law on State Guarantees of Equal Rights and Equal Opportunities for Men and Women was promulgated to ban gender discrimination in the public administration. The Government has also addressed gender equality in key policy measures, and in 2012 approved a comprehensive and forward-looking gender strategy, entitled 'Gender Equality Strategy to 2020'. The strategy was translated into the National Action Plan on Gender Equality for 2015-2017, which was approved in December 2015 and the latest, as of 2018-2020, approved in November 2018. Ministry of Labor and Social Development (MLSD) is an entity that is responsible for the gender mainstreaming and monitoring the implementation of the National Action Plan on Gender Equality (GE NAP). The gender strategy and action plan highlight: (i) women's economic empowerment; (ii) functional education for girls and women; (iii) improving women's access to justice and eliminating discrimination; and (iv)

<sup>85</sup> FAO, *National Gender Profile of Agricultural and Rural Livelihoods: Kyrgyz Republic* (Country gender assessment series), 2016. Available at: <http://www.fao.org/3/a-i5763e.pdf>

<sup>86</sup> ADB, *Country Gender Assessment: Kyrgyz Republic*, 2005

gender parity in decision making and expanding women's political participation (v) regulatory policy to ensure gender mainstreaming across the state agencies and the standardization of national gender statistics. The strategy and action plan pay special attention to improving rural women's non-formal education in such areas as information and communication technology with a view to facilitating their better access to employment and business opportunities<sup>87</sup> as well as engaging women in income-generating projects, training for women in nutrition education and agrotechnology.

14. Despite the adequate legal framework and Government's proclamations of gender equality, researchers and development practitioners point out that Kyrgyzstan faces high gender inequalities. Deep-rooted patriarchal attitudes and conventional beliefs of women's roles and responsibilities in the family and society serve to perpetuate gender inequality. While women's councils exist at the rural municipality level to address gender issues and support women, many are not strong. Some argues that gender inequalities are on the rise due to recent revival of Islam<sup>88</sup>. Economic empowerment of women is lagging behind as barriers to their equal employment opportunities and entrepreneurship development continue to remain. In 2015, the average wage of men was 1.3 times higher than that of the women (14,743 soms for men, compared to 11,125 soms for women)<sup>89</sup>. While both men and women take agricultural loans from microfinance institutions (MFIs), women borrow smaller sums than men, and are more likely to borrow as a group<sup>90</sup>. A recent study revealed that men are usually the primary decision-makers within the household on such matters as finance (saving, spending and taking loans), choice of crops and the sale of agriculture and livestock products while women have more agency over non-economic decisions (such as child care) and some economic decisions related to the spheres of their influence (i.e. kitchen garden)<sup>91</sup>.

15. Violence against women is widespread, and there are reported cases of domestic violence, bride kidnapping, trafficking, early marriages and physical abuse. In rural areas, in particular, bride kidnapping and early marriages remain a matter of great concern. In its 2014 review of Beijing Declaration and Platform of Action, the country reported a research finding that '60 percent of marriages in the countryside in mono-ethnic areas are accomplished through bride kidnapping, of which two thirds are performed without consent of the girl'<sup>92</sup>. According to the 2006 data cited in the same Beijing+20 National Review, over 12% of women in Kyrgyzstan get married before the minimum marriage age of 18. The incidence of such marriages is higher in rural areas (14.2%) than in urban areas (9.7%). Early marriages are more common among poor households (16.5%) than in rich families (9.1%). Although more updated information is not available, an increase in fertility rate among young women – 4.4 children per 1,000 women aged 15-17 in 2006 to 7.7 children in 2012 – may indicate that early marriages are on the rise.

16. According to a population and health survey in 2012, 27% of all households are headed by a woman<sup>93</sup>. Rural area records a lower percentage of FHHs (21%), compared to urban area (36%). Sex of the household head is not a strong factor to influence the poverty level of the family. The NSC data suggests that female-headed, one-parent families are not poorer than male equivalents, but among the two-parent families, poverty is higher if they are headed by a woman (see Table 3 below). Similarly, assessments found that FHHs in Kyrgyzstan are not more likely to be food insecure than male-headed households (MHHs)<sup>94</sup>. Although FHHs are slightly more likely to be severely insecure (10% of FHHs in comparison to 7% of MHHs), the reverse is true for moderately food insecure households (16% of MHHs and 12% of FHHs)<sup>95</sup>.

**Table 3: Poverty Rates by Sex of Household Head (2014)**

	Female- headed		Male- headed	
	2-parent family	1-parent family	2-parent family	1-parent family
Not poor	64.4	91.4	70.0	81.4
Poor	35.6	8.6	30.0	18.6

<sup>87</sup> FAO (2016).

<sup>88</sup> Muldoon, R. and Casabonne, U., *Gender Norms in Flux: Bride Kidnapping and Women's Civic Participation in the Kyrgyz Republic*, World Bank, 2017.

<sup>89</sup> UNFPA, *Gender in Society Perception Study*, 2016.

<sup>90</sup> According to data from *Annual Report of the National Bank of the Kyrgyz Republic 2015*, quoted in FAO (2016).

<sup>91</sup> FAO (2016)

<sup>92</sup> Ministry of Social Affairs, *National review of the 20th year anniversary of the Beijing Platform for Action in Kyrgyzstan*, 2014.

<sup>93</sup> National Statistical Committee, Ministry of Health, and IFC International, *Kyrgyz Republic: Demographic and Health Survey 2012, 2013*.

<sup>94</sup> FAO (2016).

<sup>95</sup> NSC data cited in FAO (2016).



Source: NSC, *Women and Men of the Kyrgyz Republic: 2010-2014*, 2015, cited in FAO (2016)

17. Although no data or comprehensive analysis is available on the situation of wives of migrant workers, some reports mention extra challenges such women face. Episodes include wives not directly receiving remittances, which are instead sent to the migrant's mother or elder sister<sup>96</sup>. On the other hand, a large number of women migrate for work both to foreign countries, as well as inside Kyrgyzstan. According to 2016 data from Russia, nearly 40% of the Kyrgyz citizens among official migrants in the country were women<sup>97</sup>. Compared to other Central Asian countries, where the migrants in Russia originate, Kyrgyzstan records the highest proportion of women among the migrants in Russia. As for internal migration, women outnumber men: 64% of inter-regional migrants in 2014 were women, mainly rural women migrating to urban areas<sup>98</sup>. Women may migrate together with males or alone, and a significant proportion of Kyrgyz women migrants are the primary breadwinners<sup>99</sup>. It is pointed out that the massive out-migration Kyrgyzstan has been experiencing is 'affecting gender norms in multiple and conflicting ways'<sup>100</sup>. While negative consequences, including those for women and girls, may be numerous, some argue that such a large social disruption, which makes previous social norms and mental models untenable, may bring about some positive changes to women, such as males' taking more childcare responsibilities and women's seeking more work outside the home<sup>101</sup>.

## Women in Agriculture and Natural Resource Management

18. Agriculture underscores the lives of the rural population as almost all adults engage in some work related to crop and livestock production. Rural women work in crop cultivation, livestock production, food processing and marketing. In terms of formal labour, agriculture is the largest sector of employment for both women and men. Around a third of all working women and men are employed in agriculture, according to the statistics<sup>102</sup>. It must be noted that the share of women employed in agriculture has increased considerably in recent years. While women's share in the agriculture (including forestry and fisheries) was about 40% during the decade leading to 2012, it increased to 44.5% in 2014<sup>103</sup>. This may have been caused by the tendency of male labour's increased entrance into other sectors and their out migration. It could be also possible that this reflects women's limited employment opportunities in other sectors.

19. Employment patterns between women and men in agriculture differ. Women are more likely to be self-employed, while men are more often engaged as hired (contracted) workers. According to the NSC data, 73.9% of all self-employed women worked in agriculture in 2014, compared to 58.4% of all self-employed men<sup>104</sup>.

20. Women's equal rights to properties, including agricultural land, are legally protected. The Land Code (1999) and Law on Introduction of Land Code of the Kyrgyz Republic (#46, 1999) are the main documents regulating land relations and establishing the grounds for the commencement, procedure for the exercise and termination of land titles. The Law on Agricultural Land Management (2006) enable women to 'obtain and register individual rights to land shares by dividing land plots in plots into individual parcels for independent management and transactions'<sup>105</sup>. The law recognizes men's and women's equal right to inherit land. Only 3 percent of rural women have sole ownership of land, whereas there are about 22 percent of rural men who own land. About 60 percent of rural women do not own any land<sup>106</sup>.

21. Researchers and development practitioners argue, however, that exercising such rights is a

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<sup>96</sup> International Federation for Human Rights, *Women and children from Kyrgyzstan affected by migration: An exacerbated vulnerability*, 2016.

<sup>97</sup> Data from the Russian Federal Migration Service, quoted in FAO (2016). Total number of Kyrgyz citizen among the official migrants was 574,194, of whom 351,121 (61.2%) were men.

<sup>98</sup> NSC data quoted in FAO (2016).

<sup>99</sup> Data from *A Needs Assessment of Women Migrant Workers: Central Asia and Russia*, UN Women, 2009, cited in FAO (2016).

<sup>100</sup> Muldoon and Casabonne (2017).

<sup>101</sup> Ibid.

<sup>102</sup> NSC data from 2015 cited in FAO (2016).

<sup>103</sup> Ibid.

<sup>104</sup> Ibid.

<sup>105</sup> FAO (2016), page 9.

<sup>106</sup> EuroPlus Consulting & Management Helen Dubok Dilbar Turakhanova. 2018 (p. 39). Gender Study for Central Asia. [https://eeas.europa.eu/sites/eeas/files/kyrgyzstan\\_final\\_report\\_09.01.2018\\_approved\\_workshop\\_final.pdf](https://eeas.europa.eu/sites/eeas/files/kyrgyzstan_final_report_09.01.2018_approved_workshop_final.pdf)

challenge for women due to the prevailing notion that males are natural heads of the household. Land is usually registered under husband's name. According to a 2011 country assessment of access to land, the formal law in Kyrgyzstan 'has not in most cases been successful in protecting and improving women's rights, including rights to access and own land'<sup>107</sup>. For example, although women who leave her birth families to marry have the right to sell her land shares to the families, they seldom do so because such a demand is seen as shameful<sup>108</sup>. Women who are divorcing have similar challenges in claiming their land shares. It is pointed out that young wives, ex-wives, daughters-in-law and widows are 'least likely to challenge patriarchal traditions about property rights'<sup>109</sup>.

22. A Livelihood Study conducted during the project preparation organized focus group discussions in the project area, including those with women. The results revealed that women and women's groups are not considered as separate groups that have special needs, for which special approach is required. A major difficulty that women in the project area face is stereotypes and traditional rights that limit the participation of women in the management of natural resources. In communities, the public role of women is reduced to solving the problems of benefits and pensions, or to resolving social issues related to the upbringing of children and motherhood. Often women are not informed about meetings held on pasture and forest issues, so their interests are not taken into account.

23. In spite of this, the participants of the discussion note that in recent years there has been opportunities for women and women's groups in solving various issues related to natural resources. Despite the fact that there are no women in the forestry and pasture committee, especially in the management body, women's committees often became involved in the discussion of problems in the use and management of natural resources.

24. **Livestock.** Women's engagement in animal husbandry is significant. Women are particularly active in raising young animals, milking, and preparation and sales of dairy products. Women in households which graze animals in distant pastures during summer would travel with the husbands and children, maintain seasonal home in the pasture and carry out domestic tasks in addition to their responsibility in animal raising and other economic and livelihood activities of the family<sup>110</sup>. However, women's participation in the livestock sector is considered secondary to males' under social norms prevailing in rural areas which label livestock production primarily a male-led activity. Official data on individual ownership of livestock are unavailable. Studies found that FHHs are less likely to own livestock (41%) than male-headed households (56%), but there is no significant difference in terms of the number of livestock owned by each type of household<sup>111</sup>.

25. Women's involvement in pasture management is also limited. A recent study on gender and pasture management points out that traditionally women's rights to pastures are secured through their male kin members - husbands or, if the family is headed by a woman, her male relative<sup>112</sup>. Women's representation in the executive committees (Pasture Committees or PCs) of Pasture Users Unions (PUUs) is very low. Of 454 PUUs in total in 2016, only 11 (2.4%) had PCs chaired by a woman<sup>113</sup>. The aforementioned study argues that PUUs' investment tends to reflect more of men's priorities, which are related to overseeing of the grazing animals, and focuses on infrastructure, such as roads and bridges. On the other hand, services and goods prioritized by women during the families' stay at the pasture land, such as electricity, drinking water, child support and health care are often lacking.

26. **Forestry.** The National Action Plan on Forestry Development for 2006 to 2010<sup>114</sup> addressed gender and included a task to improve gender policy including employment of women in *leskhoz*es (Forest Enterprises or FEs), but due to weak implementation of the action plan, gender-related goal (goal 2.4) were not achieved. It is important to mention that even though National Action Plan on Forestry Development for 2006 to 2010 did not achieve its gender-related goals and AE can use this case as an opportunity to learn in order to assist the project to contribute to improving the implementation of its action plan and including this in the project-level gender action plan of the project. First of all, the National Action Plan on Forestry Development failed because it this sector is poorly

<sup>107</sup> USAID, *Property Rights and Resource Governance: Kyrgyzstan*, 2011.

<sup>108</sup> Ibid.

<sup>109</sup> Ibid., page 32.

<sup>110</sup> A recent FAO assessment indicates a tendency that women are increasingly staying behind because far-away pastures because of danger, lack of services and poor infrastructure (Gender equity and pasture management assessment: Technical report under the project TCP/KYR/3503, 2015).

<sup>111</sup> FAO (2016).

<sup>112</sup> Scalise, E. and Undeland, A., *Gender and Kyrgyz Community Pasture Management: a Case Study*, Paper prepared for presentation at the 2016 World Bank Conference on Land and Poverty, 2016.

<sup>113</sup> FAO (2016).

<sup>114</sup> National Action Plan on Forestry of the KR 2006-2010. Available at <http://cbd.minjust.gov.kg/act/view/ru-ru/57841>

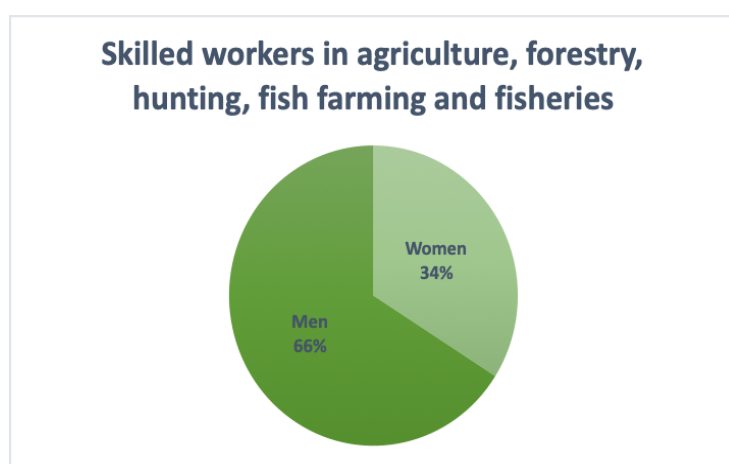
funded, where forestry specialists have low wages and that fact does not attract youth and women. Secondly, the responsibilities for the implementation of gender-responsive policies was laid on international projects (not specified) solely, without the involvement of the state and community (lack of a sense of ownership, responsibility, and accountability). Third reason is that the document does not provide clear mechanisms and tools. Fourth reason, lack of monitoring and control over the implementation of the gender-related activities. To tackle this issue of project allocates special budget line for the Gender and Social Inclusion Plan, assigns clear responsibilities in ToRs of EG and PIU staff, it also works in close partnership and cooperation with state representative Ministry of Agriculture, Food Industry and Melioration (MAFIM) and its relevant departments, State Agency for Environment Protection and Forestry (SAEPF), local councils, communities who support the project and help in planning, monitoring and implementation phases.

27. Studies found typical leaseholders of forest lands are older males, and women and young men have limited access to such arrangements. Young women, in particular, are constrained to accessing pertinent information, as well as participating in meetings organized by EFs or community authorities 'due to their domestic responsibilities and also gender stereotypes about women's role in resource allocation and management'<sup>115</sup>. Another gender bias was identified in collaborative forest management, which was designed to provide communities with rights to use and manage the forests for income generation, according to a study<sup>116</sup>. The model did not work due to several factors, such as small plot size and labour requirements. It is noteworthy that FHHs and poor households were not given opportunities to participate in the scheme because they were seen to be incapable of handling labour requirements or lacking sufficient resources to carry out the works.

28. Non-timber forest products (NTFPs) are important sources of income and household consumption among families living near the forest land, particularly for FHHs and poor households. FHHs gather firewood, make hay and pick fruit for consumption, but collect nuts to sell<sup>117</sup>. According to Undeland (2012), many women access forest land and resources without any agreement or only with informal agreements. Poor families and women who do not have other means to access forest resources are allowed by lessees to collect leftover nuts and fruits for free under a system called *mashak*.

29. In order to visualize the gender gaps in agricultural sector, three figures are presenting recent sex-disaggregated data on misbalanced representation of women and men in the Kyrgyz Republic. (Figure 1, Figure 2, Figure 3)<sup>118</sup>.

*Figure 1. Skilled workers within agricultural sector (disaggregated by gender)*



*Figure 2. Employment status in agriculture sector.*

<sup>115</sup> Biodiversity International, *How gender-specific knowledge is inspiring change in Kyrgyzstan's walnut forests*, 2014, quoted in FAO (2016).

<sup>116</sup> Undeland, A., *Development Potential of Forests in the Kyrgyz Republic*, PROFOR, 2012.

<sup>117</sup> Ibid.

<sup>118</sup> The National Statistics Committee. *Women and Men in the KR 2013-2017*

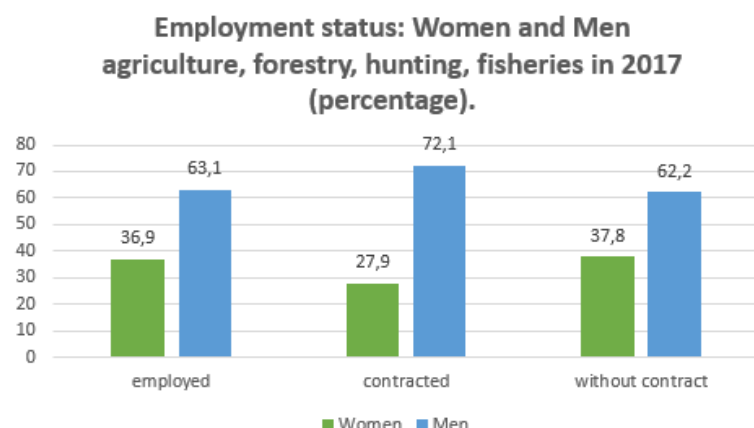
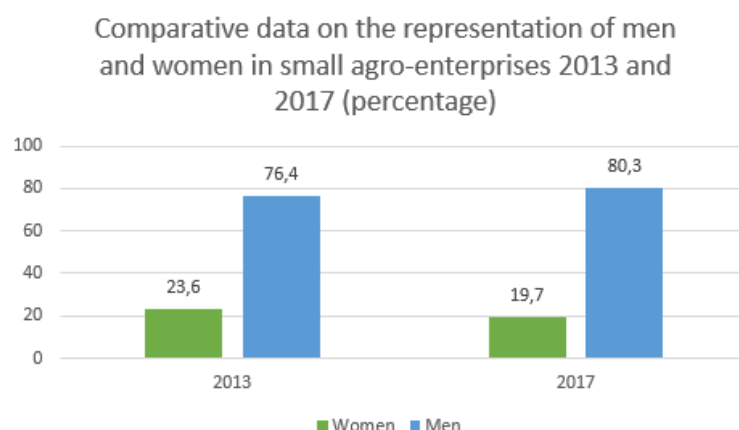


Figure 3. Comparative diagram: representation of women and men in small agro-enterprises 2013-2017.



## Gender Dimensions in Climate Change

30. It is argued that, generally speaking, women are disproportionately affected by impacts of climate change and related weather events due to the existing discriminatory norms and practices that impede equal access to land, water and other productive assets for livelihoods. According to a recent WHO report, natural disasters, such as droughts, floods and storms, kill more women than men. The report also points out that gender-gap effects on life expectancy tend to be higher in severer disasters; and climate-sensitive health impacts, such as undernutrition and malaria, show important gender differences<sup>119</sup>.

31. Women's unequal participation in the decision making processes also constraints engendering of the planning and implementation of climate-related interventions<sup>120</sup>. In the meantime women actively participate in the resilience and mitigation actions by contributing to resilience building and livelihood improvements, such as climate smart agriculture<sup>121</sup>.

32. A 2013 publication on gender and climate change in Kyrgyzstan points out a substantial institutional gap between the climate and gender discourses, and a subsequent lack of gender mainstreaming in climate programmes in the country<sup>122</sup>. The report warns that '[l]ack of gender

<sup>119</sup> WHO, *Gender, Climate Change and Health*, 2014.

<sup>120</sup> UNFCCC, Gender and Climate Change ([http://unfccc.int/gender\\_and\\_climate\\_change/items/7516.php](http://unfccc.int/gender_and_climate_change/items/7516.php)), accessed in March 2018.

<sup>121</sup> Green Climate Fund and UN Women, *Mainstreaming Gender in Green Climate Fund Projects: A practical manual to support the integration of gender equality in climate change interventions and climate finance*, 2017.

<sup>122</sup> Korotenko V.A. (ed.), *Gender Environment and Climate Change*, UNDP, UN Women and BIOM, 2013.

analysis of climate change effects and other aspects of the ecological crisis leads to a lack of a clear picture of the distribution of risks for different social groups', reducing the effectiveness of the climate programmes<sup>123</sup>. Misbalanced gender-representation is common at local level institutions, such as local councils, village administration, Water Users Associations (WUAs) and the aforementioned Pasture Committees (PCs)<sup>124</sup>. Reduction of vital natural resources as a result of climate change can fuel conflicts, which could lead to further exclusion of women and the poor. In addition, depletion and quality degradation of drinking water could increase water-related illnesses, which in turn will increase the labour of women and reduces their income earning opportunities.

33. The aforementioned Livelihood Study found that women put secure access to water – both in pasture and farm land – as the high priority action for climate change mitigation.

## Youth

34. Kyrgyzstan is a young country with nearly 50% of its total population in Kyrgyzstan under the age of 25. Youth (aged between 15 and 29) account for 27%<sup>125</sup>. According to an ILO survey, Kyrgyzstan has the highest youth labour underutilization rate (55.3%) among six countries in the region<sup>126</sup>. Female youth labor underutilization rate is higher (59.6%) than that of male (50.5%). Informal employment rate of the youth is highest in the region (79.5%), and as many as 46.6% of young workers in the country are engaged in the agricultural sector – with higher shares among young women than young men. The majority share of young workers (41.9%) is engaged without pay in a family establishment or farm. What the study reveals is a picture of typical Kyrgyz rural youth working on family farm as informal labour force with little prospect for career and income growth. This would create pressure for migration out of rural areas.

35. It must be noted that the district consultation meetings organized as part of the project's stakeholder engagement recognized needs for special actions to promote youth participation, which included ensuring their access to the project information, involvement in the community level natural resource management planning process, and support to business start-up.

## Stakeholder Engagement

36. Stakeholder engagement is a process that must be undertaken during the project formulation as well

as throughout the project implementation phases. During project formulation phase this process took place during five project design missions that were held in Kyrgyzstan from March 2017 – April 2018. Different formats for stakeholder engagement process (workshops, meetings, structured consultations) were used and consultations carried out to date included wide-range of stakeholders (national-level institutions, local government representatives, NGOs, CSOs, donors, private sector). The main objectives of these events were to brief participants on the Green Climate Fund, review climate change impact and trends in the country, identify gaps and lessons learned, and set priorities for the formulation of a proposal to the Green Climate Fund. At one of such events, at the National Facilitation Workshop on Green Climate Fund Project Formulation that was held in Bishkek on March 28-29, 2017 the State Agency on Environmental Protection and Forestry (SAEPF) under the Government of the Kyrgyz Republic (KR) jointly with the Food and Agriculture Organization (FAO) of the United Nations when

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<sup>123</sup> Ibid., page 67.

<sup>124</sup> Two large and vital associations in the agricultural sector Water User's Associations (WUAs) and Pasture User's Association (PUAs) play crucial role increasing opportunities and gaining access to resources. Within 486 WUAs there are only 11 percent of women working in the leadership positions. There are only 4 pasture committees which are chaired by women out of 454 PCs.

<sup>125</sup> 2017 data, NSC.

<sup>126</sup> Elder, S., et al, *Labour market transitions of young women and men in Eastern Europe and Central Asia*, ILO, 2015. The data in the report were derived from School-to-work transitions survey (SWTS) carried out in six countries (Armenia, Kyrgyzstan, Republic of Moldova, Russian Federation, the former Yugoslav Republic of Macedonia and Ukraine). Kyrgyz data is from 2013. Youth labor underutilization is defined as 'the sum of shares of youth in irregular employment, unemployed (relaxed definition) and youth neither in the labour force nor in education/training (inactive non-students) as a percentage of the youth population'.

working on preparation of a project proposal for the GCF identified gender gaps and actions to fulfill the gaps<sup>127</sup>:

### **Gender gaps**

- Management of households by women from vulnerable groups of the population.
- Lack of women on senior positions.
- Lack of gender statistics.
- Misbalance in the profiles of specialists and in public authorities.
- Gender stereotypes.
- Misbalance of profile specialties (forestry faculty and other specialties).

### **Actions (approaches) to fulfill the gaps**

- Capacity building of specialists, Evidence-based training, Program monitoring and evaluation.
- Work with decision-makers (parliament, ministries).
- Improvement of public-private partnerships; Attraction of investments in agriculture.
- Data collection (Data disaggregated by sex) methodology.
- Involvement of women in production in greenhouses, nurseries, etc.
- Strengthening of the value chains for processing products.
- The quota for female entrants in environmental specialties (forestry faculty, etc.).

Based on work of the second day, it was decided to include the results of the working groups in the project proposal for the Green Climate Fund.

37. At the district-level consultations participants suggested including members of women council or female representatives should be members of the Community Landscape Management Group (CLMG). One of the groups stressed that at least 30% of the membership should be women<sup>128</sup>. Moreover, it is important to emphasize that at the district level consultations there was a gender misbalance that is quite representative and illustrates the gender misbalanced situation within the country - out of about 120 participants of the district-level consultations, women constituted only about 10%. Gender gap is formed as it was highlighted in the previous paragraph is strongly related to gender stereotypes that leads to misbalance in the positions of socialists and in decision-making positions (very low level of women's involvement in such sectors as pastures, forestry, WUAs, PUUs, local self-government bodies, village councils and etc.). Taking into consideration the cultural and structural gender-related inequalities, it is necessary for the project to target vulnerable and underrepresented groups such as women, especially, female-headed households, unemployed, youth.

### **Target Area**

38. Vulnerability to climate change was the most important parameter for the target area selection. The design team collected a large number of data sets at national and sub-national scale and using the Earth Map tool, performed a series of vulnerability analysis to identify project's core target areas<sup>129</sup>. Target areas have been selected according to the following criteria:

- a. Exposure of ecosystems and communities to natural hazards triggered by climate change;
- b. Vulnerability of ecosystems and communities to climate change;
- c. Mitigation potential in terms of forest and pasture rehabilitation;
- d. High dependency of communities from natural resource exploitation; and
- e. Socio-economic vulnerability of communities.

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<sup>127</sup> CS-FOR Stakeholder Engagement.

<sup>128</sup> CS-FOR Stakeholder Engagement.

<sup>129</sup> Data and analysis that allowed the identification of the proposed target areas were organized in form of an atlas that presents the rationale behind areas' selection and that form the main part of the baseline in terms of distribution, density, status and vulnerability of target ecosystems (forests and pastures) and communities. The atlas presents key information such as climate variables, including trends, demography, agriculture productivity, infrastructures' distribution, pasture user associations grazing areas, forest fund lands and others. The ensemble of presented data constitutes the context generating the assessed needs as well as the context into which the validity of the paradigm shift will be objectively demonstrated. The atlas will include also available historical data so to create, in GE, time series analysis as well as interactive videos.



39. The core intervention area of the CS-FOR project will be located in selected rural municipalities (ayil aymak) in four contiguous districts of Ak-Talaa, Toguz-Toro, Suzak and Uzgen. . *Ayil aymaks* are local self-government units, comprising the administrative body (*ayil okmotu*) and the council of elected members (*ayil kenesh*, those are represented only by 8%). Each rural municipality has several villages. Suzak and Uzgen have a fairly large ethnic Uzbek population (34.6% of the total district population in Suzak; 22.2% in Uzgen), as well as small percentages of Turkish (1.9% in Suzak; 3.1% in Uzgen). Uzbek households in Suzak and Uzgen are found in rural villages and engaged in agricultural activities.

40. **Livelihoods.** Rural households in the target area have several sources of income, most important of which are livestock production and crop farming. According to a Livelihood Study conducted during the project preparation<sup>130</sup>, households in the project area have about 1.0 – 1.5 ha of own agricultural land<sup>131</sup>. Among the households with irrigated agricultural land, those in Ak-Talaa have smallest plots (0.7 ha) compared to the three other districts which have 1.5 ha (Uzgen) and 1.2 ha (Suzak and Toguz Toro)<sup>132</sup>. Most of the households have homestead garden (often called ‘kitchen garden’) in the size of 0.15 – 0.17 ha, where vegetables are typically grown for household consumption. The size of leased forest land in among the households in the project area is 5.0 ha<sup>133</sup>. Two thirds of the households who lease forest land have long-term (49 years) lease agreements, while and 27.8% have annual contracts.

41. Livestock owning households have on average 3 – 4 cattle and about 20 sheep<sup>134</sup>. Among the households who graze animals on pasture, 65.6% said they send their animals to distant pastures under State Land Fund (SLF) during summer in contrast to 11.1% who answered that their animals graze in State Forest Fund (SFF)<sup>135</sup>. A great majority of the livestock owners who send their animals to summer pastures (74.0%) rely on shepherds, while 15.2% answered they graze animals by themselves.

42. Results of focus group discussions (FGDs) in the Livelihood Study revealed that forest resources are popularly used in the Suzak and Uzgen districts as the main source or an additional source of income<sup>136</sup>. The use of forest resources in comparison with the management of agriculture is of greater interest to the residents of these districts and constitutes an important part of their income, especially for women. Collecting such forest resources as nuts, apples, mushrooms and wild rose brings a significant income as residents of these districts have access to the markets of large cities such as Osh, Jalalabad, Uzgen. Participants in the FGDs noted that residents invest income from the sale of forest products to purchase livestock. In Ak-Talaa and Toguz Toro districts, on the contrary, there are less users of forest resources because there are fewer forests and types and volumes of non-wood resources that generate income are limited. Marketing channels for products are also limited.

43. **Vulnerability.** The aforementioned Livelihood Study categorised the surveyed households by the economic activity on which the household’s welfare depends (livestock production, crop farming, forest resource use, beekeeping, off-farm commercial activities, and employment in the public sector). In addition, qualitative information was obtained through interviews and focus group discussions. The results indicates that households whose welfare depends on the use of forest resources are vulnerable to climate change as forest ecosystems are subject to negative effects of natural disasters. Meanwhile analysis of the household data found a relatively higher percentage of vulnerable households (households with low income and limited savings and assets) in both livestock and farming households. Those households that receive seasonal income are particularly at risk. Less vulnerable households are those in which at least one member of the family has is formally employed or those with additional income from businesses.

44. **Disadvantaged groups.** The same study found that unemployed people (both women and

<sup>130</sup> Livelihood Study for CS-FOR collected data from 907 households, 600 of which were in the project area (Ak-Talaa, Toguz-Toro, Uzgen and Suzak districts). In addition, qualitative information was obtained through interviews and focus group discussions (FGDs). Separate FGDs were organized for women.

<sup>131</sup> The figures are based on median values of those with own agricultural land, disaggregated at district level.

<sup>132</sup> Median values.

<sup>133</sup> Median value. Only 8.9% of the total sample use forest land through leasing arrangement.

<sup>134</sup> Average values. Medians are not available.

<sup>135</sup> Of the total sample. No figures for the project area are not available. SLF pastures are managed by Pasture Users Unions (PUUs) at ayil aymak level, whereas SFF pasture is under forest enterprises (leskhoz).

<sup>136</sup> The study conducted 12 FGDs, in which a total of 197 people participated, including 66 women in FGD for women.

men), low-income families, single-parent households (both headed by women and men), and young families are in disadvantaged position in the rural communities due to their weak social and economic standing. It was highlighted that such disadvantaged groups may further weaken their social and economic situation if their access to natural resources decreases or natural disasters intensify.

## Target Groups

45. The primary target group of the CS-FOR are all the *de facto* users (both women and men) of pasture and forest resources (both formal and informal) in the target area of the four districts where interventions will be undertaken. Special attention will be paid to ensure inclusion and informed participation of poor families, women and young women and men (for specific project actions to ensure their inclusion and participation, see the next section: Gender and Social Inclusion Action Plan<sup>137</sup>). It is estimated that about 90,000 rural families in the target area will directly benefit from the project as the primary target group.

46. In addition, the project will benefit the following categories of people:

- i. **Institutions at national level:** the State Agency for Environmental Protection and Forestry (SAEPF), the Ministry of Agriculture, Food Industry and Melioration (MAFIM), the Ministry of Emergency Situations (MES), the Agency for Local Self Government and Interethnic Relations (ALSGIR), the Climate Finance Center (CFC), the Ministry of Economy (ME), the Ministry of Culture, Information and Tourism (MoCIT), various research and educational institutions and NGOs, with the focus on those, specializing in rural women's empowerment. **Institutions at local level:** Leskhozoes (Forest Enterprises), National Parks, self-government bodies (*ayyl okmutu* and *aiyl kenesh*), women's councils, Pasture Users' Unions and other natural resource users groups.
- ii. **Agribusinesses and their raw material suppliers** participating in the project supported value chains.

47. Direct beneficiaries of the project include 432,450 individuals (7% of the country's population) of which 246,497 are women in the Project Area. By reducing the exposure of rural communities to natural disasters such as landslides, mudslides and floods, the project will also include 540,563 (8% of the country's population) individuals of which 380,121 are women, as indirect beneficiaries in the Project Area, who will benefit from the significant increase of forest coverage and rangeland rehabilitation in hotspots with high risks of hazards.

48. Due to structural, cultural and system-wide barriers women from various groups (rural and urban women, religious women, ethnic minorities, young rural women and women from transboundary communities and other) face multiple discrimination in decision-making and resource allocation at the community and family levels<sup>138</sup>. The main barriers that women face are related to time poverty<sup>139</sup>, lack of family/public support, extreme economic constraints (poverty, economic marginalization, lack of differentiated access to/control over financial resources), lack of experience in politics, business, unequal distribution of labor between women and men<sup>140</sup>, misbalance/lack of women of profile specialties and senior positions<sup>141</sup>.

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<sup>137</sup> At the onset of the project implementation, the project's Expertise Group, under the overall responsibility of Gender and Social Development Specialist, will organize a workshop to validate the proposed Gender and Social Inclusion Action Plan and sensitize key stakeholders.

<sup>138</sup> Beijing +25: National-Level Review of the Kyrgyz Republic on the Implementation of the Beijing Declaration and Beijing Platform for Action. Progress and Challenges. 2019

<sup>139</sup> Case Study on combating gender inequality in political participation in Kyrgyzstan. UNDP (2016). Regional Human Development Report. Progress at Risk: Inequalities and Human Development in Eastern Europe, Turkey, and Central Asia - "survey on time budgeting conducted in 2015 showed that the most burdened with domestic work were women living in rural areas, who spent roughly 303 minutes per day on housework. Women living in rural areas spend 1.5 times more time on housework than women in urban areas (197 minutes per day). Men from urban areas (59 minutes per day) and rural areas (87 minutes per day) spent 3.5 times less time on domestic work than rural women did". P.7  
[https://www.undp.org/content/dam/kyrgyzstan/Publications/gender/Case%20study\\_Eng10Oct2016.pdf](https://www.undp.org/content/dam/kyrgyzstan/Publications/gender/Case%20study_Eng10Oct2016.pdf)

<sup>140</sup> Beijing +25: National Level Review of the Kyrgyz Republic on the Implementation of the Beijing Declaration and Beijing Platform for Action. Progress and Challenges. 2019

<sup>141</sup> CS-FOR Stakeholder Engagement. National Facilitation Workshop on Green Climate Fund Project Formulation on March 28-29, 2017 in Bishkek.

## Gender Strategy

49. CS-FOR, while promoting positive shifts in the natural resource management through policy instruments, capacity building and investments for restoration on the ground, presents a major opportunity to mainstream gender empower women and eliminate, where possible, gender stereotypes and patriarchal attitudes in the forestry and livestock sectors whereby gender equality and women's rights have had faced a number of challenges. The gender strategy of CS-FOR is informed by Gender Assessment (Section B) and recognises that rural women in Kyrgyzstan play a key role in the natural resource management, and that they have a high stake in both climate change adaptation and mitigation measures. It also reflects the understanding that women's equal participation and as active actors and agents of change in the project needs to be facilitated through a set of specific measures, including those, related to leadership and decision-making skills. The gender strategy of CS-FOR therefore aims to use every possible opportunity in the project actions to advance towards gender equality and women's rights.

50. The gender strategy is also framed by the FAO Policy on Gender Equality<sup>142</sup>, the FAO Environmental and Social Management Standards<sup>143</sup> and the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security<sup>144</sup>.

51. Underlying principles and key features of the gender strategy of CS-FOR are as follows:

- women will equally participate in the project implementation at all levels and benefit from its opportunities; for this, pro-active measures will be taken to address existing burdens that could limit women's opportunities to benefit from the project, and where considered necessary a minimum of women's quorums will be set;
- the project, through the inclusive participation of stakeholders will support the strengthening of a national policy on gender equality, in collaboration with MLSD, targeting such areas as livelihood adaptation, natural resource management and disaster prevention and warning
- project will target female headed households and women to support the opportunities to participate at decision-making levels: in the executive committees (Pasture Committees or PCs) of Pasture Users Unions (PUUs)
- women's informed engagement in decision making processes on related matters (e.g. livelihood adaptation, natural resource management and disaster prevention and warning) – both at community and household levels – will be facilitated;
- opportunities for women's social and economic empowerment, as well as their leadership and decision-making opportunities, will be identified and supported
- needs for women's capacity enhancement on relevant topics will be addressed and acted upon, and all trainings will take gender issues into consideration in the modules, selection of participants, communication and mobilization channels, selection of venues and logistical issues (including transportation needs, timing, baby-sitting services, etc); Needs assessment will be part of the M&E system to collected data on a systematic basis.
- all project stakeholders will be sensitized and trained on the importance of gender mainstreaming under the project and of specific GAP actions;
- gender equality and mainstreaming are adequately introduced to the target communities, project staff and other stakeholders; all communication materials and project messages address gender aspects and use gender-sensitive languages;

<sup>142</sup> FAO (2012) *FAO Policy on gender equality. Attaining food security goals in agriculture and rural development*. (Available at: <http://www.fao.org/docrep/017/i3205e/i3205e.pdf>)

<sup>143</sup> FAO (2015) *Environmental and social management guidelines*. (Available at: <http://www.fao.org/3/a-i4413e.pdf>)

<sup>144</sup> CFS and FAO (2012) *Voluntary guidelines on the responsible governance of tenure of land, fisheries and forests in the context of national food security*. (Available at: [http://rs.one.un.org/content/dam/unct/serbia/docs/Publications/Recovery\\_Needs\\_Assessment.pdf](http://rs.one.un.org/content/dam/unct/serbia/docs/Publications/Recovery_Needs_Assessment.pdf))

- staff in the project unit (Expertise Group) will include a qualified personnel (Gender and Social Development Specialist) who oversees gender mainstreaming in the project and GAP implementation; and
- knowledge management of the project mainstreams gender, and the project will monitor and evaluate gender-differentiated outputs and outcomes through sex-disaggregated M&E indicators and other tools.

52. **Inclusion of the poor, youth and other disadvantaged groups.** The Livelihood Study and stakeholder consultations informed that certain groups in the rural community are socially disadvantaged, particularly poor families, single-headed households (both headed by women and men), and youth, due to their weak social and economic standings<sup>145</sup>. The project therefore incorporate special actions to ensure their equal participation in the project. For youth, in addition to ensuring their equal access to project information and benefits, particular attention will be paid to promote their engagement in business opportunities in the project supported value chains by proactively including them in business related capacity building activities.

53. Similar to the gender strategy above, the project will raise awareness among stakeholders on the risks of potential exclusion of the disadvantaged groups and importance of inclusive approach, and ensure their informed participation through a set of specific actions. The project manager will take the full responsibility to ensure gender mainstreaming and social inclusion of the project as per FAO standards. All members of the project team will be held accountable for gender mainstreaming and social inclusion, and will be technically assisted by the Gender and Social Development Specialist (part of the PMU).

### Gender and Social Inclusion Action Plan (GAP)

54. A Gender and Social Inclusion Action Plan (GAP) was prepared to implement the gender strategy and to ensure inclusion of disadvantaged groups (poor families, single-headed households and youth). Table below presents specific actions in each project component with indicative budget as envisaged at the proposal stage. Minimum 30 percent was set as a target in accordance with the FAO's operational work and budget at the country and regional levels is allocated to women-specific targeted interventions.<sup>146</sup> Female-headed households, unemployed, youth, disabled groups will be prioritized as a vulnerable groups to be targeted in the project activities. All trainings will have post-training evaluation questionnaires to track the usefulness of the trainings. Gender assessment and monitoring will help to track how the skills are being adopted that were acquired in trainings, how knowledge and equipment was used by women to improve their businesses.

55. The budget for the Gender and Social Inclusion Action Plan (GAP) was calculated according to the underlying principles:

- a. For activities related to capacity development / training / awareness campaigns: 30% of the budget is considered gender sensitive. This is related to the project target of women inclusion in such kind of activities.
- b. For activities involving policy dialogue / regulatory framework: 50% of the budget is considered gender sensitive. This is due to the estimates on beneficiaries of project interventions.
- c. For activities involving investment in rangeland and forestry (comp 2 – excluding training): 50% of the budget is considered gender sensitive. This is due to the estimates on beneficiaries of project interventions.
- d. For activities related to investment in climate sensitive value chains (comp 3 – excluding training): 10% of the budget is considered gender sensitive, considering the estimated potential outreach of the project.

56. On the basis of the final GAP, the Gender and Social Development Specialist each year prepares an annual work plan and budget of GAP for submission to the Project Director.

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<sup>145</sup> Stakeholder consultation meeting for Uzgen and Suzak districts invited Uzbek community leaders.

<sup>146</sup> FAO. 2012. Minimum standards for Women Targeted Interventions. FAO Policy on Gender Equality.

57. The GAP is in line with the overall project implementation plan and timeline, thus all activities are incorporated into the relevant components of the project.

58. Capacity development activities will be carried out not only by providing trainings for beneficiaries (both women and men) but also ensuring access of women and female headed households to decision-making processes, such as securing quotas (at least 30%) for memberships in CLMGs, close collaboration with and promotion of gender sensitization among the local government and core district-level institutions (PUUs, WUAs) responsible for the management of access to natural resources (water, pastures, land and other resources). The project will ensure a specific approach for women when partnering with financial institutions and working on financial education of women entrepreneurs, supporting the latter one VCD. Through these activities it is anticipated to work on sustainability of the project interventions.

**Table 1: Outline of Proposed Gender and Social Inclusion Action Plan**

Component/ Output	Activities	Indicators and Targets	Timeline	Responsibilities for the implementation	Cost estimate (US\$)
<b>Component 1/ Output 1.1. Evidence based natural resources management governance is strengthened across stakeholders</b>	Activity 1.1.1 Prepare communication material and organize information awareness campaigns to mobilize national stakeholders	Community awareness raising campaigns and communication materials in Kyrgyz and Russian languages introduced in line with the developed Gender equality and social inclusion mainstreaming communication strategy. Undertake gender awareness events among the project staff and relevant partners (at local and national levels) involved in the implementation at least once per year. Gender-responsive mobilization and communication channels will be developed to reach both women and men, including vulnerable groups (such as female-headed households, low income families, unemployed). <b>Baseline:</b> 0 <b>Target:</b> - 100% of developed communication materials and campaigns are gender-sensitive, in line with communication strategy. - At least 4 awareness campaigns on management of natural resources conducted in 4 project districts (with 540,563 residents) are women and youth targeted per year. - 100% of project staff and local and national partners have participated at gender awareness events - # of direct and indirect beneficiaries TBD during inception phase, based on baseline survey with mandatory 30% quotas for women and youth	By end of Project year 8	FAO (as Executing Entity), led by: Communications specialist, in close collaboration with The Gender and Social Expert	49 515 (30%)
	Activity 1.1.2 Organize fora/ international conferences meetings to sensitize the stakeholders	Gender-related issues discussed at the fora/international conferences, meetings with developed and translated short films, social advertisement and other means in the mass media screened for gender sensitive content. Number of women and men, including vulnerable groups (such as female-headed households, low income families, unemployed engaged in the fora/international conferences, meetings, <b>Baseline:</b> 0 <b>Target:</b> - 100% of developed and translated short films, social advertisement and other means in the mass media are screened for gender sensitive content; # of direct and indirect beneficiaries TBD during inception phase, based on baseline survey with mandatory 30% quotas for women and youth - At least 10 gender-related issues are discussed at the fora international conferences	By end of Project year 8	FAO (as Executing Entity), led by: Capacity development specialist, in close collaboration with The Gender and Social Expert	170 460 (30%)
	Activity 1.1.3 Training sessions/ workshops on forest and rangeland tenure arrangements, policy making, management of natural resources	Gender mainstreaming is ensured in session/workshop materials, including trainings. Number of individuals who took part in the sessions/workshops (data disaggregated by sex, region, age group, training topic) <b>Baseline:</b> 0 <b>Target:</b> - Number of women and men, including vulnerable groups (such as female-headed households, low income families, unemployed) trained, with mandatory 30% quota (data disaggregated by sex, region, age group, training topic).	By end of Project year 8	FAO (as Executing Entity), led by: The M&E and Planning team leader, in close collaboration with The Gender and Social Expert	202 940 (30%)



Component/ Output	Activities	Indicators and Targets	Timeline	Responsibilities for the implementation	Cost estimate (US\$)
		<ul style="list-style-type: none"> <li>- # of women TBD during inception phase, including based on baseline survey.</li> <li>- gender mainstreamed in all session/workshop materials and 20% of training time devoted to what kind of measures/arrangements could improve women's and youth lives and how and why.</li> </ul>			
	Activity 1.1.4 Propose recommendations for enforcement of sustainable management and use of forest- rangeland ecosystems through participatory process (Dialogues / workshops / meetings)	<p>Stocktaking tasks (legal and policy review and analysis) integrate gender analysis targeting the assessments of women's needs, access to national resources and consultations are conducted with diverse community groups in 4 project districts (during the inception phase, mid-term assessment, final assessment)</p> <p><b>Baseline:</b> 0</p> <p><b>Target:</b></p> <ul style="list-style-type: none"> <li>- Final report with specific recommendations in the area of gender and sustainable management, forest-rangeland ecosystems, biodiversity, environmental resources, and livelihoods.</li> </ul>	By end of Project year 8	FAO (as Executing Entity), led by: The Gender and Social Expert	113 811 (30%)
	Activity 1.1.5 Identify approaches for national stakeholder involvement process and organize National Stakeholders Platform Policy Dialogue for the management and use of municipal forest and facilitate thematic workshops, and submit the recommendation document to the Parliament	<p>TORs of the National Platform for policy discussions and decision making are gender mainstreamed. The National Platform representatives (Government and CSO) are knowledgeable about gender and social issues on natural resource management. Contribute to the facilitation of thematic workshop with the focus on gender and social equality principles and provide recommendations with identified approaches and principles that are in line with the FAO Gender mainstreaming and human rights-based approach.</p> <p><b>Baseline:</b> 0</p> <p><b>Target:</b></p> <ul style="list-style-type: none"> <li>- Gender and social inclusion perspectives and activities taken into account in 100% of ToRs developed.</li> <li>- TORs of all EG members include gender mainstreaming.</li> <li>- At least 50% of the EG members will be women.</li> <li>- 100% of thematic workshops are conducted with consideration of gender and social issues (data disaggregated by sex, age, region, thematic topic).</li> <li>- Final document with recommendations include targeted gender-related aspects, that are line with the FAO Gender mainstreaming and human rights-based approach.</li> </ul>	By end of Project year 3	FAO (as Executing Entity), led by: Senior International Technical Adviser will have overall responsibility for preparing terms of references of technical experts, in close collaboration with The Gender and Social Expert.	266 700 (50%)
	Activity 1.2.1 Demonstrate and accompany national and local institutions in adopting the evidence-based Natural resources Planning, Monitoring and Evaluation System	<p>M&amp;E guidelines include gender-responsive standards, methodologies and modalities for the state monitoring of rangelands and forests resources to help to generate data that shows trends in the correlation between management practices and climate change mitigation and adaptation, recognizing and capturing that women and men can face differential climate change vulnerabilities, risks and impacts based on their gender and age. Trainings on introduction of the gender responsive M&amp;E guidelines are provided for the key stakeholders. Final assessment and annual monitoring provide information on how the adoption of skills acquired in trainings and how they were used.</p> <p><b>Baseline:</b> 0</p> <p><b>Target:</b></p>	By end of Project year 8	<p>FAO (as Executing Entity), led by: The M&amp;E and Planning team leader, in close collaboration with The Gender and Social Expert</p> <p>Project M&amp;E will collect and track sex-disaggregated and gender-specific</p>	351 588 (25%)

Component/ Output	Activities	Indicators and Targets	Timeline	Responsibilities for the implementation	Cost estimate (US\$)
		<ul style="list-style-type: none"> <li>- 100% of developed and approved methodologies, guidelines, materials and tools, including qualitative and quantitative data, considering gender and social inclusion aspects, including community monitoring;</li> <li>- 100% of trainings include gender and human rights standards with participants disaggregated by sex, age, region with mandatory 30% quotas for women and youth.</li> <li>- Data collected and reports are developed on the annual basis as well as final assessment is conducted on adoption of Natural Resources Planning, Monitoring and Evaluation System, with a focus on adoption of gender-sensitive approach.</li> </ul>		indicators, and corrective measures will be taken if needed during project implementation.	
	Activity 1.3.1 Mobilize communities, establish CLMGs and accompany in formulating INRMCRPs	<p>All members of Landscape Management Groups (CLMGs) trained on gender and climate change, forestry and other areas of FAO mandate. CLMG includes the representative of women's council as well as youth organization in each ayil aimak. Methodologies, guidelines and materials on the elaboration of INRMCRPs considering gender issues.</p> <p><b>Baseline:</b> 0</p> <p><b>Target:</b></p> <ul style="list-style-type: none"> <li>- At least 30% of the members should be women and youth.</li> <li>- 100% of CLMGs trained on gender issues and its links to climate change.</li> <li>- 100% of developed documents on the elaboration of INRMCRPs include gender and social aspect/component.</li> </ul>	By end of Project year 8	FAO (as Executing Entity), led by: ARIS facilitates the establishment of such groups in the four target areas, in close collaboration with The Gender and Social Expert	726 550 (50%)
2.1 Green investments for forests and rangelands rehabilitation are made available	Activity 2.1.1 Conduct training to 50 communities and institutions on technical/ legal matters on forest enrichment and afforestation/ reforestation, and provide technical/legal assistances on forestry PPP establishment	<p>Trainings will address gender and social issues and cover participants from 50 ayil aymaks (municipalities) and their communities. Training sessions will be also provided to women on leadership, decision-making and participation in local institutions with a view to supporting women's further engagement in PUUs, WUAs and other community resource user groups.</p> <p><b>Baseline:</b>0</p> <p><b>Target:</b></p> <ul style="list-style-type: none"> <li>- At least 50% of participants in 50 ayil aymaks (municipalities) took part in the gender training with mandatory 30% quotas for women and youth</li> <li>- 20% of the training time needs to address gender issues within the thematic topics covered under this Activity.</li> </ul>	By end of Project year 8	FAO (as Executing Entity), led by: The Gender and Social Expert	621 617 (30%)
	Activity 2.1.2 Provide technical assistance to the Pasture Department on climate-sensitive pasture management, assessment and monitoring, and conduct INRMCRP assessment and monitoring	<p>Gender aspects are addressed during the study tour and workshops targeting the pasture department with specific task to reinforce the gender-responsive monitoring capacities and coordinate the department's efforts in pasture management awareness and capacity development.</p> <p><b>Baseline:</b> 0</p> <p><b>Target:</b></p> <ul style="list-style-type: none"> <li>- At least 50% of all study tour and workshop participants will be women.</li> <li>- 20% of the training time needs to address gender issues within the thematic topics covered under this Activity.</li> </ul>	By end of Project year 7	FAO (as Executing Entity), led by: GIS and pasture specialists, Consultant of Pasture Management, along with the technical support of the Gender and Social Expert	252 914 (30%)
	Activity 2.1.3 Conduct training of trainers on pasture rotation and evidence-based rangeland M&E to local cadres as well as training of	<p>ToT mainstreamed both gender and social aspects and land tenure within the framework of the VGGTs.</p> <p><b>Baseline:</b> 0</p> <p><b>Target:</b></p>	By end of Project year 8	FAO (as Executing Entity), led by: The Gender and Social Expert	879 723 (30%)

Component/ Output	Activities	Indicators and Targets	Timeline	Responsibilities for the implementation	Cost estimate (US\$)
	trainers on INRMCRP management and implementation, and training sessions to the CLMGs and local stakeholders to implement INRMCRPs on rangeland management	<ul style="list-style-type: none"> <li>- 100% of TOT intervention have gender aspects.</li> <li>- At least 30% of participants will be women.</li> </ul>			
	Activity 2.1.4 Provide climate investment in restoration and improvement of forests based on INRMCRP developed, and execute afforestation/ reforestation and forest enrichment work by Leskhoz with technical assistance	<p>Community contributions to forest restoration is provided with active participation of women. 100 business cases with the establishment of relatively small-scale nurseries (100 m2) are supported.</p> <p><b>Baseline:</b> 0</p> <p><b>Target:</b></p> <ul style="list-style-type: none"> <li>- At least 30% of community contributions will be done by women.</li> <li>- At least 50% of women will be included in the establishment of small-scale nurseries.</li> </ul>	By end of Project year 8	FAO (as Executing Entity), led by: The Gender and Social Expert	5 067 403 (50%)
	Activity 2.1.5 Develop and execute INRMCRP pasture investment plans for catalyzing green investment in rangeland rehabilitation and livestock production	<p>Beneficiaries (data disaggregated by sex, age, region) receive supporting investment in pasture rehabilitation and livestock production, that are aimed at overcoming pasture degradation through the adoption of pasture rotation, training, mentoring.</p> <p><b>Baseline:</b> 0</p> <p><b>Target:</b></p> <ul style="list-style-type: none"> <li>- At least 30% of participants will be women (# of women TBD during inception phase, including based on baseline survey).</li> </ul>	By end of Project year 7	FAO (as Executing Entity), led by: The Gender and Social Expert	2 193 925 (50%)
<b>3.1 Selected value chains are climate sensitive and producers adopt carbon optimization technologies and practices</b>	<i>Activity 3.1.1. Select value chains in operation and provide technical support to the value chain actors/organizations for climate-sensitive business development</i>	<p>The value chain performance assessment is done as per FAO guiding framework Developing gender sensitive value chains (<a href="http://www.fao.org/3/a-i6462e.pdf">http://www.fao.org/3/a-i6462e.pdf</a>) and guidelines for practitioners (<a href="http://www.fao.org/documents/card/en/c/I9212EN">http://www.fao.org/documents/card/en/c/I9212EN</a>)</p> <p>Women's participation in/benefiting from the value chain is taken into consideration when selecting value chains.</p> <p>Assessment will be done using the FAO guiding framework Developing gender sensitive value chains (<a href="http://www.fao.org/3/a-i6462e.pdf">http://www.fao.org/3/a-i6462e.pdf</a>). VC development interventions will require a degree of analysis that goes beyond identification of constraints and problems, but focus instead on understanding interlinked root causes for CV underperformance, finding the solutions in the system.</p> <p><b>Baseline:</b> 0</p> <p><b>Target:</b></p> <ul style="list-style-type: none"> <li>- Final report on value chain performance assessment as per guidelines is developed.</li> </ul>	By end of Project year 8	FAO (as Executing Entity), led by: The Gender and Social Expert	803 172 (30%)

Component/ Output	Activities	Indicators and Targets	Timeline	Responsibilities for the implementation	Cost estimate (US\$)
	<i>Activity 3.1.2. Identify and mobilize operating agribusinesses in the selected value chains via information campaign and value chain mapping for climate-sensitive business practices</i>	<p>Climate-sensitive value chains are developed and upgraded as per FAO standards on gender mainstreaming. Capacity development through training provided with mandatory 30% quotas for women and youth. Information campaigns of the availability of credit lines designed to outreach women and men, including vulnerable groups (such as female-headed households) borrowers.</p> <p><b>Baseline:</b> 0 <b>Target:</b></p> <ul style="list-style-type: none"> <li>- 100% participating entrepreneurs will receive training on gender sensitization training.</li> <li>- 100% financial education modules on financial literacy developed with the project support will include gender and social aspects.</li> <li>- At least 50% of Information campaign target women and youth entrepreneurs.</li> <li>- 100% of data on training is disaggregated by sex, age, topic, region.</li> <li>- Women's share in financial education training will be 50%.</li> <li>- Share of youth in the financial education training will be 50% (among them, 50% young women and 50% young men).</li> <li>- At least 60% of the participants in trainings for raw material suppliers will be women.</li> <li>- At least 30% of the participants in trainings for entrepreneurs will be women.</li> <li>- At least 30% of the participants in trainings for entrepreneurs will be youth (50% of them must be women).</li> <li>- Reports of the partners banks including disaggregated data by sex, age, region.</li> </ul>	By end of Project year 8	FAO (as Executing Entity), led by: The Gender and Social Expert	100 718 (30%)
	<i>Activity 3.1.3. Activate special credit lines and provide loans for eligible value chain actors in communities/ entrepreneurs/ enterprises in the project-relevant value chains</i>	<p>Activated special credit lines for project-relevant value chains and entrepreneurs provide developed new products and services that are women and youth-friendly.</p> <p><b>Baseline:</b> 0 <b>Target:</b></p> <ul style="list-style-type: none"> <li>- # of developed special credit lines that are women and youth-friendly</li> </ul>	By end of Project year 6	FAO (as Executing Entity), led by: The Gender and Social Expert, in close collaboration with RKDF.	
PMC Project Management Costs		<p>TORs of key positions in the PIU (Project Manager, M&amp;E Manager and Communication Specialist) include gender competency requirement and responsibilities in mainstreaming tasks. Project M&amp;E will collect and track sex-disaggregated and gender-specific indicators, and corrective measures will be taken if needed during project implementation. Senior International Technical Adviser, The M&amp;E and Planning team leader, Project Coordinator, M&amp;E specialist</p> <p><b>Baseline:</b> 0 <b>Target:</b></p> <ul style="list-style-type: none"> <li>- At least 50% of all study tour and workshop participants will be women.</li> <li>- Developed and approved guidelines on gender and social inclusion for the PMU to be used during the project implementation.</li> </ul>	By end of Project year 8	FAO (as Executing Entity), led by: Senior International Technical Adviser will have overall responsibility for preparing terms of references of technical experts, in close collaboration with The Gender and Social Expert.	142 345 (10%)
<b>Total budget (gender focused budget)</b>					<b>11 943 381 (39,8%)</b>

59. **GAP planning and implementation.** At the onset of the project implementation, the EG, under the overall responsibility of PIU Project Manager, with the technical support of the Gender and Social Development Specialist, will organize a workshop to validate the proposed GAP and sensitize key stakeholders. This would be followed by briefings and capacity development activities on GAP for the project team, implementation partners and other relevant stakeholders (refresher training will be organized later on as and when appropriate). A gender focal point will be nominated for each implementing partner, who will coordinate all issues related to gender mainstreaming and social inclusion. Gender-responsive mobilization and communication channels will be developed to reach both women and men, including vulnerable groups (such as female-headed households, low income families, unemployed). On the basis of the final GAP, the Gender and Social Development Specialist each year prepares an annual work plan and budget of GAP for submission to the Project Director.

60. Project Manager will be held accountable for gender mainstreaming and social inclusion of the project, technically supported by the Gender and Social development specialist. This specialist will coordinate all work on gender mainstreaming in collaboration with the gender focal points of partner institutions and other stakeholders, the FAO Lead Technical Officer (LTO) and other members of the project team.

61. Implementation of GAP will be supported by relevant FAO gender equality tools, such as FAO Gender mainstreaming and human rights-based approach: guidelines for technical officers<sup>147</sup> and the VGGT technical guide: governing land for women and men<sup>148</sup>. In addition, to promote and share its best practices FAO developed policies, guidelines and valuable tools in gender-mainstreaming:

- In 2012, FAO endorsed a Policy on Gender Equality, the goal of which is to achieve equality between women and men in sustainable agricultural production and rural development, with the aim of eliminating hunger and poverty<sup>149</sup>.
- Regional Gender Equality Strategy for 2019–2022 represents a common vision of what FAO intends to achieve over the next four years in promoting gender equality and women's empowerment through its interventions in the region, and how<sup>150</sup>
- Gender mainstreaming and human rights-based approach. Guidelines for technical officers<sup>151</sup>.
- Agri-Gender Statistics Toolkit<sup>152</sup>
- Environment and Social Management Guidelines<sup>153</sup>.
- Developing gender-sensitive value chains. A guiding framework<sup>154</sup>
- FAO-Adapt<sup>155</sup>
- Climate-smart agriculture<sup>156</sup>

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<sup>147</sup> FAO (2017) *gender mainstreaming and human rights-based approach. Guidelines for technical officers* (Available at: <http://www.fao.org/3/a-i6808e.pdf>)

<sup>148</sup> FAO (2015) *Governing land for women and men. A technical guide to support the achievement of responsible gender-equitable governance of land tenure*. (Available at: <http://www.fao.org/3/a-i3114e.pdf>)

<sup>149</sup> <http://www.fao.org/3/i3205e/i3205e.pdf>

<sup>150</sup> <http://www.fao.org/3/ca4521en/ca4521en.pdf>

<sup>151</sup> <http://www.fao.org/3/a-i6808e.pdf>

<sup>152</sup> FAO (2016). <http://www.fao.org/3/a-i5769e.pdf>

<sup>153</sup> FAO (2015). <http://www.fao.org/3/a-i4413e.pdf>

<sup>154</sup> FAO (2016). <http://www.fao.org/3/a-i6462e.pdf>

<sup>155</sup> FAO-Adapt: <http://www.fao.org/climatechange/fao-adapt/en/>

<sup>156</sup> Climate Smart Agriculture: <http://www.fao.org/3/a-i3325e.pdf>





## Chapter 3: Country performance and lessons learned

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## I. Background and Rationale

1. An overwhelming number of Kyrgyzstan's poor live in remote mountainous areas, their livelihoods heavily dependent on natural resources in these fragile ecosystems. Any natural disaster can push them over the edge into extreme poverty and, in recent years, those disasters – floods, mudflows, landslides and avalanches -- have significantly increased in part due to climate change such as rising temperatures and rapid snow and glacier melt. In some cases, whole villages have disappeared under the mudflows.<sup>157</sup> To reduce vulnerability to climate change, strengthen resilience, and reduce greenhouse gas emissions, it is urgent to arrest resource degradation and to regenerate them. The key measure in Kyrgyzstan is to improve governance in managing these resources in order to prevent livestock overgrazing and overharvesting of fuelwood and timber, and to create an enabling environment that stimulates innovative technologies and investments that conserve and regenerate natural resources.

2. Poor governance in the management of natural resources has been one of the major stumbling blocks in the economic development of mountain communities and in enhancing environmental sustainability. With rapid climate change and deterioration of natural resources, the urgency of addressing an appropriate, and functioning, management framework is growing. The current policy and regulatory environment is weak and not conducive to sustainable management, community involvement and private investments. It is highly fragmented and dictated by a narrow view of the resource: a productive function reflected by livestock grazing and a protective function of forest. About 1.2 million ha of pastures, located on the State Forest Fund lands, are managed differently than the 9 million ha of municipal pastures. Forests on municipal-owned lands in general are neglected and over-exploited.

3. Two sets of legislation fail to support effective tenure arrangements and contradict each other, creating conflicts on the ground between users and managing bodies. Several institutions in charge of forest-pasture ecosystem resources operate in isolation, and do not make efforts to synergize tenure regimes and arrangements. Such an uncooperative situation leads to further, rapid degradation of fragile mountainous resources, affecting not only upstream but downstream communities and countries. The feasibility study identified the following key legal, institutional and operational barriers:

- Lack of technical capacity at the local and national level in assessing climate change risks and trends, and providing methods and arrangements in policy and decision making to strengthen resilience of mountainous forest-pasture ecosystems;
- Lack of harmonization and convergence of forest-rangeland management approaches and tenure arrangements;
- Lack of tenure arrangements, mechanisms and incentives for communities and community user groups, local governments, and private sector agents to participate in management and improvement of forest-rangeland resources;
- Lack of tools, an enabling environment, and arrangements for state monitoring of forest-rangeland ecosystems and enforcement capacity at the national level.

4. Without proper and functioning forest-rangeland ecosystem policy and legislation, backed by supporting environmental legislation, management of these resources has been and will be inefficient. As described in this feasibility study, this can be seen by the fact that pastures are overgrazed, and forest resources are overharvested and degraded. Afforestation activities conducted by local forest enterprises have a very low survival rate due to poor land preparation, poor seedling quality, and lack of maintenance. The country lacks institutional and community capacity to evaluate climate change risks and appropriate ways to build resilience. While there is systematic collection and analysis of data and information on current climate variability and consequences, which would inform decision-making, monitoring systems are very weak to guide policies on resource management and use under changing weather patterns. Forecasting and modelling knowledge is non-existent and would require external support.

5. The Kyrgyz Republic ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 2000 and the Kyoto Protocol in 2003. The State Agency on Environmental Protection and Forestry (SAEPF) was nominated as the Designated National Authority (DNA) for climate change.

6. There is a strong will with the new President and Cabinet to create an enabling environment for

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<sup>157</sup> Ministry of Emergency of the Kyrgyz Republic data

sustainable management and resilient livelihoods. The Government of Kyrgyzstan has ambitious plans reflected in the National Sustainable Development Strategy 2040 and accompanying state programme “Forty Steps” (especially Steps 39 and 40), which recognize the importance of mitigation and adaptation to climate change by supporting mountainous ecosystems, preserving forest ecosystems and their biodiversity, and regenerating natural resources. These goals are to be achieved by establishing an adequate legal framework and providing state support for environmental protection and afforestation/reforestation of fragile mountainous areas.

7. The Climate Change Adaptation Programme and Action Plan for 2015-2017 for the Forest and Biodiversity sector and the draft Concept of Forestry Development 2040 aim to reduce poverty of the forest communities by 10 percent, increase the contribution of the forestry sector to national GDP by 0.5 percent, and increase forest cover from 5.7 to 6 percent. The Government’s estimates indicate that the cost of GHG emissions reduction measures total US\$17.6 billion<sup>158</sup>.

8. Within the framework of the PPCR, the Government has started developing the Strategic Programme for Climate Resilience (SPCR) and established a Climate Finance Coordination Mechanism (CFCM), including a Climate Finance Centre (CFC) in 2017. It is expected that the CFCM and CFC will become fully operational in 2018. UNDP is providing support to the Kyrgyz Government, including the MES, MAFIM of the Kyrgyz Republic, and the SAEPF in development of the National Policy for the Adaptation to Climate Change (NPACC).<sup>159</sup> FAO is a partner in the process focusing on forestry and agriculture sectors. The main findings and policy directions of this document are reflected in the CS-FOR proposal. However, while there are several coordination mechanisms available in the country, there is a lack of technical capacity and limited inter-ministerial coordination between the SAEPF, MAFIM, MES, and SALGSIR and coordination among local self-government bodies. The CS-FOR will be a major contribution to the strengthening of these arrangements and facilitation. From this point, the project will be directly implemented under the government guidance and political/cross-sector coordination of the Climate Change Coordination Commission (CCCC) to create a multi-sector coordination processes for integrated forest/rangeland ecosystem management to address climate risk.

9. In this context, the Government of the Kyrgyz Republic, under the leadership of the Climate Change Coordination Commission and the State Agency for Environmental Protection (SAEPF) acting as National Designated Authority (NDA) to the GCF, has set clear scope for climate action in the country and provides important guidance with regards to the required support from the international community towards achieving the (INDC) targets for climate change adaptation and mitigation.

10. In line with this guidance, understanding the agriculture sector presents important opportunities for the implementation of adaptation and mitigation actions according to the country’s INDC. The State Agency for Environment Protection and Forests (SAEPF), has requested the World Food Programme of the United Nations (WFP) and the Food and Agriculture Organization of the United Nations (FAO) to serve the country as Accredited Entity and to submit two complementary funding proposals for priority investments. The WFP and FAO Project proposals have the following particularities and represent an important effort to ensure successful implementation of country commitments:

- *Climate services and diversification of climate sensitive livelihoods to empower food insecure and vulnerable communities in the Kyrgyz Republic* (**WFP**, 10m USD grant, 4 years): responds to the GCF **Climate Change Adaptation** result area.
- *Carbon Sequestration through Climate Investment in Forests and Rangelands in the Kyrgyz Republic* (**CS-FOR**) (**FAO**, 30m USD grant, 8 years): responds to the GCF **Climate Change Mitigation** results area.

11. The development of these proposals is the result of a long lasting history of collaboration between the Government of the Kyrgyz Republic, through the SAEPF and the two United Nations Agencies. The proposed investments are also in line with the national support programmes, that WFP and FAO have agreed with the country. A note on the complementarity of FAO and WFP proposals has been submitted to the GCF secretariat by the NDA of the Kyrgyz Republic; additional details on these complementarities

<sup>158</sup> Government of the Kyrgyz Republic. 2009. Second National Communication of the Kyrgyz Republic to the United Nations Framework Convention on Climate Change. Bishkek.

<sup>159</sup> CBD definition: “the use of biodiversity and ecosystem services to help people adapt to the adverse effects of climate change”.

can be found in the referred note in Annex 9 of the Funding Proposal.

12. The CS-FOR will support the Government of Kyrgyzstan in pursuing ecosystem-based adaptation as declared in the Climate Change Adaptation Programme and Action Plan for 2015-2017 for the Forest and Biodiversity sector. It will adopt a participatory, evidence-based approach to Kyrgyzstan's most vulnerable mountainous areas, enabling national institutional capacity to be informed by evidence and lessons learned from the four large pilot areas. Strengthening the national institutional and legal framework for climate resilience will provide the umbrella for long-term transformational change. An improved framework will contribute to a more effective mainstreaming of climate resilience in vulnerable economic sectors, such as forestry and livestock, and enable lessons learned from the field to be progressively scaled-up. The project will integrate climate risk management into national and sub-national planning, thus seeking to change the long-term resilience of vulnerable populations, exposed assets and natural systems to climate stresses. It will introduce new approaches and technologies, including innovations in pilot areas. The four major priorities are:

1. Set up facilities and tools, and create capacities for assessing and forecasting availability and resilience of forest-rangeland resources using innovative technologies in line with climate change trends and risks;
2. Improve the planning process at the national and community level through stratification and zoning of forest-rangeland resources based on assessment and climate change trends;
3. Create sustainable legal and institutional conditions, mechanisms and tenure arrangements for communities, local agents and private sector to access, use and improve forest-pasture resources, to arrest degradation and to stimulate investments in afforestation, resources improvement and maintenance;
4. Establish mechanisms and arrangements for feeding climate change data and information into decision-making in all sectors of economy;

## II. Recent portfolio and performance

13. The purpose of compiling the past and on-going projects in the CS-FOR relevant sectors is to support full complementarity and effectiveness of the proposed interventions. The project will establish linkages with on-going projects to strengthen impact as well as avoid duplication of efforts. Here below is reported a selected review of the most relevant past and ongoing interventions.

### a. Policy and forestry-pasture management reform

14. Forestry Sector reforms in the Kyrgyz Republic were supported for more than a decade by the **Swiss Development Corporation** (SDC) from 1995 till 2009. The Kyrgyz-Swiss Forestry Support Programme (KIRFOR) covered a wide range of activities, including elaboration of tenure arrangements and legal framework for a collaborative forest management (CFM), providing technical support to the SAEPF in developing the Concept of Forestry Development of 1998 and corresponding National Action Plan. It also provided support in development of forestry inventory methodologies and tools.

15. **FAO** has been another key partner in the forestry sector. The major focus of support has been on strengthening national capacities to monitor and assess forest and trees resources. Recently FAO has provided highly valued support with the development of the new Forestry Sector Concept and Action Plan (2017). The FAO/GEF Sustainable Management of Mountain Forests and Land Resources of the Kyrgyz Republic under Climate Change Conditions has started in 2013 and will be completed in 2018.

16. The **GIZ** has started supporting piloting forest sector reforms in Kyrgyzstan 2015 in the framework of the Sustainable and Climate Sensitive Land Use for Economic Development in central Asia project. In Kyrgyzstan, the GIZ facilitated establishing the Coordination and Consultative Council at the national level, comprised of representatives of state ministries, international organizations, and civil society

representatives to discuss various policy issues in the forestry sector. The project has initiated piloting of new management approach in six leskhozoes. The Biodiversity Conservation and Poverty Reduction Through Community-Based Management of Walnut Forests and Pastures in Southern Kyrgyzstan (2015-2018) is another GIZ project focusing on six pilot leskhozoes with promotion of sustainable management.

17. The **World Bank** has started Integrated Forest Ecosystem Management Project (IFEMP, 2015-2019) funded by the WB/GEF in the amount of US\$16.11 million has been implemented by the SAEPF, aiming to strengthen the capacity of government institutions and communities to improve sustainable forest ecosystem management through investments in management planning, ecosystem restoration, and infrastructure. The IFEMP is focused on piloting new management approaches in 14 leskhozoes.

18. Pasture management reforms have been supported mainly by the UNDP (Suusamy Valley Project, completed in 2015), the World Bank (Agriculture Investment Support Project, Pasture Management Improvement Project), IFAD (Livestock and Market Development Project I and II), Aga Khan Foundation and GIZ. Support to enhance the national hydrometeorological service (Kyrgyzhydromet) is being provided by the WB and IFAD.

## b. Forestry

19. The following selection comprises a set of relevant ongoing projects, followed by relevant projects closed.

20. **Ongoing projects.** The Project on “Sustainable management of mountainous forest and land resources under climate change conditions” started implementation in five oblasts of the Kyrgyz Republic for the years 2014-2018. It is supported by the GEF, the FAO, the IFAD and GIZ (with significant co-financing from SAEPF). It aims to enhance the enabling environments for maintaining flows of the ecosystem services such as carbon stocks. The project is also closely linked with the country’s efforts for poverty reduction through enhanced productivity of mountainous silvo-agropastoral ecosystems as well as the mountain livelihoods of the country’s mountain residents (FAO&GEF, 2012).

21. Biodiversity Conservation and Poverty Reduction through Community-based Management of Walnut Forests and Pasture is a project supported by Germany through GIZ (grant of USD 6.5 mill. for 2014-2018). It introduces a modern sustainable forest and pasture management model in southern Kyrgyzstan (Jalal-Abad region). Promotes the conservation of biodiversity, and supports adaptation to climate change and increase of local incomes. Three action areas: (i) support state agencies and local communities (forest enterprises, pasture committees, local self-government, etc.) to develop a joint management model for natural resources, with active involvement of the forest and pasture users; (ii) increase the forested area by planting walnut and fruit trees, which are well-adapted to climate change; and (iii) improve livelihoods of the local population. SAEPF and the Ministry of Agriculture and Melioration of the Kyrgyz Republic are local partners.

22. GIZ and SAEPF, in collaboration with NGOs, are implementing a *Regional Project on Ecosystem-based Adaptation to Climate Change in High Mountainous Regions of Central Asia (Kazakhstan, Kyrgyzstan, and Tajikistan)* in 2015-2019. It introduces an ecosystem-based approach to climate adaptation, in which people continue to use natural resources to secure their livelihoods without harming the environment. The objective is to test ecosystem-based adaptation and other climate adaptation strategies and to integrate them into national policies.

23. *Sustainable and Climate Sensitive Land Use for Economic Development in Central Asia* is a Regional Programme by GIZ in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan (2016-2019). It adopts integrated, economically and ecologically sustainable forms of land use, which are climate-change compliant. In Kyrgyzstan, pilot implementation of the forest sector reforms began in June 2015. Six forestry enterprises are now testing innovative and adaptive mechanisms for decentralised, participatory management, and the activities are coordinated at the national level by the Coordination and Consultative Council, which includes representatives of governmental and international organisations and the civil society.

24. The World Bank started to finance the GEF's Integrated Forest Ecosystem Management Project in 2017-2021, in order to strengthen the capacity of government institutions and communities to improve sustainable forest ecosystem management through investments in management planning, ecosystem restoration, and infrastructure. The development objective of this USD 16.11 million project is to strengthen the capacity of government institutions and communities to improve sustainable forest ecosystem management through investments in management planning, ecosystem restoration, and infrastructure. It supports an ecosystem-based approach to the improved management of the area controlled by 14 leskhozoes in seven districts. Target areas are forested lands, pasture, and unproductive or marginal lands. Support is given to institutional reforms and capacity building, and to the introduction of integrated natural resource management planning at the leskhoz level. A one million USD grant has been recently agreed from the WB to SAEPF for starting a National Forest Inventory.

25. *Conservation of Globally Important Biodiversity and Associated Land and Forest Resources of Western Tian Shan Forest Mountain Ecosystems to Support Sustainable Livelihoods* is a GEF-UNDP Project with USD 28.6 million for 2017-2021 in Toktogul and Toguz-Toro districts. The project's focus is on a landscape conservation and management approach in and around Key Biodiversity Areas (KBA). It promotes a better understanding on conservation of biodiversity and sustainable use of forest and land resources in buffer zones and corridors, and sustainable forest and pasture management through a landscape approach. There are three components: (i) conservation and sustainable management of Key Biodiversity Areas within landscapes supporting the national protected areas network and vulnerable species habitats, and avoiding loss of High Conservation Value Forests (HCVF) through official recognition; (ii) enhanced ecosystem resilience and habitat connectivity in Western Tian Shan by regulating land and forest use in buffer zones and corridors and supporting sustainable livelihoods; (iii) strengthened national capacities for snow leopard conservation, promoting Kyrgyz regional and global cooperation and up-scaling.

26. **Past projects.** The Swiss funded Kyrgyz-Swiss Forestry Support Programme (KIRFOR) 1995-2009, introduced Collaborative Forest Management (CFM)<sup>160</sup>. The project has assisted the Government to implement a forest policy and sector reform. The work was piloted in two leskhozoes (Ortok and Uzgen) to develop a lease model of leskhoz forest lands to private individuals to achieve the concept of CFM. It was quickly expanded into a national programme and was subsequently rolled into a national policy (National CFM Regulations Decree No 377 in 7 July 2001). (PROFOR/RDF, 2011). Under this tenure arrangement, the leskhoz defines forest area (usually up to 5 ha) and allocates it for use under the CFM initially for 5 years, and then extends it to 49 years. While it has advanced local community access to forest resources, it has also led into disparity between lease holders, agricultural crops planted on leased lands, and forest fragmentation. As an unwanted outcome, forest conditions and regeneration have sometimes been impaired. The political support to CFM waned gradually after KIRFOR's closure, but there are still a small number of such leases active in the original walnut areas in Ortok and Uzgen. Fieldwork exposed that while in the beginning private tenants paid their leases in working time to leskhozoes, nowadays fees are mostly paid in cash. Economic incentive to lease walnut forests runs high in these areas, but their good governance has proven problematic. Fake auction bids and overlapping lease areas have been reported, together with land amassing and unreported lease agreements.

27. The Handbook on *Integrated Assessment of Natural Resources of Kyrgyzstan* for fieldwork was prepared by FAO in 2009, and it was localized to fit into the Kyrgyz context. The draft Handbook was designed for the field work of the working groups with the help of the international and national consultants. Training was provided in 2010, following the pilot-testing of the Handbook during the field survey in 2008-2009. The Handbook highlights the principles, methodologies and procedures used for a complex assessment of natural resources in Kyrgyzstan. The inventory is based on a random sampling approach, which includes field assessment, remote evaluation, GIS data collection and other available additional relevant data.

28. Project titled "Rehabilitation of floodplain forests of the Kyrgyz Republic" implemented by UNDP Kyrgyzstan, in Issyk-Kul region (2010-2013). Main aim was a sustainable multi-sectoral forest management contributing to the conservation of the globally important diversity of riparian forest

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<sup>160</sup> Walnut value chain study findings, Programme on Forests and Rural Development Fund, 2011. Funded by World Bank.



ecosystems, increasing carbon flow, reducing land degradation and improving livelihoods.

29. With support from the German Development Cooperation (GIZ), the “Forest Management Program”, SAEPF is implementing projects supporting forest management since 2014 (USD 200,000). GIZ mainly worked on establishing of Joint Forest Management Councils (JFMC) and sensitized communities and increased their awareness of forest reform. The main results so far have been: Support to JFMC and institutional strengthening; Introduction of the integrated land management approach; Support and facilitation in the process of transferring SAEPF economic functions to the private sector; and Support to JFMC in communicating with the stakeholders.

30. Under JICA's five-year project, *Support for Joint Forest Management in the Kyrgyz Republic (2009-2014)*, the SAEPF and the National Agency for the Affairs of Local Self-Governance (NALSG) piloted joint forest management (JFM) practices at 10 pilot areas of Chui and Issyk-Kul oblasts. It involved the planting of fast-growing fruit trees, support to nurseries and provided irrigation systems, following the JFM implementation guidelines designed for this purpose. This meant engaging local communities in decision-making with respect to sustainable forest management and actually delegating implementation of many forest management activities to the forest users themselves (USD 900,000).

31. The Kyrgyz-German inter-governmental programme on “*Exchange of Debt for Environment Protection*”, supported planting of fast-growing willow trees in water protection areas and lands prone to flooding under the aegis of ARIS Community Development and Investment Agency (USD 650,000, 2012-2014). This was part of a debt write-off for a total amount of EUR 8.5 million between Germany and Kyrgyzstan.

32. According to the KFW project coordinator from ARIS, mostly poplar and to a less degree salix were planted on 320 ha of municipal land and on SFF. All lands were defined as unproductive land by KyrgyzGiprozem. Project bought seedlings and transported them to the planting sites. Other expenditures for planting and fencing were borne by tenants. Local municipalities rented out lands to local tenants. As a payment, tenants have to give the municipality 20-30% of their needs of wood. In the South, one tenant could lease a plantation of up to 1ha; in the North up to 5 ha. Non-accessible lands are planted by the municipality.

33. With support from the FAO Project “Capacity Building for National Forest and Tree Resources Assessment and Monitoring”, the SAEPF undertook a National Forest Inventory (NFI) for defining and completing the data on forest resources in the country. The NFI project, which adopted the IPCC guidelines and general recommendations for carbon estimations, was completed in 2014. The results have not yet been inserted into the process of carbon reporting.

34. With support from the Korean International Cooperation Agency (KOICA) project on “*Capacity Building on Forest Conservation in the Kyrgyz Republic*”, a Research Center on forest pests control was established in Chui oblast as a center of quality control for forest tree seeds, research and control on pests and forest disease control and transfer of technologies and know-how (USD1 million, 2012-2015).

35. With support from the EU, the “Forest Law Enforcement Governance (FLEG)” program also supported forest management with the aim to strengthen forest governance (2013-2015, USD 350,000). This is insufficient against the background that in 2017, Kyrgyzstan recorded 249 cases of illegal logging (in 2014 there were 622 cases). A moratorium on cutting trees in the nut forests of Arslanbob was introduced for 10 years.

### c. The livestock sector

36. The World Bank and the International Fund for Agricultural Development (IFAD) are supporting implementation of the 2009 Pasture Law through three major projects that focus on the law and other interventions to improve forage supply, animal health, veterinary services, and dairy marketing. The World Bank has supported the Agriculture and Services Project and, since 2014, the Pasture Management Improvement Project, which addresses pasture management, health of livestock (veterinary training and kits, brucellosis control), and value added (dairy, cooling points). Together with the IFC, the World Bank

is working to support dairy processing by building the capacity of private processing companies and their supply chains. FAO, the GIZ, the Global Environment Fund, IFAD, Australia International Development Agency, and USAID are all active in the agriculture sector.

37. The Japan International Cooperation Agency has conducted several projects in the Kyrgyz Republic, including the Data Collection Survey on the Dairy Industry (May–November 2013) and various trainings in Japan related to the dairy industry and to milk and dairy products safety and policy. The Project for the Support of Joint Forest Management in the Kyrgyz Republic (2009–14) sought to improve forest co-management. The Community Empowerment Project through Small Business Promotion by the One Village One Product Approach in Issyk-Kul Region, known as the One Village One Product Project, was initiated in 2007 and is currently in its second phase. The project is working with 74 local communities to develop local products and support local economic development. In 2015 it initiated the Project for a Master Plan on the Inspection of Quality and Safety of Milk and Dairy Products (August 2015 to April 2016), followed by the Project for Improvement in Technology for the Sanitary Management of Milk in Chuy Province (2016–21).

38. An FAO-supported pilot project on animal identification will provide one oblast with physical ear tags, a database, and scanning equipment for inputting information. Tagging will begin in the dairy industry and at breeding farms. It is expected that 50 percent or more of all households in the village will be active in the pilot. For the purpose of ear tagging and trace-back, herds will be co-mingled into groups of 500 head.

39. In close partnership with UNICEF, the World Food Programme, governmental departments and non-state partners, FAO developed the National Food Security and Nutrition Programme, which is now being finalized by the Ministry of Agriculture and Melioration in collaboration with stakeholders. Activities have been carried out under the European Union-funded project, “Strengthening of the Food Security Information System in the Kyrgyz Republic”. This is the first case of a broad, multi-sectoral food security instrument being implemented in the country.

40. Since 2012, FAO has been partnering with the International Fund for Agricultural Development (IFAD), WFP and UN Women in a five-year Joint Programme on Rural Women’s Economic Empowerment. Kyrgyzstan is one of seven target countries (together with Nepal, Guatemala, Ethiopia, Liberia, Niger and Rwanda). FAO sees this Joint Programme as a unique opportunity to expand its work on gender equality and to strengthen collaboration with other UN agencies for maximum impact at the country level.

41. In 2014, the second phase of a successful project for “Sustainable Fish and Aquaculture Development in Kyrgyzstan” was launched. The project is directly in line with Kyrgyzstan’s national agricultural development priorities, which see a major role for fisheries in contributing to a right-to-food approach, improving food and nutrition security and strengthening rural development. The previous phase of the project resulted in the creation of fisheries associations, including the creation of two women’s associations in the Issy-Kul oblast, to promote the participation of farmers and fishing communities in the management and development of aquaculture and fisheries, while two private-public partnerships were established to promote primary fish processing and equipment was supplied to a fisheries laboratory at the country’s Institute of Biology. In addition, more than 1 000 fish farmers and fishers, technical officers, academics and researchers improved their technical skills and knowledge of best practices through the project’s training activities, and biodiversity indices and radiation levels were determined for fish and water in Issyk-Kul Lake.

42. The first single-country Global Environmental Facility (GEF) project to be implemented by FAO in the region became operational in Kyrgyzstan in September 2014. Entitled “Sustainable management of mountainous forest and land resources under climate change conditions”, the four-year US\$5.5 million project aims to apply an integrated cross-sectoral approach. It will consider the role of land and forest resources in the carbon balance, for example, while generating multiple global environmental and socio-economic benefits by sustaining flows of critical ecosystem services, including climate and water regulation, soil erosion control and regulation of natural hazards. New sustainable forest and land management approaches and practices will be promoted to increase the productivity of healthy forest and agroecosystems. The ultimate objective is to improve livelihoods of mountain people, including rural women and other disadvantaged groups who largely depend on agriculture-based incomes.

#### d. Pasture Management

43. The core development programme focusing exclusively on pasture and livestock management on SLF pastures is the Livestock and Market Development Programme (LMDP) funded by the International Fund for Agricultural Development (IFAD). This programme has been implemented in two phases: LMDP I in Issyk-Kul and Naryn regions, 2012-2017, and LMDP II in Batken, Jalalabad and Osh regions in 2013-2018. The project aims to improve pasture management, livestock productivity and village prosperity in the context of resilience to adverse climate effects and adaptation to climate change trends. Improvement in animal health services and enterprise diversification are additional components of the programme. LMDP utilizes the framework of PUUs and their authority under the law “On Pasture” to achieve community-based pasture management through participatory community planning.

44. A closely related project addresses principally the needs of Chui and Talas regions, with ramifications for other parts of Kyrgyzstan. The Pasture and Livestock Management Improvement Project (PLMIP), 2014-2019 funded by the World Bank, aims to improve community-based livestock management and pasture governance, with an emphasis on strengthening the technical capacity of pasture management advisors and Pasture Committees.

45. Prior to these two projects, the World Bank, IFAD and the Swiss agency for Development and Cooperation (SDC) supported the Agricultural Investments and Services Project (AISP), 2008-2013, within the MAFIM. A primary aim was to improve the institutional environment for livestock producers, plus a programme of livestock disease melioration for both animal and human health. The law “On Pasture” was enacted as this project was beginning, so under AISP 475 PUUs were created in rural communities across the country, and use rights on pasturelands were transferred and registered to PUUs for management, with support from the Land and Real Estate Registration Projects (WB) and FAO (TCI). FAO supported capacity building of PUUs to implement the innovative tenure arrangements (TCP/KYR/3503 Capacity building and awareness raising for the sustainable use and tenure governance of pastures), in line with the *Voluntary Guidelines on the Responsible Governance of Tenure of Lands, Fisheries and Forests in the Context of National Food Security* (VGGT).

46. At around the same time (2007-2012), the Global Environment Facility (GEF) and UNDP launched the Sustainable Mountain Pastures Management project for the MAFIM in Suusamyr Valley, Naryn region. The general objective was to combat overgrazing through cost-effective pasture management practices.

47. Two current SAEPF projects that have a pasture-management component are specifically concerned with Districts embraced by the proposed GCF project.

- The Sustainable Management of Mountainous Forest and Land Resources Under Climate Change Conditions, with GEF and FAO support, 2014-2018, aims to improve sustainable management and productivity of silvo-agro-pastoral ecosystems in 5 Kyrgyz regions. Among the areas of focus are Ak-Talaa Leskhoz in Naryn region and Kara-Alma Leskhoz in Jalalabad region.
- In Toktogul and Toguz-Toro Districts, GEF and UNDP have a joint project with SAEPF (2017-2021) on landscape conservation and management, with an emphasis on conservation of biodiversity and sustainable use of forest and pasture resources. The project has the long title: Conservation of Globally Important Biodiversity and Associated Land and Forest Resources of Western Tian Shan Forest Mountain Ecosystems to Support Sustainable Livelihoods.

48. In the Jalalabad region, the SAEPF is implementing a project funded by GIZ (German Ministry for Economic Cooperation and Development), 2014-2018, on Biodiversity Conservation and Poverty Reduction Through Community-Based Management of Walnut Forests and Pastures in Southern Kyrgyzstan. The strategy to achieve sustainable forest and pasture management is to work with PUUs, forest enterprises, Local Self-Governing Bodies, Leskhozes and state agencies, for mutual goals and better livelihoods for the local populations. Climate change will be addressed by planting trees resistant to anticipated adverse impacts of climate change, such as walnut and certain fruit trees.

49. Finally, a GIZ project covering Kyrgyzstan, Kazakhstan and Tajikistan (2015-2019) plans to

introduce Ecosystem-Based Adaptation to Climate Change in High Mountainous Regions of Central Asia. The concept is that people will continue to use natural resources, including pastures, to improve their livelihoods without harming the environment within a climate-change scenario.

#### e. Meat industry performance

50. **The Kyrgyz agriculture: modest role in country's economy and high dependence on livestock. Significant growth potential driven by diversification from livestock and premium markets positioning.** In 2016, the agriculture sector accounted for 13.2 percent of the country's GDP with the livestock sector representing some 48 percent of gross agricultural output (GAO) or KGS 197 billion (USD 2.9 billion), with 15 percent generated from dairy and 30 from meat sub-sectors<sup>161</sup>.

51. **Poor performance as a result of highly fragmented production structure.** Industry estimates annual red meat output as 35 thousand tons<sup>162</sup>, of which 16 percent has been illegally exported to Uzbekistan and Kazakhstan. Illegal traffic of live animals, in turn, has brought to Kyrgyz animal owners substantial losses worth some 300 thousand USD (value of confiscated animals).

52. **Ensuring timely offtake of animals remains the major obstacle for industry development and, most importantly, for pastures rehabilitation.** Red meat export performance is significantly lower than committed quantities as organizing batches of animals sourced from a multitude of unorganized small producers is extremely challenging. Thus, out of 340 tons of mutton contacted by the Iranian buyers in 2017, Kirgizstan was only able to supply 11 percent. The main reasons – stemming from the highly fragmented production structure – include non-compliance with industry standards and the lack of relevant infrastructure, such as livestock holding paddocks (animals holding facilities before transport to slaughterhouse) and cattle trucks. Organizing and linking animal owners to modern slaughterhouses with regular sourcing needs, while providing the former with the competent advisory and veterinary services becomes an important mechanism of reducing pressure from pastures. Relations of trust need to be re-established between animal owners and processors to shorten, thus strengthen the entire chain.

53. **High potential on domestic and export markets.** Kyrgyz pastures feature over 3.5 thousand botanical species, including some 200 medicinal plants, and therefore represent a highly nutritious pasture forage for animals. Exceptional palatability traits of Kyrgyz beef and lamb are valued by consumers from Russia, Kazakhstan, Islamic Republic of Iran, Uzbekistan, and the United Arab Emirates notwithstanding the fact that Kyrgyz lamb has a high price tag. New markets, such as Qatar and China, are to welcome Kyrgyz red meat in 2018. On domestic market, meat accounts 23 percent of households' expenditures on food<sup>163</sup>. Red meat is consumed exclusively fresh (chilled) with *bazars* (traditional wet markets) remaining the main retail outlet.

54. Bishkek-based company "Toro" and its slaughterhouse "Toyboss" have expressed their interest in sourcing young bulls and sheep in three districts out of four.

55. With regards to dairy, the closest to the core project area milk-processing factory "Ak-Sut" is located in Osh and sources raw milk in Osh and Jalal-Abad Provinces, including Suzak and Uzgen districts, through its network of 14 milk collection centres. Ongoing investment operations, such as IFAD-supported ATMP, can support further development of milk collection schemes.

56. The IFIs' country programmes have been designed on the basis of the following strategic considerations agreed with the Government of Kyrgyzstan: the focus of the programme should be the livestock sector, as such a focus would support Government's aim of developing this backbone of the rural economy for improved food security, nutrition and incomes as livestock is the basis for the livelihood of the poorest segments of the rural population who have little or no access to scarce and expensive arable land. Within the livestock sub-sector the initial focus should be on the two pillars of productivity enhancement: a rational and efficient use of the country's pasture resources through support to the roll-

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<sup>161</sup> The National Statistics Committee

<sup>162</sup> 2017 data

<sup>163</sup> National Statistical Committee, 2016 data

out of the community based management regime introduced by the new pasture law; and improved animal health, nutrition and husbandry through support to the implementation of the national animal disease control strategies and the establishment of a private veterinary service. Once these fundamental issues were being addressed, the focus of the programme should gradually shift to the commercial aspects of the sector, in particular the market access and market integration of primary producers in order for them to transform increased production into increased incomes, as well as to ensure full impact on food security and nutrition beyond the local level.

**TABLE 1 – RECENT INVESTMENT OPERATIONS RELATED TO LIVESTOCK SECTOR AND SUPPORTED BY THE INTERNATIONAL FINANCIAL INSTITUTIONS**

#	Project name and Investment cost	Development objective
1	<b>IFAD/WB.</b> Agricultural Investments and Services Project (AISP)	Supported the important pasture reforms introduced by the Pasture Law of 2009, and the pursuit of improved animal health through the national animal disease control strategies.
2	<b>IFAD.</b> Livestock and Market Development Programme-I, II (LMDP) USD 25.9 and 39.5 Million	Increase livestock productivity through (i) more productive and accessible pasture areas and increased supplementary feed available to community livestock; (ii) healthier livestock with lower levels of mortality; and (iii) market partnerships in the milk value chain providing incentives for productivity increases. LMDP-I focused on Issyk-Kul and Naryn Provinces, LPDP-II on Batken, Osh and Jalal-Abad
3	<b>WB.</b> Pasture and Livestock Management Improvement Project, USD 15 Million (active)	Objectives and activities similar to those of LMDP I+II and covers the two remaining oblasts of the country
4	<b>IFAD.</b> Access to Markets Project (ATMP), USD 55.5 Million (active)	To improve access and integration of smallholder livestock farmers with remunerative markets for their products, leading to improved and equitable returns
5	<b>WB.</b> Integrated Dairy Productivity Improvement Project, USD 5 Million (active)	To enhance dairy animal productivity and milk quality on beneficiary farms (Issyk-Kul Province)

57. IFAD's and WB's interventions have been designed in close coordination between two financial institutions. The three projects now constitute a coherent programme with national coverage, implemented by the Ministry of Agriculture. ASAP funding present in LMDP-II has ensured the mainstreaming of measures specifically aimed at enhancing the climate resilience of pastoral communities.

#### **f. Rural Finance**

58. Several international and domestic funders are currently implementing or considering projects aimed at the development of agriculture in the Kyrgyz Republic, but few are working in the area of "green" finance. Those most relevant to CS-FOR's Component 3 include (alphabetically):

- (a) European Bank for Reconstruction and Development (EBRD);
- (b) Russia-Kyrgyz Development Fund.

59. **EBRD.** In 2015, EBRD launched the Green Economy Transition approach<sup>164</sup> aimed at increasing the volume of sustainable financing by focusing on investments that bring environmental benefits. Under this framework, EBRD launched a USD 20 million facility in April 2013 – the Kyrgyz Sustainable Energy Finance Facility (KyrSEFF) as one of the Sustainable Energy Financing Facilities of EBRD. KyrSEFF financing included grants of up to 10-35 percent of project cost from the European Union's Investment

<sup>164</sup> [www.ebrd.com/cs/Satellite?c=Content&cid=1395250237163&d=Mobile&pagename=EBRD%2FContent%2FContentLayout](http://www.ebrd.com/cs/Satellite?c=Content&cid=1395250237163&d=Mobile&pagename=EBRD%2FContent%2FContentLayout).

Facility for Central Asia.<sup>165</sup>

60. In November 2016, EBRD launched the extension of KyrSEFF – KyrSEFF+. This is a USD 35 million financing program that works under similar conditions and includes both grants and loans disbursed through local partner banks. KyrSSEFF+ loans are supported by grants incentives of up to 35 percent as well as technical assistance. As of April 2018, there are 6 banks taking part in the facility.<sup>166</sup>

61. The services of the KyrSEFF+ facility are available to:

- (c) Private households, owners of houses and apartments and residential buildings for investments in energy and water saving technologies. Investments may range from wall insulation through to innovative solar energy and rainwater harvesting solutions, allowing families to save money and increase the comfort of their homes.
- (d) Private enterprises in industry, agribusiness and service sectors for investments that result in energy, water and other resource savings. These investments may include new efficient machinery for production companies, compact waste-water treatment systems and energy saving devices for hotels, drip irrigation and machinery for agricultural companies, etc.
- (e) Suppliers, vendors and installers of energy and resource efficient technologies to ensure these are readily available in Kyrgyzstan. Investments may include an expansion of stock holding, the operating base, etc.

62. The sectors and energy efficient technologies covered by KyrSEFF and KyrSEFF+ include:

- (f) Agribusiness: tractors, harvesters, working trailers, irrigation systems, grain/fruit/vegetable dryers.
- (g) Greenhouses: ventilation systems, heating systems, energy efficiency glazing.
- (h) Buildings: air conditioning, boilers, lighting, windows and glazing, insulation materials, household appliances.
- (i) Construction: conveyors, generation sets, drilling machines, soil compactors.
- (j) Textile: washing systems, drying units, air compressors, and textile machines.
- (k) Food processing: baking equipment, freezing technologies.

63. **The Russian-Kyrgyz Development Fund (RKDF)** was established in late 2014 as an international organization per the Agreements between the governments of the Kyrgyz Republic and the Russian Federation “On the development of economic cooperation in the conditions of Eurasian economic integration” and “On the Russian-Kyrgyz Development Fund”.<sup>167</sup> The capital of the Fund is USD 500 million.

64. RKDF provides both direct funding to Kyrgyz medium-sized and large enterprises (with loans starting from USD 1 million) and indirectly through commercial banks to smaller enterprises (loans below USD 1 million). RKDF lends to all economic sectors and as of April 2018, has funded 926 enterprises for a total amount of over USD 275 million.<sup>168</sup>

65. Agriculture is one of the key focus areas for RKDF: it takes the first place in terms of the number of loans (338 out of 926, or 36.5 percent) and second in terms of the volume of funding (over USD 64 million, or 23 percent). In 2016, RKDF has partnered with International Fund for Agricultural Development (IFAD) to provide loans to agricultural producers and processors identified and assisted through IFAD’s “Access to Markets Programme” in Kyrgyzstan, to be launched later in 2018. RKDF has also expressed interest in partnering with CS-FOR by providing a credit line for project beneficiaries in the amount of USD 15 million.

<sup>165</sup> [www.ebrd.com/cs/Satellite?c=Content&cid=1395253733728&d=Mobile&pagename=EBRD%2FContent%2FContentLayout](http://www.ebrd.com/cs/Satellite?c=Content&cid=1395253733728&d=Mobile&pagename=EBRD%2FContent%2FContentLayout).

<sup>166</sup> <http://www.kyrseff.kg/green-trade-finance-for-suppliers/?lang=en>.

<sup>167</sup> [http://www.rkdf.org/o\\_nas/obschaja\\_informatsija/informatsija\\_o\\_fonde](http://www.rkdf.org/o_nas/obschaja_informatsija/informatsija_o_fonde).

<sup>168</sup> [http://www.rkdf.org/ru/o\\_nas/otchet](http://www.rkdf.org/ru/o_nas/otchet).



### III. Lessons learned and best practices

66. The CS-FOR project builds on experience of various past and on-going interventions related to management of natural resources, especially of forests and pastures, mitigating climate risk and building adaptive capacity. The following important lessons have been considered and incorporated accordingly in the design of the CS-FOR project.

#### a. Policy and forestry-pasture management reform

67. Regarding the integrated approach to natural resources management under a climate perspective, the main lessons originated in the initiatives on sustainable pasture management supported by the WB and IFAD, sustainable forest management projects funded by the WB and GIZ. The related activities in the CS-FOR project (with specific reference to component 1) have incorporated lessons learned from a number of donors, government and non-government financed initiatives.

- *An operationalized dialogue and close cooperation between state agencies and civil society is a key for improvement of governance and strengthening integration in the management of the natural resources based on ecosystem approach.* The CS-FOR project will set up a formalized by the Government Decree a National Platform under the CCCC chaired by the Vice Prime Minister to ensure that there are conducive discussions on issues of tenure arrangements, planning, management and monitoring and decision made based on evidences provided by the project. The National Platform will be comprised of the high level representatives of the relevant agencies, experienced civil society and private sector. It will be assigned responsibilities and authorities to act would be a body above the line ministries ensuring that the integrated approach to management of forest-rangeland ecosystem resources is introduced and reflected in the policies and legislation.
- *Lack of scientific and evidence based data on health of natural resources is one of the root causes of low commitment of the Government to the improvement of the NR management.* There is a widespread lack of data and understanding on the health and level of deterioration of the natural resources, leading to inadequate and weak policies and decision made on NR management and use. The CS-FOR project will introduce and enhance evidence based system to assess condition of resources with a use of georeferencing and remote sensing. This powerful tool combined with on the ground assessment will be used to make decision on use regime, investments, and to monitor results.
- *Without a state policy and enforcement arrangements on sustainable grazing of natural pastures the growing number of livestock would lead to further fast deterioration of fragile resources.* The CS-FOR project will support Kyrgyz Government to develop methodology and arrangements for evidence based monitoring of the management and use of forest-rangeland ecosystem resources and facilitate elaboration of legislation to enforce sustainable and climate resilient practices.
- *Lack of incentive or their inadequate understanding could lead to weak participation of communities in integrated management.* There is a need to have clear incentives for all stakeholders to participate in ecosystem based adaptation planning and implementation. The CS-FOR will employ social mobilization campaign and community level consultations on the advantages of the participatory and integrated NR management and clearly spell out incentives to all stakeholders (in this regard, see Textbox on the experience from Balykchy *leskhoz*).
- *Community and private sector engagement in afforestation and pasture improvement need to be based on clear and secure tenure arrangements based on the principles of Responsible Tenure*

**Governance (VGGT).** Greater involvement of non-governmental organisations and private sector in forest and pastures management and improvement will be facilitated by the project through elaboration of innovative tenure arrangements based on economic and non-economic incentives, development of legal framework for private-public-community partnerships.

**Textbox. The experience from Balykchy leskhoz local stakeholders partnership**

In Balykchy *leskhoz*, a partnership between *leskhoz*, community, local government and private entrepreneurs is based on leasing low-productive *leskhoz* lands to private tenants. Leasing is based on competitive auctions announced in the community, and land plots are provided for rent after careful evaluation of applications and their description of use purposes, protection activities and proposed rehabilitation work. The evaluation of the applications is made by an established Steering Committee, consisting of representatives of different local institutions and users. *Leskhoz* supports private tenants with consultations, provides land plots with irrigation through donor funding. Balykchy *leskhoz* also leases forestland based on a Collaborative Management of Forest Resources approach, mostly for purposes of wood production, with 70 percent of wood to be owned by users, and the remaining 30 percent by *leskhoz*es. *Leskhoz* already has 40 ha of lands of fast-growing trees and around 1,000 women and men are involved in the Collaborative Forest Management scheme. In addition to planting fruit trees, which comprise 70 percent of all leases, renting forest lands in Balykchy *leskhoz* for recreation services is of interest to local people, although the price for leasing forest plots for recreation services is much higher than for planting trees. During the last year *leskhoz* collected 4 million KGS from renting land, of which 30-40 percent was from providing services.

(Source: Working Paper “Evidence-Based Strengthening of the NRM Governance Sector Assessment and Recommendations for the CS-FOR Project – Feb 2018)

## b. Forestry

68. The following key lessons were taken from previous project experiences

- Supporting Government efforts to reform forestry legislation to allow the sustainable use of timber resources as well as reflect the regulatory needs of present circumstances; reconsider decoupling the regulatory functions, control and monitoring functions from economic functions.
- SAEPPF should develop appropriate regulations which are needed, based on current challenges. For example: there is no appropriate regulation on grazing on SFF territory, although grazing is the main reason for failure of afforestation.
- Improve transparency of forest sector, and use a multi-stakeholder and multi-sector approach.
- Strengthen the institutional base for SLM/SFM knowledge management and share SLM/SFM knowledge locally to specialised farmer groups.
- Implementing integrated forest management approaches to planning helps to achieve more sustainable forest management.
- Involving local communities and private sector in forest management (through Collaborative Forest Management, CFM) will bring positive long-term impacts on forest protection and reforestation/afforestation.
- Introduction of long-term land leasing will provide a sense of ownership to tenants, which will help to improve forest conditions (5-year renewable leases up to 49 years are still much shorter than coniferous timber production rotations, i.e. 80-120 yrs.).
- There is a need to increase community/local government participation in management planning through support to the development of public-private partnerships (PPP).
- There is a need to increase access to private sector capital to increase investments in the sector through PPP, and generate sustainable economic growth. Corporate Social Responsibility (CSR) investments of larger companies will be a development option in the future, if such companies can be identified and engaged.
- There is a need to stimulate investments in the up-scaling and replication of good SLM/SFM practices that could involve development of micro-finance schemes and better integration of

mountain farmers in regional and global environmental markets. Examples include the carbon market, certification for environmentally sustainable, wild collection or organic production, and payments for ecosystem services.

- Micro-finance schemes may be used, as part of the blended finance component of the Project, to support e.g. the initial investments for establishing community tree nurseries (shades, seed tables, closed-root seedlings in plastic bags/containers, greenhouses, irrigation), improved equipment (agricultural tractors and auxiliaries) and supplies for tree planting irrigation systems (drip, hydro-pumps, solar or wind-fueled pumps, fencing/protection and fertilizing, and access to new locally adjusted technologies for improved forest management activities (e.g. weeding, sanitary cuts and thinning, transports, etc.), improved forest health inspections with drones, improved fire management equipment, etc.

### c. Livestock

69. Projects working on improving capacities and skills of farmers should consider the extent to which the expected outcomes may depend on other factors, like availability of machinery, seeds, fertilizers, and other resources needed to apply the learned practices.

70. Project design needs to pay greater attention to the technical and absorption capacity of the implementing agencies and parties. Low capacity of the Ministry of Agriculture, the Livestock and Pasture Research Institute, as well as of beneficiaries, undermined past projects activities. Projects should not be too complex and fragmented in terms of implementation arrangements.

71. Projects need to be centered in the government agency with capacity- building activities focused as much as possible on related governmental institutions to ensure replicability and sustainability of the results. With the high turnover in government agencies, this might be difficult to achieve and new approaches need to be considered to ensure that developed knowledge is well documented and widely disseminated to all stakeholders to ensure its availability and use.

72. External technical assistance needs to be closely interlinked with implementing agencies and parties to ensure ownership and maintain commitment.

73. Investment in hardware (equipment, machines, etc.) without investment in operating skills leads to procurement of goods that are either not suitable or are under-utilized and as such a waste of resources.

74. Broad-spectrum change in a complex sector where there is limited experience can be made effective through a learning-oriented and continuously adaptive program approach aimed at establishing a platform for future development.

75. Project design and implementation arrangements need to correspond to the capacity of all implementing agencies and beneficiaries.

76. Major policy and legislative reform need extensive technical support and be adopted through a wide consultation processes.

77. A strong and gender-sensitive Monitoring and Evaluation (M&E) system is particularly important for projects that pioneer new approaches, and may need adjustment as implementation progresses. Monitorable indicators to measure achievements against the project objectives, and M&E arrangements, need to be detailed prior to project commencement including processes that enable learning from evaluation results.

78. Effective donor cooperation at the country and project levels significantly improves the prospects for achieving development objectives by generating positive synergies, minimizing duplication and overlap, avoiding conflicting and/or confusing advice, and facilitating mutual support across projects.

79. While financial independence for providers of agricultural services is generally desirable, self-financing options need to take account of the public-goods nature of some services, the special needs of poorer rural communities, and the rate at which communities and entrepreneurs can adapt to a pay-for-service environment.

80. Overall, it was possible to bring about quite far-reaching changes in the management of pastures, a key natural resource in the country. Critical to the success was the development of a vision on pasture management transfer and what the system would look like based on real life experience from an initial pilot. These principles then informed specific policy initiatives and the development of the legal framework.

81. The vision and strategy need to be built on consensus of all stakeholders. At that stage, all stakeholders agreed that the pasture management system needs to be revised to reflect rapidly growing livestock numbers in smallholder farms coupled with increased resource degradation.

82. There is a weak capacity in government agencies to formulate policy and it requires extensive technical support.

83. Policy needs to be geared towards social targets, such as increased access to pastures for women and men, economic factors such as improved animal productivity and profitability, and environmental targets, such as improved areas of pasture and increased areas under sustainable use.

84. Policy and strategy initiatives should have a clear and gender-sensitive Monitoring and Evaluation plan with allocated adequate resources and a clear plan to implement it. An issue in assessing the effectiveness of reforms has been the relatively weak M&E system and reporting on outcomes in the project to implement the reforms. Projects should have planned outcomes, such as fee collection rate, financial solvency and quality of O&M of pasture areas. The ultimate outcomes are livestock productivity, farm income, rural standards of living, and human health. Projects need to have a monitoring and evaluation system with indicators to monitor and measure reform, such as total cost of pasture management, adequacy of resources mobilized for pasture management, collection rate for pasture management fee, quality of the management (equity, timeliness, reliability, adequacy), organizational effectiveness of PUUs, profitability of grassland-based livestock, and etc. All this data needs to be disaggregated by sex and other relevant social determinants, such as age.

85. Institutional relationships are important. There are good institutional relationships evinced between the State Registration Agency and the Ministry of Agriculture which led to relatively easy title issuance and registration process. These need to be sustained. On the other hand, lack of cooperation and support from Giprozem limited access to necessary cadastral inventory data, legal information and maps. This needs to be resolved.

86. Knowledge needs to be tested before massive transfer and up-scaling. Given the pioneering nature of the effort, there needs to be substantial learning by doing in order to develop the local governance and management institutions in order for them to perform well. It is imperative to develop approaches and test them on a small scale first before up-scaling to a country level to minimize cost and avoid frustration of beneficiaries.

87. There remain poor connections between policy, research and on-ground practice of livestock farming. For instance, there have been various research programmes on fodder production undertaken by the Pasture Institute which have not been translated into policy or capacity building of PUUs.

88. The absorption capacity of knowledge on pasture management by the PUUs is low. PUU and PCs are still at the very initial stage. Trainings are attended by chairpersons and in some cases by accountants. Many of these people often lack basic understanding of the pasture management issues and are not able to absorb and apply received knowledge. Other members of PCs are reluctant to participate in trainings since they often are not engaged in PC activities or engaged in a very limited way (collection of fees from specific groups). This then requires a two-track system of capacity building at the local level. Capacity building related to participation in the direct reforms and programs of the project, such as the pasture improvement grants, can continue largely as in the past. However, substantive issues related to sustainable pasture resource management will require a longer-term program of instruction which is geared to the local-level absorption capacity as well as the particular needs of different communities and their management of pastures. Substantial resources need to be put into technically well-targeted training while also ensuring that this is put in terms that are relevant -- and hence implementable -- by the PUUs and PCs.

89. As is often the case with mass training, high turnover of participants - mainly chairpersons and accountants in PCs -- could lead to the complete loss of transferred knowledge.

90. Exchange visits of PC members to successful PUUs were regarded as very effective and appreciated by all participants. Evidently, poorly performing PCs were able to learn from peers and replicate good lessons in their work. Future training should likely target some of the best-performing PC chairs to conduct knowledge exchanges in terms that are easily comprehended and accepted by others.

91. Guidelines for preparation of pasture management plans, and the plans themselves, should be simple, considering traditional and existing knowledge at the grassroots level. A few basic principles should be emphasized, above all that the plans must aim to ensure adequate seasonal movement of animals over the entire range of the available pastures. Furthermore, there must be a commitment to take effective measures to enforce the provisions of this plan in protecting pastures.

92. The use of the more distant pastures must be made obligatory for all livestock owners during the spring, summer and fall, when only a minimal number of animals, to cover the needs of the local households, should be allowed to graze on the near-village pastures. This is a fundamental prerequisite for the rehabilitation of the winter pastures, since they must have adequate time to recover and seed in the spring and early summer. The PCs should develop and enforce pasture management plans that are appropriate for the small farms and households, including the hiring of community shepherds. If necessary, stall feeding must be enforced for animals that are not sent to the more distant pastures to relieve pressure on near-village pastures. Monitoring mechanisms through use of mobile telephony can be considered for enforcement efforts.

93. Rotational grazing systems should be introduced to provide the plants the necessary rest periods and the possibility to produce seeds. An annual change of specific areas to be excluded from grazing should be considered if the introduction of a rotational grazing system is too difficult to realize.

94. Devolution on pastures leads to an increasing influence of a powerful and affluent segment of livestock keepers and skilled urban absentee herd owners. This may be accompanied by an unequal distribution of productive assets and the emergence of new poverty groups if there are no proper safeguards in place.

95. The problem with rehabilitation of roads, bridges and other infrastructure that in mountainous areas become deteriorated very fast. PUUs need to have access to machinery to maintain the infrastructure in the course of the O&M. The machinery can be owned jointly by several PUUs either at the rayon level or along the watershed boundaries depending on the size of pastures of the *Aiyl Aimak*, and their proximity to each other.

96. Pasture improvement micro-projects without adequate technical support can fail and lead to frustration and lowering of trust from the PUU members to the PC. In one observed area, the PC made investments in a near-village pasture area with seeding of improved fodder species, but at the end of the year it was severely degraded because of increased pressure from cattle grazing. In other cases, PUU/PCs had limited knowledge and ability to address problems raised in Community Pasture Management Plans.

#### **d. Pasture**

97. Traditional livestock management that has its roots in centuries of Kyrgyz herders moving their animals on established seasonal routes still governs the approach to livestock management today. At the local pasture level, cattle and small ruminants usually spend seasonal grazing time in the same area every year. To change these traditions and introduce an intensive pasture rotation will require an incentive scheme, training and capacity building at the PUU and PC level. In its thrust to enhance carbon sequestration potential through direct investment in afforestation, reforestation and pasture rehabilitation, the CS-FOR project is equipped to drive changes in management of community and forestland pastures through a programme of technical assistance and strategic incentives. An illustrative incentive is for the project to pay the grazing fees on behalf of PUUs who agree to change their grazing management practices under project guidance. In Tajikistan, 203 PUUs were financed by the IFAD-funded project (LMDP) for their top funding priority and then were required to adopt and implement pasture rotation before receiving additional tranches of investment.

98. In the past 8 years since passage of the law On Pasture, Kyrgyzstan has decentralized pasture management to Local Self-Governing Bodies (Ayil Okmotus) that have in turn delegated pasture management to Pasture Users Unions and their Executives, the Pasture Committees. This process has transformed pasture management from a state of relative chaos following national independence into an organized system. The Pasture Committees can make annual and long-term grazing plans, issue grazing tickets, collect fees, operate bank accounts, receive support from the Kyrgyz government and national NGOs and international donors, purchase equipment, repair infrastructure, and do all this with transparency and accountability to the community. The PUU/PC system is the framework for improving management practices according to principles of adaptation to climate change and responsible tenure governance.

99. Management of pastures in State Forest Fund (SFF) lands is handicapped by a lack of regulations governing rangeland tenure, livestock use and grazing management. The current level of oversight on SFF pastures by the responsible agency, State Agency for Environment Protection and Forests (SAEPF), is limited to collecting grazing fees. The result of managerial neglect is overgrazing of SFF pastures and livestock predation on seedlings of tree plantations and on shoots and young plants in areas of natural forest regeneration. SAEPP has not invested in infrastructure like roads and bridges to facilitate access to SFF pastures, nor in water-point development to improve animal distribution. Whereas the income from grazing tickets issued by the PUU is spent locally to help the community, income from SFF grazing tickets goes to the SAEPP office or state Treasury in Bishkek, from where some is redistributed back to Leskhozoes. The CS-FOR project has an opportunity to encourage and guide good pasture tenure and management practices on SFF pastures. The operation of PUUs and PCS-FOR managing SLF pastures is a good model to establish local control over SFF pastures, perhaps by giving more responsibility to Leskhozoes and fully implementing the Agreement between SAEPP and the Ministry of Agriculture and Melioration authorized by the Kyrgyz government in April 2013. This Agreement gave official sanction to cooperative management of grazing lands by Leskhozoes and PUUs, but it has had little effect so far.

100. Poor infrastructure occurs on community pastures as well, though not as bad as on SFF land. Infrastructure has deteriorated since independence. Many PUUs are working to fix roads and bridges to improve access to remote summer pastures. At present, however, there is an imbalance in seasonal grazing pressure. Due to access problems, summer pastures tend to be underutilized which forces heavier grazing pressure onto spring-autumn pastures at lower elevation, and particularly heavy use of winter pastures close to the village. Overgrazed and degraded winter pastures are the highest priority for rehabilitation. The situation has been exacerbated since independence. In the Soviet era, livestock numbers were regulated, many livestock were kept in collective farms under feedlot conditions, and the livestock that grazed pastures moved in a fixed pattern that included prescribed summer grazing and a year of rest in one quarter of the pastureland, rotated annually. Animal numbers are no longer restricted, the collective farms have been abandoned, and the seasonal pastures are no longer under mandatory regulation. The PUUs and PCs exercise oversight under the law On Pasture, but this has not prevented overgrazing and degradation.

101. Grazing management that employs a pasture rotation protocol allows spring growth to approach potential productivity, which in turn increases biomass accumulation above- and belowground and raises carbon sequestration. Contrary to intuition and common opinion, carbon stores are preserved or increase under sound grazing management, according to numerous research studies. After the ecological integrity of a pasture ecosystem has been restored, the carbon dynamics reach equilibrium between carbon export via livestock grazing and carbon sequestration via plant growth. Insofar as leaf removal stimulates buds and shoots in some grasses, grazing enhances carbon capture.

102. In areas of Tajikistan ecologically analogous to the target Districts of CS-FOR, rotational grazing has been introduced to 203 PUUs for the past 3 years with promising results. Intensive pasture rotation has been associated with higher milk yields, more forage available, bigger animals, higher birth rates, improved livelihoods, and reduced erosion. Efforts are underway to trial intensive pasture rotation in Kyrgyzstan, for example in Toguz-Bulak PUU in Issyk-Kul region and on 1500 fenced ha of Maady PUU in Kara-Suu District, but there is inertia in the traditional Kyrgyz system of pasture use. The CS-FOR project will attempt to find incentives to challenge current management practices because we know that pasture rotation can increase carbon sequestration and mitigate the adverse effects of climate change.



103. As PUUs adopt intensive pasture rotation, there needs to be a strong M&E programme to assess innovative management and provide feedback to PUU and project leadership so that appropriate adjustments can be made. In spite of the assurance of profitable outcomes from pasture rotation, initial implementation is likely to be a trial and error process. It will require coordination and commitment on the part of everyone involved: the PUU and Pasture Committee, the herders, the small-holder households contributing livestock to grazing herds, government agencies and the representatives of donor organizations and NGOs. It is also necessary to provide relevant training for PUU and PC members so that they understand the reasons for adopting new methods of pasture management and are not just following a prescription. An understanding of principles facilitates adaptive management.

104. Monitoring of pasture condition using remotely sensed satellite images and Geographic Information Systems has not yet been adopted in Kyrgyzstan, despite exploratory efforts. FAO is already conducting trials to arrive at a practical and cost-effective method of RS/GIS monitoring of forests and pastures that is useful at different scales: regional, district and village lands. This will be the basis for an evidence-based approach to measuring and evaluating CS-FOR project impact.

105. One of the limitations that changes in grazing management will face is a lack of technical capacity in the village and a shortage of specialist advice and extension service. Capacity building is required not only for MAFIM and NGO staff, but also in educational and research institutions. Dissemination of technical advice and research results to government agencies and PUUs/PCs needs to be improved. Extension services need to be strengthened with trained personnel, helpful bulletins in print and online materials, and need to support mutual exchanges between farmers. A maxim of innovation efforts worldwide is that adopters need to be part of a supportive peer community with which they can share experiences, receive advice and participate in a mutually sustaining dialogue. In Kyrgyzstan, one simple step in this direction is to arrange for exchange visits among different PUUs to build confidence and learn from one another.

106. Trials on grazing management needs to be at the scale of community pastures. An important lesson from rangeland grazing research in the United States is that the results from grazing trials conducted in small paddocks on research stations are misleading. They fail to accommodate the effects of livestock distribution at a landscape scale, where animal movement is a critical component of grazing ecology. For example, commercial producers consistently report that rotational grazing increases forage production and carrying capacity, but the majority of research trials have found no benefit to pasture rotation. Research has emphasized timing of grazing events and stocking rate of livestock while ignoring the spatial dimension of livestock movement over a landscape.

107. Private-public partnerships in agricultural enterprises can expand the scope of donor-funded or government-supported programmes and increase the likelihood of sustainability of development activities. The CS-FOR project could organize public-private partnerships in the four target Districts with an emphasis on activities that address the issues of climate change adaptation and mitigation.

#### **e. Value chain development**

108. **Lessons from IFAD and WB projects. Improved pastures lead to higher animal productivity, however linking smallholders to formal markets is key to remain on sustainable development path.** Observations of the supervision missions for the LMDP indicate consistently that there is an improvement in livestock productivity in the project communities. Over the period of three years, milk yields went up on average from 4-5 to 6-7 litres per cow/day; and weight gains for cattle bred for meat were up from 280 kg to 300 kg prior to slaughter. This is attributable to the combined contribution of interventions under the AISP and LMDP I, most notably improved access to remote pastures and water; and a reduction in disease.

109. The expected production increases from the improved pasture management will lead to increased surplus, which in turn would lead to an ever increasing number of smallholders learning to earn income from livestock. Such a transition will, however, require intensive support to profitably link smallholders with the value chain. To mention the key concerns, first, the smallholders will need improved financial literacy in order to improve their decision making in commercial dairy primary production; second they will need to cooperate to improve their output quality collectively and submit to controls; third they will need to improve new negotiating and collective bargaining capacity when cooperating with a commercial partner to receive their fair share from the surplus generated by improved quality of produce.

110. **Let end-buyer be the entry-point to value chain upgrade.** The main difficulty in linking the farmers in profitable red meat value chains is bulking and compliance with industry standards. Evidence from other donor programmes that have sought to improve the quality of livestock produce emphasizes the importance of channeling support to farmers with close involvement of the processors that are the immediate purchasers of the primary produce. This will facilitate the formulation of a set of appropriate standards to farmers by which the processors wish them to abide; ensure commitment by processors to the standards to which the farmers are trained and setup of suitable monitoring arrangements case by case. Strengthening the capacity among value chain operators on gender mainstreaming would facilitate gender-sensitive analysis and support to value chain development.

111. Poor animal health situation and limited access to veterinary services are a major limitation of further livestock sector development in Kyrgyzstan. Diseases and parasites negatively impact animal productivity and human health. In addition, the presence of animal diseases causes great economic losses to rural poor representing a large group of the region's livestock owners and strongly affects their ability to trade on national and regional markets. In IFAD experience, successful animal disease control requires intensive public awareness efforts and strong logistical coordination at community level. The successful brucellosis control programme implemented under AISP demonstrated the importance of intensive public awareness and community level planning of vaccination campaigns with private veterinarians.

112. **Network of mediators as an efficient way to link herders and end buyers.** There are also examples of good practices originating from local farmers. Thus, “Reina-Kench” leading farm (Ak-Suy district, Issyk-Kul) has organized over 100 farmers into groups with a network of brokers providing mentorship on animal health and hygiene. The initiative was further supported by IFC and Helvetas. Key lessons learned include the need for valid incentives for brokers to work better (e.g. honorarium per LW gain) and stringent control by the state veterinary inspection of all market players.

113. Past projects experience and national industry experts suggest the immediate results to increase offtake of animals would be in investment in livestock holding paddocks at community level and change in feeding practices (keeping animals in stalls after certain age).

#### f. Rural Finance

114. **Credit usage remains relatively high in Kyrgyzstan, especially small and micro credit (including in rural areas).** A specific feature of Kyrgyzstan is that there is virtually no gap in account ownership in terms of gender or urban versus rural areas. In the area of formal credit usage, the country is slightly ahead of its peers in lower middle-income countries according to the World Bank Global Findex (2018), in 2017, 10.2 percent of adults used formal credit in the past year versus 9.8 in the middle-income countries, and behind ECA where this figure is higher – 24.2 percent. Credit usage is slightly higher among rural residents of Kyrgyzstan (close to 11 percent). Overall, as compared to 2014 Global Findex data, both formal and informal credit usage in Kyrgyzstan has decreased which may be a sign of credit market stabilization after rapid credit growth in the recent years.

115. The data from the country's Credit Information Bureau “Ishenim” confirms the relatively high usage of credit in the Kyrgyz Republic. According to “Ishenim”, the total number of borrowers as of January 2016 was close to 600,000, with about 15 percent of them with parallel loans. This is a significant improvement of the over-indebtedness crisis of 2012 when about 30 percent of borrowers had parallel outstanding loans, often from more than one lender. The tables below shows trends in parallel loans in 2014 – 2016, and the composition of borrowers with parallel loans as of January 2016.

Table 2. Number of borrowers with parallel loans, 2014 – 2016

Indicator	2014	2015	2016
Number of borrowers with parallel loans	86,893	93,670	82,372
Total number of borrowers	489,363	534,411	552,396
Number of borrowers with parallel loans, %	18%	18%	15%

Source: Credit Information Bureau “Ishenim” (2016).

*Table 3. Number of loans per borrower, January 2016*

Number of loans per borrower	Number	% of total
1 loan	470,024	85.1%
2 loans	74,370	13.5%
3 loans	7,057	1.3%
4 loans	716	0.1%
5 and more loans	229	0.0%
<b>Total</b>	<b>552,396</b>	<b>100%</b>

Source: Credit Information Bureau “Ishenim” (2016).

116. Borrowers are especially active in using micro and small loans: of all outstanding loans reported to “Ishenim” as of January 2016, 78 percent are below KGS 250,000 (USD 3,650), and 29 percent – below KGS 50,000 (USD 730).

*Table 4. Number of loans by loan size, KGS, January 2016*

Loan size	Number	% of total
Below 50,000	171,257	29%
50,000 - 250,000	296,297	49%
250,000 - 500,000	93,035	16%
500,000 - 2,500,000	33,094	6%
Over 2,500,000	5,089	1%
<b>Total</b>	<b>598,772</b>	<b>100%</b>

Source: Credit Information Bureau “Ishenim” (2016).

117. The active usage of micro and small credit has been confirmed during the CS-FOR Project Design Mission in April 2018 at meetings with 4 commercial banks (including one microfinance bank) and the banking and microfinance associations. Micro and small credit is generally available to all clients with a source of income and acceptable credit histories, including for micro and small loans for agriculture which represents a significant portion of banks’ portfolios.

118. **Cost of credit remains high in Kyrgyzstan due to high cost of funding.** While the cost of credit has been slowly declining in the past 5 years, it still remains very high. Per the data from “Ishenim”, weighted average interest rates have not changed significantly over the course of the last 5 years.

*Table 5. Weighted average interest rates on credit. 2013 – 2017*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>2013</b>	19.8	19.7	19.5	19.4	19.3	19.2	19.0	18.8	18.7	18.6	18.4	18.4
<b>2014</b>	18.3	18.1	17.9	17.8	17.8	17.6	17.6	17.5	17.5	17.5	17.5	17.6
<b>2015</b>	17.8	17.6	18.8	18.8	18.8	18.7	18.7	18.7	18.8	18.9	18.8	18.9
<b>2016</b>	19.6	19.7	19.6	19.7	19.7	19.5	19.3	19.1	19.0	18.8	18.6	18.3
<b>2017</b>	18.2	18.0	17.7	17.5	17.2	16.9	16.7	16.6	16.5	16.3	16.2	16.0

Source: Credit Information Bureau “Ishenim” (2018), based on NBKR data.

119. For local currency loans, the weighted average interest rate in December 2017 was even higher – close to 19 percent, and for foreign currency loans – 11.3 percent. The banks interviewed mentioned a

range of 22–37 percent for micro and small loans as typical commercial interest rates offered in the market (Table 7).

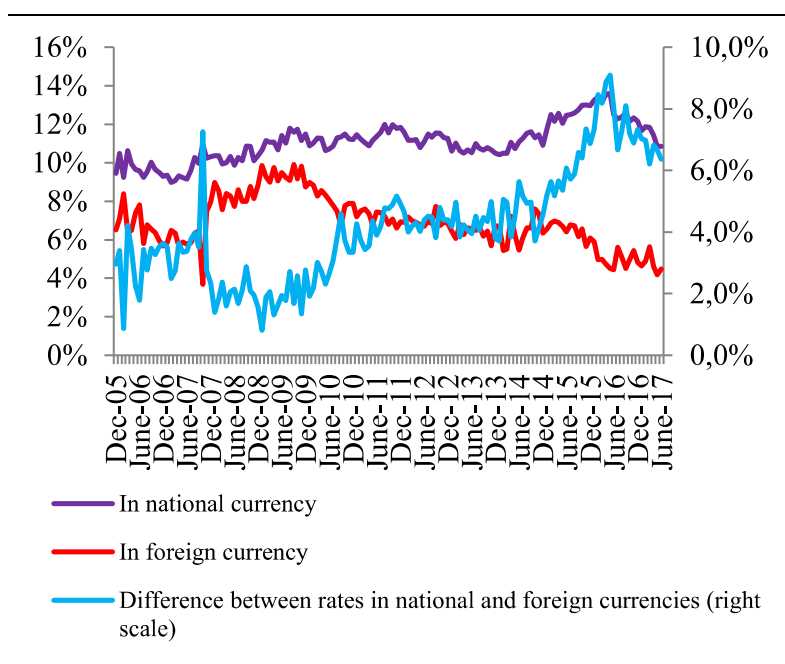
*Table 6. Weighted average interest rates on credit, in local and foreign currency. 2017*

Interest rates	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Loans in national currency	22.1	21.9	21.5	21.1	20.7	20.2	19.8	19.7	19.5	19.2	19.1	18.8
Loans in foreign currency	13.3	13.1	12.9	12.7	12.4	12.3	12.1	12.0	11.8	11.7	11.5	11.3

Source: Credit Information Bureau “Ishenim” (2018), based on NBKR data.

120. The high costs of credit are partially due to high cost of funds in Kyrgyzstan. Thus, the NBKR refinancing rate is currently 5 percent p.a.,<sup>169</sup> and the interest rates on retail deposits have been around 10 percent p.a. and higher in local currency, and around 6-8 percent p.a. in foreign currency.

*Figure 1. Trends in average weighted interest rate of individuals’ time deposits, 2005 – mid-2017.*



Source: NBKR 2018.

**121. The credit needs of micro enterprises are largely met, while there is a gap in small, medium and larger enterprise financing.** The agricultural sector plays an important role in the economy and society of the Kyrgyz Republic; this role is reflected in the financial sector loan portfolio, with agriculture being the second largest funded economic sector that has been taking up a consistent share over the past years (between 21 and 23 percent of the total loan portfolio). The existing financial services providers and government programs have been focusing both on the agricultural sector as well as micro and small businesses: as noted above, there are over 283 thousand microfinance borrowers served by MFIs with average loan balances of USD 716; the largest agricultural bank in the country, Ayil Bank, serves over 60 thousand active borrowers with an average loan amount of USD 3,539 and issues about 25,000 loans annually to socially vulnerable categories, with amounts up to USD 735. Overall, close to 80 percent of all

<sup>169</sup> <http://www.nbkr.kg/newsout.jsp?item=31&lang=ENG&material=84389>

loans in the country are below USD 3,650, including 29 percent – below USD 730.

122. Therefore, the niche of micro and small agricultural loans appears to be well covered by the existing lending programs of the government and commercial banks, and no additional loan funding will be necessary for this category. At the same time, it appears that there may be a financing gap in the area of medium-sized and larger loans for agricultural producers and processors.<sup>170</sup>

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<sup>170</sup> It appears there has been no comprehensive national market research done in Kyrgyzstan on the funding needs of the agricultural sector.





## Chapter 4: Detailed project description

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## I. Project description

### a. Project area and target group

1. CS-FOR project intervention area is introduced in Chapter 1 of the Feasibility Study and further details on the natural resources base are presented in the Annexed Project Atlas.
2. Vulnerability to climate change was the most important parameter for the target area selection. The design team collected a large number of data sets at national and sub-national scale and using the Earth Map tool, performed a series of vulnerability analysis to identify project's core target areas<sup>171</sup>. Target areas have been selected according to the following criteria:
  - a. Exposure of ecosystems and communities to natural hazards triggered by climate change;
  - b. Vulnerability of ecosystems and communities to climate change;
  - c. Mitigation potential in terms of forest and pasture rehabilitation;
  - d. High dependency of communities from natural resource exploitation;
  - e. Socio-economic vulnerability of communities.
3. The core intervention area of the CS-FOR project will be located in selected rural municipalities (aiyl aymak) in four contiguous districts of Ak-Talaa, Toguz-Toro, Suzak and Uzgen. The table 1 below indicates population and numbers of rural municipalities and villages by district. *Ayil aymaks* are local self-government units, comprising the administrative body (*ayil okmotu*) and the council of elected members (*ayil kenesh*). Each rural municipality has several villages.

**Table 1: Population and Numbers of Rural Municipalities and Villages in Target Area (2016)**

District	Region	No of rural municipalities	No of villages	No of rural households	Total Rural Population <sup>172</sup>
Ak-Talaa	Naryn	13	18	8,274	38,008
Toguz-Toro	Jalal-Abad	5	13	5,456	24,942
Suzak	Jalal-Abad	13	125	51,713	272,096
Uzgen	Osh	19	102	40,143 <sup>1/</sup>	205,517
<b>TOTAL</b>		<b>50</b>	<b>258</b>	<b>105,586</b>	<b>540,563</b>

Source: NSC data (2017)

Note: 1/ extrapolated by the average of the other three, where data on household numbers is available.

## II. Project objective and impact indicators

### b. Project objective

4. In line with the national policies and regulatory framework in the fields of climate change and natural resources management, the **goal of the project** is to contribute to the development of a low carbon-emission and climate-resilient economy, while capitalizing important co-benefits from adaptation and

<sup>171</sup> Data and analysis that allowed the identification of the proposed target areas were organized in form of an atlas that presents the rationale behind areas' selection and that form the main part of the baseline in terms of distribution, density, status and vulnerability of target ecosystems (forests and pastures) and communities. The atlas presents key information such as climate variables, including trends, demography, agriculture productivity, infrastructures' distribution, pasture user associations grazing areas, forest fund lands and others. The ensemble of presented data constitutes the context generating the assessed needs as well as the context into which the validity of the paradigm shift will be objectively demonstrated. The atlas will include also available historical data so to create, in GE, time series analysis as well as interactive videos.

<sup>172</sup> Estimates for 2016 (NSC).

disaster risk reduction.

5. The **project objective** is to **increase carbon sequestration through supporting climate investments in forests and rangelands and through reducing drivers of degradation and emissions** via institutional support, participatory ecosystem-based sustainable management of natural resources and green growth investments.

### c. Paradigm Shift Objectives

6. The project will contribute to two Paradigm Shift Objectives of the GCF: (i) Shift to low-emission sustainable development pathways, with co-benefits in the GCF objective related to (ii) Increased climate-resilient sustainable development. More in details:

- (i) **Shift to low-emission sustainable development pathways.** According to the INDC document submitted by the Government of the Kyrgyz Republic, it was determined that the Kyrgyz Republic's contribution to mitigation will be to reduce GHG emissions in the range of 11.49 - 13.75% below business as usual (BAU) in 2030. Under international support, the Kyrgyz Republic could implement mitigation measures to achieve total reduction in the range of 29.00 - 30.89% below BAU in 2030. Projecting to 2050, the Kyrgyz Republic will reduce GHG emissions in the range of 12.67 - 15.69% below BAU. Additionally, under international support the Kyrgyz Republic could implement the mitigation measures to achieve total reduction in the range of 35.06 - 36.75% below BAU in 2050<sup>173</sup>. As detailed in this Funding Proposal, the project will support the reduction of emission and enhance carbon storage of about 19.8 million tCO<sub>2</sub>eq. through: (i) the creation of legal and management enabling environments supported by an innovative evidence-based climate and natural resource planning and monitoring system; (ii) community-based investments in natural forest regeneration, sustainable forest management, afforestation and reforestation; (iii) rehabilitation of rangelands and prevention of further degradation; (iv) diversification of options for community livelihoods; and (v) reduction of emission intensity per unit of animal protein. The country will thus shift from a local economy that is currently negatively impacting on carbon storage potential of ecosystems (forest and rangelands) to a low-carbon emission economy where mitigation investments will trigger and enhance resilience of ecosystems as well as of communities that, in addition to provisioning ecosystem services, will also benefit from supporting and regulating services (e.g. improved climate regulation, flood regulation, soil retention, habitat provision). The project will measure its success by assessing the degree *to which it will have contributed to low-emission sustainable development*.

The current level of forest degradation under BAU scenario generates an estimated net loss of 1.5 m tCO<sub>2</sub>eq in 20 years; through the combined effect of the various interventions, the project will be able to avoid the mentioned losses and to generate an additional over 18 m tCO<sub>2</sub>eq sequestration (15.1 from rangeland and livestock, 2.9 from forest activities and 0.2 from other agricultural activities), for a net effect of 19.8 m tCO<sub>2</sub>eq sequestered. Such expected sequestration (4.2m tCO<sub>2</sub>eq) is composed of: (i) 0.7 m tCO<sub>2</sub>eq from afforestation and reforestation, and forest enrichment; and (ii) 3.5 m tCO<sub>2</sub>eq from improved forest management of the existing forests. The EX-Act LUC calculations are based on current degradation trends, showing 25% of the forest as largely degraded, 15% as moderately degraded and 60% as non-degraded. The potential net sequestration calculation is based on the current trends (showing substantial degradation).

- (ii) **Increased climate-resilient sustainable development.** Throughout the preparation of the project, the household survey has assessed the level of resilience of the target population (compared to a possible project expansion areas a control group). The approach used is the FAO-developed Resilience Impact measurement Analysis methodology ([RIMA II](#)), which allows to derive a *Resilience capacity index* tailored on the local vulnerability, focusing on explaining how certain households are able to better cope with shocks and stressors (i.e., natural hazards and climate change).<sup>174</sup> The analysis shows, and shows how **the control group is more resilient** with respect

<sup>173</sup> The Government of the Kyrgyz Republic. Intended Nationally Determined Contribution to the UNFCCC. Submitted to UNFCCC in 2015.

<sup>174</sup> A Working Paper on Resilience Analysis is enclosed in Annex 9 of the Funding Proposal.

to the intervention group. Looking at the resilience structure matrix for the **intervention group**, **adaptive capacity is the most influential pillar, followed by access to Basic Services, Social Safety Nets and Assets**. For the control group **adaptive capacity is the main pillar, followed by Assets, access to basic services and social safety nets**.<sup>175</sup> For both the intervention and control groups, the importance of adaptive capacity is mainly driven by the **high level of education** (household head with university degree, which accounts for almost 25 percent on the final Resilience Composite Index (RCI) score) and the **diversification of income portfolios** (which account for almost 16 percent in the intervention group and 11 percent in the control group). These findings confirm the need for economic diversification as part of the adaptive capacity and help identifying priorities for investment in the country, including for partner organizations and parallel projects. It is noted that the CS-FOR project is complementary with the WFP-GCF adaptation project for the country. Through its evidence-based approach, the project will support the diversification of sources of rural income ensuring mitigation-oriented productivity with co-benefits for adaptation to climate change-related stresses and hazards through implementation of systematic INRMCRPs and related investments. The project will secure, mainstream and upscale the enabling environment for diversification, increase of efficiency and competitiveness by reducing dependency of communities on direct uses of resources (i.e., wood and pasture) and improving their livelihoods through benefits gained by improving ecosystem functions and diversification of livelihood opportunities for women and men. Ultimately, the experience of this project will serve as a driver for dissemination of good practice throughout the country, shifting national agricultural production from a predominantly unsustainable subsistence livestock production to a diversified and climate-sensitive value chain business-oriented economy. Through the mid-term and final assessment of resilience using the RIMA II approach,<sup>176</sup> the project will assess the degree to which it will have contributed to climate-resilient sustainable development. To this end, the project will assess the *degree to which it will have contributed to climate-resilient sustainable development*.

7. **Scaling up potential.** By targeting policy harmonization, and strengthening the capacities of key national and local institutions in the use of new approaches and tools, the project will significantly influence the policy and operational environment in a way to shift towards climate change mitigation-driven natural resources management. Component 1 is instrumental to ensure the national scale up of the project approach (reference: section C.3, and Chapter 4 and 5 of the FS). The improved framework will also contribute to a more effective mainstreaming of climate resilience in vulnerable economic sectors (forestry and livestock), and enable lessons learned from the field to be progressively adopted by all involved stakeholders, and scaled-up by the relevant authorities (SAEPF, Pasture Department, and all institutions involved in monitoring the country's natural resource base). As a reinforcing element, even during the project life cycle, the project will promote at national level market driven incentives (via Component 3 and private sector involvement) to income diversification thus reducing pressure on natural resources. Finally, the harmonized and evidence based approach of integrated management of forests and rangelands has the potential for replication also in other countries - especially in Central Asia, with similar economic structure (ie, livestock dominated in rural areas, and suffering from progressive rangelands degradation). As shown in the EFA (Annex 3) and in the carbon accounting (Annex 3.a), the project has the potential to enhance carbon sequestration at a low cost per ton of CO<sub>2</sub>eq, which is an attractive element to adopt similar approach for other countries committed to similar mitigation objectives.

### III. Components and Outputs

8. The project's investments and activities will be executed through three components in addition to Project Management:

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<sup>175</sup> The WP on Resilience in Annex 9 includes an appendix with all statistical references and details on tests used to check the significance of the results.

<sup>176</sup> The Resilience Impact measurement Analysis methodology ([RIMA II](#)) is described in Chapter 6 of the Feasibility Study. RIMA II is an innovative quantitative approach developed by FAO that focuses on explaining how certain households are able to better cope with shocks and stressors (i.e., natural hazards and climate change).

- 1. Evidence-based Strengthening of Natural Resources Management Governance;
- 2. Green Investments for Forest and Rangeland Rehabilitation; and
- 3. Climate-sensitive Value Chains Development.

#### a. Component 1: Evidence-based Strengthening of NRM Governance

##### Component's Rationale, Approach, Outcome and Outputs

9. **Rationale:** The leading element of this Component is to provide Kyrgyzstan with **an enabling environment that supports investment for carbon sequestration through forest and rangeland management while providing economic and social incentives to the users of natural resources**, to avoid the depletion of carbon sink potential. The key measure in Kyrgyzstan to preserve forest-rangeland ecosystem's natural resources is to improve governance in their management in order to prevent livestock overgrazing, overharvesting of fuelwood and timber, and to create an enabling environment that stimulates innovative practices and investments that conserve and regenerate these resources. The current policy and regulatory environment is highly fragmented and ineffective. About 1.2 million ha of pastures, located in and around forests on the State Forest Fund (SFF) lands are managed differently than the 9 million ha of municipal pastures. Forests which grow on the municipal lands are governed by different legislation than forest on the SFF lands. The management, use and protection arrangements for the resources within the SFF are regulated by the Forest Code and related set of legislation, while municipal lands and their resources are governed by a different set of legislation. The major gaps in the regulations for use of natural resources relate to lack of legal framework on management of communal (municipal forest), contradictory tenure arrangements for use of pastures located within the forest-rangeland ecosystems and managed by different agencies, and lack of legal foundation for private-public partnerships in management of natural resources. Other gaps relate to legislation and guidance to the users on preservation of biodiversity of the forest-rangeland ecosystem. As a result, **the existing regulatory framework fails to support effective and sustainable arrangements for natural resources management**, hampering: (a) effective investment for carbon sequestration; and (b) adaptive investment to reduce the impact of climate related stresses on natural resources (see Chapter 1, Feasibility Study). Several institutions in charge of forest-rangeland ecosystem resources operate in isolation, and there are no formal arrangements to synergize tenure regimes.

10. As described in Chapter 1 of this FS, the current (baseline) situation is that the policy and governance mechanism in NRM is segmented and limits further inclusion of climate risk in the management schemes in forestry and rangeland ecosystem in an integrated manner. In addition there is no enabling environment of public-private partnership in climate resilient NRM. The added value proposed by CS-FOR rests in the use of evidence for the identification of resources, and in the cohesive and inclusive approach in validation of the evidence, and identification of investment priorities with a view at carbon sequestration potential. The GCF additionality in the proposal is therefore focused on establishing an integrated climate sensitive NRM mechanism in public-private partnership.

11. The participation of private sector is critical to realize the theory of change and paradigm shift of the project. In this sense the policy and legal framework will enable private sector engagement by enhancing the inclusive policy dialogue in public-private partnership for integrated ecosystem management in the context of a changing climate, based on the established stakeholder engagement process, which was initiated during the project formulation stage by involving private sector and identifying their needs and requirements. The process will be sensitized by knowledge management and facilitated by the experts, aiming at institutionalizing policy instrument and governance framework to create the enabling environment for public-private partnerships; and sensitizing private sectors in green investments (Component 2) and climate-sensitive value chain development (Component 3).

12. The work under component 1 will build on the work carried out by FAO together with the state Agency for Environmental Protection and Forestry to put together the Forest Assessment, as a tool containing an inventory of the forests in the Kyrgyz Republic, developed with a very participatory approach with the support of major stakeholders working on forest management, civil society, NGOs, forest services, scientists, line ministries and international partners. Additionally, the work under this project will also be based on the findings of the PROFOR Study conducted by the WB, particularly considering the

main recommendations.

13. **Component objective:** This Component will **contribute to the harmonization of procedures and regulations to ensure a sustainable and climate change sensitive integrated planning, monitoring and evaluation of natural resources management**. The key tool to ensure success will be the promotion of evidence-based and inclusive processes, involving all institutions responsible for natural resources' (forests and rangelands) protection and management at national and local levels.

14. Component 1 has one output :

**1.1: Evidence based natural resources management governance is strengthened across stakeholders**

15. The key measure in Kyrgyzstan to preserve forest-rangeland ecosystem's natural resources is to improve governance in their tenure and managing in order to prevent livestock overgrazing, overharvesting of fuelwood and timber, and to create an enabling environment that stimulates innovative technologies and investments that conserve and regenerate these resources. The current policy and regulatory environment is highly fragmented and ineffective. About 1.2 million ha of pastures, located in and around forests on the State Forest Fund (SFF) lands are under tenure and management regime different from the 9 million ha of municipal pastures. Forests, which grow on the municipal lands are under tenure regime and governed by different legislation than forest on the SFF lands. The management, use and protection arrangements for the resources within the SFF are regulated by the Forest Code and related set of legislation, while municipal lands and their resources are governed by a different set of legislation. Two sets of legislation fail to support effective and sustainable tenure arrangements and contradict each other, contributing to the confusion and conflicts on the ground between users and managing bodies, and leading to deterioration of the resources. Several institutions in charge of forest-rangeland ecosystem resources operate in isolation, and there are no formal arrangements to synergize tenure regimes. As key result, the work under this output will support strengthening and harmonization of the policy and legislation related to integrated management and use of forests-rangeland resources based on ecosystem approach.

16. The first group of activities implemented within this output will support the development of a set of knowledge products, aimed to enhance the quality, effectiveness and harmonization of the policy and regulatory framework on natural resources management. Specifically, the work under this output will promote: **(a) Support to review and harmonize the current regulatory framework on forest and rangeland management** for identification of legal gaps and ambiguities in sectoral policies and regulations; conduct special assessments on impacts of existing legislation on biodiversity, environmental resources, and livelihoods for women and men, including on gender equality. The major gaps in regulations relate to lack of legal framework on tenure and management of communal (municipal forest), contradictory tenure arrangements for use of pastures located within the forest-rangeland ecosystems and managed by different agencies, and lack of legal foundation for private-public partnerships in management of natural resources. Other gaps relate to legislation and guidance to the users on preservation of biodiversity of the forest-rangeland ecosystem. These analyses together with the consultations with the local government bodies, district administrations, forest institutions, PUUs and other community groups representing the interests of both women and men and users in four target districts will identify critical policy elements for integrated and participatory natural resources management and use. **(b) Capacity development and mobilization of an Expert group for technical assistance.** The project will support the establishment of an Expert Group comprised of various technical expertise with engagement of local research and outreach organizations will develop and deliver capacity-development interventions to enhance capacity on policy making and management of natural resources among key stakeholders. The Expert Group (part of the PMU) will include Gender and Social Development Specialist, and TOR of each member includes gender mainstreaming. The output will seek to provide evidence to inform the policy and legislation framework and plans for priority climate financing activities and investments. The project will also finance studies to advise on forest-rangeland ecosystem zoning, stratification and planning, spatial and territorial development.

17. Key activities will comprise:



- 1.1.1. Prepare communication material and organize information awareness campaigns to mobilize national stakeholders. The activities will support the preparation of material for the mobilization of stakeholders at the local level to advance participatory management of natural resources.
- 1.1.2. Organize fora/ international conferences meetings to sensitize the stakeholders. The activity will comprise making and translating short films, social advertisement and other means in the mass media. Special attention will be on developing such materials for schools to be incorporated in classes to raise awareness in target communities. Various community information events will be held to attract attention of resource users to climate change impacts and mitigation measures.
- 1.1.3. Training sessions/ workshops on forest and rangeland tenure arrangements, policy making, and management of natural resources. The activity will support existing natural resources monitoring functions at national level (including measurement, reporting and verification within SAEFP) with evidence-based tools and methodologies for Planning, Monitoring and Evaluation, and will facilitate linkages between evidence and data from the ground, information systems and the forest-rangeland ecosystem planning processes.
- 1.1.4. Propose recommendations for enforcement of sustainable management and use of forest-rangeland ecosystems through participatory process. The activity and related sub-activities will support the harmonization of legislation on tenure arrangements for forest-rangeland ecosystem and include aspects such as: (a) recommendations for enforcement of sustainable management and use of forest- rangeland ecosystems; and (b) technical, legal and institutional approaches to advance public-private partnership in promotion of integrated natural resources management. More specifically, the project will work on improvement of the existing forest-rangeland ecosystem related legislation required for integrated management. The major issues to be analyzed, documented and utilized for the policy agenda relate to: i) development and introduction of a harmonized approach to sustainable management of livestock grazing in a participatory manner on pastures of the State Forest Fund (SFF) and State Land Fund (SLF); ii) elaboration of different tenure arrangements for use of various natural resources on the lands of SLF and SFF with engagement of communities, municipalities, users' groups, and individual women and men farmers (in line with the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests – VGGT, and its technical guides, including on gender equality (*Governing land for women and men*), (<http://www.fao.org/tenure/resources/results/card/en/c/39d3d18f-3ebc-4aa5-bc2a-7c5996788a81>), improving governance of forest tenure, and improving governance of pastoral lands); iii) elaboration of legislation and regulations on gender equitable and sustainable management and use of municipal forests. The project will also elaborate standards of sustainable use of pastures and forests, methods and tools for monitoring and compliance requirements and arrangements while ensuring social equity.
- 1.1.5. Identify approaches for national stakeholder involvement process and organize National Stakeholders Platform Policy Dialogue for the management and use of municipal forest and facilitate thematic workshops, and submit the recommendation document to the Parliament. The project will establish a system of documenting findings and evidences to channel to the CS-FOR National Platform for discussions. The national platform aims to facilitate discussion and cooperation between agencies engaged in the NRM and advance legislation, and will serve as Steering Committee of CS-FOR. The National Platform will include representatives from Government and CSOs knowledgeable about gender issues, and its TORs will include gender aspects. The project will also support inclusive technical discussions to deepen selected topics (via specific consultations, including on impacts of existing legislation on biodiversity, environmental resources, and livelihoods for women and men, including on gender equality) to inform dialogue and harmonization of regulatory framework. Dialogue on biodiversity and environmental resources in target areas will be supported, with the aim to endow the country with better chances to ensure ecosystem preservation.

18. Risks and mitigation measures include:

- Insufficient inter-ministerial coordination between the SAEPP, MAFIM, MES, and SALGSIR and coordination among local self-government bodies, *leskhoz*es and PUUs in implementation of reforms. Mitigation factor. This could be mitigated by the establishment by the project of a dedicated National Platform, formally set up chaired by the Vice Prime Minister to ensure inter-ministerial coordination and cooperation
- Changes in the Government's political vision such as the decentralization of resource management with high change in the highest decision making positions may affect the project implementation in the way it involves local communities. Mitigation factor. In order to mitigate the risk, the project will establish a continuous engagement process as key strategic element of implementation, following the process already started at design stage (see ESMF and stakeholders engagement report), involving of technical staff of relevant ministries and stakeholders on the ground in the preparation and implementation to ensure buy-in, and supporting communications campaigns to disseminate results of the studies, to raise public awareness on climate change risks and to ensure wide political support.
- The mobilization at local level and the dialogue around the INRMCR may be affected also by vested interests, gender-based inequalities and distorted incentives, as well as petty corruption leading to resistance to changes. Mitigation factor. In this sense, the project with the experience of ARIS and other partners will ensure social mobilization process in target communities and a strong gender-responsive participatory approach in implementation of all activities to ensure transparency and accountability. In this, broad and active communication and awareness campaigns will be established with indication of clear project implementation benchmarks. Gender-responsive mobilization and communication channels will be developed to reach both women and men, including vulnerable groups. All project monitoring will be disaggregated by sex and other relevant social determinants.

19. The second group of activities implemented in this output will aim to enhance capacities on climate change risks and natural resource assessments, support further enhancement of capacities of the existing monitoring units at the central level with evidence-based integrated NRM Planning, Monitoring and Evaluation tools and methodologies, and facilitate linkages between the evidences, data from the ground, information systems and the forest-rangeland ecosystem planning processes. This output is dedicated to strengthening the existing national system for monitoring natural resources, with the specific additionality to focus on climate-sensitive and evidence-based *monitoring* and decision making (e.g., via Earth Map, Collect Earth, and other tools developed by FAO specifically for climate monitoring and decision making)<sup>177</sup>.

20. Key activity will be as follows:

- 1.2.1 Demonstrate and accompany national and local institutions in adopting the evidence-based Natural resources Planning, Monitoring and Evaluation System. The activity will be twofold, including:

**a. Establishment of a dedicated evidence-based and georeferenced project M&E system**, including a dedicated NRM and climate-oriented monitoring procedure for central institutions to ensure scalability across the country. The project will support development of standards, methodologies and implementation modalities for the state monitoring of rangelands and forests resources, which, in addition to tracking investments in climate change-related activities, will also contribute to enhancing the knowledge-base of the impact of ameliorated/managed pasture and forest lands to climate change (including human and ecosystem resilience). Over time, data generated can show trends in the correlation between management practices and climate change mitigation and adaptation. The activity will be

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<sup>177</sup> Tools and methodologies are described in Chapter 6 of the annexed Feasibility Study and in Annex 6.b. Project ATLAS and Earth-Map.

developed in the framework of the targets of the Memorandum of Understanding (MOU) agreed by Kyrgyz institutions with the Kyrgyzstan National Spatial Infrastructure: central, local institutions, academia, and Civil Society Organizations (CSO).

**b. Supporting use of georeferencing and evidence-based approach.**<sup>178</sup> This will be done at all levels in an interactive manner and through the implementation of the project's activities. **(a) At national level:** by establishing an NRM communications framework to secure data and information transfer across the country and within institutions. Within the framework of the Kyrgyzstan National Spatial Infrastructure Memorandum of Understanding and existing policies and laws, the project will ensure that mechanisms, tools and approaches will be used to support the dissemination of NRM and climate policies/laws/information across the country, and to update central institutions with data/information/needs originating from local administrations and rural communities. Trainings will develop the capacity of central and local institutions, schools, academia and CSOs in bridging policies and management plans with data and information (using the FAO approach and tools for Georeferencing and Geospatial Analysis). **(b) At local level:** by providing technical support to PUUs and Leskhozoes (local forest institutions) to update and enhance their datasets, working maps and tools to support the evidence-based NRM/climate-oriented strategies. This will be linked to the implementation of Integrated Natural Resource Management and Climate Resilience Plans (INRMCRPs) (under Component 2), where the project will provide PUUs with *ad hoc* tools (i.e., digital maps, GPS, field met-stations) to map and monitor their pastures and forests adequately.

21. The third group of activities implemented in this Output will aim to create and improve skills and capacity in promotion of climate-resilient and adaptive NR management and use in participating communities. The investments for monitoring in the activity 1.2.1 are instrumental to the communities' integrated climate-resilience plans.

22. Key activity will be as follows:

1.3.1 Mobilize communities, establish CLMGs and accompany in formulating INRMCRPs. The activity will be threefold, including:

**a. Establishment of Community Landscape Management Groups (CLMGs).** Through social mobilization, this activity will support the establishment of CLMGs as informal institutions on a local level by the project to advance participatory management of resources. The CLMGs will be comprised of the representatives of the district administration, local self-government bodies (aiyl okmotu and aiyl kenesh), management of leskhozoes and national parks, representatives of the Pasture Users Unions (PUUs), Water Users' Association (WUAs), other civil society and community organizations. The CLMGs would also include active forest and pasture resources' users, and local entrepreneurs, as well as representatives of women's and youth committees. Because women are not likely to be represented in PUUs and WUAs, any other civil society and community organizations representing the interests of women will also be mobilized and engaged, as well as local women leaders. A standard minimum quota of 30 percent of women in CLMGs will be sought for the first year of the project, and efforts will be conducted to increase this percentage in the following years of the project.

The ARIS will elaborate social mobilization and institutions development process on establishment of such groups in four target areas, starting from the village meetings to the district clusters' organizations. Representatives of the communities will be selected at the general village meetings, depending on the specifics of the area. Some villages are located far from the forests and do not use forest resources, and thus they might not be interested to join the CLMG, which will be formed at the level of the Aiyl Aimak. Several CLMGs will form a cluster at the district level chaired by the head of the state district administration (District

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<sup>178</sup> See Georeferencing Strategy, annexed as Working Paper to the Feasibility Study and to the Funding Proposal.

Akim), at the tier of the forestry management and district authorities, as well as other state institutions. When necessary, the CLMG cluster would invite representatives of the State Registration Offices, district tax bodies to participate in the meetings.

**b. Methodologies for INRMCRP elaboration.** The project will develop methodologies, guidelines and materials on elaboration of the INRMCRP considering all issues of environment and biodiversity protection and ecosystem functions. The methodologies will be in line with the expected roles and functions of the CLMGs, which will in turn be based on assessment and mapping of resources and other evidences to develop integrated natural resources management and climate resilient plans (INRMCRP) for their forest-rangeland ecosystem; implement it and/or monitor its implementation. These groups through participation of all local stakeholders will ensure that ecosystem's resources are used sustainably, improvement are made where necessary based on assessment, as well as considering needs and priorities of the communities, including those of women and vulnerable groups. These plans will incorporate various resource use regimes, including agreed schedule, migratory routes of the livestock grazing on the lands of the SFF and SLF. Joint decisions will be made on limitations on number of livestock to be grazed on different pastures to preserve fragile resources and allow regeneration, on various improvements to the pasture and forests to be implemented under Component 2. It is expected that the CLMGs will propose different tenure arrangements for use of forest and pasture resources, such as municipal forests, including shelterbelts and windbreaks, as well as private and community based tree plantations, and sustainable fuelwood resources and alternative rural fuel sources. The CLMGs will report to their communities on the preparation and implementation of the INRMCRPs. The project will develop training methodologies and materials on INRMCRP and other issues of pasture-forest ecosystem management and use, organize training for local government, *leskhoz*es and Community Landscape Management Groups (CLMGs) on new arrangements for pasture-forest ecosystem management and monitoring arrangements.

**c. Design of INRMCRPs in all communities in the target districts.** In order to develop INRMCRPs, the project will build capacity of stakeholders (providing in turn capacity development to the communities) on community mapping of Natural Resources and livelihood strategies. As such, communities and PUUs will be guided by project staff in georeferencing and mapping their territory, its natural resources and livelihoods of resident women and men. The activity will work also as on-the-job training and it will be an additional opportunity for communities to gradually contribute to governance of NR. Supported by the training at community level, this activity will guarantee ground-truthing of geospatial analysis and GIS managed at the central level to guarantee monitoring of NR. The project will organize training for local government, *leskhoz*es and on new arrangements for forest-rangeland ecosystem management and monitoring arrangements. Within this set of activities, technical assistance will be provided to increase capacities at subnational and local levels for coordinated implementation of NRM and SFM policies, including strong cooperation between forestry organizations, pasture associations and local government. Information dissemination and capacity building programme will be developed to target decision makers on various source of funding for SNRM that includes carbon finance, especially in the international context of carbon sequestration in grasslands. This activity will also document lessons learned on the ground and perform evidence-based knowledge generation and management activities to inform the policy and legislation framework, and to provide recommendations to relevant sectoral strategies and plans for priority climate-financing activities and investments.

## **b. Component 2: Green Investments for Forest and Pasture Rehabilitation**

### **Component's Rationale, Approach, Outcome and Outputs**

23. **Rationale.** Forest ecosystems hold the largest shares of terrestrial carbon, and trees and perennial-grass pastures are dynamically sequestering CO<sub>2</sub> from the atmosphere into long-term biomass in trees

and shrubs. The climate rationale of green investments in forests and pasture rehabilitation is anchored in the imperative of maintaining the health of these ecosystems to perform their carbon cycle functions. This capability has been weakened in the Kyrgyzstan forests and pastures due to their poorly governed use and unsustainable management. The project aims at mainstreaming the principles and benefits of their sustainable management into broader user groups than their traditional custodians. Equally important is that management planning becomes integrative and goes beyond the sub-sectorial boundaries, which seem to lead to policy contradictions and only partial solutions that do not lead to sustainable development.

**Private sector's involvement in forestry investment.** The key returns of forestry investment are essentially represented by carbon sequestration, which in the current absence of carbon pricing initiatives, makes financial returns largely unattractive for the private sector. The financial benefits of pure forestry investment are too low even in a 20 years horizon to mobilize private capitals. However, considering the strong interlinkages between forestry and rangelands especially in their use by local rural communities as amongst the primary sources of livelihood, the **project approach envisages private sector's participation in forestry investment**. Even if the investment are local native (not commercial) tree species, communities and individuals will contribute with own resources (as also reflected in the project budget). The level of concessionality for such investments has been set according to the potential returns of the forestry investment (reference: Chapter 7 of the Feasibility Study, where the individual forests financial and economic returns are described). Varieties such as Juniper, Spruce, Poplar, and Mixed tree species give particularly low returns (the related financial performance indicators such as IRR and NPV are all negative), making public resources (including GCF grant) necessary for about 90 percent of the investment. On the other side, walnut and pistachio reforestation, even with the selected non-commercial local varieties, generate some higher financial results (IRR at 20-year horizon result positive only for walnut forests, barely positive for pistachio), and the concessionality is set at 65 percent. Such level, when accompanied by a leasehold agreement on the use and harvest of non-timber forest products, generate private sector's interest to provide an actual contribution even when the major benefit of the investment is a public good as mitigation. As per the EFA (Annex 3 of FS), for Pistachio and Walnuts the concessionality is 65% of the investment. Even considering the grant, the returns are barely positive. For Pistachio Forests (non-commercial varieties, afforestation activities), the IRR for a grant-supported investment over 20 years is 16% and the NPV is positive at barely 1,000 USD. Walnut (same, non-commercial indigenous varieties) is slightly more viable, with 20-ys IRR at 19% and NPV 5,000 USD.) All forest investment envisage the participation of private sector, with direct investment in land, labour, and other costs. The concessionality has been set at a level that raises the interest of possible private investors – that could access to credit lines generated by RKDF. See also Annex 11, which summarizes the significance of private sector involvement in the project.

**Private sector's participation in rangelands development.** Rangelands play a critical role in the project's expected carbon sequestration potential, and are one of the key elements of innovation compared to previous interventions and to the existing regulatory framework. In the project's framework, improvement of rangelands conditions contributes by over 70 percent of the carbon sequestration potential of the project (14.9 m tCO<sub>2</sub>e over a total expected sequestration of 19.7 m tCO<sub>2</sub>e in a 20 years horizon). Thus, the importance of rangeland investment is critical and cost effective: when considering the sole investment in rangeland (i.e., excluding the associated cost of capacity development and for improving the enabling environment) the cost of sequestration is about 0.26 USD / tCO<sub>2</sub>e, very low compared to average sequestration investment. Rangeland are at the centre of the livelihoods of rural communities in the target areas, but the currently prevailing livestock management is incompatible with considering rangeland as a carbon sink. In order to provide incentives to the behavioral change of private sector, the project has, on one side, set an attractive level of concessionality to the rangeland investment (yet with a private sector contribution of at least 10 percent). On the other side, the project has established an innovative associated investment (Component 3) that stimulates private sector's investment in value chains that will contribute to reducing the pressure on rangeland.

24. **Component objective.** Through investment on afforestation/reforestation and forest enrichment,

and productive investment in pasture restoration, this Component will contribute to increase carbon sequestration in the country as well as to increase the resilience of populations in the target areas and decrease their exposure to climate change related risks and hazards.

25. Component 2 includes one single output:

### **2.1: Green investments for forests and rangelands rehabilitation are made available**

26. Improved management of forests and rangeland on SLF and SFF to mitigate the effects of climate change and increase carbon sequestration, besides solid adapted and tailored investment in forestry, pasture and agroforestry, can be achieved only through training and mentoring of the principal actors involved in livestock and forest management. As such, this component will have a preparatory section dedicated to accompany the local level stakeholders and their institutions through a capacity development process with technical and institutional nature, to implement and monitor the INRMCRPs. More specifically, it will ensure that, through an evidence based processes, the stakeholders are able to make informed decisions on the investment based on the agreed plans, and at the same time have sufficient technical capacities and skills to implement the selected investment in forest and pasture. Key results of the component's capacity development investment will include: reaching a consensus among the involved institutions of the need to change current pasture management practices; a general understanding of the risks to community resilience if current practices are not amended; knowledge acquired among relevant agencies and pasture user groups of the ecological justification for rotational grazing and how to implement and monitor pasture rotation. Jointly with the investment in pasture supported under Component 2, these will lead to a generalized application of rotational grazing to pastures in the target areas.

27. This component will carry out the five following activities, with a first set (activities 2.1.1 to 2.1.3) dedicated to strengthening stakeholders capacities to manage integrated natural resource management climate resilient plans, and a second (activities 2.1.4 and 2.1.5) dedicated to implement these investments.

2.1.1 Conduct training to 50 communities and institutions on technical/ legal matters on forest enrichment and afforestation/ reforestation, and provide technical/legal assistances on forestry PPP establishment. All trainings will address gender issues as appropriate in the thematic topic. More specifically, within this activity, the project will perform the following:

**a. Carry out community mobilization and training for 50 Aiyi Aymaks and their communities**, including gender-responsive mobilization, training on gender issues and institutional support, as well as the establishment of task forces and fire management teams at leskhoz level. Within this activity, a service provider will be contracted to provide training of trainers on technical and institutional matters and facilitate local consultations and dialogue among leskhoz, NGOs, CSOs, forest and pasture experts, PUUs, water users associations and other Natural Resources users. Various forest and pastures stakeholders meetings will be held: the first one for information-sharing, dialogue, membership and organization of Community Landscape Management Groups (CLMGs); the second one focusing on change management in forest sector. The project will provide also support to follow-up institutional dialogue. It is expected that the results of the activities jointly with the local (between districts) and regional study tours for leskhoz staff and leaders will stimulate a leverage for improved forest investments, as well as an improvement of linkages with fuelwood and alternative rural energy and with the Green Growth Strategy on local level, ultimately helping to promote the Project into new target areas. Training sessions will be also provided to women on leadership, decision-making and participation in local institutions with a view to supporting women's further engagement in PUUs, WUAs and other community resource user groups.

**b. Provide technical assistance on forestry**, to ensure covering all technical requirements for leskhoz staff as well as municipal administration and forest users to ensure sustainable management of forests and Integrated Pest Management (IPM). In addition, as part of the



Evidence based approach of the project, all natural resources will be mapped and georeferenced also to facilitate the M&E of progress in planting, safeguards, carbon sequestration, etc.

**c. Provide technical and legal assistance on Public-Private Partnerships** for forest management, to ensure that individual households have the opportunity to benefit from the introduction of the new regulation which allows leasing of SFF forest land (in five-year renewable leases) for tree planting on unproductive land.

**d. Provide technical assistance on land tenure matters**, to ensure that all actors at local level are aware of and apply the principles of responsible governance on tenure arrangements for forest-rangeland ecosystem management (with support from FAO expertise), and follow the approaches proposed through the regulatory framework harmonization under component 1.

2.1.2 Provide technical assistance to the Pasture Department on climate-sensitive pasture management, assessment and monitoring, and conduct INRMCRP assessment and monitoring. The activities under this output will provide support for Technical assistance, Training and Study Tours to the pasture department, including via national and international expertise. This will include one short term international and two long-term national consultants (GIS and pasture specialists) based in the pasture department with specific task to reinforce the monitoring capacities and coordinate the department's efforts in pasture management awareness and capacity development, along with the technical support of the gender and social development specialist. The tangible result of this support will be the participation to the monitoring of the INRMCRP implementation.

2.1.3 Conduct training of trainers on pasture rotation and evidence-based rangeland M&E to local cadres as well as training of trainers on INRMCRP management and implementation, and training sessions to the CLMGs and local stakeholders to implement INRMCRPs on rangeland management. More specifically, within this activity the project will:

**a. Develop local cadres capacity** on pasture rotation and evidence-based rangeland M&E. Through a system of TOT, trainings and refreshers trainings, administrators will be educated on the ecological wisdom of rotational grazing for better resource management, carbon sequestration and erosion control, and the need for policies and regulations that support improved resource management. The output of capacity building along these lines is a cadre of extension staff created within existing organizations to provide guidance and technical assistance to Ayil Okmotus and Pasture Users' Unions/Pasture Committees in implementing change in grazing management practices and adopting mechanical and biological applications to improve sustainable and efficient pasture utilization. The capacity of administrative and managerial organizations with oversight of pasture activities to understand and support measures for adaptation to climate change will be enhanced. Capacity building should be targeted at all 49 Pasture Users Unions (and their Pasture Committees) and the 6 Leskhazes in the project area. In addition, the project will support M&E activities to ensure that all pasture / grazing resources are mapped and georeferenced.

**b. Strengthen CLMGs' capacities to implement INRMCRP on pasture management.** Training of trainers will be provided through the mobilization of national and international expertise. Local stakeholders capacities (AO, Leskhazes, PUUs...) to implement INRMCRP on pasture management will be strengthened through a set of initial technical trainings and refreshers Training (both mainstreaming gender aspects and land tenure in the framework of the Voluntary Guidelines on the responsible Governance of Tenure of land fisheries and forestry in the context of food security –VGGT-). The project will support the participation of local stakeholders in local (districts) and regional (international) study tours (of which at least 30% will be women), and provide the required technical, institutional assistance to ensure the implementation of INRMCRP by the CLMGs. Capacity building should be targeted at all 49 Pasture Users Unions (and their Pasture Committees) and the 6 Leskhazes in the project area. A conservative estimate comes to 600 individuals from Pasture Committees and

Leskhoz leadership, plus a further 100 individuals in ARIS, Ayil Okmotus, SAEPF, and other government organizations. Under this activity, capacity development will focus on:

- Livestock owners and their immediate supervisory organizations (Pasture Committees, local self-governing organizations, Rayon leadership, and leskhozoes) will be coached on implementing on-ground measures to achieve outcomes that enhance resilience to climate change. Livestock owners and shepherds who care for livestock grazing pastures will be trained in improved grazing management practices, and their performance monitored under project supervision.
- As part of capacity building, to recognize the incentive structure of livestock producers to own as many animals as possible to compensate for low productivity per head, and the vicious cycle of resource degradation driven by such incentives. The project will try to change the incentive structure by introducing an appreciation of the benefits from managing for higher production per head, and how that can be achieved through more available forage resulting from pasture rotation, and fewer animals grazing the pastures. Offer incentives for change in pasture management, anticipating higher livestock productivity, higher income, opportunity to reduce total animal numbers as production per animal rises, and opportunities for enterprise diversification.
- Training on genetic selection of livestock in current herds to cull unproductive or less-productive animals, and on the careful use of Artificial Insemination to achieve cross-bred livestock that yield more meat and milk, and therefore reduce the need for large herds.
- Training on how to integrate and harmonize pasture management of state land fund and state forest fund lands. Training also on the benefits of planting trees on municipal land and in Leskhoz grazing land to create shelterbelts and copses for shade, and windbreaks to protect livestock from cold winds.

28. In line with FAO's comparative advantage and with the objective to support forest investments that will directly respond to the core impact of the project, land tenure activities are being co-financed by a grant. These activities will also aim to contribute to the sustainability of the CO<sub>2</sub>eq sequestration potential; however, direct climate change related activities will be mostly financed under the GCF grant.

### Green investments in forests and rangelands

29. The economic behaviour in rural areas responds to economic and market incentives. The project, under the group of activities clustered as "green investments in forests and rangelands", will stimulate the required incentives by: (a) Facilitating the development of sustainable forests as repository of CO<sub>2</sub>eq and (in DRR prone areas) as disaster risk reduction measure; (b) providing concessional investment and technical assistance that demonstrate success in rangeland management and to ensure breaking the vicious circle of poor NR management; and (c) Facilitating the development of diverse value chains, sensitive to the changing climate pattern and all aiming at ensuring the sustainability of rangelands and forest.

30. Such activities represent the bulk of investment for carbon sequestration via restoration and improvement of forests and pastures in the target area through the community integrated NRM and resilience plans (INRMCRP) developed based on ecosystem and climate-smart agriculture approaches. The investments will be discussed and decided by the Project Steering Committee and final confirmation of decisions by Accredited Entity within the INRMCRP framework. They include two main branches of investment, structured in the following activities.

- 2.1.4 Provide climate investment in restoration and improvement of forests based on INRMCRP developed, and execute afforestation/ reforestation and forest enrichment work by Leskhozoes with technical assistance. More specifically, within this activity the project will perform **investments in Afforestation / Reforestation and Forest Enrichment**. The investment under this output will lead to the following results: (a) at least 3,000 hectares of new forests have been planted on degraded land and ensured to survive on

afforestation/reforestation areas; (b) at least 3,000 additional ha of existing degraded forests have been enriched; (c) about 54,000 ha of existing forests (slightly above half of the existing forests) with different levels of degradation are brought under improved management. For a. and b., all selected tree species are indigenous and non-commercial varieties, which makes their financial returns very low to stimulate private sector investment. Non-commercial trees will be used in forest areas owned by the state only where forests are established and maintained in order to ensure primarily ecosystem services (i.e., public goods and services) without specific direct economic purposes. Nevertheless, the project still envisages the participation of the private sector, especially for local walnut and pistachio tree species (reduced concessionality, as detailed in the EFA), considering their potential participation in the export markets.<sup>179</sup> A detailed approach in **forestry interventions** is divided into **three main areas of work** as follows (the eligibility criteria of the site interventions are listed in the dedicated box and in further technical details are presented in Appendix to this chapter). The beneficiaries of investment in Afforestation/ Reforestation and Forest Enrichment will be the State Agency for Environment Protection and Forestry and local communities. Beneficiaries will contribute with their own work as a form of ownership of the investment. Being the investment decided within the INRMCRPs where local communities and their institutions are represented, all beneficiaries have incentives to participate in the investment. The forestry investments are as follows:

- **Afforestation/reforestation (A/R).** The activity will be supported following two models. First, it will be practiced **on public land where urgently needed**, including in the severely degraded forests, on failed or delayed reforestation sites, and on open grasslands of SFF which have been totally deforested by grazing. The project will adopt the most suitable approach, by fencing and reforesting patches of highlands/grassland between and around the remnants of forest, on roadsides, and extending forest margins. In walnut and pistachio forests households are granted with long-term leases (5 years and renewable) to plant/sow new plantations with a combination of selected varieties that are (i) maturing early (3rd year) to bear nuts, (ii) are early-ripening to yield harvest in August. Secondly, part of the A/R will be supported **as private tree planting** activities through long-term lease contracts from the ayil okmotus to households (mostly in combination of fruit trees and endemic deciduous trees and trees for fuelwood) on SLF low-productivity communal lands, riparian zones and landslide-prone areas around floodplains. Total target area of the two A/R types of interventions is 3,000 ha, divided into five years (yr. 2-6) of the Project.
- **Forest enrichment.** The project supports the restoration of moderately degraded growing forests through enrichment planting of walnut (in Uzgen and Suzak leskhozoes), and of spruce and juniper in Ak-Talaa and Toguz-Toro leskhozoes and in Saimaluu-Tash and Kara-Shoro National Parks, and on their buffer zones. Total target area of the forest restoration/ enrichment planting is 3,000 ha, divided into five years (yr. 2-6) of the Project.
- **Improved Forest management.** In addition, the quality of forest management on another 56,400 ha of growing forests will be improved through the training of leskhoz staff and implementation of INRMCRPs. Activities such as better planning of thinning and sanitary cutting to stimulate the growth rate and health of existing forests, and use the harvesting residues to collect fuelwood for the rural household needs, will be strengthened. It is also expected that there will be a positive spill-off effect of the improved practices in nurseries, planting and tending of growing forests from the Project's core target areas to elsewhere in the adjacent leskhozoes.
- **Support to establishment of climate-resilient tree nurseries will include** training to local leskhoz nurseries on planning (design and operational); standards of production for closed-root spruce and juniper seedlings. Walnut and pistachio seeds will be collected from "Plus-trees" and grown. Support will include improved greenhouses, rootstock collection and training on growing resistant and endemic varieties of wild apricot, apple, pear, cherry, plum. Under Component 3 (climate sensitive value chains), the project may

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<sup>179</sup> Experiences such as Vega Plus, Gedik, Lesnoy Produkt, Golden Walnut, Farmers Organic Garden, and others have shown how it is possible to benefit from economically vibrant sector of NTFP and dried fruits and integration with well-functioning export markets.

support investments in **nursery** establishment, aiming at establishing sustainable businesses that can produce high quality seedlings both for commercial and restoration purposes. The investment package will mainly include young seedlings, drip irrigation, fence and fertilizers. It is planned to support 100 business cases with the establishment of relatively small-scale nurseries (100 m<sup>2</sup>). IRR at 28% signals about financial attractiveness of such business under the condition of access to markets. 100 beneficiaries are expected to benefit from these activities.

**Box. The eligibility criteria** of sites selected for Project's interventions take stock of the past experiences in forestry:

- Planting of spruce forests in the lower zones of the Ak-Talaa and Toguz-Toro districts (2200-2400 m above sea level) should preferably be done in northern exposures. Above 2500 m above sea level, plantations can be carried out both on the northern slopes, and on the eastern and western slopes. Juniper mainly grows in southern exposures, where no spruce grows.
- For planting pistachios lower zones in 700-1000 meters above sea level should be selected. These zones are pistachio's natural distribution area. For walnut, the most suitable growing zone is from 1200-2000 m above sea level, mainly in the northern slopes. On higher altitudes, the walnut can grow on the western and eastern exposures, and sometimes on southern exposures.
- Planting lands in afforestation/reforestation can be either in open areas, clearings, forest fringes, roadsides, as well as in light forest with a crown cover of less than 10%. In all such areas slope steepness is not to exceed 50%.
- For enrichment planting, the areas where the crown cover is less than 30% and/or areas with low-value species are eligible.

**Environmental safeguards.** The main tree species have been matched per target leskhoz conditions according to scientific knowledge from the Kyrgyz Forest Institute under the Academy of Science and validated with SAEPP. The project supports only the planting of endemic or non-invasive domesticated tree species from the Central Asia region, or introduced from the Russian Federation. In the case of fast-growing poplars and willows, the varieties to be used have been domesticated to Kyrgyzstan more than 50 years ago from Russia, and do not pose an environmental, genetic or phytosanitary risk. Whenever possible, priority consideration will be given to conserving the biodiversity and genetic pool of endemic species that are becoming scarce or are under threat (as defined by IUCN, etc.). The same rule applies both for afforestation/reforestation purposes (i.e. where mostly single-species forest is the target), for mixed forests with several tree species, and also in forest restoration work. The list of most preferable sub-species and varieties is presented in **Appendix 1 to Chapter 4**.

**Box. Forestry and climate change – Detailed Activities on improving the scale and quality of production in climate-resilient tree nurseries:**

- A. Training to local leskhoz nurseries on: site selection; lay-out of seedling section and growing section; operational (business) plans; preparation of seeds/cut-off sticks for planting; norms and standards of seeds/seedlings by species; watering techniques; seedling bags/containers for closed-root spruce and juniper production.
- B. Walnut and pistachio seed collection campaigns from "Plus-trees", and crafting.
- C. Investments in greenhouses; rootstock collection and training on crafting resistant and endemic varieties of wild apricot, apple, pear, cherry, plum on leskhoz and private community nurseries.

**Linkages to CC mitigation:** higher scale and quality of seedling output expands areas of A/R and enrichment planting, enables the sequestration of more CO<sub>2</sub>, and reverses the net emissions from forestry over time.

**Linkages to CC adaptation:** technically advanced and professionally managed tree nurseries are more resilient to climate change impacts (droughts, flooding) and are adaptive to weather

anomalies. Local communities can better respond to climate change and build green infrastructure.

**Activities on afforestation/reforestation and forest restoration / enrichment planting:**

- A. Training and technical assistance to SAEPP, leskhoz, staff, private forest tenants, households on the accountability, CFM approach; and application of Tax Code.
- B. Assistance in deploying the new Regulation No. 192 (replaces Reg. 482) which allows leasing of SFF forest land to Ayil okmotus, households and private people.
- C. On Ayil aimaks, SLF communal lands: tap local knowledge to define unproductive lands, slopes and other natural formations such as riparian zones as planting area.
- D. Promote Collaborative Forest Management and Public-Private Partnership models on planting and improved forest management.
- E. Planted forest management (weeding, replanting, maintenance, irrigation, thinning, fencing procurement, erection and maintenance.
- F. Help procurement of tractors and their auxiliaries, fire extinguishers.
- G. Develop local investments to improve seedling survival and growth media (in adaptation to CC):
  - local fertilizer production (mix of dung, crushed quartz of Toktogul rayon, organic soil) for planting trees on degraded, poor soils and on higher and rocky terrains
  - develop plot terracing on the upper range of planting (40-50 degree slopes)
  - investments for irrigation at forest plots: hydro-pumps, solar and wind-powered water pumps, spring and underground water reservoirs

**Linkages to CC mitigation:** A/R and enrichment planting intensifies the dynamic sequestration of CO<sub>2</sub> in young forests (<20 years) and lowers emissions from local spots of forest die-back. A healthy forest cover/canopy has a lower albedo (measure of the diffuse reflection of solar radiation). Forests reflect only around 5-15% of sun's radiation, in comparison to 20-35% by dry soil and 45-85% by snow. Forest lessens the impact of radiation in warming up the lower spheres of the atmosphere. Wood-based products serve as long-term carbon sinks until incinerated or decayed in landfills.

**Linkages to CC adaptation:** net forest cover (new planting area minus logged/degraded area) increases and holds soil and water from uncontrolled erosion. Selected local tree varieties will withstand the future climate conditions and form the basis for future climate-resilient forests. Expanding forestry activity will create additional rural income, leasing of less-productive lands, and livelihood options to supplement future natural restrictions of livestock. Forestry helps maintaining rural infrastructure such as bridges, housing, shelters and remote roads. Better accountability in forest activities and monitoring improves resilience of ecosystems.

**Responsibilities** in forestry related investments (cf. Appendix 1 to Chapter 4 in Feasibility Study). In order to ensure effective and efficient forest investments, the Project's forest investment model takes into account the region, altitude, climate, dominant tree species, forest legal status, custodianship and the main partners and their knowledge. Three investment models are applied:

1. Leskhoz investments in high-altitude spruce and juniper forests (long rotation timber forest, but devoid of direct economic incentives to private partners). Main implementing partner: leskhoz.
2. Collaborative forest management through long-term leasing of walnut and pistachio forests on SFF lands from leskhoz to households, as allowed in Regulation No. 192 (where economic interest runs at the highest level and competition for leases is intense). Main implementing partners: leskhoz, private individuals, households in ayil okmotus.
3. Individuals investing in tree-planting on municipal low-productive SLF lands, with a long-term lease tendered from ayil okmotu (poplar, willow, fruit trees and mixed deciduous trees, to combine short-term income with long-term timber, fuelwood and carbon benefits).

**Maximizing the capacity development and learning from local knowledge**

- A. In walnut and pistachio forests, the Project will emulate the past experiences of Collaborative Forest Management, which suggest that rural households prefer to pay fees for leasing the forest plots over paying back in labor to leskhozoes.
- B. On SFF lands close to communities, and on SLF communal lands, the Project will tap the local household knowledge and land-use decision-making through CLMGs on inter-cropping timber and fuelwood trees with agricultural crops and fruit orchards.
- C. Project will revive and modernize the cultural traditions of homestead/roadside tree-planting at times of family/community events (e.g. the birth of children, festive campaigns).
- D. Project will support A/R site selection through local experience of the residents in and around communities who face severe threats of environmental degradation and emergencies such as riverbank flooding, erosion, and collapse of hillsides due to lack of tree cover.
- E. Project will publicize featured and interviews stories on the application of traditional knowledge for sustainable tree-planting.

**2.1.5 Develop and execute INRMCRP pasture investment plans for catalyzing green investment in rangeland rehabilitation and livestock production.** More specifically, within this activity the project will support **investments in Pasture rehabilitation and livestock production.**

This activity will contribute to increase the carbon sequestration and to make the local communities, including both women and men, more resilient to the adverse impacts of climate change. These aims will be achieved through changes in grazing management, establishing tree plantings on grazing land, promoting more productive and more palatable pasture vegetation composition, and smarter livestock herd management with training, mentoring and monitoring. These investment need to be coupled with investments in diversification from the livestock management activities promoted under Component 3. As results of a combined effort of improved pasture management and rationalize livestock management, higher income are expected at household level from more productive animals (more milk yield and bigger animals at market, for example) and opportunities to invest in alternative or complementary enterprises. In order to facilitate these investments, ARIS as operational partner will support the procurement of goods and services required for the investment. The investment will depend on the initial diagnosis of NR base and on the agreed INRMCRP. The selection will be made according to climate scenarios and utilization plans, and would focus mostly on ensuring appropriate pasture rotation. Ever since Kyrgyzstan obtained independence from the Soviet Union in 1991, roads and bridges providing access to remote and often high-elevation pastures have been neglected. A critical project activity is to improve access to remote pastures through bridge and road repair, and thereby spread livestock grazing impacts more evenly. Pasture Committees have pointed out that when large areas of their pastures are inaccessible, the grazing pressure is high on those pastures that are easily reached, exacerbating localized degradation. The project should attach conditions to pasture-access interventions to ensure that the freshly available pastures are carefully managed for sustainable forage production. The investment could also comprise the application of shade shelters and wind breaks, the provision of seeds to increase fodder production, construction of water points or bridges to unlock inaccessible pasture, and possible procurement of excavator for infrastructure improvement. All investment will be combined with technical support for integrated and improved pasture management. Key recommendations comprise the following elements (see also **Appendix 2 to Chapter 4** for reference on pasture and livestock investment). Beneficiaries of the investment in pasture rehabilitation and livestock production will be Pasture Users Unions (PUUs) and members of the CLMGs. Beneficiaries will contribute with own work and possibly some simple construction material as a form of ownership of the investment. Being the investment decided within the INRMCRPs where local communities and their institutions are represented, all beneficiaries have incentives to participate in the investment.



- The main method for achieving higher pasture production, and therefore greater carbon sequestration over 644,695 ha of grazing land, is rotational grazing (pasture rotation). The essential feature of pasture rotation is a focus on long periods of rest from livestock grazing to allow the growth of pasture vegetation to approach its potential. Accordingly, small areas of seasonal pasture are grazed for a short period of time while the remainder of the pasture is rested. An area of pasture grazed early in the season can recover over the remainder of the growing season; and an area not grazed until near the end of the season has already reached maximum growth. By allowing pastures to approach maximum growth, above-ground plant biomass rises from an estimated 1 tonne DW/ha on degraded land to 3 tonnes DW/ha under pasture rotation. The root:shoot ratio for perennial grasses is at least 2:1, so total plant biomass rises from 3 tonnes DW/ha to 9 tonnes DW/ha, or an increase of 3 million tonnes of plant biomass over 644,595 ha.
- An important consequence of pasture rotation is that greater ground cover by plants and leaf litter traps rainwater where it falls and increases water infiltration into the soil. More root growth into a greater soil volume, promoted by more leaf growth, takes up that water to increase plant production. A deeper and more extensive root system will confer greater resilience to drought via the ability of plants to explore a larger soil volume when water is scarce. The mechanism of benefits from pasture rotation is control over grazing pressure and more soil water available for plant growth.
- A complement to higher infiltration rates is a reduction in overland water movement and the associated erosion. Erosion manifest in mudslides and land slumps is a characteristic feature of degraded land, accompanied by muddy streams, flooding and bridge destruction. Erosion must be addressed at a landscape scale, and rotational grazing management of large pastures achieves that objective.
- Another activity that addresses adaptation to climate change is the planting of trees on municipal pastures and Leskhoz land. The project will promote shelterbelts and copses to provide shade and reduce wind velocity to improve both livestock and forage production. Windbreaks of trees with lower strata of shrubs are especially beneficial for protection against winter wind. The environmental impact of cold temperatures is significantly magnified by cold winds. Tree planting to advance livestock production is also a contribution to carbon sequestration. A reasonable application of windbreak and shade-shelter tree planting is 2 windbreaks per PUU at 20x100m, 2 copses for shade at 40m diameter and 2 shelterbelts for shade also 20x100m. These tree plantings would need to be protected from grazing for 3-5 years. The fencing required is 1210m per PUU or 59,290m for 49 PUUs. At 140 Som/m for fencing materials, the total cost is 8,300,600 Som, or roughly USD 121,200. Fences can be removed and re-located after trees have grown to safe heights. Trees should be freely available from SAEPP. Tree seedlings will require maintenance, including watering in summer months, for the first 3 years.
- Pasture rotation will improve plant composition because palatable leafy grasses have a competitive advantage during the long rest periods over less palatable plants. However, broadcasting seed of desirable indigenous perennial plants can accelerate pasture improvement. The project will promote the establishment of 1-ha seed-multiplication fields near PUU villages, separate from the 1-ha demonstration sites promoted by LMDP. A 1-ha seed-increase field in each PUU requires fencing materials of 400m per PUU, or 19,600m for 49 PUUs. At 140 Som/m, the total cost is 2,744,000 Som or approximately USD 40,000.
- Better herd management contributes to more efficient use of pastures. The project will emphasise smart livestock herd management. Low-productive or barren cows should be culled and sold. The aim is for every mature cow to produce a calf every year. Similarly, weak or injured or low-productive small ruminants should be eliminated from the flock. Daily milk yields will rise to an average of 10 litres/cow or more from the current level of 5 litres. Herd reproduction will rise to 90% average calf weaning percentage from current estimate of 70%. Animals intended for sale should be sold at 1.5 (sheep and goats) to 2 years of age (cattle). Households are then left with a core livestock herd with higher yields per head, and larger body size. A large ruminant releases less methane per kg of body weight than a smaller animal. By simply applying aggressive culling to existing herds,

and selling 80% of male calves at 2 years old and male small ruminants at 1.5 years, livestock production is expected to rise by at least 10%.

### c. Component 3: Climate-sensitive value chains Development

#### Component's Rationale, Approach, Outcome and Outputs

31. There is enormous potential for agricultural practices and technologies to achieve co-benefits for mitigation of greenhouse gas emissions and environmental health. Managing for multiple outcomes makes sense where emissions reductions are possible without compromising farm livelihoods, since agriculture is a major contributor to global greenhouse gas emissions. Case studies identified and analyzed by the CGIAR (2016)<sup>180</sup> demonstrate the potential for agricultural practices and technologies to achieve such benefits. Nonetheless, strong mechanisms for finance, capacity enhancement and technology transfer are prerequisites for success. In the precise framework of the country, collected data from the household survey and from literature confirm that, in target areas, enhancing market opportunities and ensuring financial viability of target communities will be greatly contribute to green current agro-value chains (NTFP and livestock) and support carbon sequestration in target areas.

32. To this end, the project will promote in target areas two approaches: (i) **reduction of the number of animals** grazing on pastures in the project intervention; and (ii) adoption of **international sustainable management certification** schemes and (iii) access to **valid market opportunities** for locally grown/harvested non-timber forest products and livestock-derived products.

33. The role of the Component is therefore to strengthen the sustainability of the investment in carbon sequestration carried out in Component 2 by providing local communities with an incentive to undertake behavioral change – and sustain it– as they gain access and receive support to valid economic opportunities in red meat and non-timber forest products<sup>181</sup> (NTFP) markets. This will eventually lead to more sustainable management of forests and pastures, thus contributing to enhanced resilience. Ultimately, the component will not only foster sustainable use of natural resources but will also provide economic opportunities for entrepreneurial growth among women and youth engaged in NTFP activities.

34. **International certification to drive the paradigm shift.** Most of food certification schemes (HACCP, Organic, Fair Trade, Eco, Bio) are focused on both particular indicators (food safety, fair share, use of pesticides etc.) and mostly in agricultural sector. Product profile from Kyrgyzstan can open totally new niche in markets for actual eco product - from forests which are well-managed, taking into account social values (wages, equal rights for both gender to participate in transparent implementation of ILO convention principles), economic (business plan and management plan for forest unit creation, alignment with local legislation), ecologic (biodiversity conservation, ecosystem services, high conservation value areas management). FSC is the highest standard for forest management system. Coupled with HACCP for food safety and other standards as required by the end market (e.g. Halal), aggregated in sufficient quantities and commercialized by organized collectors (or producers), Kyrgyzstan can get to a very new level of recognition on international market. Combination of FSC<sup>182</sup> responsible forest management certification scheme and any of retailer preferred schemes are adding value to supply chain as well as rising image of natural products from Kyrgyzstan. The Project will also promote Ecosystem Services Certification that will allow Ecosystem Services producers in a given area to market their products with the specific FSC label (e.g. “spring water from responsibly managed forests”). Additionally, from the same group certificate, they can bring their recreation and green tourism to another level.

35. **Contribution to UN Sustainable Development Goals through FSC.** “Ensuring sustainable consumption and production patterns” is one of 17 Sustainable Development Goals (SDGs) agreed by the United Nations to direct the activities of governments, businesses, and civil society organizations over the next 15 years. Sustainable public procurement is listed as a specific target of this goal, and supporting forest certification can directly contribute to this. In accordance with the UN’s goals, FSC subscribes to

<sup>180</sup> <https://cgspace.cgiar.org/bitstream/handle/10568/71051/SBSTA44-Agricultural-practices-technologies.pdf>

<sup>181</sup> NTFP include all products such as tree nuts, fresh and dried fruits and mix of these products, honey, mushrooms, herbs etc. other than timber derived from the Management Unit (e.g. walnut-fruit forests, orchards and other management units included in forest fund land use).

<sup>182</sup> FSC is world known as most credible Forest Management certification system for both planted and wild NTFP products.

the 10-year framework of programmes on sustainable consumption and production patterns (<http://www.scpclearinghouse.org/what-10yfp-0>). This global framework aims to enhance international cooperation in order to accelerate the shift towards sustainable consumption and production in both developed and developing countries.

36. **Opening doors to new marketing and promoting responsible practices.** Consumers – especially in Europe and North America – are increasingly aware of, and concerned by, the origins of the products they buy and the processes that go into making them. They want to make responsible decisions about what they buy, weighing up social and environment credentials. Research has shown that businesses that become FSC certified benefit from better access to international markets, have higher revenues, and see positive change to their public image.

37. Almost 70 percent<sup>183</sup> of all forest tenants harvesting walnuts, fruits and other NTFP operate in the project intervention area mainly in Uzgen and Suzak districts. The ultimate goal will be to unite all willing leaseholders into one group certified according to the Forest Stewardship Council (FSC) Forest Management, Chain of Custody and Ecosystem Services scheme. Naryn and Ak-Taala instead are more specialized in raising cattle and sheep for meat and this is where economic opportunities exist thanks to direct linkages with agro-enterprises (Agents of Change).

38. Through provision of capacity development and the increased access to credit (via RKDF co-financing), component 3 will provide support the transformation of the pre-selected value chains towards higher efficiency and adoption of sustainable management practices. More specifically, beef and mutton value chains will be optimized with herd control through intensification and accelerated offtake of animals.<sup>184</sup> To protect forests from overharvesting, the project will promote and support the implementation of the international sustainable forest management standards to upgrade the existing non-timber forest products' chains into sustainable and accountable ones.

39. Component 3 is composed of a single output (and three activities).

### **3.1: Selected value chains are climate sensitive and producers adopt carbon optimization technologies and practices**

40. The project will provide capacity development across a number of carefully selected value chains, and will support establishing direct linkages between producers and corporate buyers operating on end markets and having strong green orientated corporate social responsibility. This component will support the investment in carbon sequestration under component 2 **by providing local communities with the access to skills and technologies conducive to sustainable use of forests, improved livestock management practices and strong linkages to the corporate markets.** The component is structured in a first preparatory phase (activities 3.1.1 and 3.1.2) and an investment phase (activity 3.1.3). Targeted value chains include non-timber forest products (NTFP) such as nuts and other dried fruits, beekeeping, but also other value chains that can complement the rural smallholders income (as an incentive for diversification), including poultry, turkey, etc. Certification of NTFP according FSC standard<sup>185</sup> and other voluntary international standards such as HACCP, Fair Trade, Organic and GlobalGAP to enable direct linkages with end markets will be the driving force towards paradigm shift in forest use and local economies growth. The FSC certification will guarantee gender equality in employment practices, training opportunities, awarding of contracts, processes of engagement and management activities. Project builds on the existing positive experience of FSC-certified forest users in Jalal-Abad. The activities will be as follows:

#### **3.1.1 Select value chains in operation and provide technical support to the value chain actors/organizations for climate-sensitive business development.** This activity will include:

<sup>183</sup> Some 15 thousand forest lease ticket holders out of the national total of 22 thousand (2017 data).

<sup>184</sup> See Chapter 4 of the Feasibility Study, and the two Working Papers on Livestock Development and on Pasture.

<sup>185</sup> FSC-NEPCo Interim National Standard of Kyrgyz Republic.

**a. Conduct and publish an end-markets assessment.** This will include:

- **End markets assessment**, covering key international markets<sup>186</sup> for the Kyrgyz NTFP, nuts, fruits, and honey. Analysis will cover qualitative and quantitative requirements, supply planning calendars and gaps, existing bottlenecks and risks. This will allow to informing the policy dialogue under component 1 in terms of regulatory limitations to unlock the market potential. Assessment to be carried out periodically to monitor market trends;
- **Market prospecting campaign** on national and international markets to identify potential buyers operating in premium segments and fostering environmental and social responsibilities as their corporate commitment;
- **Resource inventory** using geospatial tools followed by a thorough Market Development Plan, which will include the analysis of Geographic Indication (for Arslanbob walnut in particular) introduction for some products and various voluntary certification options. The Market Development Plan will be the driver of growth and diversification from livestock. Such planning will also offer cost saving opportunities as products will be harvested/produced in clusters to achieve sufficient quantities and minimize logistical costs.

**b. Raise awareness on market opportunities and requirements.** This will comprise the design and rollout of the *Kyrgyz Tree Nuts & Dried Fruits information and trade portal*. The purpose of the portal will be to provide potential buyers with a comprehensive information on the Kyrgyz offer in tree nuts, dried fruit and other NTFPs (including beekeeping, see details in the EFA, Chapter 7 of the Feasibility Study and details in CS-FOR Annex 3), sustainably and responsibly sourced. The portal will feature country's portfolios, product advertisements and contacts, as well as will centralize all knowledge material related to good management practices and marketing.

**c. Support to agribusinesses operating in the selected value chains identified and interest to take part in project activities**, targeting Kyrgyz companies sourcing (or interested to source) raw material within the core project area to upgrade their supply chain by introducing good farming practices, voluntary certification, optimized logistics and robust marketing. Round tables in Bishkek (focus on agribusinesses) and Osh (agribusiness, forest tenants, farmers, cooperatives). Potential for women's participation in and benefitting from the value chains will be considered in selecting the operators (FAO guideline on gender sensitive value chains will be a reference).

3.1.2 Identify and mobilize operating agribusinesses in the selected value chains via information campaign and value chain mapping for climate-sensitive business practices. This activity will include:

**a. Map and analyse selected value chains.** This will comprise:

- **Value chain mapping and performance assessment.** Businesses interested to take part in the project, receive assistance to conduct digital mapping of their respective value chains using the FAO-developed mobile app *Collect Mobile* (Open Foris suite);
- **Raw material suppliers' performance analyzed** for value chain upgrade business (action) plan.

**b. Develop / upgrade climate-sensitive value chains.** This will comprise:

- **Accompanying the preparation business proposal.** Agribusinesses, where necessary, jointly with the supplying communities, prepare and submit for appraisal

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<sup>186</sup> See Working Paper on NTFP.

business proposals for value chain upgrade/development. Project provide support to properly design and evaluate business plans;

- **Technical capacity development** through training and reference material provision to collectors of NTFP, farmers, mediators and agribusinesses. This process will be straightforward and aligned with end clients' needs and requirements and the principals of green economy. Tentatively, the training modules include: green economy and development objectives (for local administration key staff); FSC principles (for collectors of NTFP); female business leadership training (for women-entrepreneurs); agro-techniques, PHH, farm economics; food safety, good feeding practices and herd management, (for herders); quality control, food safety, sorting and labelling (for aggregators and mediators); business planning, marketing and labelling (for processors).
- **Financial literacy.** Regardless of involvement in value chains supported by the project, villagers' awareness on green economy will be raised and training on financial literacy provided.
- **Support to certification.** Based on targeted market/specific client, project participants will receive support to adopt international standards requirement and undergo the third party audit. Standards include FSC, HACCP, Fair Trade, Organic, GlobalGAP. Third party audits will enable to exert control along the chain — at any point in the chain, certification scheme has and enforces parameters under which others in the chain operate;
- **Value chain reorganization** aiming at transparent livelihood development using geotagging and block-chain principles, established of certified logistical centres, and other modalities conducive to transparent tracing economic activities;
- **Market promotion.** This activities include project-supported product marketing, testing of chemical parameters of selected NTFP (e.g. in collaboration with Rhine-Waal University of Applied Sciences or University of Bonn), co-financing of exporters participation at international trade shows, design and dissemination of promotional material. It will include also the facilitation of the establishment of an apex organization to promote export (*Export Promotion Secretariat*). The Project will promote partnership approach among development partners, chambers of commerce (that of Kyrgyzstan but also in Uzbekistan and Tajikistan to increase quantities), official trade organizations, etc.;

41. Project will provide assistance in establishment of the chain of custody and empowerment of woman through trainings and opportunities for business development.

### Climate-sensitive value chain financing

42. The activities of the project will facilitate the access to external credit line provided by RKDF.

#### 3.1.3 Activate special credit lines and provide loans for eligible value chain actors in communities/ entrepreneurs/ enterprises in the project-relevant value chains

43. The **key element of this activity** will include the activation of special credit lines for project-relevant value chains and entrepreneurs. Supported by the technical assistance provided under this activity 3.1.3, small, medium and larger enterprises in the project area (as well as other areas with economic connections to the project areas) will have access to the credit lines. The loans will range from USD 10,000 to USD 300,000, with the average amounts about USD 100,000 extended to about 150 end borrowers. The loans will be provided at 5 percent p.a. in USD and at 10 percent in local currency, for a term of about 3-5 years, to existing enterprises representing eligible value chains. Indicative loan purposes include: packaging equipment, equipment for laboratories, vacuum and solar driers, agricultural machinery, greenhouses, eco-tourism, agricultural produce processing etc.

44. In order to reduce forest and pasture degradation and to change the behaviour of keeping an

alarming number of unproductive animals as a source of cash income for safety net, communities need a parallel path towards increased efficiency and productivity of the livestock production system along with a progressive continuous creation of alternative (to livestock) income opportunities able to offer at least the same incentives for economic return (e.g., orchards and high value non-timber forest products). This shift will not only reduce the pressure on resources (increased carbon sink and enhanced ecosystem benefits) but also reduce emissions (as more productive animals raised using good practices emit less). These models shall be regarded as a potential set of project investments and this set can be flexibly adapted within the project implementation.

45. Selected value chains include Walnut; however, value chains or raw material is not the only entry point for the component, which besides development of orchards, nurseries, greenhouses, beekeeping, beef, includes logistics, cold storages, and solar driers (See EFA, Chapter 7 and WP on Value Chains Development, Folder 9).

46. **Involved institutions.** The credit line funding will be provided by RKDF through local commercial banks that already reach out to the project target areas. Preliminarily, 5 commercial banks will participate in the disbursement of the credit line (listed alphabetically): (i) Ayil Bank; (ii) Bank Kyrgyzstan; (iii) BTA Bank; (iv) Kompanion Bank; and (v) RSK Bank.

47. The project will work in close collaboration with RKDF and the partner banks to identify prospective beneficiaries within the eligible value chains and ensure the complementarity of the technical assistance provided under activities 3.1.1 and 3.1.2 and credit resources under activity 3.1.3. This senior loan input will follow the grant inputs considered under Component 3 sequentially as a co-financing of the grant component.

48. The project will provide de-risking for the participation of private entrepreneurs in the financial market, and will work in parallel to enhance the overall financial literacy in rural areas (in collaboration with the National Bank) and financial inclusion. Moreover, the approach of Component 3 is to first identify selected value chains, and map their actors, before working with selected entrepreneurs and leading entities with **(a)** potential for expansion of their activities in the project areas; and **(b)** potential for expansion of outsourcing their raw material in the target areas.

49. **Indicative outputs and respective targets** will include about 150 entrepreneurs – end borrowers in selected value chains who will access the loans financed by RKDF.

50. The proposed approach of the activity 3.1.3 will support the required diversification and enhanced efficiency, productivity and competitiveness of existing economic activities in the highly degraded target areas, based on leveraging available local financial resources and the provision of highly targeted technical assistance to carefully selected value chains.

51. The total estimated value of the activity 3.1.3 is US\$ 16.6 million, including USD 15 million of the RKDF-financed credit line and USD 1.6 million of beneficiaries' contributions.

52. The main risks for the Component include:

- (a) Saturation of the agricultural lending market when expected disbursement rates by RKDF and partner banks may not be possible;
- (b) Low skills and capacity of RKDF and partner banks in “green” agrilending and value chain finance. This risk will be addressed by the close interaction with activity 3.1.1 and 3.1.2 and collaboration with RKDF and partner banks in identification of the beneficiaries.
- (c) Use of subsidized resources provided by RKDF which present a risk to the sustainability of the project intervention.

53. Sustainability factor is built into the design of the project:

- (a) The project will partner with the existing domestic funder and partner banks interested in the development of the “green” agricultural sector;



- (b) The project will ensure complementarity of technical assistance and credit resources provided to the eligible value chains and enterprises;
- (c) The project will explore new frontiers in the agricultural lending product development in cooperation with interested FSPs and share these learnings among FSPs interested in scaling up these products.

54. As mentioned above, use of subsidized resources provided by RKDF presents a risk to the sustainability of the project intervention. The technical assistance provided under activity 3.1.1 and 3.1.2 should contribute to the mitigation of this risk by supporting the development of the competitiveness of the selected value chains.

55. **General criteria and approach for identification of eligible private sector actors and value chains.** While criteria will be set within the project inception phase, following the rationale of Component 3 and in line with the project's theory of change, as first and utmost criterion for the identification of eligible value chains and private sector actors is the potential contribution to the solidification the efforts of the project for mitigation through forestry and rangeland investment. At first, the value chains and actors will be selected according to the potential to contribute to income diversification from unsustainable livestock or forestry practices. This will constitute the building block for both the mitigation and the increased resilience objectives. Additional general principles will be developed during the project inception phase, and will include criteria such as: (a) readiness to expand the business and include / procure from smallholders in the project target areas; (b) readiness to follow international and EU standards; (c) Experience to work with sustainable technologies of harvesting / drying / processing; and (d) overall past financial / economic performance.

## Appendix 1 to Chapter 4 - Forestry related investment

1. The list of most preferable sub-species and varieties is presented here below (in the text and tables only common names are used).

A. Trees for single-species forests (endemic ones):

- Spruce: *Picea shrenkiana* / *Picea tianshanica* Rupr.
- Juniper: *Juniperus turkestanica* and *Juniperus semiglobosa*
- Poplar: *Populus alba* and *Populus nigra* (introduced at minimum 50 years ago)
- Walnut: *Juglans regia* L.
- Pistachio: *Pistacia vera* L.

B. Trees for mixed broadleaved forests:

B.1. Wild fruit trees (endemic ones):

- Wild apricot: *Armenica vulgaris*
- Wild apple: *Malus sieversii* and *Malus kirghisorum* (both threatened)
- Wild pear: *Pistus spp.*
- Wild plum: *Prunus spp.*
- Wild cherry plum: *Prunus cerasifera*, *Prunus magalebskaya*
- Wild hawthorn: *Crataegus turkestanica* and *Crataegus pontica*

B.2 Other deciduous trees (endemic or introduced at minimum 50 years ago):

- Poplar: *Populus alba* and *Populus nigra* sy, *Populus pyramidalis* Rozier
- Maple: *Acer turkestanicum*
- Elm: *Ulmus parvifolia*
- Ash: *Fraxinus excelsior*
- Willow: *Salix alba*
- Hawthorn: *Crataegus turkestanica* and *Crataegus pontica* Koch

2. Local interest on planting these species was verified in fieldwork meetings with local communities and in consultations with leskhozoes and National Parks. The details of forest planting per target area, by type of planting and species used are in Table A1 below. Walnut (1,000 ha), mixed forests (770 ha, to be composed of fruit trees such as wild varieties/rootstocks of apple and apricot, cherry, plum, and poplar, willow, juniper etc.), and spruce forests (630 ha) will cover the largest planted areas in afforestation/reforestation part of the Project.

3. In forest restoration, enrichment planting with spruce (1,400 ha) and walnut (1,370 ha) will occupy most of the target area of planting, and juniper 230 ha. Whenever possible, priority consideration will be given to conserving the biodiversity and genetic pool of endemic species that are becoming scarce or are under threat (as defined by IUCN, etc.).

**Table A1. Tentative allocation of potential areas and species for afforestation/reforestation and forest restoration (enrichment) in four target districts**

Tree Species	State Forest Enterprise (ha)						National Park (ha)		Total (ha)
	Ortok	Urum-Bash	Kara-Alma	Uzgen	Ak-Talaa	Toguz-Toro	Saimaluu Tash	Kara – Shoro	
Afforestation / Reforestation									
Spruce					400	150	50	30	630
Juniper					70	70	40	40	220
Poplar	20	20	20	30	30	50		10	180
Walnut	500	100	100	300					1 000
Pistachio	50	50	50	50					200
Mixed forests	60	100	100	100	60	150	100	100	770
Total:	630	270	270	480	560	420	190	180	3 000
Forest Restoration / Enrichment Planting									
Spruce					400	400	300	300	1 400
Walnut	300	360	350	360					1 370
Juniper					100	30	50	50	230
Total:	300	360	350	360	500	430	350	350	3 000
Grand Total:	930	630	620	840	1060	850	540	530	6 000

4. In order to ensure effective and efficient forest investments, the Project's forest investment model takes into account the region, altitude, climate, dominant tree species, forest legal status, custodianship and the main partners as follows (Table A2). Three investment models can thus be identified:

4. Leskhoz investments in high-altitude spruce and juniper forests (long rotation timber forest, but devoid of direct economic incentives to private partners).
5. Collaborative forest management through long-term leasing of walnut and pistachio forests on SFF lands from leskhoz to households, as allowed in Regulation No. 192 (where economic interest runs at the highest level and competition for leases is intense).
6. Individuals investing in tree-planting on municipal low-productive SLF lands, with a long-term lease tendered from ayil okmotu (poplar, willow, fruit trees and mixed deciduous trees, to combine short-term income with long-term timber and carbon benefits).

**Table A2. Investment types for afforestation/reforestation and forest restoration (enrichment)**

Tree Species	Altitude (m)	Type of Forests	Main Partners
Spruce	1800-2600	Single-species spruce reforestation & enrichment on leskhoz land and in National Parks (Ak-Talaa, Toguz-Toro, Saimaluu-Tash, Kara-Shoro)	Leskhoz
Juniper	2300-2800	Single-species juniper reforestation & enrichment on leskhoz land (Ak-Talaa, Toguz-Toro, Saimaluu-Tash, Kara-Shoro)	Leskhoz

Tree Species	Altitude (m)	Type of Forests	Main Partners
Walnut	1400-2000	Single-species walnut reforestation & enrichment on leskhoz land, collaborative forest management through long-term leases (Suzak and Uzgen)	Individuals, a.o. members & leskhoz
Pistachio	500-1000	Single-species pistachio reforestation & enrichment on municipal and leskhoz land, collaborative forest management through long-term leases (Suzak and Uzgen)	Individuals, a.o. members & leskhoz
Poplar	500-2200	Single-species poplar planted forest on municipal & leskhoz land (all target areas except Saimaluu-Tash)	Individual, a.o. members & leskhoz
Mixed forest	1000-2200	Mixed broadleaved fruit and timber trees on municipal unproductive land (all target areas)	Individual, a.o. members & leskhoz

5. Forest activities are rolled out after planning/training stage of the Project year from year 2 (5% of all planting), scaled up on year 3 (20%), and completed on years 4-6 at a rate of 25%.

6. In each type of forest investment (tree species and type of planting), the initial investment costs are calculated to include the following activities:

- cost of seeds (in direct sowing of pistachio)
- cost of seedlings (including locally produced fertilizer: a mix of dung, organic soil and mineral quartz powder from Toktogul rayon)
- cost of fencing materials (net, poles, fixings etc.)
- labour: transports, preparation of soil (opening soil either in plots or lines), planting work, the loosening of soil, weeding and mulching, fencing. With poplar also watering and ditching is calculated for labour cost.
- contingencies: 10% of labour cost; and on second year, a replanting cost of 30% of seedlings (or 20% in mixed forest) has been assumed; also soil loosening and weeding are repeated in the next 2-3 years.

7. Full perimeter-fencing is used on A/R sites: a metal wire meshed into a net which is sheep-holding, non-barbed wire, reusable fencing, erected with metal or concrete poles (400 meters per ha, cost USD 764/ha). Alternatively, short strips of similar nets can be wrapped around individual trees and supported to the ground with three metal sticks (cost is USD 3/seedling). The selection depends on the type of planting, species and terrain. Individual tree-nets are preferably used for enrichment planting, where the number of seedlings per hectare is low: costing is USD 564/ha for spruce and juniper, and USD 249/ ha for walnut.

8. **Activities by type of forest investment.** All forest activities have some preceding and preparatory activities in common. Nursery production is a key activity to sustain the planting of enlarged areas during the Project's lifetime. Although preliminary studies suggest that seedlings will be available from other rayons in the country, the Project will invest in local production at leskhoz nurseries and in private communal nurseries. Each leskhoz in Project's target area operates 1-5 tree nurseries with imminent needs for skills and techniques development. Community nurseries are lacking basic knowledge of trees, materials and working methods to supplement seedling supply and generate local income diversification. The target number of tree seedlings is closer to 8 million, depending on the rate of survival and the need for replanting on troubled sites in the following years (see Table A3 and A4).

9. Scaling up of planting areas coincides therefore with the **intensification of tree nursery production**, i.e. a move towards **closed-root system production** of smaller and younger seedlings, and **diversification of the selected tree species** in the Project. This type of seedlings can be planted also beyond the current 2-3 weeks spring planting window (late March-early April), which is a considerable hindrance to extending the planting areas. Closed-root seedlings are in plastic bags or containers, what improves their survival rate in transports and planting. Their production cycle at nurseries is faster and more efficient to ramp up seedling supplies. Their planting season can be extended to 2-3 months from the spring.

10. Investment in equipment for the State forest fund in support of forestry activities may include: tractors, with nursery equipment (for scaling up nursery productivity); four-wheel trucks for transport needs; 30 portable fire extinguishers; 105 Sets of Safe Working Gear (uniforms + protective shoes)

**Table A3. Investment case on tree nurseries: activities and responsibilities**

Tree Species	Target number of seedlings	Beneficiaries	Type of activities / Project support	Supporting partners
Concerns all tree species promoted by the Project	Around 7-8 million pieces	Training to local leskhoz nurseries	Training needs: <ul style="list-style-type: none"> <li>- Selection of the plot for establishment of nursery</li> <li>- Planning of nursery operational scheme</li> <li>- Preparation of seeds/cut-off sticks for planting</li> <li>- Preparation of the seedling section and growing section ("schooling of seedlings")</li> <li>- Norms and standards of seeds by species</li> <li>- Watering techniques and standards</li> <li>- Moving of seedlings from seedling sections to growing section</li> <li>- Norms of digging up of seedling materials</li> <li>- Transportation norms of seedlings</li> </ul>	Forest Research Institute Institute for Forest and Walnut Research NGOs Universities
Spruce Juniper	3,54 million 0,59 million	Local leskhoz nurseries	Spruce seedlings for reforestation & enrichment: Project supports investments into seed tables, shades, greenhouses, irrigation, seedling bags/containers for closed-root production, preparation of organic fertilizer, agricultural tractor and auxiliaries to work on nursery soil ploughing, seedling harvesting, ditching, etc.	Private community nurseries Forest Research Institute Households (for labour) Universities
Walnut Pistachio	1,41 million 0,80 million seeds	Local leskhoz nurseries Private community nurseries	Walnut seedlings for reforestation & enrichment on municipal & leskhoz land: Project supports pistachio and walnut seed collection campaigns from "Plus-trees", rootstock collection and training on crafting of valuable varieties/forms of walnut, investments into seed tables, shades, greenhouses, irrigation, seedling bags/containers for closed-root production, agricultural tractor and auxiliaries to work on nursery soil ploughing, seedling harvesting, ditching, etc.	Institute for Forest and Walnut Research Households (labour and individual nurseries) Universities
Poplar	0,45 million	Local leskhoz nurseries Private community nurseries	Poplar seedlings for reforestation on municipal & leskhoz land Project supports the collection of "Plus tree" cuttings for growing seedlings	Private community nurseries Forest Research Institute Households (labour and individual nurseries)
Mixed forest	0,31 million	Local leskhoz nurseries Private community nurseries	Mixed deciduous fruit and timber trees on municipal unproductive & leskhoz lands Project supports investments in greenhouses, collection of rootstocks of wild apricot, apple, pear, cherry, plum, etc. Collection of crafting materials from selected varieties; training in crafting	Private community nurseries Forest Research Institute Households (labour and individual nurseries)

**Table A4. Investment case on afforestation/reforestation and forest restoration/ enrichment planting: activities and responsibilities**

Tree Species	Target area	Beneficiaries	Type of activities	Supporting partners
Concerns all tree species promoted by the Project	6 000 ha	SAEPF, leskhoz, staff, private forest tenants, households	<p>Training needs (legal matters):</p> <ul style="list-style-type: none"> <li>- Application of new Regulation #192</li> <li>- Enforcement of CFM approach</li> <li>- Application of Tax Code</li> <li>- Leasing out land for grazing</li> </ul> <p>Training needs: (planting and improved forest management)</p> <ul style="list-style-type: none"> <li>- Selection of the plots</li> <li>- Preparation of the soil, for different tree species and varieties</li> <li>- Methods of planting</li> <li>- Norms of planting different species</li> <li>- Plantation management (weeding, replanting, maintenance, irrigation, thinning, etc.)</li> </ul>	Institute for Forest and Walnut Research NGOs Universities
<p>Spruce</p> <p>Juniper</p> <p>Walnut</p> <p>Pistachio</p> <p>Poplar</p> <p>Mixed</p>	<p>2 030 ha</p> <p>450 ha</p> <p>2 370 ha</p> <p>200 ha</p> <p>180 ha</p> <p>770 ha</p>	<p>SAEPF</p> <p>leskhoz</p> <p>leskhoz / HH</p> <p>leskhoz / HH</p> <p>leskhoz / HH</p> <p>leskhoz / HH</p>	<ul style="list-style-type: none"> <li>- Identify GPS tag for geo-referencing the exact planting sites through GIS and field surveys in collaboration with leskhoz and Ayil aimaks (in &amp; out of SFF lands: year 1).</li> <li>- Get approval of SAEPP Department of Inventory for Forests and Hunting (year 1).</li> <li>- Deploy the new Regulation No. 192 (replaces Reg. 482) which allows leasing of SFF forest land to Ayil okmotus, households and private people (on five-year renewable, long-term leases): years 2-6.</li> <li>- On Ayil aimaks, SLF communal lands: define unproductive lands, slopes and other natural formations such as riparian zones as planting area (year 1).</li> <li>- Promote Collaborative Forest Management and Public-Private Partnerships on both SFF and SLF lands: years 2-6.</li> <li>- Agree on whose responsibility is to maintain, and whose property is to keep fences (year 1).</li> <li>- Leskhoz purchase fencing material and metal or concrete staves/posts for erecting the fence (years 1-2).</li> <li>- Plan the number of seedlings / seeds required per target leskhoz/Ayil aimak each year; optimize their procurement and transport (mainly from local leskhoz nurseries, but fruit trees also from private community nurseries: (years 1-6)</li> <li>- Procure new technologies: agricultural tractor with multi-purpose auxiliaries (1 per leskhoz), portable fire extinguishers,</li> <li>- Develop local investments to improve seedling survival and growth media (years 2-6): <ul style="list-style-type: none"> <li>- local fertilizer production (mix of dung, crushed quartz of Toktogul rayon, organic soil) for planting trees on degraded, poor soils and on higher and rocky terrains</li> <li>- develop plot terracing on the upper range of planting (40-50 degree slopes)</li> <li>- plan for necessary and feasible investments for irrigation: hydro-pumps, solar and wind-powered water pumps, spring and underground water reservoirs</li> </ul> </li> </ul>	<p>Forest Research Institute</p> <p>Households (labour)</p> <p>NGOs</p> <p>Universities</p> <p>Institute for Forest and Walnut Research</p> <p>Households (labour and individual nurseries)</p> <p>NGOs</p> <p>Universities</p>



## Appendix 2 to Chapter 4 - Rangeland and livestock management investment

11. An adaptive approach to the use of pasture forage resources will be the introduction of new pasture management strategy and the **replacement** of low-productive cattle, sheep and goat breeds with high-yielding breeds that adapt to climate change conditions. Planting trees for windbreaks and shade-shelter combines a pro-forestry approach to better environmental conditions for livestock. Introducing locally adapted forage-grass seeds by broadcasting into existing pastures will accelerate improvement in pasture species composition.

### a) New pasture management strategy

12. New grazing management strategy is designed to raise pasture productivity, preserve a desirable composition of the pasture vegetation, and provide animals with more forage to achieve a higher yield of livestock products. By **promoting** plant growth, better control over grazing management can substantially increase Carbon sequestration. Rotational grazing is the main recommendation for an intervention that will have the most beneficial result in terms of climate change, environment and communities.

#### *Rationale*

13. Current pasture use allows livestock to stay in one area for an entire season; different herds occupy different parts of the pasture so that the entire pasture is grazed all the time. The result is that by the end of a grazing season the pasture is evenly overgrazed. Increases in livestock numbers aggravate the negative impacts of this approach to pasture use, and yet as the human population rises villages need more animals to maintain household livelihoods. And as productivity of the pasture resource declines through overgrazing, productivity per head of livestock also declines, driving up the demand for bigger herds. It is a vicious cycle. Even without the effects of climate change on pasture condition and productivity, this method of pasture utilization is unsustainable, promoting weed invasion and erosion. When coupled with climate change, overgrazing can lead to ecological and economic disaster. We need a fundamentally different approach to the way in which pasture resources are currently utilized, one which preserves the ecological longevity of pasturelands and increases their yields while capturing and storing more carbon.

14. A rotation of grazing among small areas of a seasonal pasture can let the pasture grow undisturbed by livestock for most of the season. Only small areas are stocked, and grazed for short periods. Basically, the same total area of the **pasture** is feeding the same total number of livestock, but the distribution and timing of the livestock-pasture interaction is controlled with careful management. A short grazing period combined with a long period of rest from livestock produces more plant growth and more forage, which has five important consequences.

- Root growth and depth of root penetration into the soil increases, because root growth depends on the amount of green leaves and pasture rotation increases leaf growth. If pastures are kept short under continuous grazing, the stunted leaf biomass cannot supply surplus energy to the root system, and the root biomass shrinks. A bigger root system, on the other hand, explores a larger volume of soil, and access to more soil water storage creates resilience to summer drought and periods of low precipitation brought on by climate change. Ultimately, the size and distribution of the root system drives the productivity of plant growth.
- By maximizing the growth of forage during periods of rest from grazing, the amount of leaf litter lying on the soil surface increases, namely, the loose dead leaves and other plant parts. The exposure of bare ground is reduced, and the litter protects the soil surface from raindrop impact and from loss of water through evaporation, and keeps the top layer of soil cooler.

- The increases in both aboveground and belowground plant biomass, as well as litter deposits, enlarge sinks of Carbon accumulation, enhancing Carbon sequestration.
- Higher vegetative cover exhibited under rotational grazing management, combined with more litter on the ground, create barriers to movement of rain-water and snow-melt across the ground surface. With less dispersion of surface water, more of the rainfall stays where it falls and infiltrates into the soil profile, and there is less erosion from surface water flow. Greater capture of incident rainwater may be the principal benefit of pasture rotation. Enhancing soil water content directly increases plant growth, like an irrigation effect. Soil erosion is a major problem in Kyrgyz pastures, with its worst expression on hill slopes in the form of land slumps and mudslides. As soon as a small channel is initiated on a hillside, water running down the small channel excavates a bigger channel. If ameliorative measures are not introduced immediately, such as protection of the gully head and re-vegetating the catchment area through complete rest from grazing or adopting an intense pasture rotation, the channel grows into an even bigger fissure on the landscape and eventually the hillside collapses. A full year of rest from grazing will encourage vegetation growth and allow erosion gullies to start healing.
- Botanical composition of the pasture vegetation improves with more species diversity and strong growth of palatable, nutritious plants.

15. All these effects of rotational grazing are the result of simply allowing the pasture vegetation to grow unmolested by grazing livestock for most of the season. Pasture rotation is designed to maximize pasture growth on a grazed pasture without reducing the number of animals. It solves the problem of overgrazing and stops pasture degradation; pasture condition will improve. [Trying to convince livestock owners to reduce the number of animals to match a calculated carrying capacity is rarely successful, and merely aggravates the small-holder unless he believes in higher income as a result. A negative attitude from PUU members, created by a stock-reduction programme, makes it even harder to persuade them to change their grazing management practices.]

### **Carbon sequestration implications**

16. Degraded pastures in Kyrgyzstan have a measured standing forage yield between 0.5 and 1 ton DW/ha, conservatively, the potential yield of **biomass** on Kyrgyz pastures is at least 3 tons DW/ha. This figure is less than some recorded amounts in Kyrgyzstan (e.g., 9 tons at Bazar Korgon) but it matches the yield from enclosures in similar environments in Tajikistan, where the 2017 average grass yield across 37 demonstration enclosures was 3.4 tons DW/ha. If Kyrgyz pastures can be managed so that growth approaches this level while they still provide forage for grazing livestock, as recommended in this section on a new grazing strategy, the contribution to carbon sequestration is substantial.

17. However, if belowground growth is also taken into account, the carbon sequestration is magnified. A recent study of 3 perennial grasses in the northern Great Plains of America, including *Bromus inermis* that is native to Kyrgyzstan, found that root:shoot ratios for 0-120 cm soil depth averaged 2.54. The Great Plains environment experiences very cold winters and hot summers, not unlike the Kyrgyz climate. Soil temperature is important to root:shoot ratios. The ratio increases when soil temperature goes above or below an optimum temperature defined at maximum shoot production, according to an Australian study of 8 pasture grasses conducted on a research station at 1000 m elevation. The base root:shoot ratio in that study was 2.0.<sup>187</sup> For conservative carbon accounting purposes, the above-ground biomass with a root:shoot ratio of 2:1 can be multiplied by 3 to express the total plant biomass. The calculated increase in total pasture biomass (shoots and roots) rises from 1.5 to 3 tons DW/ha in a degraded condition to 9 tons DW/ha when growth approaches the potential.

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<sup>187</sup> Northern Great Plains study report by Sainju et al., 2017, Field Crops Research 210:183-191. Australian study reported by Davidson, 1969, Annals of Botany 33:561-569.

18. Why should we use rotational grazing management? The answer is simple: More forage; more root growth with roots extending deeper into the soil; **higher** infiltration of rainwater and more water stored in the soil profile; less erosion; more diverse vegetation that includes a variety of perennial forage species; and an increase in carbon sequestration.

19. The following description of pasture rotation identifies a small portion of the pasture that is rested for an entire year in order to speed ecological recovery. The year-long rest is rotated around different segments of the pasture from year to year, gradually extending the benefit of a complete year's rest to the entire area.

### ***Detailed description of pasture rotation***

20. Pasture rotation takes the current pasture area and the livestock that use that area and simply changes the way in which livestock harvest the pasture forage. Instead of the entire pasture being exposed to grazing animals all the time, livestock access is restricted to small portions grazed by the herd for short periods. After a short grazing period, the herd moves to another small grazing unit. The first grazing unit is allowed to recover and grow freely for the remainder of the season.

21. The *grazing period* is the number of days that livestock are concentrated into a small area of the pasture, the *grazing unit*. The grazing period is quite short (2-3 days) for a unit grazed in early spring. During that short period when the grass is relatively short, the vegetation is mowed down, but then the grazing unit has the remainder of springtime to recover and a tall stand of forage is available by early summer. The grazing period is longer (6-8 days) for a unit first grazed in early summer at the end of the spring growing season. Grazing times increase gradually over the course of the spring growing season. By the end of spring the stand of forage is close to potential production. It can withstand heavy utilization because it will not be grazed again, or only once more before the end of the year.

22. When is it time to move the livestock herd off a grazing unit and on to the next grazing unit? This decision is based on experience and common sense. A patch of pasture can tolerate heavy grazing for a short time if it is allowed to recover for a long time. The pasture manager should not view a heavily grazed patch of pasture or grazing unit in a rotation in the same way he observes a short pasture created by overgrazing. An **overgrazed** area is the endpoint of an extended period of livestock impact, during which plant parts are removed, then the remaining leaves re-grow, then they are removed again by the grazing animal. The plant material is progressively diminished and the store of Carbon reserves steadily depleted over time,

23. The ideal grazing plan grazes an individual grazing unit only once per year. For pastures used in spring and summer and perhaps early autumn, however, the grazing plan could include two grazing periods per year: once during **spring** and once during the summer-autumn dormant season. The pasture grazing-year in Kyrgyzstan lasts about 210 days from April to October, although seasonally restricted pastures, such as remote summer pastures, are used for a shorter seasonal periods. For a once-a-year grazing, the pasture is grazed for 2-10 days and rested for the remainder of the year. If there are two grazing periods per year, the pasture is grazed for a total of 12-15 days and rested for the remainder of the year. Degradation is unlikely to take place under a grazing regime that provides such long rest and recovery periods.

24. Grazing should be delayed at the beginning of spring so that plants are free to produce shoots and leaves that initiate plant growth. If animals remove shoots and leaves when the environment is still cold, recovery from grazing is slow. A general rule is to delay grazing in spring until 1 April. This date could vary depending on climate and geography. Climate change could move the onset of spring to an earlier start to the grazing season. **Choose** units for the first spring grazing where growth is more advanced than in other areas of the pasture. However, it is important to avoid grazing the same small area of pasture at the same time every year. The timing of grazing should vary from year to year, as illustrated in the figures below. Units grazed in early spring one year are grazed in late spring the next year. Units grazed in early summer one year are grazed in late summer the next year, and so on.

25. A good pasture rotation plan assumes that there is sufficient winter fodder from fodder crops and hayfields to feed livestock in winter housing from late October until 1 April when they go onto pasture.

Available technology in crop production can produce perennial, high-yielding and nutritious fodder crops such as sainfoin, alfalfa and wheatgrass. A good rotation plan also assumes that livestock can go to farmland in autumn and graze crop residues until late October or even into November. The rotation plan on grazed pasture is part of an overall livestock management plan that calculates feed requirements for twelve months. The annual plan takes into account the higher nutritional requirements of lactating females with offspring (calves, foals, lambs and kids) that come from births in winter or on spring pasture. Individual households manage their livestock in winter. For pasture grazing, livestock holdings are combined from many households to form large herds that graze the pasture according to an intense rotation. The pasture rotation requires careful management, and it is recommended that the PUU or village leaders appoint a Grazing Supervisor familiar with the grazing plan and the community pastures. He or she decides where the herder should take his livestock and for how long the herder should let them graze there before moving to a new area.

26. Pasture rotation is best understood by looking at an example, described here and illustrated in the figures that follow. In the **two** spring months of April and May, grazing periods average 4.3 days spread over 14 grazing unit areas. For many villages, the herds then move onto summer pastures where a new rotation begins, and return after summer to graze on post-harvest crop residues. For pastures used in both spring and summer, grazing periods average 7 days in June (about 4 grazing units), 8 days in July (another 4 grazing units) and an average of 10 days in August-September (6 grazing units) for a total of 14 grazing units from June to the end of September. By moving the herd from one small unit area to another, the **entire** pasture is eventually grazed in each season, except for one unit that is rested for the entire year for rehabilitation purposes. There are 15 grazing units in this hypothetical pasture. This example is merely an illustration of how a grazing plan might be developed. Specific plans for particular pastures will be based on access to seasonal grazing and how much post-harvest feed is available on hayfields and cropland.

27. Pasture rotation as described here does not require a significant investment. It may be necessary to put in more drinking water-points on the pasture landscape to ease the burden of walking from grazing unit to water source. Funds may be available from donor projects and the MAFIM, combined with PUU resources, to accomplish better water-point distribution. Fencing is expensive; however, with good herders it is not necessary to **fence** individual pasture grazing units. Grazing unit boundaries can be distinguished by natural features of the landscape such as specific slopes, ridges, valley bottoms, a group of trees or prominent rocks. There may be a cost in training sessions to prepare PUUs and specifically the traditional herders on how to implement pasture rotation and care for the environment.

28. If farmers and livestock managers change their perspective from exploitation of pastures to protection of pasture productivity, they can still harvest livestock products while considering themselves not only as users of nature but also as trustees of the natural environment.

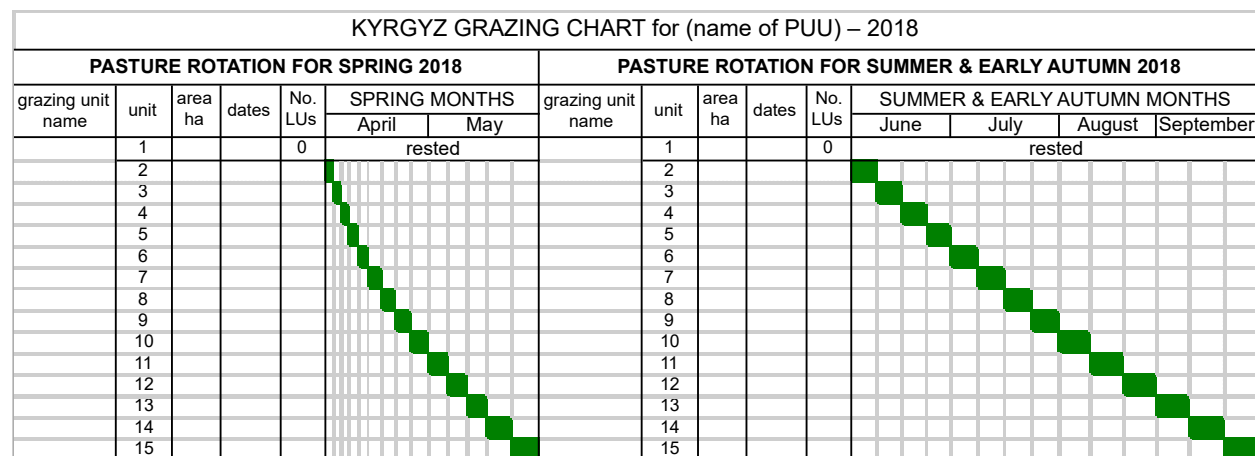


FIGURE 1. An initial Grazing Plan for 15 grazing units, of which one is rested for the year. This Plan could be for two different pastures (spring pasture and summer-autumn pasture) or for one pasture grazed in both spring and summer-autumn. Grazing periods at the beginning of April are short, just 2 days. The length of the grazing period increases

gradually to 7 days in June, 8 days in July and 10 days in August-September. This is a simple example; individual situations will vary for different PUUs. [LU = Livestock Unit.]

KYRGYZ GRAZING CHART for (name of PUU) – 2019															
PASTURE ROTATION FOR SPRING 2019						PASTURE ROTATION FOR SUMMER & EARLY AUTUMN 2019									
grazing unit name	unit	area ha	dates	No. LUs	SPRING MONTHS		grazing unit name	unit	area ha	dates	No. LUs	SUMMER MONTHS			
					April	May						June	July	August	September
	1							1							
	2							2							
	3			0	rested			3			0	rested			
	4							4							
	5							5							
	6							6							
	7							7							
	8							8							
	9							9							
	10							10							
	11							11							
	12							12							
	13							13							
	14							14							
	15							15							

FIGURE 2. A Grazing Plan for the second year following the initial grazing year (Figure 1). The calendar dates of individual grazing units shift from year to year so that the same area is never grazed at the same time in consecutive years. The lengths of the grazing periods follow the same pattern as in Figure 1. The unit receiving a full year of rest is now unit 3 instead of unit 1.

### ***Institutional aspects and implementation arrangements***

29. Community pastures associated with a specific village are part of the State Land Fund and are governed by the law On Pasture (2009). Under this law, households in a village become members of a Pasture Users' Union and elect an executive Pasture Committee. Among other responsibilities, the Committee issues tickets that assign to households the right to use pastures with a certain number of livestock, and receives a fee for the ticket. In current practice, the tickets specify an area of pasture where the ticket-holder can graze their livestock, and these areas tend to be locations where the same household or group of households have traditionally grazed for many years. In this case, traditional practice results in widespread overgrazing. In order to achieve the changes in grazing management, forage yield and pasture condition described below under *Expected benefits*, the system of pasture allocation will need to adjust to an intensive pasture rotation. That will require a change in grazing management philosophy, which means a collective agreement by the community to adopt intensive pasture rotation, and the ability of the Pasture Committee to implement the new grazing system.

30. In Tajikistan, 203 PUUs have already adopted intensive pasture rotation in hilly pasturelands similar to those in Kyrgyzstan, or perhaps at lower elevation and drier. They have been using this grazing system for 3-4 years and on annual reviews they consistently report bigger animals and higher milk yields. The change in Tajikistan was from a relatively unregulated system of communal pasture use to a highly regulated system of pasture rotation. In Kyrgyzstan, livestock owners are already accustomed to a well-regulated traditional grazing system on community pastures, one that gives unacceptable results of overgrazing and poor livestock production. The Kyrgyz law On Pasture contains language that would allow the PUUs and Pasture Committees to mandate an intensive pasture rotation to protect the pasture resource, improve livestock production, and increase Carbon sequestration. A change of this magnitude will not happen without technical advice and training, support to initiate implementation, and incentives. The CS-FOR project has resources to devise an appropriate programme of incentives to nudge Pasture Committees in the direction of better pasture management.

31. Pastures on State Forest Fund lands lie outside the MAFIM jurisdiction that oversees the PUU system of decentralized pasture management. Responsibility for management of SFF pastures lies with the State Agency for Environment Protection and Forestry (SAEPF), but SAEPP has not yet established

a framework for regulation of pasture use. Tickets for livestock grazing on SFF lands are issued every year, but there are no conditions that set grazing management guidelines or impose controls on the livestock. In consequence, stocking rates are far higher than the pastures can tolerate without experiencing severe degradation. Uncontrolled livestock consume tree seedlings and that interferes with forest regeneration and plantation success.

32. The CS-FOR project presents an opportunity to reverse this process of forestland deterioration. Under the aegis of CS-FOR, the SAEPF will be encouraged to develop pasture-use protocols and social mechanisms that introduce a management arrangement analogous to the PUU/Pasture Committee system. Community pastures in the State Land Fund and forest pastures in the State Forest Fund are both utilized by the same villages. The goal of a coordinated approach is an integrated management system in which the two sets of regulations cover livestock grazing on the two pasture domains in one Grazing Plan. Revenue from grazing tickets would go to the PUU or the SAEPF according to the pastureland allocation. However, livestock owners could expect the SAEPF to exercise a pasture regeneration and forest conservation programme with control over where and when livestock can graze similar to the pasture rotation scheme implemented by PUU Pasture Committees. The four target Districts of the CS-FOR project can serve as a pilot area to trial the introduction of pasture management regulations on SFF lands, and the integration with livestock grazing management on SLF pastures.

### ***Expected benefits***

33. The following enumerated benefits from intensive rotational grazing rely heavily on experience of pasture rotation in the Khatlon region of Tajikistan for the past four years. Kyrgyzstan does not yet have a comparable record of pasture rotation and there are no local results to draw on. That should change once the CS-FOR project is implemented. The expected benefits include:

- (1) A greater amount of standing vegetation is observed, increasing Carbon stocks and protecting the soil surface.
- (2) Ground cover by vegetation increases rainwater infiltration and reduces erosion.
- (3) A shift in species composition of the vegetation towards greater plant diversity, including palatable perennial species.
- (4) More forage of better quality available for grazing.
- (5) Higher grazing capacity.
- (6) Bigger animals, including a faster growth rate of young calves, lambs and kids.
- (7) Higher milk yield, up to 100% increase in peak milk production.
- (8) Healthier animals ascribed in part to better nutrition. Better quality feed.
- (9) Internal parasite loads drop, partly due to long rest periods interrupting stages of the life cycle of internal parasites outside the host.
- (10) More cows conceive and deliver a calf every year. Longer reproductive life of cows.
- (11) A rising population of productive cows due to higher birth rate and lower mortality.
- (12) Higher income for village households.

34. In the Tajik example, reports of higher milk yield came from the women who are responsible for household milking. The extra milk above household requirements was sold fresh or processed and sold in local markets, giving women a cash income that was not experienced before adopting pasture rotation.

35. An incidental benefit of pasture rotation is the ability to plan ahead, especially when rainfall and plant growth are below expectations. Because livestock are absent from most of the pasture, the amount of future forage resources can be estimated by observing vegetation on grazing units waiting to be grazed. The experience of pastoralists using rotational grazing in North America and Australia indicates that this planning benefit gives them a tactical advantage over producers who keep livestock on pastures continuously.

### ***Monitoring and evaluation***

36. Kyrgyzstan has several pasture monitoring methods that can track changes in composition of pasture vegetation and biomass production, the latter monitored by clipping quadrats in temporally fenced

enclosures. The methods refer to technical papers from ARIS/LMDP, the World Bank project (Pasture and Livestock Management Improvement Project), CAMP Alatau, the Kyrgyz Livestock and Pasture Research Institute and Kyrgyz National Agrarian University. KLPRI has capability to assess pasture quality. The State Design Institute Kyrgyzgiprozem carries out research on pasture monitoring.

37. Measuring change in pasture species composition will monitor climate-change expressed as trends towards more arid or more temperate environments. In a drying trend, species adapted to more arid environments will replace temperate species. This also occurs from overgrazing where two processes are involved: (1) The most grazing-tolerant plants increase at the expense of less grazing-tolerant species, and root systems shrink towards the soil surface reducing access to deep soil water storage. Grazing tolerance is generally linked to drought resistance. (2) A decline in plant cover with increased exposure of bare ground promotes run-off of rainwater and less water infiltration, which creates a deficit in soil water storage (more aridity) compared to moderate grazing conditions. For these reasons, it is difficult to distinguish the agent(s) of changes monitored in grazed vegetation.

38. In the context of pasture rotation, however, the monitoring task is simplified. The grazing episodes are short, followed by or preceded by long periods without livestock grazing pressure. Pasture vegetation can be evaluated after a long rest period, and a complete picture of composition and productivity status assessed from year to year. Pasture-rotation sites can be compared with traditional continuous grazing sites. This may still not offer a clear picture of climate change and grazing management impacts, because of the high variability in climate confounding the effects.

39. An indirect but ultimately more useful monitoring strategy is to track changes in livestock. This is the dimension of pasture management in which households will be most interested. Milk yield is an obvious parameter that should reflect feed and forage supply, amount and quality. Also, live weight can be determined for a sample of livestock using the tape-measure method. Measurements for monitoring purposes should be taken from the same household herds and from livestock of known age and reproductive status and matched to herd management, including grazing management.

40. A particularly sensitive index of feed and forage conditions is the growth rate in the first six months of life. The tape-measure method can record weights at birth and at weaning for a sample of offspring. The early growth rate integrates the amount of milk produced by the mother during lactation as well as birth weight – animals heavier at birth tend to be heavier at weaning. A higher birth weight is a function of better nutrition of the mother in the last third of pregnancy, which in turn is an indicator of pasture and fodder conditions. Third, herd records of births, sales and mortality will show whether the livestock numbers in the village are rising or falling. Finally, disease incidence is a signal of nutritional status, and therefore of the effects of different pasture and livestock management systems. Because livestock parameters integrate both management practices and the effects of nutrition, they point to the general impacts of climate change and the result of efforts at mitigation.

41. These indicators will be analyzed against the background of the meteorological data of the nearest weather station. Under the authority of the MAFIM, and in collaboration with SAEPF, informational seminars and trainings will be held for villagers, PUUs and Pasture Committees. Educational literature on the rational use of landscapes and pastures, and grazing management, will be written and distributed. Booklets documenting CS-FOR project experiences will be disseminated for community edification.

#### **(b) Establishment of windbreaks and shade-shelter**

42. **Rationale.** Research has shown that rows or groups of trees and shrubs in a grazed pasture have health benefits for livestock. The trees ameliorate the environment by lowering wind velocity and thereby reducing cold stress in cool periods of the year. Trees also provide shade during the middle of hot summer days. Shade protection has been shown to reduce heat stress with positive production benefits for livestock. There are other associated benefits in terms of enterprise diversification and carbon sequestration.

43. **Description of the intervention.** The terms *windbreak* and *shelterbelt* are often used synonymously. In this report, the term *shelterbelt* is replaced with *shade-shelter* emphasizing either a copse or row of trees that provides shade protection. With somewhat different functions they may need to



be established in different locations. Rows of trees to form a shelter for shade should be planted in a southeast to northwest orientation, giving maximum shade from noon to mid-afternoon. For a group of shade trees in a copse, compass orientation is not important but location on the landscape may be. The availability of shade is one of four elements that direct movements of livestock, the other three being topography, locations of drinking water and preferred grazing sites. Make sure that the only protection from wind and sun in a pasture is not close to the main water-point where trampling damage can be excessive.

44. As a general rule windbreaks should be planted in rows perpendicular to the prevailing winds, especially winter winds. Air flows down mountain valleys from glacier fields need to be taken into account. No matter where a windbreak is located, in the northern latitudes of Kyrgyzstan it is likely to also provide shade in addition to protection from cold winds. Similarly, a shelter intended for shade is also likely to ease the force of wind flows. In herded situations livestock movement can be controlled by the herder, so convenience of the locations of shade-shelter is more important than using location to influence movement over the landscape of free-ranging animals. During winter, livestock are kept in barns or graze close to the village. Windbreaks need to be strategically located to maximize protection on winter pasturelands near villages, whereas shade trees should be spread over the pasture.

45. The distribution of windbreaks and shade shelter should be considered in relation to the distribution of grazing units in a pasture rotation. Windbreaks should be placed initially where the strongest cold winds may be found, and where they can do the most good in winter, such as on pastures close to the village. The natural topography of hilly pastures will create wind protection in depressions in the lee of hills and ridges. Shade shelter should be widely distributed, but is most beneficial on warm south- and south-west facing slopes that receive the greatest amount of incident sunshine. Before embarking on a tree-planting initiative in pastures, make a careful plan on a GIS map of the area, identifying where rows or groups of trees should be planted in order to be most effective. Consider the two purposes of wind protection and shade shelter. Also identify the species of trees and shrubs to be planted, and from where seedlings may be sourced. Potential for multi-purpose species should be a major consideration.

46. The two objectives of wind break and shade protection generate different prescriptions for ideal plantings. A windbreak should have a solid wall of foliage produced by a combination of different layers of woody plants: tall trees plus one or two layers of lower-growing shrubs that fill in the gaps near the base of tree-trunks. Seedlings of the different layers can be planted concurrently. The longer the windbreak row, the greater the interruption of wind flows will be. A series of parallel windbreak rows separated by corridors of pasture 20-50m wide has the best effect on mitigating cold wind. Trees planted for shade can be solitary individuals, but a group of trees with contiguous canopies is better. There is no need to consider a layer of shrubs beneath shade trees; livestock seeking shelter from the sun will cluster together under the tree canopies. Livestock are likely to nibble at leaves within their reach, even if the tree leaves are not particularly palatable, creating a browse line and removing obstacles to easy movement under the trees.

47. Trees and shrubs intended for windbreaks should be evergreen, maintaining their foliage through the winter season when winds can be most debilitating. Windbreaks may be composed of evergreen species such as Schrenk's spruce (*Picea schrenkiana*) and Juniper (*Juniperus* spp.). The Forest WP notes that poplars are used for windbreaks, in addition to providing timber and construction materials. However, they are deciduous trees, so their effectiveness for windbreaks in winter is quite limited, although when planted close together in parallel rows they will achieve some windbreak benefit. Poplars are tall and leafy in summer, fast growing and serve well as shade trees. Preferably, in order to give shade a tree should have a spreading crown of dense leaves. Broad-leaf deciduous species are suitable for shade-shelter, such as willow (e.g., *Salix caprea*, goat willow, and *S. purpurea*, basket willow); walnut (*Juglans regia*); birch (*Betula* spp.); apple (*Malus* spp.); and ash (*Fraxinus* spp.), chosen according to local environmental conditions.

48. Choose trees and shrubs for windbreaks and shelter that have some economic value, in addition to their sheltering features. They might produce fruits or nuts that can be harvested for home consumption and sale. The leaves of Mulberry trees can support a cottage silk industry. Trees could also be selected because of the quality of their timber. Another consideration is providing a habitat for wildlife, especially birds. If tourism is a potential ancillary village activity for enterprise diversification, windbreaks and shelter trees can beautify the landscape and attract wildlife that appeal to tourists. A forestry expert could provide

useful advice.

49. **Institutional aspects and implementation.** Obviously it will take several years for tree plantings to reach an age and size at which they provide effective shelter, even fast-growing species. Therefore, the establishment of windbreaks and shade-shelter requires leadership from the Pasture Committee and Leskhoz, a reliable work plan with transparent budgetary implications, and a long-term commitment from the community. For at least the first five years, seedlings and young trees and shrubs will need to be protected from livestock. Herders need to be prepared to keep animals out of the way, but a physical fence is the most reliable barrier. A combination of careful herding and a fence of some kind is most likely to afford protection of young plants from being grazed. Electric fencing is easily erected and can be readily moved, but electric fencing may not be available in Kyrgyzstan, with either battery or solar power. Windbreaks and shade-shelter tree plantings may need hand-watering in the first two years, but it would depend on the location of the planting on the landscape. If planted in a swale or depression where rainwater and snowmelt accumulate, the soil may be deep enough and of good quality to provide enough soil water storage for young trees to survive the summer months. Similarly, on the northern, northeastern or northwestern slopes, the topography and low incident sun exposure will reduce evapotranspiration and enhance tree establishment without irrigation.

50. Both electric and conventional fencing are expensive, and communities will need financial support, as well as technical support on fence construction and maintenance. Pasture Committees could appeal to NGOs and international donor organizations for assistance. The project will support individual PUUs and Leskhoz to make collective agreements (INRMCRP), sponsored by an institute such as ARIS, to collaborate on seedling supplies and fencing materials. Growth of woody species will capture and store carbon and enhance carbon sequestration, so planting windbreaks and shade-shelter copses in aligned to the objectives of the CS-FOR project. Resources from that project may be available to encourage a tree-planting programme on pastures of both SLF and SFF lands. Tree establishment and management on community pastures will train communities to care for similar plantings, and even large plantations or tree regeneration efforts, on SFF land.

51. **Expected benefits.** Households can expect healthier animals if cold stress in autumn/winter and heat stress in summer are reduced. Research has indicated that protection from cold wind and midday sun reduces metabolic maintenance costs and increases livestock productivity. In addition, tree plantings could be designed to provide alternative incomes from tree-harvest products and tourism, such as bird watching. Finally, establishing windbreaks and shade-shelter copses and belts will increase carbon sequestration.

52. **Monitoring and evaluation.** From the time of planting, seedlings and young plants will need to be monitored for vigour and survival. Dead plants will need to be replaced. A drought in the first year or two after planting may require watering individual plants to keep them alive. Once established, the effectiveness of shade trees and windbreaks can be judged by the behaviour of livestock. If they seek protection from midday sun in the shelter of a row of trees or a copse, or huddle behind windbreaks in winter to avoid cold winds, the tree plantings have fulfilled their purpose.

53. Exploiting tree plantations for harvest products or other benefits can be assessed from an economic perspective. The degree to which carbon stocks are augmented in windbreaks and shade-shelter trees can be calculated from wood density estimates and trunk measurements to determine wood volume and biomass.

54. **Risks and mitigation.** The main risk with a windbreak and shade-shelter programme is that there is not sufficient community will and commitment to carry it out. It requires a vision of what the pastures could look like in the future, and that takes leadership from the Pasture Committee. This risk can be mitigated by a capacity-building effort by the CS-FOR project with training illustrated with examples of how pasture landscapes can be augmented to achieve a more benign environment that enhances livestock production, enterprise diversity and pasture scenery.

55. At the technical level, there is risk that tree and shrub plantings will be unsuccessful for biological or ecological reasons. Seedlings may not be available, and those that are planted may not thrive. The same problems apply to reforestation and afforestation activities in Leskhoz forest enterprises. SAEPP forestation and a windbreak/shade-shelter programme create an issue of such magnitude that it is

necessary to establish specific nurseries to supply seedlings to Leskhozoes and Pasture Committees that need them. This calls for Private-Public Partnerships in tree nursery enterprises.

56. Another technical risk is that fences protecting tree plantings will not be secure. Any livestock producer will testify that fence maintenance is an on-going and never-ending problem. Herders must remain vigilant and look for ruptures in the protective fence around tree plantings. When a break occurs, it must be repaired immediately before small ruminants – goats are the most inquisitive threat – become aware of access to the protected area. PUU personnel need to be trained in fence-mending skills, and have the appropriate equipment at hand.

57. There is a risk that protected tree plantings will be opened up to livestock access before it is ecologically safe to do so, and be destroyed as a result. Technical consultants should be engaged to make the determination of when to remove fences, and how to manage the plantings soon after opening.

58. Finally, once the windbreaks and shade-shelters have been exposed to livestock, there is a danger that they will suffer heavy use and be degraded to an ineffective state. Pasture rotation simplifies custodial work, which is focused only on trees exposed in the particular grazing unit stocked with livestock. The condition of open windbreaks and shade-shelters needs to be monitored. If necessary, fences may need to be re-established to allow recovery from misuse. Managing tree plantings that are used by livestock is a learning process. Nevertheless, the rewards of vigilance and careful management are worth the effort involved.

59. **Sustainability.** Maintaining tree plantings on grazed pasture is a challenge. The benefits will not materialize for at least 5 years, maybe more. In the meantime, the PUU, Pasture Committee and herders must persevere with extra care of seedlings and young trees in the first two years after planting, repair fences when necessary, and exercise custodial management of established plantations. The investment is sustainable if community leaders preserve the vision of a future pasture with trees in rows and copses. The most direct benefit to villages will likely come from windbreaks protecting livestock from cold winter winds. They will see this close to their household dwellings and see the effects in better animal condition. Observations like this and the potential harvest of tree products will help to keep the vision of a healthier environment alive, and so foster the sustainability of the intervention.

### **(c) Climate-change friendly improvements in livestock production**

60. The previous discussion on rotational grazing focused on increasing forage production and Carbon sequestration. The recommendation concerning windbreaks and shade-shelters addressed environment amelioration, Carbon sequestration and animal health. This third recommendation focuses on reducing Green-House Gas (GHG) emissions such as methane from livestock grazing natural pastures. Low-methane-emission livestock husbandry should be tested in the CS-FOR target districts.

61. This portion of the analysis refers also to the findings of the Working Paper on Livestock (developed for CS-FOR) regarding the development of livestock production with less methane emission per kg of animal products. Methane is a powerful GHG with 34 times the potency of CO<sub>2</sub>. The appropriate methods are 1) to reduce the number of unproductive animals in the herds and flocks; 2) to replace current low-yielding livestock breeds with more productive breeds; 3) adopt better manure management practices; and 4) to increase enterprise diversity to stimulate and compensate for smaller herds of grazing livestock. Biogas technology employs anaerobic digesters to capture methane gas from manure and use it for fuel for heating and cooking, and even in combustion engines. The products of methane combustion are carbon dioxide and water. Biogas technology has been developed for large livestock enterprises but is less cost-effective at a small-farm scale. Nevertheless, appropriate technology for harnessing biogas designed for farms in India and elsewhere could be tested in Kyrgyzstan.

62. Herds of cattle contain a relatively high proportion of males 1-5 years old that will eventually be sold. Meanwhile, they contribute methane GHG to the atmosphere. Unproductive small ruminants should be sold at 1 to 1.5 years of age and at least 80% of male cattle sold at 2 years old. This will not only reduce the proportion of males in the herd, it will increase livestock productivity by at least 10%. Not only will unnecessary GHG emissions be reduced but grazing pressure on community pastures also will be less. Better market price can be obtained if young males are fattened in a feedlot environment before sale. The

owner can estimate live weight (using the tape measure method) before negotiating a sale price. A faster turnover of male stock usually means more income from this component of the herd.

63. Low-yielding livestock breeds should be replaced with higher-value breeds with more rapid growth rates and higher milk yields. Milk yields could double from a peak of 5-6 litres per day to 12-15 litres with better nutrition under disease-free conditions. Daily weight gains of cattle could rise from 300-400 g/day to 650-700 g/day. Reaching the potential of higher productivity will require better nutrition: intensive pasture rotation provides a taller stand of forage; plant species diversity ensures a diverse diet of quality forage. The Working Paper on Livestock describes a number of breed options that generate higher returns per head, justifying a smaller herd size to achieve the same levels of production and income. It is not necessary to cross-breed cattle to achieve higher productivity, although the availability of semen of Brown Swiss and Black Angas bulls delivered through artificial insemination makes cross-breeding attractive to livestock owners who are looking for a “silver bullet” to solve production issues. Equally effective is an aggressive culling programme within herds of indigenous cattle, selecting cows for milk yield and the growth rates of their calves. A strong selection protocol could be combined with cross-breeding. Big fat-tailed Ghissar sheep introduced from Tajikistan and Uzbekistan are already a common component of Kyrgyz flocks. However, slaughterhouses are expressing a preference for thin-tailed sheep like local forms of Merino because there is less carcass waste such as experienced with the fat tails of Ghissar sheep that have low market value and are generally discarded.

64. The solution to the current problems of low-productive livestock and overgrazing is lower grazing pressure on more productive pastures providing a higher plane of nutrition. GHG emissions per animal and per kg of product are higher when the diet is poor quality.

65. Current winter-housing management could be magnifying the problem of GHG emissions. Livestock are often kept in enclosed barns with little ventilation. Manure and urine build up on the floor of these barns. Decomposition of manure under anaerobic conditions produces large amounts of methane gas, a very dangerous GHG with 34 times the potency of carbon dioxide. Urine breakdown releases ammonia gas. Ammonia is not a GHG but build-up of ammonia in the atmosphere creates unhealthy conditions for livestock in enclosed barns. Correct manure management practices could be introduced to the CS-FOR target districts. Manure can be excavated from barns and formed into patties that are dried for future use as fuel. The CO<sub>2</sub> released by burning is not as dangerous for global warming as the CH<sub>4</sub> released in the barn. Manure raked out of winter barns can be spread as organic fertilizer on crop or vegetable fields and nearby pastures. A sludge of manure stirred into water makes manure handling easier. Ventilation is readily enhanced by opening windows and doors on the leeward side of the barn away from prevailing winter winds.

66. Alternative livestock enterprises should be pursued to reduce reliance on cattle and small ruminants. The yak population in Kyrgyzstan has been declining in recent decades while conventional livestock numbers have been increasing. Yaks provide a unique opportunity for harvesting mountain pastures with low managerial input. They have better feed efficiency than cattle and small ruminants, with smaller feed intake needed per kg of animal product, and their high quality meat and milk products are in demand. Yak farming is a viable alternative that should be explored in the target project districts. Goat milk is in increasing demand, and yet the population of dairy goats is relatively small. Dairy goats can serve household milk requirements when cow milk is unavailable.

67. Poultry and turkey farming offer alternative enterprises that have high income potential. Chickens and turkeys do not produce GHG. They serve subsistence household needs for eggs and meat as well as providing market potential. Turkey farms are particularly profitable in meat markets. Finally, bee management for honey production has been a strong tradition in rural Kyrgyzstan, but honey yields have declined to one quarter of Soviet-era levels. This domain of agricultural production is very profitable and could be developed in rural communities of the CS-FOR target districts.

#### **(d) Broadcasting seeds of forage species to improve pasture vegetation**

68. The Kyrgyz Livestock and Pastures Research Institute has an on-going programme of pasture improvement on lands that can be lightly cultivated with harrows, i.e., relatively flat or gently sloping land. The land for broadcast seeding is cultivated with harrows in late October or early November before broadcasting, and often receives a second pass of the harrows after broadcasting to settle the seeds into

the topsoil. A flock of sheep walking over the site can also achieve a sowing effect. On pastureland that is too steep for cultivation, an alternative to the KLPRI method is to broadcast seed into undisturbed natural pasture.

69. Palatable non-invasive native perennial grasses suitable for broadcast seeding include smooth brome (or awnless brome, *Bromus inermis*), cocksfoot (*Dactylis glomerata*), bulbous barley (*Hordeum bulbosum*), volga fescue (*Festuca valesiaca*), and sheep's fescue (*Festuca ovina*) on drier sites. A desirable perennial forage plant in the rose family is salad burnet (or sheep's burnet, *Sanguisorba minor* also known as *Poterium sanguisorba*). Burnet is both highly palatable and tolerant of heavy grazing, and remains green through the summer months. Two native rhizomatous perennial grasses are well suited to protecting eroding and vulnerable sloping sites: couch grass (*Cynodon dactylon*) and quackgrass (*Elymus repens*). Although the latter grows rapidly to hold the soil in place, it can be fairly aggressive with invasive properties. Two perennial legumes have been planted as fodder crops in Kyrgyzstan for a long time and are now naturalized, if not native: Sainfoin (or esparcette, *Onobrychis viciifolia*) and lucerne (or alfalfa, *Medicago sativa*). Both legumes have been successfully broadcast into pastures in other countries. Seeds of indigenous forage shrubs can also be broadcast into pasture: some of the "shubak" (*Artemisia*) species such as "Belozemelnia" (*Artemisia terrae-albae*), "Teresken" (*Krascheninnikovia ceratoides*) and "Izen" (or forage kochia, *Bassia prostrata*).

70. The success rate of broadcast seeding into existing vegetation can be quite low, but if only 1 or 2 plants are established per m<sup>2</sup> that may be a sufficient starting point to ensure that the species survives and spreads in the plant community. Under intensive rotational grazing, palatable perennial grasses have a competitive advantage over less palatable and weedy species.

71. While seeds of sainfoin and lucerne are commercially available from local seed farms in Kyrgyzstan, only one farm is producing seeds of perennial grasses, namely, a 4-ha area managed by KLPRI. The Pastures Institute has initiated satellite seed production sites in Ak-Talaa and Loken Districts. The CS-FOR project could encourage PUUs to establish 1-ha fenced sites dedicated to perennial grass seed production, under the guidance of KLPRI. These sites must be sown to preferred species adapted to the area, and maintained free of weeds. Following the KLPRI model, grass seeds can be collected from natural stands that receive light grazing pressure, especially from grazing units receiving a full year of rest from grazing in the schedule of a pasture rotation, or a foundation batch of seeds could be obtained directly from KLPRI. Seed can be harvested by hand into bags attached to the waist of seed collectors, dried and cleaned. Stored seed is then spread by hand onto hillsides, beginning with environmentally favourable areas with good soil properties in terms of depth and fertility. Seed should be spread in October/November so that winter rain and snow can press the seeds down to the soil surface where germination takes place in spring.

72. The KLPRI 4-ha area used for grass seed production is part of 8 ha of land managed by the Pastures Institute; the remaining 4 ha is used for research. The entire 8 ha is within a 200 ha controlled by Kyrgyz National Agrarian University. The KLPRI seed production area could be expanded under project auspices through an agreement with KNAU.

## CONCLUSIONS

73. Pastures and the livestock that depend on them are the main component of Kyrgyz agriculture, supporting up to 90% of the rural population. Pastures are overgrazed and degraded, and livestock production is poor; milk yield is only half the potential. The effects of degradation are ecological, social and economic, with the livelihoods of poor households most vulnerable. The current production system is in the grip of a vicious cycle. Overgrazing reduces available forage, which then reduces animal productivity, causing households to have more animals to compensate for less production per head, which increases grazing pressure and leads to more degradation. The downward trends in pasture degradation and livestock production have continued for the past two decades and conditions will become worse under the adverse impacts of climate change. By adopting innovative grazing management strategies, these trends can be reversed, providing rest and recovery periods to restore pasture vegetation, increase Carbon sequestration and reduce or eliminate erosion.

74. The core element of ecosystem recovery is new grazing management technology. In addition, tree plantings for windbreaks and shade on pastures can improve animal health and augment Carbon sequestration efforts. Introducing higher-performing livestock breeds into community herds can raise productivity per head and drive down herd size while achieving equivalent overall production. Better manure management in winter housing facilities can reduce methane emissions. Methane, a Green-House Gas twenty times more potent than carbon dioxide, can also be reduced without threatening livestock production by culling unproductive animals such as surplus males and barren females. Poor quality feed produces more methane per kg of production than high quality feed; rotational grazing practices increase both amount and quality of forage. Finally, enterprise diversification can reduce dependency on conventional livestock husbandry and increase resilience to climate change impacts.

75. Changing traditional pasture and livestock management practices is a challenge. However, the PUU/PC organizational structure in rural villages provides a mechanism for community commitment to planning and implementation that will achieve enhanced, more sustainable production. By addressing the threats inherent in climate change, farmers and livestock producers can increase the long-term profitability of their activities while contributing to both ecosystem health and poverty reduction. The ultimate goal is to restore and preserve the ecological integrity of pasture ecosystems.

## Appendix 3 to Chapter 4: Private sector as key driver to CS-FOR mitigation approach

76. **Intro.** The project's approach has included private sector's participation as a critical element of its theory of change. Such involvement is mainstreamed in all project's technical components and contributes to all project's results. On the enabling environment component, the approach and the policy / regulatory framework proposed require representatives of local communities and private sector participating in the policy dialogue, to ensure inclusive and sustainable results (Component 1). With more substantial implication, both Component 2, the core of the mitigation objective of the project, and Component 3, on climate-sensitive value chains development, envisage actual investment of private sector.

77. **Enabling private sector engagement (Component 1).** Private sector and rural communities will have an active and central role in the decision making process of all project's investment, and will bring their contributions. Their engagement starts from the policy dialogue (component 1), and is mainstreamed throughout the whole project implementation. The stakeholder engagement process, initiated during the project formulation stage, has already set the basis for private sector's participation in the project's decision-making mechanisms (see Annex 2.b of the Funding Proposal, stakeholder's engagement report). More specifically, by enhancing the inclusive policy dialogue in public-private partnership for integrated ecosystem management in climate context carried out under Component 1, private sector and communities will start identifying their needs and investment requirements, accompanied by experts in an evidence-based and rational process. This will create an environment whereby there will be more opportunities for private businesses and/or public-private partnerships, facilitated in the development of the subsequent components.

78. **Private sector's contribution to forestry investment (Component 2).** The key returns of forestry investment are essentially represented by carbon sequestration, which in the current absence of carbon pricing initiatives, makes financial returns largely unattractive for the private sector. The financial benefits of pure forestry investment are too low even in a 20 years horizon to mobilize private capitals. However, considering the actual linkages between forestry and rangelands (as one of the primary sources of livelihood), the **project approach envisages private sector's participation in forestry investment**. Even if the investment are local native (not commercial) tree species, communities and individuals will contribute with own resources (as also reflected in the project budget), including land, labour, and other costs. The level of concessionality for such investments has been set according to the potential returns of the forestry investment (reference: EFA, in Chapter 7 of the Feasibility Study, where the individual forests financial and economic returns are described). Varieties such as Juniper, Spruce, Poplar, and Mixed tree species give particularly low returns (the related financial performance indicators such as IRR and NPV are all negative), making public resources (including GCF grant) necessary for about 90 percent of the investment. On the other side, walnut and pistachio reforestation, even with the selected non-commercial local varieties, generate some higher financial results (IRR at 20-year horizon result positive only for walnut forests, barely positive for pistachio), and the concessionality is set at 65 percent. Such level, when accompanied by a leasehold agreement on the use and harvest of non-timber forest products, generate private sector's interest to provide an actual contribution even when the major benefit of the investment is a public good as mitigation. As per the EFA (Annex 3 of FS), for Pistachio and Walnuts the concessionality is 65% of the investment. Even considering the grant, the returns are barely positive. For Pistachio Forests (non-commercial varieties, afforestation activities), the IRR for a grant-supported investment over 20 years is 16% and the NPV is positive at barely 1,000 USD. Walnut (same, non-commercial indigenous varieties) is slightly more viable, with 20-yrs IRR at 19% and NPV 5,000 USD.) All forest investment envisage the participation of private sector, with direct investment in land, labour, and other costs. The concessionality has been set at a level that raises the interest of possible private investors – that could access to credit lines generated by RKDF.

79. **Rangelands development as public good with private sector's participation (Component 2).** Rangelands play a critical role in the project's expected carbon sequestration potential, and are one of the key elements of innovation compared to previous interventions and to the existing regulatory



framework. In the project's framework, improvement of rangelands conditions contributes by over 70 percent of the carbon sequestration potential of the project (14.9 m tCO<sub>2</sub>e over a total expected sequestration of 19.7 m tCO<sub>2</sub>e in a 20 years horizon). Thus, the importance of rangeland investment is critical and cost effective: when considering the sole investment in rangeland (i.e., excluding the associated cost of capacity development and for improving the enabling environment) the cost of sequestration is about 0.26 USD / tCO<sub>2</sub>e, very low compared to average sequestration investment. Rangeland are at the centre of the livelihoods of rural communities in the target areas, but the currently prevailing livestock management is incompatible with considering rangeland as a carbon sink. In order to provide incentives to the behavioral change of private sector, the project has, on one side, set an attractive level of concessionality to the rangeland investment (yet with a private sector contribution of at least 10 percent). On the other side, the project has established an innovative associated investment (Component 3) that stimulates private sector's investment in value chains that will contribute to reducing the pressure on rangeland.

80. **Climate sensitive value chain development (Component 3).** The largest room for leveraging private sector's investments in ecosystem-based NRM is in component 3. GCF grant resources (activities 3.1.1 and 3.1.2) will be dedicated to create an enabling institutional environment for 'Climate-sensitive Value Chains', which will provide economic incentives to the required diversification and enhanced efficiency, productivity and competitiveness of existing economic activities in the highly degraded target areas. Such GCF investment will in-turn be funded by RKDF co-financing for a five-fold amount (activity 3.1.3).

- **De-risking climate sensitive value chains** (activities 3.1.1 and 3.1.2) will support the investment in carbon sequestration under component 2 by providing local communities with the access to skills and technologies conducing to sustainable use of forests, improved livestock management practices and strong linkages to the corporate markets. Certification of NTFP according FSC standard<sup>188</sup> and other voluntary international standards such as HACCP, Fair Trade, Organic and GlobalGAP to enable direct linkages with end markets will be the driving force towards paradigm shift in forest use and local economies growth. The project strategy to develop climate sensitive value chains will pass through a number of steps (reference: Value chain development working Paper; Chapter 4 and 5 of the Feasibility Study), among others: accompanying the preparation business proposal; Technical and financial capacity development; Support to certification; Value chain reorganization; Market promotion.
- **Financing climate sensitive value chains.** Directly linked with the investment in capacity described above, under activity 3.1.3 the project will include the activation of special credit lines from RKDF for project-relevant value chains and entrepreneurs. Supported by the technical assistance provided under activity 3.1.1 and 3.1.2, small, medium and larger enterprises in the project area (as well as other areas with economic connections to the project areas) will have access to the credit lines. The loans will range from USD 10,000 to USD 300,000, with the average amounts about USD 100,000 extended to about 150 end borrowers. In order to guarantee an effective use of co-financing resources, each sub-project proposal will identify the carbon sequestration benefits, and its potential contribution to the carbon sequestration objectives of the project. Moreover, each type of investment would be accompanied with a realistic business model and financial analysis. Incremental household income and jobs, productivity gains, value addition, market access, gender equality and the potential for the economic empowerment of women, youth, the poor and other vulnerable groups would be important criteria in investment proposal evaluation, together with commercial viability, climate resilience and cost effectiveness assessments.

81. **RKDF co-financing.** In order to support the sustainability of carbon sequestration investment in forests and rangeland, with US\$ 15.0 million in co-financing as senior loans from the RKDF, the project will activate special credit lines for project-relevant value chains and entrepreneurs. Within its Component 3, CS-FOR will generate loans to existing enterprises representing eligible value chains. The loans will be provided to entrepreneurs at 5 percent p.a. in US\$ and at 10 percent in local currency, for a term of about 3-5 years. The interest rates applied are about half of the prevailing market weighted average interest

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<sup>188</sup> FSC-NEPCon Interim National Standard of Kyrgyz Republic.

rates (Credit Information Bureau - see Chapter 3 of the Feasibility Study, rural finance Section). This is in line with the project concept to support investment towards reducing unsustainable use of forests and rangelands. The RKDF loans will specifically target small and medium sized enterprises that need larger loans as compared to those typically offered in the market by commercial banks.

**82. General criteria and approach for identification of eligible private sector actors and value chains.** While criteria will be set within the project inception phase, following the rationale of Component 3 and in line with the project's theory of change, as first and utmost criterion for the identification of eligible value chains and private sector actors is the potential contribution to the solidification the efforts of the project for mitigation through forestry and rangeland investment. At first, the value chains and actors will be selected according to the potential to contribute to income diversification from unsustainable livestock or forestry practices. This will constitute the building block for both the mitigation and the increased resilience objectives. Additional general principles will be developed during the project inception phase, and will include criteria such as: (a) readiness to expand the business and include / procure from smallholders in the project target areas; (b) readiness to follow international and EU standards; (c) Experience to work with sustainable technologies of harvesting / drying / processing; and (d) overall past financial / economic performance.



## Chapter 5: Institutional aspects and implementation arrangements

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## A. Implementation principles and governance

### Introduction

1. The Food and Agriculture Organization (FAO) is the GCF Accredited Entity responsible for supervising and providing technical backstopping during project implementation. SAEPF and ARIS will implement the project as Operational Partners under Operational Partner Implementation Modality (OPIM) with specific responsibilities in achieving the project outcomes or selected results. SAEPF, MAFIM, ARIS and RKDF are national co-financing institutions for the project. SAEPF and ARIS will ensure the project execution. RKDF will ensure that the co-financing reaches the final beneficiaries either through direct loans or through local partners Banks.

2. **Climate Change Coordination Commission (CCCC).** The CS-FOR project will be implemented under the government guidance and political/cross-sector coordination of the Climate Change Coordination Commission (CCCC), the national institution responsible for climate change, chaired by the First vice Prime Minister of the Kyrgyz Republic, with the Director of the SAEPF as the Deputy Chair. The CCCC ensures multi-sector coordination of all activities in the Kyrgyz Republic related to climate change, and is comprised of the heads of all key ministries and divisions, and representatives of the civil, academic and business sectors. By establishing the CCCC at the level where it has convening power, the Kyrgyz Government intends to make climate change an intrinsic part of economic development. The Commission is already operational and has a mandate to coordinate climate change activities across sectors and projects in Kyrgyzstan.

### Project execution – Operational Partner Implementation Modality (OPIM)

3. The project will be jointly executed by a Project Management Unit under the State Agency for Environmental Protection and Forestry (SAEPF), in coordination with FAO (as Executing Entity for quality assurance), the Community Development and Investment Agency (ARIS), the Ministry of Agriculture and Food Industry Melioration (MAFIM) and the Russian Kyrgyz Development Fund (RKDF), according to the respective areas of expertise. According to FAO's rules and regulations, CS-FOR will be implemented under the Operational Partner Implementation Modality (OPIM).<sup>189</sup> OPIM involves the transfer of funds to Operational Partners (OPs) for the implementation of project's components on the basis jointly defined and shared goals where FAO retains overall accountability to the Resource Partner and the Government for proper management of funds, technical quality and results achieved. In order to ensure SAEPF and ARIS' capacity to implement the project as pre-selected executing entities, FAO has commissioned an independent Operational Partners' assessment covering their programme, financial and operations management policies, procedures, systems and internal controls. The assessment reported an overall low risk, with moderate risks in procurement procedures. MAFIM will be involved to implement specific outputs via a Letter of Agreement. In its role of Accredited Entity, FAO will maintain overall accountability on the project implemented by the OPs, and will perform independent audits and spot checks, besides retaining a role of executing entity for quality assurance throughout the project. The agreement between FAO and the OPs is summarized in the respective Operational Partners' Agreements.

### Project Partners

4. The **State Agency for Environment Protection and Forestry (SAEPF)** under the Government of the Kyrgyz Republic is responsible for the formulation and implementation of policy around environmental protection, preservation of biodiversity, sustainable use of natural resources, development of forestry and hunting enterprises, and ensuring the ecological security of the State. The major tasks of the SAEPF are to develop and implement policy; oversee state control of the implementation of legislation, protection, and use of natural resources; undertake inventory and assessment of natural resources; and disseminate information about the environment. As such, the SAEPF acts as the National Designated Authority (NDA) at the GCF, and works in close cooperation with other sectorial ministries in order to integrate climate change considerations in the country's development strategy.

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<sup>189</sup> The OPIM is described in the FAO Manual Section 701.

5. Currently, SAEPF is implementing a number of projects, including the WB/GEF funded Integrated Forest Ecosystem Management Project (IFEMP), total amount of which is US\$ 12 million, scheduled to be completed in September of 2021. For implementation of this project, SAEPF has established a Project Management Unit (PMU), which includes a Coordinator, Financial Management Specialist, Procurement Specialist, M&E Specialist, and Forestry Expert. Such PMU has been trained and it is fully equipped to undertake complex procurement, disbursement, and financial management tasks.

6. The **Kyrgyz Republic's Community Development and Investment Agency (ARIS)** was established in October, 2013 as a non-commercial organization. The supreme body is Supervisory Board with 21 members. ARIS mission is to support sustainable poverty alleviation by providing assistance to local communities and local self-governmental bodies in resolving local social and economic problems by strengthening their capacity in determining and prioritizing local issues, developing investment and action plans, mobilizing resources, as well as developing, implementing and managing investments aimed at resolution of local priority issues. ARIS operates in accordance with the following principles, including: (a) autonomy; (b) impartiality; (c) involvement; (d) management; (e) transparency; (f) cost effectiveness; (g) decentralization; (h) sustainability of sub-projects/micro-projects; (i) environmental conscience.

7. ARIS will be executing the project activities with a legal agreement with FAO under an OPA as Operational Partner under OPIM or any other applicable legal instrument according to the risk classification suggested by the Operational Partners assessment. ARIS will be in charge of achieving the agreed results related to the project activities where it holds highest comparative advantages. More specifically, this will comprise output 1.3; parts of Component 2; and parts of Component 3. Under FAO rules and procedures and in conformity with this project document, any legal/formal agreement with FAO and the Annual Workplan and Budget (AWPB), the Project Coordinator will identify expenses and disbursements that should be requested to FAO for the timely execution of the project as well as timely reporting to the PMU in the format and with the information requested. In its role as EE of CS-FOR, ARIS will provide its structure of central and decentralized officers and offices to support the implementation of the activities, which will constitute a co-financing to the project implementation.<sup>190</sup>

8. The **Russian-Kyrgyz Development Fund (RKDF)** was established in late 2014 as an international organization per the Agreements between the governments of the Kyrgyz Republic and the Russian Federation "On the development of economic cooperation in the conditions of Eurasian economic integration" and "On the Russian-Kyrgyz Development Fund". The capital of the Fund is US\$ 500 million. RKDF provides both direct funding to Kyrgyz medium-sized and large enterprises (with loans starting from US\$ 1 million) and indirectly through commercial banks to smaller enterprises (loans below US\$ 1 million). RKDF lends to all economic sectors and as of April 2018, has funded 926 enterprises for a total amount of over US\$ 275 million.

9. Agriculture is one of the key focus areas for RKDF: it takes the first place in terms of the number of loans (338 out of 926, or 36.5 percent) and second in terms of the volume of funding (over US\$ 64 million, or 23 percent). In 2016, RKDF has partnered with International Fund for Agricultural Development (IFAD) to provide loans to agricultural producers and processors identified and assisted through IFAD's "Access to Markets Programme" in Kyrgyzstan, to be launched later in 2018. RKDF has also expressed interest in partnering with CS-FOR by providing a credit line for project beneficiaries in the amount of US\$ 15 million.

39. The RKDF will provide a credit line through local commercial banks that already reach out to the project target areas. Initially, 5 commercial banks will participate in the disbursement of the credit line (listed alphabetically): (i) Ayil Bank; (ii) Bank Kyrgyzstan; (iii) BTA Bank; (iv) Kompanion Bank; and (v) RSK Bank. The project will work in close collaboration with RKDF and the partner banks to identify prospective beneficiaries within the eligible value chains and ensure the complementarity of the technical assistance provided under activity 3.1.1 and 3.1.2 and credit resources under activity 3.1.3. This senior loan input will follow the grant inputs sequentially as a co-financing of the grant component.

40. The **Ministry for Agriculture, Food Industry and melioration (MAFIM)** is the central governmental executive authority that implements the national policy on agriculture, land and water resources, irrigation and land reclamation infrastructure and processing industry. The MAFIM is an authorized state body at the central level responsible for defining policy in regulating state pasture land

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<sup>190</sup> A letter of intent for co-financing signed by ARIS is annexed to the Funding Proposal.

use (except rangelands under the SFF). On the matter, MAFIM is charged with developing technical and legal regulations on pasture use, pasture land tenure recommendations, pasture condition standards, and quality assessment methodologies and monitoring. It also oversees pasture monitoring, pasture management plans, and provides support to local governments and PUUs on pasture use (Pasture Law, article 14). In 2016, the Pasture Department within the MAFIM merged with two other departments and became the Pasture, Livestock and Fishery Department (PLFD), responsible for developing policy and legislation in pasture management and use, and providing technical and other support to local governments and PUUs. The MAFIM is currently in the process of developing a new Pasture Management Strategy and Programme for 2018-2040. FAO and MAFIM have been collaborating since when the country joined the Organization, and FAO has been providing technical assistance covering the agriculture sector, including crop, livestock and fisheries projects, support to sustainable land and forest management and climate change. MAFIM and its Pasture Department as well as other government and non-government entities will be involved through Letters of Agreement (LOA).

### **Project Steering Committee - country ownership of decision-making process**

10. Under the CCCC, the CS-FOR project will establish a National Stakeholders Platform (NSP), acting as **Project Steering Committee (PSC)** for the project and when required. The PSC will be the ultimate decision making body with regard to policy and other issues affecting the achievement of the project's objectives. The PSC will provide policy and operational guidance, review results-based Annual/six monthly work plans and budgets and provide recommendations for resolving any constraints faced by the project. The PSC will be critical to ensuring close linkages between the project and other ongoing projects/programmes relevant to the project sustainability of key project outcomes, including up-scaling and replication, and effective coordination of government partner work under the project.

11. The PSC will meet on a biannual basis unless there are issues to be discussed in between meetings. The PSC will be integrated include by decision-making officials, appointed as focal points by partner institutions to guarantee the country driven decision-making processes to achieve the GCF project target: SAEPF, Climate Finance Centre (CFC), ARIS, the Russian Kyrgyz Development Fund (RKDF), the Ministry of Agriculture, Food Industries and Melioration (MAFIM), the Pasture Department (under MAFIM), State Agency for Local Self Government and Interethnic Relations (SALSGIER), the Ministry of Emergency Situations (MES), Kyrgyz Hydromet (under MES), the State Registration Agency, and the FAO Representation in Kyrgyzstan. There will be also selected representatives of the civil society and private sector participating as observers in the PSC/National Stakeholders Platform. Representatives of participating communities/CLMGs will be observers of the PSC and will be invited to the meetings of their special interest and concern.

12. The PSC functions will include: i) ensure the quality of results, and the sustainability and impacts of the project in line with the policy direction; ii) approve annual work plan and budget (AWP/B) to be sent to FAO; iii) approve six monthly project progress reports to be sent to FAO; iv) approve adjustments to the distribution of budget between items on the basis of information provided by the Project Management Unit; v) approve proposals of adjustments to indicators and the targets of results and outputs, based on information provided by the Project Management; vi) approve possible modifications to the project implementation agreements; vii) invite competent professionals to participate in steering committee meetings, in accordance with the issues under consideration; viii) endorse the selection of the Project Coordinator, based on a competitive selection process. The PSC will also support project's activities by promoting results and approaches within the Government and ensuring mainstreaming among political decision makers.

### **Project management**

13. Ensuring the country ownership, the project will be co-executed by SAEPF, ARIS and FAO (which will also have a coordinating role as Accredited Entity, providing quality assurance to the overall implementation of the project activities). SAEPF will be a primary Executing Entity of the project and host a PMU to be located under SAEPF headquarters. SAEPF will be in charge of operationalization of PMU and achieving results under selected Components (or parts of them), where SAEPF holds the highest comparative advantages. ARIS will be in charge of ensuring coordination of planning and in the execution



of project activities where ARIS holds highest comparative advantages. SAEPF and ARIS will be executing the project activities under FAO's legal agreement instruments such as Letters of Agreement (LOA) and/or the Operational Partner Implementation Modality (OPIM) according to the rules and regulations of FAO.

14. The project will be jointly executed by a Project Management Unit under SAEPF, in coordination with FAO (as Executing Entity for quality assurance) and ARIS (as Executing Entity including local coordination function) according to the respective areas of expertise. FAO will involve national Executing Entities under the Operational Partner Implementation Modality (OPIM) according to FAO's rules and regulations for the Project. OPIM provides a framework for informed decision-making on the engagement of FAO in partnership arrangements. Such setup will support strong country ownership and execution of the project but also serve the capacity development objectives of the project.<sup>191</sup> In order to ensure SAEPF and ARIS' capacity to implement the project as identified potential executing entities, FAO has commissioned an independent Operational Partners' assessment covering their programme, financial and operations management policies, procedures, systems and internal controls. The assessment reported an overall low risk, with moderate risks in procurement procedures.

15. In its role of Accredited Entity, FAO will maintain overall accountability on the project implemented by the OPs, and will perform independent audits and spot checks, besides retaining a role of executing entity for quality assurance throughout the project.

16. **The project Management unit (PMU).** The CS-FOR will establish a Project Management Unit (PMU). The PMU will be physically located under SAEPF headquarters. The PMU will be responsible for day-to-day project management, providing human resources management, financial and procurement services and management, coordinate and monitor M&E of the project's activities, generate workplans and budgets, project reporting and documentation. The PMU will be headed by a Senior International Technical Adviser for forestry, rangeland and governance will be recruited by the project. The Technical Adviser will have overall responsibility for preparing the annual work plans and budgets, technical documents for procurements, terms of references of technical experts, clearing them with FAO, the OP and the donor and obtaining Steering Committee clearances. The Adviser will also have overall responsibilities of capacity development of OPs' and of PMU's staff and consultants on technical and managerial aspects (including facilitation for procurement and financial, human resources and quality assurance for overall project implementation). The Technical adviser will be supported by the PMU staff, including a Project Coordinator, in charge of the day to day management of the project and coordination between all operating partners and project stakeholders, a Financial Specialist, a Procurement Specialist, an M&E team leader, a secretary and a driver. The M&E and Planning team leader, under the overall supervision of the Project Coordinator, will be in charge of the overall planning, M&E and learning process of the project, and will coordinate a team of technical expert (part of the Expert Group) composed of an M&E specialist, a GIS specialist and a communication expert. The PMU will also liaise with ARIS and with RKDF to ensure coordination of planning and in the achievement of the project's results, and with FAO for technical assistance and support in implementation. See Project implementation unit structure in Figure 1 and Figure 2 below.

17. In addition to the overall responsibility of the project coordination, the PMU located in SAEPF will be in charge of achieving results under selected outputs (or parts of them), where SAEPF holds the highest comparative advantages. It will be supported by technical assistance provided by FAO in the form of FAO expert or international/national consultants or partners and service providers of its trust. More specifically, the PMU's responsibility will include the achievement of results under output 1.1 and 1.2, and parts of Component 2. In its role as EE of CS-FOR, SAEPF will provide staff time and office/conference spaces to support project implementation. This will constitute co-financing to project implementation.<sup>192</sup>

18. The separation between SAEPF's NDA role and its execution role in CS-FOR implementation will be guaranteed by a fully-fledged CS-FOR PMU, operating under the aegis of the CCCC and of the Project Stakeholders Committee, where SAEPF is a member together with all relevant government and non-government institutions.

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<sup>191</sup> The OPIM is described in the FAO Manual Section 701.

<sup>192</sup> A SAEPF co-financing letter of intent is annexed to the Funding Proposal.

19. The result from independent Operational Partners' assessment can highlight some capacity baseline of SAEPF for executing the project (see Annex 4.b). The assessment, for example, suggests that the project ensures adequate staffing structure for the volume and complexity of operations. SAEPF will be executing the project activities under a legal agreement between FAO and Execution Entity (e.g. Letter of Agreement, Operational Partners Agreement (OPA) under OPIM) or any formal agreement that needs to be applied under the current FAO rules and regulations based on the risk classifications suggested by the Operational Partners assessment.

20. The **Project Coordinator** will be in charge of day-to-day project management and coordination and supervision including: (i) coordinating and closely monitoring the implementation of project activities; (ii) day-to-day management; (iii) coordination with related initiatives; (iv) ensuring a high level of collaboration among participating institutions and organizations at the national and local levels; (v) tracking the project's progress and ensuring timely delivery of inputs and outputs; (vi) Ensuring effective gender mainstreaming and social inclusion of the project, with the technical support of the gender and social development specialist (vii) implementing and managing the project's monitoring and communications plans; (viii) organizing annual project workshops and meetings to monitor progress and preparing the Annual Budget and Work Plan (AWP/B) for the PSC; ix) reviewing and submitting the quarterly reports, six-monthly Project Progress Reports (PPRs) with the AWP/B and FAO; x) submitting the reports as required in OPA (e.g. six-monthly technical and financial reports<sup>193</sup>) to FAO and facilitate the knowledge? (information) exchange between the OP and FAO; xi) preparing the regular reports; and xii) supporting the organization of OPIM quality assurance activities (spot checks, audit), FAO project supervision, the interim independent evaluation and final independent evaluation in close coordination with FAOKG and the FAO Independent Office of Evaluation (OED). Likewise, under FAO-GCF rules and procedures and in conformity with this project document, the Operational Partner Agreement (OPA) and the AWP/B, the Project Coordinator will identify expenses and disbursements that should be requested to FAO for the timely execution of the project. The Project Coordinator will be accountable for monitoring, providing technical support and assessing the outputs of national experts hired with GCF funds, as well as the products generated in the implementation of the project, including products and activities carried out by project consultants.

21. **Expert group.** Through the Project Coordinator, the PMU will coordinate the provision of technical expertise for the implementation of the components expected results. A pool of individuals (Expert Group) and organizations (state agencies, research, educational, and extension organizations, etc.) will be identified to provide technical support in implementation. The thematic specialists under the Expert Group will contribute in their field of expertise to the provision of technical assistance, training and support to implementation to the activities carried out under the various projects' components. The expertise mobilized include policy and expertise in: Natural resources management, forestry, pasture management, pasture monitoring, climate change, ecosystem, gender equality, environmental and social management specialist, and an interpreter. The ESM specialist, under the overall supervision of the Project Coordinator, will be in charge of the implementation and application of the Environmental and Social Management Framework and of the Grievance Redress Mechanisms (GRM), and within this function will coordinate also the design of Environmental and Social Management Plans for the relevant investment as negotiated within the Integrated Natural Resource Management Climate Resilience Plans (INRMCRP).

22. Besides the overall responsibility of the coordination of the NSP, under the Operational Partner Agreement (OPA) the PMU in SAEPF will be in charge of achieving results under selected outputs (or parts of them) which is responsible for and where SAEPF holds the highest comparative advantages. It will be supported and supervised by technical assistance activities provided by FAO in the form of FAO expert or international / national consultants or partners and service providers of its trust. More specifically, the PMU's responsibility will include the achievement of results under outputs 1.1 and 1.2 (with solid FAO support), and parts of Component 2. In its role as OP of CS-FOR, SAEPF will provide staff time and office / conference spaces to support the implementation of the project. This will constitute a co-financing to the project implementation.<sup>194</sup>

23. **ARIS execution.** As Operational partner of the project, ARIS will be in charge of achieving the

<sup>193</sup> Preparation of financial reports according to Accreditation Master Agreement (e.g., Disbursement report, Reflowed funds report, Statement of investment income, Unaudited annual financial statement)

<sup>194</sup> A SAEPF co-financing letter of intent is annexed to the Funding Proposal.

agreed results related to the project activities where it holds highest comparative advantages. More specifically. This will comprise output 1.3; parts of Component 2; and of Component 3 (activities 3.1.1 and 3.1.2) under FAO rules and procedures and in conformity with this project document, the Operational Partner Agreement (OPA) and the AWP/B, the Project Coordinator will identify expenses and disbursements that should be requested to FAO for the timely execution of the project as well as timely reporting to the PMU in the format and with the information requested. In its role as OP of CS-FOR, ARIS will provide its structure of central and decentralized officers and offices to support the implementation of the activities, which will constitute a co-financing to the project implementation.<sup>195</sup>

24. **RKDF execution.** As co-financier of the project, RKDF will coordinate with the PMU and ARIS to ensure the timely delivery of the activities under Component 3 (activity 3.1.3) and will be in charge of the overall monitoring of the financial aspects of the related loans. It will ensure that the monitoring reports are available at the time and with the format requested by the PMU. In its role as co-financier of CS-FOR, RKDF will provide its structure of central and decentralized officers and offices to support the implementation of the activities, which will constitute a co-financing to the project implementation.<sup>196</sup>

## Summary of implementation Responsibilities

### Operational Partners roles and responsibilities

25. SAEPF and ARIS will be the project “Operational Partners” (OP), delivering project results and responsible for the day-to-day management of project components entrusted to it in full compliance with all terms and conditions of the signed OPA. As OP, SAEPF and ARIS will be responsible for the following:

- a) Commencing work on the responsibilities allocated to it in the CS-FOR Funding Proposal, results matrix and work plan promptly (but in no case prior to signing the OPA) and, as applicable, receipt of the first instalment of the funds, supplies and equipment to be transferred to it by FAO;
- b) Making designated contributions of technical assistance, services, supplies and equipment towards the implementation of the project as provided for under this Agreement, including the CS-FOR Funding Proposal, results matrix, work plan and budget;
- c) Completing their responsibilities with diligence and efficiency, and in conformity with the requirements set out in the CS-FOR Funding Proposal results matrix, work plan and budget;
- d) Performing M&E activities and providing the reports required under the OPA in a timely manner and satisfactory to FAO, and furnishing all other information covering the CS-FOR Funding Proposal, results matrix, work plan and budget and the use of funds, supplies and equipment transferred to it by FAO that FAO may reasonably ask for;
- e) Exercising the highest standard of care when handling and administering the funds, supplies and equipment provided to it by FAO, and ensuring that its personnel will conduct itself with the highest standards of integrity and care in the administration of public assets including money.
- f) Maintaining accurate, complete and up-to-date books and records and keep original supporting documentation as per OPA provisions.
- g) Accommodate monitoring visits of representatives of any Resource Partners that are funding the project, supervision missions organized by FAO and cooperate with auditors during performance of Spot-checks and Audits.

### FAO's roles and responsibilities

26. **The Food and Agriculture Organization (FAO)** will serve both as: (a) **GCF Accredited Entity**, being responsible for overall management, implementation and supervising of GCF funded activities in line with FAO rules and Regulations and in accordance with the signed Accreditation Master Agreement

<sup>195</sup> A letter of intent for co-financing signed by ARIS is annexed to the Funding Proposal.

<sup>196</sup> The RKDF co-financing letter of intent is annexed to the Funding Proposal.

between GCF and FAO; and (b) as **CS-FOR Executing Entity**, providing quality assurance and technical assistance during the project implementation. **The independency of the two roles** will be guaranteed by establishing two separate functions as in the following sections.

### FAO Role as Accredited Entity

27. **FAO as Accredited Entity.** The FAO's supervising role will be attributed to the FAO Regional Office for Europe and Central Asia (REU, located in Budapest) with support by the FAO Climate, Biodiversity, Land and Water Department (CB, located in Rome) and other technical divisions as required. In order to fulfil this function, a specific **project supervision team** will be established, including FAO staff from REU, CB and other technical divisions. Such team is referred to as Project Task Force (PTF). The PTF will ensure effective technical, operational and administrative project management throughout the project cycle. PTF consists of designated FAO staff possessing the appropriate authority and skills mix. As per the FAO Guidelines, The PTF is formed by Budget Holder (BH), Lead Technical Officer (LTO), Funding Liaison Officer (FLO)/TCP Officer, Headquarters Technical Officer (HQ-TO) etc.

28. A Lead Technical Officer will be appointed in the regional office, coordinating the supervision functions. The separation from the role of executing entity will be ensured by the establishment of: (a) regular system of approval of annual workplan and budget – exercised by the Lead Technical Officer (belonging to REU) and the members of the Project Task Force; (b) regular independent supervisions of the project activities throughout the project intervention, ultimately to ensure the project management to take corrective measures if and when required, and (c) through the evaluation functions carried out by the FAO Office of Independent Evaluation (in Rome) at mid-term and final stage. More specifically, the **FAO Lead Technical Officer (LTO)** will have overall technical responsibility of the project implementation. The role of the LTO is central to FAO's comparative advantage for projects and to separate the functions of FAO in its role as Accredited Entity and as Executing Entity. The LTO will oversee and carry out technical backstopping to the project implementation. The LTO will support the BH in the implementation and monitoring of the Annual Workplan and Budget (AWPBs), including work plan and budget revisions. The LTO is responsible and accountable for providing or obtaining technical clearance of technical inputs and services procured by the Organization. In addition, the LTO through supervision missions (she/he may call other experts to participate and advise) will provide technical backstopping to the Project Team to ensure the delivery of quality technical outputs. The LTO will coordinate the provision of appropriate technical support from PTF to respond to requests from the PSC. The Funding Liaison Officer (FLO) is responsible for maintaining corporate relations with resource partners throughout the project cycle. In particular, FLOs advise all PTF members on how to ensure all project documentation is in line with resource partner requirements. FLOs manage resource partners' specific requests for information on projects and liaises with the PTF and FAO Departments accordingly. FLOs also play a key role in preparing the Funding Agreement, coordinating the appraisal process on behalf of the PTF, endorsing project budgets and budget revisions in FPMIS after obtaining clearance from the resource partner as stipulated in the Funding Agreement and clearing project progress and terminal reports. The HQ Technical Officer (HQ-TO) is accountable for advising and supporting the LTO in ensuring project formulation, appraisal and implementation adhere to FAO corporate technical standards and policies.

29. FAO will be the GCF Accredited Entity of the project and, as such, FAO will supervise and provide technical guidance for the overall implementation of the project, including:

- h) Administrate the portion of project GCF funds that has been agreed with the OPs to remain for FAO direct implementation. These funds will be managed in accordance with the rules and procedures of FAO;
- i) Monitor and oversee OPs' compliance with the OPA and project implementation in accordance with the project document, work plans, budgets, agreements with co-financiers and the rules and procedures of FAO;
- j) Commence and completing the responsibilities allocated to it in the Project Document in a timely manner, provided that all necessary reports and other documents are available;

- k) Making transfers of funds, supplies and equipment, as applicable, in accordance with the provisions of the OPA;
- l) Review, discuss with the OPs, and approve the project progress and financial reports, as detailed in the OPA and its annexes. undertaking and completing monitoring, assessment, assurance activities, evaluation and oversight of the project;
- m) Liaising on an ongoing basis, as needed, with the Government (as applicable), other members of the United Nations Country Team, Resource Partner, and other stakeholders;
- n) Providing overall guidance, oversight, technical assistance and leadership, as appropriate, for the Project;
- o) Initiating joint review meetings with the OPs to agree on the resolution of findings and to document the lessons learned;
- p) Report to the GCF, through the Annual Project Report, on project progress and provide consolidated financial reports to the GCF (including, e.g., Disbursement report, Reflowed funds report, Statement of investment income, Unaudited annual financial statement);
- q) Conduct at least two supervision mission per year;
- r) Lead the Independent Interim and Final Evaluation, through the FAO Evaluation Office;
- s) Monitor implementation of the gender action plan of the project, framed by the FAO Policy on gender equality, and the plan for social and environmental safeguards, in accordance with the FAO Environmental and Social Safeguards.

30. In collaboration with the PMU and the PSC, FAO will participate in the planning of contracting and technical selection processes. FAO will process fund transfers to the OP as per provisions, terms and conditions of the signed OPA.

31. The **Lead Technical Officer (LTO)** will have overall technical responsibility of the project implementation. The role of the LTO is central to FAO's comparative advantage for projects and to separate the functions of FAO in its role as Accredited Entity and as Executing Entity. The LTO will oversee and carry out technical backstopping to the project implementation. The LTO will support the BH in the implementation and monitoring of the AWP/Bs, including work plan and budget revisions. The LTO is responsible and accountable for providing or obtaining technical clearance of technical inputs and services procured by the Organization.

32. In addition, the LTO through supervision missions (she/he may call other experts to participate and advise) will provide technical backstopping to the Project Team to ensure the delivery of quality technical outputs. The LTO will coordinate the provision of appropriate technical support from PTF to respond to requests from the PSC. The LTO will be responsible for:

- 1. Assess the technical expertise required for project implementation and identify the need for technical support and capacity development of the OP, including effective gender mainstreaming and social inclusion, within the framework of the FAO Policy on gender equality and the FAO Environmental and Social Standards.
- 2. Provide technical guidance to the OP on technical aspects and implementation.
- 3. Review and give no-objection to TORs for consultancies and contracts to be performed under the project, and to CVs and technical proposals short-listed by the PMU for key project positions and services to be financed by GCF resources;
- 4. Supported by the FAO Representation in Kyrgyzstan, review and clear final technical products delivered by consultants and contract holders financed by GCF resources;
- 5. Assist with review and provision of technical comments to draft technical products/reports during project implementation;
- 6. Review and approve project progress reports submitted by the Project Coordinator, in cooperation with the BH;
- 7. Support the FAO Representation in examining, reviewing and giving no-objection to AWP/B submitted by the Project Coordinator, for their approval by the Project Steering Committee;
- 8. Ensure the technical quality of the six-monthly Project Progress Reports (PPRs). The PPRs will be prepared by the Project Coordinator, with inputs from the PT. The BH will submit the PPR to the LTO for technical clearance. The PPRs will be submitted to the PSC for approval twice a year.
- 9. Supervise the preparation and ensure the technical quality of the Annual Performance Report (APR). The APR will be drafted by the Project Coordinator, with inputs from the PT. The APR will

be submitted to the BH and the FAO-GCF Coordination Unit for approval and finalization. The FAO/GCF Coordination Unit will submit the APRs to the GCF Secretariat. The LTO must ensure that the Project Coordinator and the PT have provided information on the co-financing provided during the year for inclusion in the APR;

10. Conduct annual supervision missions;
11. Provide comments to the TORs for the interim and final evaluation; provide information and share all relevant background documentation with the evaluation team; participate in the mid-term workshop with all key project stakeholders, development of an eventual agreed adjustment plan in project execution approach, and supervise its implementation; participate in the final workshop with all key project stakeholders, as relevant. Contribute to the follow-up to recommendations on how to insure sustainability of project outputs and results after the end of the project.
12. Monitor implementation of the Risk Mitigation Plan, in accordance with the FAO Environmental and Social Safeguards.

33. The **HQ Technical Officer** is a member of the PTF reinforcing the role of FAO as Accredited Entity. The HQ Technical Officer is a mandatory requirement of the FAO Guide to the Project Cycle. The HQ Technical Officer has most relevant technical expertise - within FAO technical departments - related to the thematic of the project. The HQ Technical Officer will provide effective functional advice to the LTO to ensure adherence to FAO corporate technical standards during project implementation, in particular:

1. Supports the LTO in monitoring and reporting on implementation of environmental and social commitment plans for moderate risk projects. In this project, the HQ officer will support the LTO in monitoring and reporting the identified risks and mitigation measures in coordination with the OPs.
2. Provides technical backstopping for the project work plan.
3. Clears technical reports, contributes to and oversees the quality of PPRs.
4. May be requested to support the LTO and PTF for implementation and monitoring.
5. Contribute to the overall ToR of the Interim and Final Evaluation, review the composition of the evaluation team and support the evaluation function.

### FAO's role as executing entity of CS-FOR

34. **FAO as Executing Entity.** Within its CS-FOR Budget Holder functions,<sup>197</sup> the **FAO Representation in Kyrgyzstan** (FAO-KG) will be in charge of the execution of selected activities and of the contractual agreements with the project implementing partners (see below, SAEPF, MAFIM, ARIS and RKDF). A **project delivery team** will be set up in FAO-KG, comprising staff covering all functions relevant to the execution of the envisaged activities. More specifically, following the principle to ensure the highest level of ownership and sustainability of the project investment at country level (i.e., within local institutions), FAO-KG's role in CS-FOR will be **limited to the provision of technical assistance** throughout all project components, to ensure quality delivery and to enhance the success of the project and its potential replicability, and to **ensure coordination with SAEPF and ARIS as Operational Partners and RKDF as co-financier** in charge of specific activities. Technical assistance will be provided by mobilizing FAO experts, or FAO supervised consultants and service providers. FAO's mandate as a global stakeholder in the field of agriculture, forests and rangeland management, and climate change, and its related expertise represents a comparative advantage in providing technical assistance and quality assurance.

35. The FAO Representation in Kyrgyzstan will be the **Budget Holder** (BH) of the project, and will be responsible for timely operational, administrative and financial management of GCF resources implemented by FAO directly. The budget holder will be also responsible for i) managing OPIM for results, including monitoring of risks and overall compliance with the OPA provisions; ii) review and clear financial and progress reports received from the OP and certify request for funds iii) approve and clear budget revisions and annual work plan and budgets; iv) ensure implementation of the Risk Mitigation and

<sup>197</sup> The Budget Holder (BH) is accountable for managing to achieve project and proper use of resources in accordance with FAO's Financial Regulations and Financial Rules.

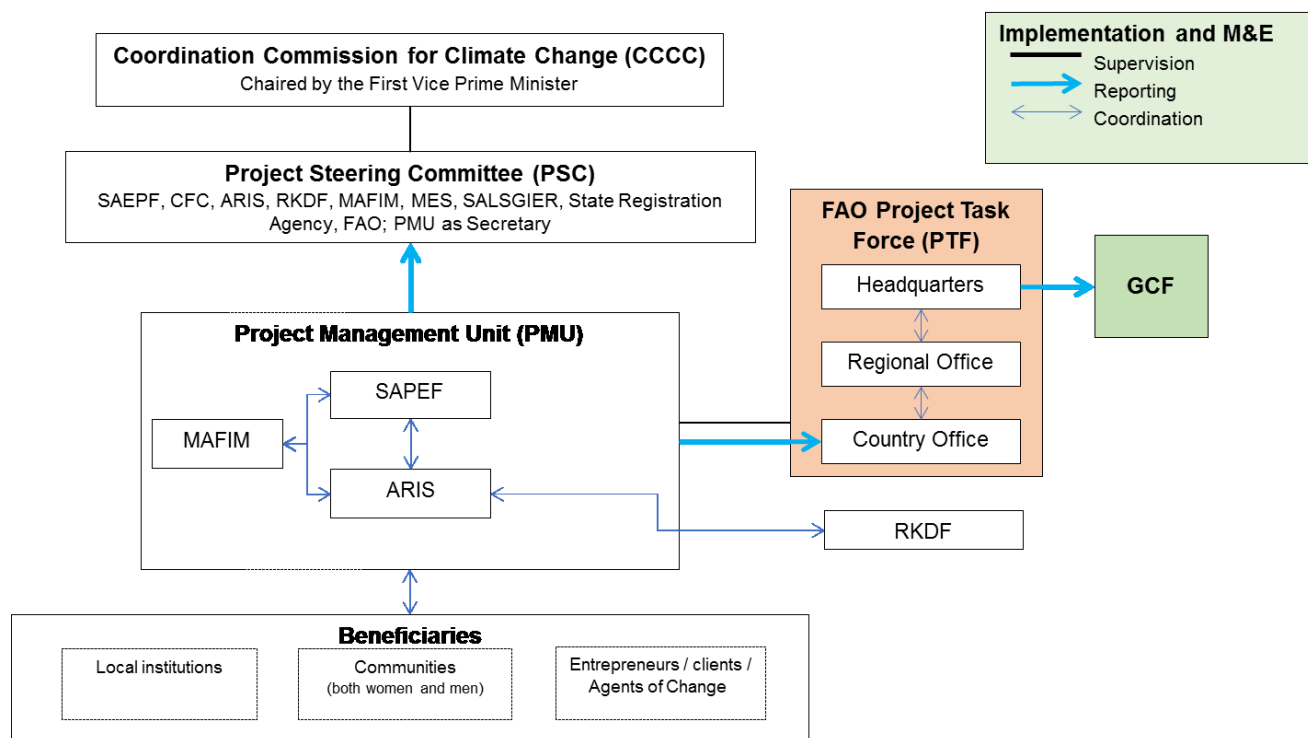
Assurance Plan v) follow up and ensure that the OP implements all actions and recommendations agreed upon during Assurance Activities.

36. As a first step in the implementation of the project, the FAO Representation in Kyrgyzstan will establish an interdisciplinary Project Task Force (PTF) within FAO, to guide the implementation and results delivery of the project. The PTF is a management and consultative body that integrate the necessary technical qualifications from the FAO relevant units to support the project. The PTF is composed of a Budget Holder, a Lead Technical Officer (LTO), the Funding Liaison Officer (FLO) and one or more technical officers based on FAO Headquarters (HQ Technical Officer). FAO-KG, in accordance with the PTF, will give its clearance to the AWP/Bs submitted by the PMU as well as corporate and donor reporting documents such as Project Progress Reports (PPRs). PPRs may be commented by the PTF and should be cleared by the LTO and the FLO.<sup>198</sup>

### Project Organization

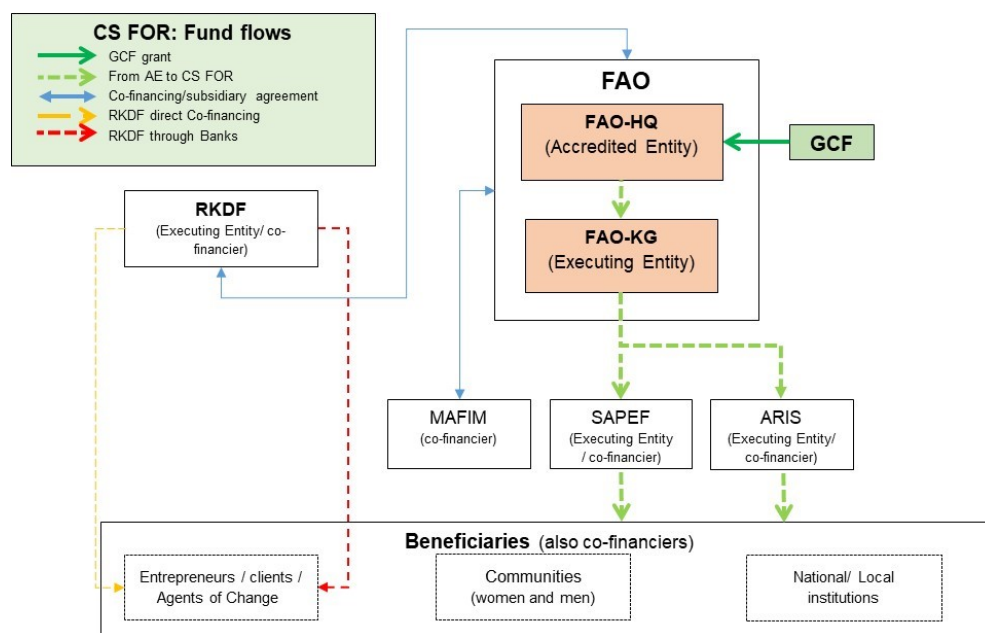
37. The Implementation structure is presented in Figure 1.

**Figure 1. CS-FOR Project organization structure**



<sup>198</sup> As per FAO project Handbook:  
[http://intranet.fao.org/fileadmin/templates/faomanual/Projects\\_NEW/ANNEXES/ANNEX\\_3\\_Roles\\_and\\_ResponsibilitiesFINAL.pdf#page=18](http://intranet.fao.org/fileadmin/templates/faomanual/Projects_NEW/ANNEXES/ANNEX_3_Roles_and_ResponsibilitiesFINAL.pdf#page=18)



**Figure 2. Fund flows and contractual arrangements**

Indicative roles in project execution

38. The project will be jointly executed by SAEPF, ARIS, and MAFIM with FAO support for quality assurance according to the respective areas of expertise, and by RKDF for the climate-sensitive value chain financing. More specifically,

- **SAEPF** will have a role in executing of Activities 1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.2.1, 1.3.1, 2.1.1, and 2.1.4. SAEPF will contribute to PMC;
- **ARIS** will have a role in executing of Activities 1.3.1, 2.1.3, 2.1.5, 3.1.1, and 3.1.2. ARIS will contribute to PMC;;
- **MAFIM** will contribute to PMC;
- **RKDF** will be responsible for the entire Activity 3.1.3;
- **FAO** will provide support for execution throughout all project components.

#### A. Organizational setting and arrangements for components implementation

##### Component 1 - Evidence-based strengthening of NRM governance

39. The SAEPF in coordination with partner institutions such as the Pasture Department under MAFIM will be responsible for undertaking specific activities under Component 1. A lack of technical expertise in the area of climate change and adaptive NR management is one of the key issues in the Kyrgyz Republic. CS-FOR will attract international and local technical experts to support the introduction of an integrated approach to the forest and pasture ecosystems in policy and legal reforms. These experts will be working in relevant institutions undertaking stocktaking of legal documents and providing support in elaboration of the legal framework, establishing monitoring system, and elaborating INRMCRP methodologies. All technical experts will form the Experts Group (part of the PMU) will recruit local and international technical assistance and establish Expertise Group, which would include NRM policy expert, local forestry and pasture specialists, NRM lawyer, environmental specialist; capacity development specialist,

communication specialist, gender and social development specialist, Environmental and Social Management and grievance redress mechanism specialists, and others as required.

40. *Community institutions:* The CS-FOR will be working with state and local self-government bodies, and various civil society and community organizations. These include Pasture Users' Unions (PUUs) and Pasture Committees (Jayit Committees) - their executive bodies, Water Users' Associations, and other community groups and enterprises. ARIS and its Community Development Support Officers (CDSOs) will be working with communities on social mobilization and will facilitate the establishment of Community Landscape Management Groups (CLMGs), providing them with various ongoing support with elaboration of the INRMCRPs. The CLMGs will be comprised of representatives of the district administration, local self-government bodies (aiyl okmotu and aiyl kenesh), management of leskhozoes and national parks, representatives of the Pasture Users Unions (PUUs), Water Users' Association (WUAs), other civil society and community organizations. The CLMGs would also include active forest and pasture resources' users, and local entrepreneurs, as well as representatives of women's and youth committees (see also Chapter 4 on Component 1).

#### **The Community Landscape Management Groups (CLMGs)**

The Community Landscape Management Groups (CLMGs) would be established as informal institutions on a local level by the project to advance participatory management of resources. The CLMGs will be comprised of the representatives of the district administration, local self-government bodies (aiyl okmotu and aiyl kenesh), management of leskhozoes and national parks, representatives of the Pasture Users Unions (PUUs), Water Users' Association (WUAs), other civil society and community organizations. The CLMGs would also include active forest and pasture resources' users, and local entrepreneurs, as well as representatives of women's and youth committees. The ARIS will elaborate social mobilization and institutions development process on establishment of such groups in four target areas, starting from the village meetings to the district clusters' organizations. Representatives of the communities will be selected at the general village meetings, depending on the specifics of the area. Some villages are located far from the forests and do not use forest resources, and thus they might not be interested to join the CLMG, which will be formed at the level of the Aiyl Aimak. Several CLMGs will form a cluster at the district level chaired by the head of the state district administration (District Akim), at the tier of the forestry management and district authorities, as well as other state institutions. When necessary, the CLMG cluster would invite representatives of the State Registration Offices, district tax bodies to participate in the meetings.

41. Key institutions engaged in implementation of the Component 1 of the CS-FOR Project and their roles are described in the Table 2.

**Table 1: Roles of institutions for CS-FOR component 1**

Existing institutions	Institutional Arrangements under the CS-FOR	Role in the CS-FOR
<b>At national level</b>		
<b>SAEPF</b>	Main implementing body	Serves as a Secretariat/Anchor for the CS-FOR PSC/National Stakeholders Platform; provides overall strategic guidance; recruit and maintain PMU; leads policy dialogue on NRM
<b>ARIS</b>	Operational Partner, member of the CS-FOR PSC/National Stakeholders Platform	Engaged in elaboration of the INRMCRPs' methodology and in accompanying the implementation of the INRMCRP.
<b>CFC</b>	Coordinating body	Plays a coordination role connecting CS-FOR with other climate related interventions and investments
<b>Pasture Department, MAFIM</b>	Implementing partner	Provides strategic guidance on pasture management policy and legislation elaboration; responsible for the elaboration and introduction of pasture monitoring system
<b>GIPROZEM, MAFIM</b>	Implementing partner	Co responsibility in elaborate and introduce pasture monitoring system

Existing institutions	Institutional Arrangements under the CS-FOR	Role in the CS-FOR
<b>MES</b>	Members of the CS-FOR PSC/National Stakeholders Platform	Contribution to elaboration of the integrated policy and legal framework
<b>SALSGBIER</b>	Member of the CS-FOR PSC/National Stakeholders Platform	Contribution to elaboration of the policy and legal framework on municipal forests management
<b>Kyrgyz Hydromet</b>	Members of the CS-FOR PSC/National Stakeholders Platform	Contribution to elaboration of the monitoring system
<b>PMU</b>		Preparation of the workplans, budgets, reports; Working with all implementing partners, coordination; Recruitment of consultants and experts; Recruitment of service providers; Financial management, procurement and administrative supports; Responsible for achievement of outputs and outcomes
<b>Expert Group</b>		Coordination with the PMU and CS-FOR National Stakeholders Platform; Development of legal, technical and knowledge products; Elaboration of the policy and legal revisions/suggestions; Training of Trainers, capacity building of stakeholders
<b>NGOs and other technical service providers</b>	Resource pool of individuals and organizations;	Provide technical, social, other support in implementation of the CS-FOR;
<b>At local / community level</b>		
<b>Leskhoz, national parks, local self-government bodies, PUUs/PCs, community organizations, private sector</b>	Community Landscape Management Groups	Establishment of the CLMGs for INRMCRPs preparation, implementation and monitoring; Channeling lessons and evidences to the national level

## Component 2 - Green investments for forest and pasture rehabilitation

### a. Forestry

42. The implementation will be coordinated by SAEPF as the government institution responsible for the coordination of state programs on forest management with the participation of the Regional (Oblast) Administration and District (Rayon) Administration including the SAEPF representatives at their respective levels. The following rayons together with their local communities as target areas will be involved in the project implementing activities: (a) Uzgen district (Osh region); (b) Suzak district in Jalal-Abad region; (c) Toguz-Toro district in Jalal-Abad region; and (d) Ak-Talaa district in Naryn region.

43. Each Region/District and State Forest Enterprise (SFE, Leskhoz) will designate competent forestry officers to act as District Focal Points for implementation of the project activities. The staff will form a local Project Delivery Team (PDT) for coordinating, facilitating, or jointly implementing Project activities with service providers, contractors and community members of selection. PDT's main role is to ensure technical supervision and local back-stopping to the specific interventions, including on gender mainstreaming and social inclusion of activities, operated through the decentralized forest administrations, SFEs in the regional and district offices. Extension tasks will be shared with Forestry Officers, Agriculture and Pastures Officers, and Conservation Officers in some activities, e.g. those on Protected Areas. A large amount of farmer sensitization, capacity-building and technical assistance from contractors is foreseen in the field

44. There will be an extensive deployment and sub-contracting of the private sector operators (contractors, companies, consultants, etc.) and community members and groups to implement the Project activities. NGOs and CSOs are already actively running projects on the ground and have accumulated experience on approaching and mobilizing women and men from local communities for forest development work. Their experience and skills will be tapped for an expedited learning curve. It is expected that the Project detailed planning phase will identify new actors, whose capacities, quality of services, and self-governance and will be evaluated. Their charters and records will be evaluated as part of the as part of the due diligence in the procurement process. The PMU will compile a pool of such

expertise and their frequent delivery ratings will be institutionalized into a Roster of Project Implementation Partners. During the design, the following NGOs and CSOs working close to the Project target areas as potential service provider were identified, including: Pasture User Unions “Kyrgyz Jaiyty” (AKJ); NGO Rural Development Fund (RDF); NGO Kyrgyz Association of Forest and Land Users; Kyrgyz Republic Union of water user association; NGO Agrolead; NGO Rural Advisory Service Jalal-Abad; NGO Lesik Jug; NGO CAMP Alatoo; Forest Research Institute (under Institute of Biology, National Academy of Sciences); Institute for Forest and Walnut Research (under National Academy of Sciences).

#### **b. Rangeland**

**45. Pasture Rotation:** An instruction booklet on pasture rotation has been developed by ARIS as a tool for Training the Trainers. The Trainers are ARIS specialists, Community Development Support Officers, and representatives from Pasture Committees and Ayil Okmotus. The training module is not sufficient by itself but will be accompanied by workshops and training with 1 or more PCs at a time. Based on prior experience, the Project can expect it to take 3 rounds of exposition and training for interest in pasture rotation to be translated into implementation. ARIS has the principal responsibility to provide training and mentoring in Pasture Rotation, since that is where most Kyrgyz expertise lies, chiefly with Dr. Natalya Barakanova. There are two dimensions to implementing pasture rotation. One is on SLF pasture where the PUU alone exercises responsibility and appoints a grazing supervisor to direct the rotation. The second is an integrated approach to pasture management by the Leskhoz and PUUs acting collaboratively. A second training module focused on INRMCRP and targeting Trainers in both PUUs and Leskhoz will be prepared. Meanwhile, pasture rotation will be implemented on PUU community land, according to practices already established by ARIS. Changes to SAEPF policy and regulations are a likely pre-requisite for agency collaboration. A pilot trial of Leskhoz-PUU collaboration in integrated pasture management should be attempted in each of the 4 target Districts by year two of the project. The goal of successful INRMCRP is to have the two institutions working side-by-side in planning, implementation and monitoring. The main risk to successful implementation of pasture rotation is reluctance to change grazing-management behaviour from traditional methods, and adopt an innovation. The Project will need to persevere with instruction and guidance and encourage sharing of ideas among PUUs considering the new grazing system. A further risk is difficulty in establishing a collaborative relationship between Leskhoz and PUUs to achieve an integrated management plan across neighbouring tracts of grazing lands. This collaboration may take a year or two of discussions at all levels, and amendments to policies and SAEPF regulations, to reach a management implementation stage.

**46. Tree Plantings:** within the INRMCRP, SAEPF will supply seedlings of trees and shrubs free of charge. The specific locations of windbreaks, shade-shelter belts and shade copses will be determined through joint decisions by both livestock owners (represented by the PUU/PC) and Leskhoz personnel. Actual planting of trees for windbreaks and shade-shelter will be undertaken by the PUU and Leskhoz members, chiefly on Leskhoz and municipal lands, under supervision of SAEPF staff. PUUs and Leskhoz will be collectively responsible for placing fences around belts and copses of trees to protect them from grazing animals during their first 3-5 years. Likewise the task of removing fences when the young trees have grown to a height beyond the reach of livestock will be shared by Leskhoz and PUU people. During their first 2-3 years after planting, individual trees may need to be watered during hot summer months, another task shared by Leskhoz and PUU personnel. Tree planting on designated sites for environmental melioration addresses the objective of SAEPF to expand forests, and also the overall goal of increasing carbon sequestration, as well as assisting livestock owners to create a better production environment for their animals and mitigate adverse climate-change impacts. Collaborative arrangements for joint efforts by PUUs and Leskhoz may require a year or two of negotiation. The tree-planting aspect described here could be part of a package of joint activities including pasture rotation and infrastructure improvements. By the second year, the Project should aim to establish windbreaks and shade-shelter belts and copses on at least 2 Leskhoz/PUU land combinations in each of the 4 target Districts. The principal risk in tree-planting activities is failure of Leskhoz/PUU leaders to reach an agreement for joint action. A shift in SAEPF policies and regulations may be a pre-requisite to achieving effective collaboration. There is always the risk that fences surrounding tree plantings will be breached by grazing livestock and the young tree seedlings damaged or killed.

47. **Broadcast seeding:** The KLPRI currently has the lead role in growing and distributing seed of perennial forage grasses. They are the only institution multiplying seeds for broadcast seeding, from 3-4 ha of the KLPRI research farm. This area could be expanded with support from the project. However, the primary project goal is for PUUs themselves to establish seed-multiplication plots on 1-ha fenced sites in each PUU. The foundation seed could come from the Pastures Institute in KLPRI, or foundation seed could be collected from PUU grazing units that are being rested for an entire year. The PUUs would have the resources to harvest, clean and broadcast seeds themselves. Seed can be broadcast by hand or with a mechanical spinner. Several native perennial grasses are excellent candidates for seed increase and broadcast: *Dactylis glomerata*, *Festuca valesiaca*, *Hordeum bulbosum*, and *Bromus inermis*. PUUs may choose to also spread seed of sainfoin and alfalfa. The most reliable seeding technology is an agricultural treatment using harrows or a chisel plough to break the soil surface but leave the existing sod intact, followed by broadcasting and additional harrowing if necessary. This can be done only on relatively flat land, however. On hill-slopes seed can be broadcast into natural pasture vegetation. The success rate may be low, but achieving 1 or 2 plants established per m<sup>2</sup> may be sufficient to initiate a bigger population of the seeded species through regeneration. Seeding is done before winter in late October/early November. Appropriate seeding rates (kg/ha) depend on the size of the individual seeds of broadcast species. Dr. Natalya Kilyazova at the Pastures Institute of KLPRI can give relevant advice. There is a risk that seed-increase plots will be poorly maintained and become infested with weeds, or fencing around the plots will be broken and allow grazing animals inside. PUUs should not be too ambitious, seeding only 20-40 ha each year. PUUs may have difficulty finding stands of desirable perennial grasses for harvesting foundation seed on their SLF pastures, unless they protect areas where plants of the target species are known to grow. Producing seed of desirable perennial grasses is an entrepreneurial enterprise that may be attractive to progressive PUUs.

48. **Smart herd management:** Herd improvement can be readily achieved by genetic selection of animals of indigenous breeds in existing village herds. Production traits are quite heritable. ARIS livestock specialists, animal scientists at KLPRI, and village veterinarians can provide expert guidance to livestock owners. In the Project's first year, a handbook will be prepared on genetic selection and criteria for the culling of unproductive, low-productive cattle and small ruminants to increase overall herd productivity. Relevant criteria are: size and age at first conception; prolificacy (producing a calf or lamb every year); milk yield; and the growth rate of offspring. PUUs have been advised previously on use of the tape-measure method to estimate weight of livestock prior to taking them to market, to increase their bargaining power in negotiations with potential buyers. The same method can be used to make decisions on culling and selection of the best females. Culling unproductive/less productive animals will increase the production efficiency of the herd, and reduce herd numbers, at least at first. PUUs/PCs will receive advice on options for Artificial Insemination and the need for enhanced forage and feed supplies for cross-bred stock to achieve their potential productivity. Cross-bred animals from exotic semen may not be able to walk long distances to and from water in hot summer days like local indigenous animals, and they are likely to be more susceptible to pests and diseases for which indigenous breeds have developed some immunity. There is a risk that livestock owners will continue to look for the "silver bullet" of a better breed and neglect the potential for significant improvement through smart management of their herds. In seeking a cross-bred animal, livestock owners are at risk of losing their investment if forage and feed for the cross-bred stock are inadequate, or if the cross-bred animals succumb to local pathogens and inclement weather.

49. **Infrastructure to improve access to remote pastures:** The collapse of the Soviet Union in 1991 was followed by a collapse in road and bridge infrastructure leading to remote pastures, which were no longer maintained. Only in the last 5-10 years have attempts been made to remedy the situation. ARIS and donor organizations such as the World Bank have been heavily involved in infrastructure improvement, and now PUUs through their fee structures have funds to do some of the needed repairs themselves. There is more to be done, and the Project could play a lead role in the 4 target Districts. Many PCs have purchased road-repair heavy equipment such as graders and bulldozers, and in mutual arrangements some PUUs share their equipment. There is also the option of renting heavy equipment. The stakeholders are funding sources, engineers and equipment operators on one hand, and the beneficiaries on the other. Among beneficiaries, SAEPF and Leskhozoes should be listed because access to remote summer pastures often assists access to SFF land, especially at high elevation. Within the ARIS framework, infrastructure ventures are funded through micro-projects in which the PUU contributes a

portion of the capital cost and labour, as appropriate. The risks attached to infrastructure repair and development are that there may be errors in the preparatory engineering work, and that the execution of the construction and road repair plans may be deficient. In view of progressive climate change, risk of erosion of roads and bridges will increase, and engineers should take those trends into account.

### Component 3 – Climate-sensitive value chains Development

50. Component 3 will be implemented by ARIS and RKDF, with technical support from FAO. ARIS will be responsible for the delivery of capacity development to all agents of change eligible for technical assistance under the project (see infra for a definition), including entrepreneurs, legal entities, etc. RKDF will be responsible to ensure availability of funds to finance the agents of change's investments.

51. Under Component 3, the CS-FOR will recruit a Value Chains Financing (VCF) Specialist. The VCF Specialist will work in close collaboration with RKDF and the partner banks to identify prospective beneficiaries within the eligible value chains and ensure the complementarity of the technical assistance provided under activities 3.1.1 and 3.1.2 and credit resources under activity 3.1.3.

52. The selection of partner banks will also be the responsibility of RKDF. The VCF Specialist will not interfere with RKDF or partner banks' lending policies and procedures. Based on preliminary agreement with RKDF, the VCF Specialist may be based in the RKDF office which will facilitate the communication with RKDF and ensure better connection within the de-risking and investment activities in Component 3.

#### Details for implementation

53. The component 3 will be implemented through a sequence of steps designed to optimize the transaction costs related to sub-projects review and appraisal. Thus, the implementation will consist of (i) elaboration of the Market Development Plan for pre-selected value chains; (ii) phased screening of subprojects (from profiling to detailed business plan); (iii) provision of targeted technical assistance; and (iv) appraisal of loan applications and loan disbursement.

1. **Raw material inventory** is necessary to pre-select and prioritize the value chains that will be supported by the Project. Its results will serve as an input to the work of the expert in charge of the Market Development Plan.  
*Executed by:* PMU/ARIS
2. **Market Development Plan** for each pre-selected value chain (e.g. dried prune, walnut, dried apricot).  
*Executed by:* ARIS and international consultants
3. **Identification of Agents of Change** Any legal entity (e.g. association of leaseholders, a farmer, or an agribusiness) willing to upgrade the chain within which it operates into green and accountable one is referred as the Agent of Change (AoC). Such agent will serve as an entry point into a given value chain for its analysis, upgrade plan design, implementation and monitoring. The AoC will implement third party-audited sustainable natural resources management practices and a transparent supply chain monitoring system in line with the Project dereferencing strategy.  
*Executed by:* ARIS
4. **Preparation and screening of Sub-projects' Profiles.** Each AoC willing to take part in CS-FOR, will first prepare a Sub-project Profile. Such Profiles will be screened by the PMU against the following but not limited to criteria:
  - positive carbon footprint vs. business as usual modality;
  - valid market potential;
  - strong accountability (e.g. third party audits);
  - targeted performance indicators and monitoring mechanism.
  - number of participating smallholders;

- level of gender equality and potential for women's economic empowerment, and for the empowerment of the poor, youngsters and other vulnerable groups;
- job creation including managerial position for women.

*Executed by:* ARIS together with the AoC

5. **Preparation and screening of Sub-projects' Proposals.** Appraisal of eligible sub-project proposals will include:

- situational analysis and market potential;
- assessment of expected carbon sequestration and/or emission reduction;
- incremental income for raw material suppliers and jobs creation.

Each sub-project proposal will list the potential types of investments eligible for CS-FOR support and each type of investment would be accompanied with a realistic business model and financial analysis. Incremental household income and jobs, productivity gains, value addition, market access, gender equality and the potential for the economic empowerment of women, youngsters, the poor and other vulnerable groups would be important criteria in investment proposal evaluation, together with commercial viability, climate resilience and cost effectiveness assessments.

RKDF will be validating the recommendations of the PMU for financing, while it is solely RKDF's decision to whether finance or not to finance all or part of the credit project private good investment. PMU's recommendations for RKDF financing will be based upon assessments made against key Project criteria and in accordance with the PIM.

The development of a sub-project proposal would not be a guarantee of CS-FOR financing.

Sequencing of proposals implementation will be based on a first come - first serve principle.

*Executed by:* PMU and RKDF together with the AoC

6. **Value Chain Upgrade Needs Assessment** includes upgrade needs, including investment and technical assistance, constraints for upgrading, necessary policy measures; and recommendations on implementation modalities and accountability mechanisms.

*Executed by:* ARIS together with the AoC

7. **Technical Assistance.** The investments would be reinforced by a massive capacity building programme for participating enterprises and their suppliers and service providers with a view to optimize value chain performance, hence mitigate investment risks.

*Executed by:* ARIS and FAO.

8. **Value Chain Performance Assessment** is an optional step to evaluate key performance indicators of potential borrower to enhance investment viability.

9. **Design and appraisal of Business Plans** (Loans Application). Each loan application will be accompanied by a comprehensive business plan. Towards this, the Project will provide dedicated business advisory services to assist the candidates in elaboration of such proposals. Relevant financial analysis would include: (i) cost benefit analysis at relevant key points of selected value chains using with and without investment scenarios; (ii) for medium term capital investments, the estimation of capital NPV and IRR; (iii) full financial and economic analysis of investments by intermediary enterprises, including monthly cash-flow/working capital analysis during the first years to avoid liquidity problems and development of a small business plan; (iv) investments by processing enterprises would be supported by a well-articulated business plan, which can also be used by these enterprises for implementation of the investment – the business plan would including detailed financial and economic assessments and social and environmental impact assessments and monthly cash flow/working capital analysis; and (v) an economic multiplier impact assessment for the selected value chain. Approved business plans



would have an accompanying chart providing the time line for all activities to be supported by the CS-FOR, that would also identify the responsible party, place and time and how it is measured.

54. **Eligibility of applicants.** Only legally registered societies and companies would be eligible to act as Agents of Change for CS-FOR supported value chain development. Due diligence would be performed and entities that are the subject of bankruptcy, criminal investigation, fraud, corruption or are in default of contractual agreements would be ineligible. Only applicants sourcing raw material within the core project area will be eligible to Project support.

55. Agents of Change eligible to apply for CS-FOR financing include: (i) cooperative societies/associations; (ii) partnership; and (iii) companies. Eligible entities should be able to provide the following documents:

- Business License
- Certificate of registration and extract from Registry
- Annual tax Return Report (2 years for existing entities)
- Statutory Chart
- Permission for the CS-FOR to collect information from trade partners.

56. None of the above entities shall be eligible for support under the following circumstances:

- Having gone bankrupt or being liquidated; having its operations managed by courts; signing agreements with creditors, having its operational activities suspended; being subject to procedures concerning these matters or being in a condition due to a similar situation as per national laws or arrangements;
- Being sentenced for offences related to their own business which cannot be appealed;
- Being convicted of gross abuse related to business matter;
- Non performing obligations related to the payment of social security contributions or tax payments in accordance with the legal provisions in the Kyrgyz Republic;
- Being subject to an adjudication due to being involved in fraud, corruption, a criminal organization or other illegal activity which cannot be appealed.

57. The CS-FOR will not finance the following expenditures:

- Leasing of equipment, land and facilities;
- Bank charges, cost of guarantees and similar charges;
- Value of intellectual property rights;
- General costs involved in an investment project proposal development/design (architects', engineers', consultants' and general legal fees, and costs for acquisition of patents and licenses, etc.).

58. **Main project stakeholders:** forest leaseholders and their associations, farmers (herders and growers, targeting both women and men), aggregators, and agro-processors.

59. **Involved institutions include:** ARIS, MAFIM, National Statistics Committee, National Bank of the Kyrgyz Republic, local self-governing institutions, State Forest Enterprises, Pasture Users Unions, Water Users Associations, Kyrgyz Association of Forest and Land Users (KAFLU), Kyrgyz Association of Fruits & Vegetables Processors, Agro-Asia market information portal.

60. The project should build on the local knowledge available within the national **Research Institutes and Academia:** Kyrgyz-Kazakh University, Food Technology; Kyrgyz National Agriculture University; Kyrgyz-Turkish Manas University, Department of Food Engineering; National Academy of Science of the Kyrgyz Republic, Institute of Walnut and Fruit Crops, Kyrgyzstan; National Academy of Science of the Kyrgyz Republic, Institute of Walnut and Fruit Crops, Kyrgyzstan; University of Central Asia, Mountain Societies Research Institute, Kyrgyzstan; World Agroforestry Centre, Central Asia Office (Kyrgyzstan).

## Appendix 1 to Chapter 5 – Post-project sustainability plan for operation and maintenance

### A. Operations & maintenance

It is noted that the project will upgrade existing systems, for example, the geo-referenced monitoring and evaluation system (Component 2) instead of installing new systems. The operation and maintenance of such large system has already integrated as a part of government structure. Accredited Entity will follow the standard handover procedure of project assets accordingly. Essential systems/infrastructures are listed in the subject of operation and maintenance plan in the CS-FOR project:

Project outputs	Equipment, assets and products	Operation and Maintenance (O&M) plans (during the implementation and post project)
Output 1.1:	Evidence-based / georeferenced M&E (monitoring of progress in planting, safeguards, carbon sequestration, etc.)	During the project implementation, the project will make sure that project stakeholders guarantee the operation and maintenance of the tools through a series of technical training and technical demonstration. These include: <ul style="list-style-type: none"> <li>- Georeferencing strategy including: (a) Principles of Georeferencing and geospatial data management; (b) Principles and use of basic remote sensing analysis (FAO Earth Map tool) for trainers and stakeholders;</li> <li>- Coordination on GIS / Georeferencing evidence-based monitoring;</li> <li>- Evidence-based Project Planning, Monitoring and Evaluation System developed and functioning</li> </ul>
Output 2.1:	Establishment of community / leskhoz tree nurseries	During the project implementation, the project will strengthen households, communities and their institutions' capacities to ensure operation and maintenance of the equipment and tools handed over to them. In particular the project will make sure: <ul style="list-style-type: none"> <li>- Training to local leskhoz nurseries on: site selection; lay-out of seedling section and growing section; operational (business) plans; preparation of seeds/cut-off sticks for planting; norms and standards of seeds/seedlings by species; watering techniques; seedling bags/containers for closed-root spruce and juniper production.</li> <li>- Promoting Collaborative Forest Management and Public-Private Partnership models on planting and improved forest management.</li> <li>- Training on planted forest management (weeding, replanting, maintenance, irrigation, thinning, fencing procurement, erection and maintenance).</li> </ul>
Output 2.1:	Equipment in A/R and forest enrichment Equipment/ seedlings/ contracting in INRMCRP Afforestation / reforestation Equipment/ seedlings/ contracting in INRMCRP-forest restoration investment Equipment/ seedlings/ contracting in rangeland rehabilitation and livestock	Only small tools/equipment will be procured. During the project implementation, a series of training will be provided. The target communities will develop O&M plans with the technical experts. The experts will prepare O&M manual, if necessary. The project will review the developed O&M plans based on the actual activities including requirements of spare parts etc. and fine tune the plan.

## **B. Sustainability**

### **Component 1 - Evidence-based strengthening of NRM governance**

1. This Component will contribute to the harmonization of procedures and regulations to ensure a sustainable and climate change sensitive integrated planning, monitoring and evaluation of natural resources management.

#### **a. Technical and financial sustainability**

2. Main equipment and assets for the implementation of the component include evidence-based / georeferenced M&E (monitoring of progress in planting, safeguards, carbon sequestration, etc.). The main features and functioning of the tools used for climate sensitive natural resources monitoring, planning and evaluation are described in Chapter 6 of the FS, and in the WP on Georeferencing Strategy (annex 9 of the FP).

3. During the project, to ensure ownership and sustainability of the action, the PMU will organize and implement both training and on the job capacity development activities so to ensure engagement of stakeholders and transfer of information to the concerned public. Also, with support from the PMU, the project partners will develop the O&M manual of the georeferencing tools introduced, and will be trained in their use including on maintenance, and at the closure of the project, the owners will receive the final O&M plans in the handover note, and after the project, the asset owners will continuously allocate operation and maintenance budget.

#### **b. Community and Social sustainability**

4. The project will ensure extensive and inclusive social mobilization process in the target communities and a strong gender-responsive approach to ensure the participation of all stakeholders. In this, broad and active communication and awareness campaigns will be established with indication of clear project implementation benchmarks. The involvement of households, communities and their institutions in the key decision making process of the project (including the social mobilization for the joint design of the Integrated Natural Resources Management Community Resilience Plans), jointly with the stakeholders contribution to the related investment will ensure the needed ownership (also detailed in component 2 specific sustainability, where investment in forestry and rangelands are described).

5. Moreover, specifically on gender (further details are available in the Gender Action Plan, Annex 2.a of the FP), sustainability elements will depend on strategic choices of the project approach, such as:

- the inclusion in the National mechanism for policy dialogue (National Platform) of representatives (Government and CSO) knowledgeable about gender issues on natural resource management.
- the attention paid by the legal and policy review and analysis of policies and legislation to women's access to natural resources, and will consult community groups representing the interests of women and local women leaders.
- The comprehensive and inclusive training of all members of Landscape Management Groups (CLMGs) on gender issues and the integration of the methodology for INRMCRPs including guidelines on gender assessment.

#### **c. Institutional and Policy sustainability**

6. The project will establish a continuous engagement process as key strategic element of implementation, following the process already started at design stage (see ESMF and stakeholders engagement report), involving of technical staff of relevant ministries and stakeholders on the ground in the preparation and implementation to ensure buy-in, and supporting communications campaigns to disseminate results of the studies, to raise public awareness on climate change risks and to ensure wide political support.

#### **d. Environmental sustainability**

7. Key feature of the component is the contribution to ensure the country is endowed with a mechanism applicable both at national and at local grass root level to assess and monitor the natural resources base, but also to plan and evaluate the investment and actions accordingly.

## **Component 2 - Green investments for forest and pasture rehabilitation**

8. Through investment on forests and in rangeland rehabilitation, this Component will aim to contribute to increasing carbon sequestration as well as the resilience of populations in the target areas and to decrease their exposure to climate change related risks and hazards.

### **a. Technical and financial sustainability**

9. The execution of the forestry investment will be coordinated by SAEPF and its Leskhozoes, as the government institution responsible for the coordination of state programs on forest management. Each Leskhoz will designate competent forestry officers to act as Focal Points for the implementation of the project activities. The staff will form a local Project Delivery Team (PDT) for coordinating, facilitating, or jointly implementing Project activities with service providers, contractors and community members of selection. The SAEPF staff including all relevant Leskhozoes and PDT in particular will receive trainings and on the job learning opportunities generated by the involvement of service providers and of FAO experts. Such capacity development will be the vehicle towards technical sustainability.

10. Moreover, during the project, with support from the PMU, the communities (local existing institutions such as Pasture User Unions, Forest Entreprises (Leskhozoes), Municipalities, etc.) will develop the O&M manuals for the tools and equipment received as a support for the Integrated NRM climate resilience plans. By the closure of the project, the beneficiaries will have closed their investment and will have reported on the intended mechanisms for Operation and Maintenance of the investments. After the project, the communities will have established financially viable economic activities to ensure financing the operation and maintenance and will depend on it for the replacement of the investment after obsolescence.

11. The support to the **establishment of climate-resilient tree nurseries will include** training to local leskhoz nurseries on planning (design and operational) as well as on standards of production. Support will include improved greenhouses, rootstock collection and training on growing resistant and endemic varieties.

12. As far as rangeland investment are concerned, during the project, with support from the PMU, the communities (local existing institutions such as Pasture User Unions) will develop the O&M manuals for the operationalization of the nurseries, will benefit of trainings and technology transfer. At the closure of the project, the owners will receive the final O&M plans in the handover note, and after the project, the community nurseries will be stand-alone economic activity and would be able to generate sufficient financial returns to finance the operation and maintenance.

### **b. Community and Social sustainability**

13. Fifty district and local institutions will be trained on technical and legal matters on forest enrichment, Afforestation/Reforestation techniques and on rangeland rehabilitation. Through the wide social mobilization initiated under Component 1, all relevant communities and their institutions will be involved. The approach will include gender-responsive mobilization, training on gender issues and institutional support.

14. Moreover, specifically on gender (further details are in the Gender Action Plan, Annex 2.a of the FP):

- Service providers to be engaged for community mobilization must have a good track record on gender analysis/ mainstreaming and poverty analysis/inclusion, and their TORs include responsibilities for addressing gender and inclusion of the poor.
- Training sessions will be provided to local women on leadership, decision making and participation in local institutions with a view to supporting their engagement in PUUs, WUAs and other community resource users groups.
- All INRMCRPs will have a section on social assessment which includes poverty and vulnerability analysis.

- All INRMCRPs will have a section on gender assessment, and elaborates measures for women's inclusion and participation.
- Women's access to/benefits from improved natural resources (forests and pasture) will be monitored.

### **c. Institutional and Policy sustainability**

15. The capacity development of Community Landscape Management Groups as inclusive institutions (including municipalities, Leskhozoes, Pasture user unions, other institutions...) will be geared towards the effective implementation of INRMCRP and of on forests and rangeland management. This approach will include initial technical trainings and refreshers trainings, as well as learning on the job related to the implementation of the investments and will leave at local level the capacity to assess and monitor but also plan and evaluate the conditions of natural resources.

### **d. Environmental sustainability**

16. Component 2 will generate multiple benefits for environmental sustainability, besides being the main vehicle to carbon sequestration. In particular, in order to ensure effective and efficient forest investments, the forest investment model will take into account the region, altitude, climate, dominant tree species, forest legal status, custodianship and the main partners and their knowledge. Selected local tree varieties will withstand the future climate conditions and form the basis for future climate-resilient forests. These benefits are consistent with the Sustainable Development Goals, including SDG 15.1.1; 15.2.1; 15.3.1 and 15.4.2.

17. Specifically related to climate change mitigation, the higher scale and quality of seedling output expands areas of A/R and enrichment planting, enables the sequestration of more CO<sub>2</sub>eq, and reverses the net emissions from forestry over time.

## **Component 3 - Climate-sensitive value chain**

18. The sustainability of the investment in carbon sequestration carried out in Component 2 by providing local communities with an incentive to undertake behavioral change – and sustain it – as they gain access and receive support to valid economic opportunities in red meat and non-timber forest products<sup>199</sup> (NTFP) markets. This will eventually lead to more sustainable management of forests and pastures, thus contributing to enhanced resilience. Ultimately, the component will not only foster sustainable use of natural resources but will also provide economic opportunities for entrepreneurial growth among women and youth engaged in NTFP activities. A long-term co-benefit of this component also includes improved food security and poverty reduction in the target communities.

### **a. Technical and financial sustainability**

19. Financial sustainability of the support to climate sensitive value chains is guaranteed by the financing mechanism of the component itself. With a significant investment in capacity development and identification of relevant value chains and their business opportunities, the project will accompany private sector actors towards expanding their business in a financially viable manner to ensure access to financial services provided by RKDF and its partner banks. The local banks will be supported by capacity development from the project to ensure that the banks increase their efficiency in the appraisal of business proposals. Detailed financial and economic sustainability of the possible investment financed under the component is provided in Annex 3 of the FS (Economic and Financial Analysis).

### **b. Community and Social sustainability**

20. Each type of investment would be accompanied with a realistic business model and financial analysis. Incremental household income and jobs, productivity gains, value addition, market access, gender equality and the potential for the economic empowerment of women, youth, poor households and other vulnerable

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<sup>199</sup> NTFP include all products such as tree nuts, fresh and dried fruits and mix of these products, honey, mushrooms, herbs etc. other than timber derived from the Management Unit (e.g. walnut-fruit forests, orchards and other management units included in forest fund land use).

groups would be important criteria in investment proposal evaluation, together with commercial viability, climate resilience and cost effectiveness assessments.

21. Specifically on gender (further details are in the Gender Action Plan, Annex 2.a of the FP), the value chain performance assessment will be done within the FAO guiding framework *Developing gender sensitive value chains* (<http://www.fao.org/3/a-i6462e.pdf>), and will be done using the guidelines for practitioners (<http://www.fao.org/documents/card/en/c/I9212EN>), with the technical support of the gender and social development specialist. Potential for women's participation in/benefiting from the value chain development will be taken into consideration when selecting value chains, and all financial education modules developed with the project support will include gender aspects.

### **c. Institutional and Policy sustainability**

22. GCF grant resources (Component 3) will be dedicated to create an enabling institutional environment for 'Climate-sensitive Value Chains', which will provide economic incentives to the required diversification and enhanced efficiency, productivity and competitiveness of existing economic activities in the highly degraded target areas.

### **d. Environmental sustainability**

23. Besides the guidance from the Environmental and social management framework of the project (Annex 5 of the FP), the overall environmental sustainability of the component is guaranteed by the criteria for eligibility of support. In order to guarantee an effective use of co-financing resources, each sub-project proposal will identify the carbon sequestration benefits, and its potential contribution to the carbon sequestration objectives of the project. In this sense, the component will work primarily with Value chain actors and private sector actors with the potential to contribute to the project's efforts for mitigation through forestry and rangeland investment. At first, the value chains and actors will be selected according to the potential to contribute to income diversification from unsustainable livestock or forestry practices. This will constitute the building block for both the mitigation and the increased resilience objectives.





## Chapter 6. Planning, M&E and Learning and Knowledge Management

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## I. Planning

1. As reported in previous chapters of the funding proposal, over a long period of time, pasturelands and forests have become heavily degraded. Causes are multiple, including past policies and management regimes (dating from pre-Soviet times), lack of coherent, or conflicting, integrated pasture and forest policy, governance, institutional and regulatory frameworks, poor natural resource management practices, tenure arrangements, but also other issues such as data collection, monitoring and reporting.

2. The ecosystem-based approach used in this CS-FOR project acknowledges that improving interlinked environmental, climate and sustainable livelihood dimensions requires a systems approach, and that climate change mitigation can be an entry point. Addressing the biophysical ecosystem does not suffice – the enabling environment, including social dimensions (e.g. participation, equity, “ownership”), economic opportunities for beneficiaries, achieving national environmental, sustainable development and climate change objectives, governance, and capacity building must also be tackled. As the name implies, given the “ecosystem-based” nature of project interventions, key issues are not addressed in “silos”, but rather as an integrated package.

3. Integrated Natural Resource Management and Climate Resilience Plans (INRMCRPs), which primarily focus on forest-pastureland ecosystem management and use, are the main project vector through which an ecosystem-based approach will be achieved. Through evidence-based and inclusive processes, relevant institutions in the project intervention areas, including Territorial State Bodies for Forest Management (Leskhozoes), National Parks, self-government bodies (AOs and their institutions), Pasture Users’ Unions and other community organizations and groups for natural resources use and management, will jointly design and implement integrated, participatory and adaptive INRMCRPs. INRMCRP will also be developed, negotiated and agreed within all Community Landscape Management Groups (CLMGs).

4. At the level of project management, ensuring intragovernmental commitment and encouraging good governance, the project will work under the guidance of a National Platform acting as CS-FOR Steering Committee (SC), formed by the following institutions: SAEPF (NDA and Chair of the SC), Climate Finance Center (CFC), MAFIM, MES, the State Agency for Local Self-Government and Inter-Ethnic Relations, and FAO. The Steering Committee will include, as observers, representatives of civil society as well as of national academia and the research sector.

5. Therefore, planning of project’s activities and actions will follow a clear process and will be supported by the evidence and result based approaches adopted to define the theory of change and identify project’s execution strategies. Core of the planning exercise is the preparation of the Annual Working Plan and Budget (AWPB) that contains the strategic, financial and procurement rational to justify annual investments and to present project’s annual strategy to the Steering Committee and Accredited Entity. Preparation of the AWPB will involve tangible participation of identified partners as well as local communities and their administrations following the approach described in the previous paragraphs. Gender-responsive budgeting will be implemented.

6. The AWPB constitute the main formal instrument to ensure ownership and participation of stakeholders and beneficiaries. It represents the resultant of the national engagement process and the executing tool of the INRMCRPs. It also helps to ensure effective gender mainstreaming and social inclusion of the project. To this end the PMU, via its M&E unit, will secure constant dialogue with target communities and administrations and will ensure their participation in the AWPB formulation process.

7. The AWPB will be georeferenced and will report clearly coordinates related to planned interventions. The AWPB will contain 5 main sections as described below:

- 1) Georeferenced<sup>200</sup> Annual Report;
- 2) Georeferenced Annual Sub-LFM;

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<sup>200</sup> Georeferencing is the process of assigning a unique set of geographical coordinates to data, information, physical elements, areas, and any other point/action/activity/process related to your project including policy development and training.

- 3) Timeframe with annual milestones, as well as considerations to cross-cutting issues (including gender mainstreaming and social inclusion);
- 4) Working Plan Rational;
- 5) Communication and KM annual strategy;
- 6) Budget;
- 7) Procurement Plan.

**Georeferenced Annual Report.** Other than for the first AWPB, the PMU will present on a yearly base the annual report including coordinates of each executed activity. The report will describe executed activities and reached milestones including data and analysis from the M&E unit. The report will also include a detailed description of past years expenditures and highlight issues encountered in procuring goods and services. Detailed outline of the annual report will be developed with partners and PMU at start-up.

**Georeferenced Annual Sub-LFM.** The AWPB will include a sub logframe matrix summarizing activities and reporting contribution to project's targets. Proposed activities will have to clearly present geographical coordinates related to planned investments and soft activities.

**Timeframe with annual milestones.** The AWPB will contain the annual timeframe identifying as well reporting deadlines, SC meetings and targets to be reached for the year. The timeframe will also report, community engagement milestones as well as M&E targets for the year.

**Working Plan Rational.** Each activity presented in the Sub-LFM will be clearly explained including description of planned approaches and tools deployed to achieve annual goals, milestones and community engagement. Rational will also include results of geospatial analysis performed on areas identified for activities' execution.

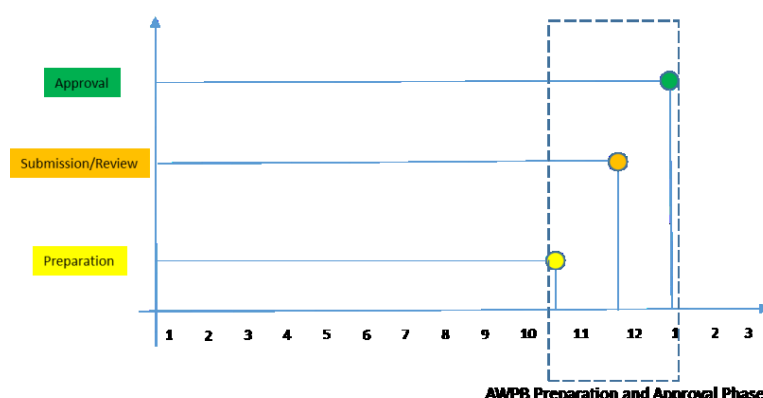
**Communication and KM annual strategy.** The AWPB will also include clear description of project's communication and knowledge management strategies including, approaches, methodologies targets and list/rational of key stakeholders to be reached by the proposed set of actions.

**Budget.** The AWPB will contain a detailed budget built following the one presented with the Full Funding Proposal. The budget will contain all planned expenditures according to FAO rules and procedures or else according to covenants of the project financial agreement.

**Procurement Plan:** The procurement plan will be prepared according to FAO rules and procedures and will ensure clarity and transparency of the process.

8. Planning and approval of the AWPB will be done at the end of each fiscal year and will require formal approval of both the SC and FAO (figure 1).

**Figure 1: Timeframe Scheme of the Planning and Approval phase of the Annual Working Plan and Budget.**



## IV. Monitoring and Evaluation

### B.1 Introduction:

9. CS-FOR will apply FAO's M&E standard procedures and will be compliant with the GCF performance measurement framework. FAO will manage and coordinate reporting to the GCF according to agreed standards and procedures. The project will follow an Evidence and Result-Based Management (ERBM) approach, framed by the FAO Policy on gender equality<sup>201</sup> and the nine FAO Environmental and social standards<sup>202</sup>, which is intended to aid decision-making towards the explicit goal, outcomes and outputs identified as part of the Theory of Change.

10. Project's achievements towards approved targets will be monitored via identified indicators and against the project baseline as reported in the logframe matrix. As described in the next sections, the project will ensure georeferencing of activities including trainings and capacity development so to allow constant follow up via the FAO newly developed Remote Sensing application "Earth Map". The combination of georeferencing, groundtruthing with communities and remote sensing analysis via FAO/Earth Map will allow the M&E unit, the NDA, the FAO and the GCF to have a clear understanding of project's effectiveness and efficiency. Additionally, the described approach will allow the M&E unit to advise and support the PMU with evidence enhancing project's capacity not only to deliver but also to support stakeholders and beneficiaries in their decision making processes.

11. CS-FOR project cycle will be monitored using a combination of tools based on: **(i)** field data collection, **(ii)** georeferencing and **(iii)** geospatial analysis

**(i) Field data Collection:** field data will be collected by the M&E unit via dedicated activities planned with communities according to the monitoring exercises planned by the Project. To this end the M&E unit will collect data from communities following the HH survey methodological approach and specifications. Additionally the project has planned to have two additional households and institutions survey at mid term and project completion.

**(ii) Georeferencing:** Georeferencing will ensure a unique relation between project's activities and geographical coordinates collected according to a specific procedure (Ref: Georeferencing Procedures). This will allow the project and the Country to ensure clear identification of activities and beneficiaries in the precise context identified during project identification and design. Georeferencing will allow the project to profit from the vast geospatial data set available for the Country and will support involved institutions in sharing and mainstreaming geospatial data as aimed by the 2016 NSDI MOU.

**(iii) Geospatial analysis:** the M&E unit will monitor activities and processes thanks to a series of remote sensing and photointerpretation analysis that have been made accessible to the Country via the newly FAO developed application Earth Map. The application will allow the project to factor in climate change variables as well as socio-economic and environmental data into the planning and decision making process. The integration of 'geo-spatial' elements will allow stakeholders to overlay different classes of data such as climate trends, hydrography, erosion, flood risks, land cover, land use, distribution of population and livelihoods that are a non-negligible part of an evidence based and informed decision making process. Finally, the process will contribute in enhancing national and regional data collection activities that will support the understanding of Climate Change impacts at local level.

12. Having georeferenced investments as well as soft activities (i.e. trainings, capacity development) will allow the project to answer indicators with objective elements of evaluation. In the specific case of this project, the PMU as well as all the other stakeholders - including GCF- will be able to understand if activities have been executed, if these have been successful and finally if there is a specific impact that could be objectively linked to project's theory of change. The use of such approach will not require special technologies, equipment or advanced IT skills. Basic software are available under license (i.e. ArcGis/ESRI) or in open source (i.e. QGIS) and most of the currently available smart phones/tables, regardless of their operative systems, can execute most of the processes required to ensure georeferencing and data management. Additionally, FAO will provide dedicated training to PMU, M&E unit and project's partners/stakeholders during the stat-up phase of

<sup>201</sup> FAO (2012) FAO Policy on gender equality. Attaining food security goals in agriculture and rural development (Available at: <http://www.fao.org/docrep/017/i3205e/i3205e.pdf>)

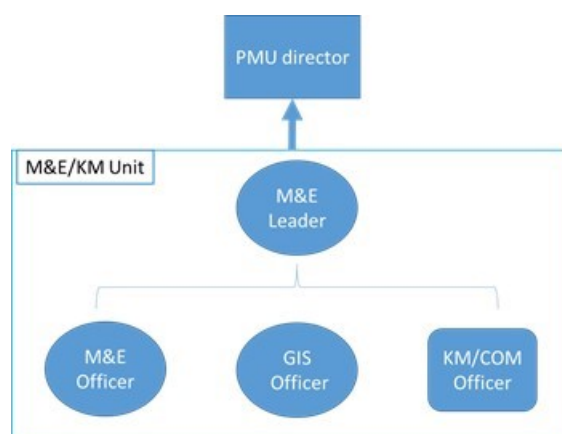
<sup>202</sup> FAO (2015) Environmental and social management guidelines. (Available at: <http://www.fao.org/3/a-i4413e.pdf>)

the project.

### B.2 M&E Unit Composition and Functions:

13. The M&E process will be under the responsibility of the PMU. The M&E unit (Figure 2) is composed of one team leader and of three officers (M&E/GIS/KM-COM). The team leader will respond directly to the PMU director and to the SC.

Figure 2: M&E Unit Composition



14. During execution of the project, the M&E unit will ensure, among the others, support at the following levels:

1) **Monitoring of Execution Performances:** the unit will be responsible for: (a) collecting data from identified service providers / partners and (b) submitting progress reports on approved targets on a quarterly basis to the PMU. The M&E unit will ensure correct and efficient filing of collected GPS coordinates. Once coordinates will start populating the M&E database, activities will be shared by the PMU via thematic project's maps and will be monitored via consolidated remote sensing practices (geospatial analysis). This aspect of the process is paramount to ensure knowledge building within the PMU and among stakeholders and in evaluating direct and indirect impacts of project's activities. Showing activities in their exact location - visualizing relations with the context - will allow a more objective impact's evaluation and will provide decision makers with an objective, transparent and evidence based support to national strategies. Data, collected via reports prepared by service providers/partners and verified with beneficiaries, will be disaggregated by sex and other social determinants as relevant and possible (such as age, ethnicity and income level), among the others, and will be georeferenced. Gender-specific indicators will also be developed and monitored as deemed necessary. Data will be stored in a database accessible to the SC as well as to FAO. Detailed procedures related to georeferencing are available in appendix 1.

2) **Community Monitoring and Ground Truthing:** The project will also apply a new approach to monitoring ensuring participation of target beneficiaries and stakeholders into the process. Given the importance and relevance attributed by the theory of change to community's participation in ecosystem based natural resource management, the M&E unit will ensure annual consultations in target areas so to support planning and monitor execution of the INEMCRPs. Thanks to the described georeferencing process - pillar of such development plans - , communities will participate directly both in planning, according to the criteria designed for the INEMCRPs, and in groundtruthing the results obtained via FAO spatial analysis tools and methodologies. This particular aspect of the M&E strategy will allow as well for enhanced and evidence based knowledge sharing with local communities and their administrations as well as for mainstreaming climate change among key stakeholders. As per all the other activities data deriving from this exercise will be part of the project atlas and available for consultation via KMZ files upon request.

3) **Strategic level:** annual results and related analysis, jointly reviewed by FAO and the PMU, will form the base for each annual year planning exercise via the AWPB. These will be presented to the

SC in order to support its strategic role and to secure transparency and evidence based strategy development.

### B.3 Project's Baseline:

15. CS-FOR Baseline is the resultant of data collected in target/control areas via: (i) literature review<sup>203</sup>; (ii) questionnaire-based household survey<sup>204</sup>, (iii) focus group at community level and; (iv) geospatial analysis<sup>205</sup>.

16. Goal of the baseline is to collect socio-economic and climate data in both target and control areas, analyze interactions with available natural resources and describe beneficiaries' perceived impacts on climate change. Main objectives of the baseline are:

- Establish the ex-ante project's climatic/environmental and socio-economic state of the art;
- Assess resilience capacities and coping strategies of communities, households and individuals (women and men) in relation to climate change shocks; and
- Present the interrelationships between communities and natural resources using the livelihood approach, with special attention to groups which are: (i) particularly vulnerable to climate change-induced alterations of the natural resources basis; and (ii) disadvantaged in terms of access to natural resources and accessing project opportunities due to certain socio-economic characteristics.

17. Baseline data have been collected both at national and community level. Target and control areas have been selected within the national engagement process and according to data and assessments available in literature review and fine-tuned by FAO with Earth Map. Local data have been collected in the following districts:

#### Target Areas:

1. Osh region, Uzgen district
2. Jalalabat region, Suzak district
3. Jalalabat region, Toguz-Toro district
4. Naryn region, Ak-Talaa district

#### Control/Expansion Areas:

1. Talas region, Talas district
2. Talas region, Bakai-Ata district
3. Chui region, Jayil district
4. Jalalabat region, Toktogul district

18. Baseline data are fully georeferenced and available in both Earth Map and Google Earth Pro. Data are organized and presented in the project Atlas that represents also a part of the M&E strategy and that will be the repository of all monitoring and evaluation data. A summary of baseline data is presented below (table n. 1).

**Table 1: Baseline Summary according to LFM**

Data	Origin	Hierarchy	Main indicators	Verification period	Extension	Location
<b>GHG Baseline</b>	Third National Communication / FAO Baseline Atlas FAO Carbon Accounting (Ex-Act-GLEEM tools)	Fund Level Impacts	Core Indicator 1 and M4.1	Annual, Interim / Final Evaluation / Impact Evaluation	PDF	NDA FAO PMU GCF
<b>Resilience (Livelihood and most vulnerable people) baseline (Local)</b>	FAO data/National Statistics/ RIMA II Index Value Assessment/	Fund Level Impact	A1.2	Interim / Final Evaluation / Impact Evaluation	PDF, KMZ, HTML	

<sup>203</sup> Literature review is available as annex to the full funding proposal.

<sup>204</sup> HH report and focus group findings are available up on request.

<sup>205</sup> Geospatial analysis are available on Earth Map: <https://storage.googleapis.com/eetest/EarthMap/index.html>

Data	Origin	Hierarchy	Main indicators	Verification period	Extension	Location
	National Statistics / Socio-Economic Assessment (RDF)					
<b>Resilience (ecosystem and services) baseline (Local)</b>	FAO data/ FAO Baseline Atlas National /Statistics/Land Productivity Dynamics assessment	Fund Level Impact	A4.1	Interim / Final Evaluation / Impact Evaluation	PDF, KMZ, HTML	
<b>Climate Technology and solutions availability and accessibility</b>	Third National Communication / National Adaptation Plan / FAO/EBRD <sup>206</sup>	Outcome	Core Indicator Outcome level	Interim / Final Evaluation / Impact Evaluation	PDF, KMZ, HTML	
<b>Institutional and regulatory Baseline</b>	FAO Data / FAO Feasibility Study / External Assessment (RDF)	Outcome	M5.2 / A5.2	Interim / Final Evaluation / Impact Evaluation	PDF	
<b>Adaptive Capacity of Households</b>	Third National Communication / National Adaptation Plan / FAO/EBRD <sup>184/</sup> RIMA II Index Value Assessment/ National Statistics	Outcome	A7.1	Interim / Final Evaluation / Impact Evaluation	PDF, KMZ, HTML	
<b>Pastures and rangelands Baseline (Local)</b>	FAO Assessment / National Statistics/ ARIS Data	Outcome	M9.1	Annual/ Interim / Final Evaluation / Impact Evaluation	PDF, KMZ, HTML	

## B.4 Description of Selected Indicators, contribution to SDGs and Monitoring Strategy

### B.4.1 Description of Selected Indicator

19. CS-FOR identified a series of indicators deriving from both GCF core performance indicators and from FAO experience. Selected indicators have been discussed and agreed with the NDA and with partners during the design phase and within the national engagement process. Table 2 reports the list of selected indicators and related means of verification.

**Table 2: CS-FOR Indicators and Means of Verification**

Expected Result	Indicator	Detailed Means of Verification (MoV)
<b>Fund-level impacts</b>		
<i>Core Indicators</i>	Tonnes of carbon dioxide equivalent (tCO <sub>2</sub> eq) reduced as a result of GCF-funded projects/programmes	Tonnes of carbon dioxide equivalent (tCO <sub>2</sub> eq) emissions reduced will be monitored and processed with FAO <a href="#">EX-ACT/ GLEAM</a> methodologies. Results will be disaggregated per district, community and type of investment. And will be presented annually to the Fund. <b>Measurement Unit: tCO<sub>2</sub>eq</b>
	Cost per tCO <sub>2</sub> eq decreased for all Fund-funded mitigation projects/programmes	The cost of tCO <sub>2</sub> eq monitoring will be based on estimated disbursement over estimated tCO <sub>2</sub> eq reduced. The project will report at mid-term and closure. <b>Measurement Unit: USD per tCO<sub>2</sub>eq</b>
	Volume of finance leveraged by Fund funding	Volume of finance leveraged by Fund funding will be monitored via reports from cofinancing actors and executing agencies. The project will report annually. <b>Measurement Unit: USD</b>
	Total number of direct and indirect beneficiaries; Number of beneficiaries relative to total population	Via its planned mid-term and terminal independent surveys, the project will be able to report on direct beneficiaries, intensity of support provided and indirect beneficiaries according to Core indicator 1 of the Adaptation Fund and will be presented annually. <b>Measurement Unit: Number of people</b>

<sup>206</sup> [Climate tech in Kazakhstan and Kyrgyzstan can help stifle greenhouse gases](#)



Expected Result	Indicator	Detailed Means of Verification (MoV)
<i>M4.0 Reduced emissions from land use, reforestation, reduced deforestation, and through sustainable forest management and conservation and enhancement of forest carbon stocks</i>	GCF M4.1 Tonnes of carbon dioxide equivalent (tCO <sub>2</sub> eq) reduced or avoided (including increased removals) as a result of GCF-funded projects / programmes	Georeferencing of activities and geospatial analysis analysis ( <a href="#">Earth Map</a> ) will provide the project with data on investments' distribution and effectiveness. Results will be disaggregated per district, community and type of investment. Tonnes of carbon dioxide equivalent (tCO <sub>2</sub> eq) emissions reduced or avoided and/or GHG removal by sinks from forestry and land use activities including emission intensity per unit of animal protein will be monitored and processed with FAO <a href="#">EX-ACT</a> / <a href="#">GLEAM</a> methodologies. The indicator will be informed according to CIF FIP I1 Table 1. Results will be disaggregated per district, community and type of investment. And will be presented annually to the Fund. <b>Measurement Unit: tCO<sub>2</sub>eq</b>
<i>A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities and regions</i>	GCF A1.1 Number of males and females benefiting from the adoption of diversified, climate resilient livelihood options (including fisheries, agriculture, tourism, etc.)	Georeferenced data will be processed using the <a href="#">RIMA II methodology</a> against the assessed project's baseline including climate variables. Results will be disaggregated per district, community, livelihood practice, exposure to climate risk, age and sex. Results will be presented at Mid Term and Project's Completion. <b>Measurement Unit: Index 0/100</b>
<i>A4.0 Improved resilience of ecosystems and ecosystem services</i>	GCF A4.1 Coverage/scale of ecosystems protected and strengthened in response to climate variability and change	Georeferencing of activities and geospatial analysis (Earth Map) will provide the project with data on investments' distribution, effectiveness and climate variables. Analysis of the Land Productivity Dynamics (LPD) via FAO Earth Map will allow the assessment of project's impacts on ecosystems (Biological and Land asset). Results will be disaggregated per level of degradation, district, community and ecosystem. Results will be presented at Mid Term and Project's Completion. <b>Measurement Unit: hectares</b>
<b>Outcome level results</b>		
	Number of technologies and innovative solutions transferred or licensed to support low-emission development as a result of Fund support.	The project will build a standardized scorecard of the various strategic plans and official documents at regular intervals to observe changes in terms of climate change streamlining, adopted technologies. The scorecard will also be informed by the various independent survey (households, institutions, entrepreneurs) planned within the M&E process at mid-term and closure. The project will also collect and analyze official documents from involved institutions and partners to assess impacts at local level. Results will be disaggregated per institutions, district and community and will include analysis on potential impacts on gender equality in target areas. Results will be presented at Mid Term and Project's Completion. <b>Measurement Unit: Score card index.</b>
M5.0 Strengthened institutional and regulatory systems for low-emission planning and development	GCF M5.2 Number and level of effective coordination mechanisms.	
A5.0 Strengthened institutional and regulatory systems for climate-responsive planning and development	GCF 5.2 Number and level of effective coordination mechanisms	
M9.0 Improved management of land or forest areas contributing to emissions reductions	M9.1 Hectares of land or forests under improved and effective management that contributes to CO <sub>2</sub> emission reductions SDG: 15.1.1 Forest area as a proportion of total land area SDG:15.2.1 Progress towards sustainable forest management SDG: 15.3.1 Proportion of land that is degraded over total land area SDG: 15.4.2 Mountain Green Cover Index	Georeferencing of activities and geospatial analysis (Earth Map) will provide the project with data on investments' distribution, effectiveness and climate variables. Analysis of the Land Productivity Dynamics (LPD) via FAO Earth Map will allow the assessment of project's impacts on ecosystems. Results will be disaggregated per level of degradation, altitude, district, community and ecosystem. Results will be presented at mid-term and closure. <b>Measurement Unit: hectares</b>
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	Strengthened adaptive capacity and reduced exposure to climate risks	The project will monitor through surveys the implementation of commercial arrangements between agribusinesses and primary producers in the project intervention areas, and will monitor the implementation of technologies and practices. The project will also verify the diversification of income sources at mid-term and at project completion. The assessment will be done via a standardized scorecard of the adopted technologies. The scorecard will also be informed by the various independent survey (households, institutions, entrepreneurs) planned within the M&E process at mid-term and closure. <b>Measurement Unit: Score card index</b>

Expected Result	Indicator	Detailed Means of Verification (MoV)
<b>Output 1.1: Evidence based natural resources management governance is strengthened across stakeholders</b>		
<b>Project Monitoring Sub Outputs and related indicators</b>		
1.1.1: By Y3 Studies, analysis and information / awareness material are developed and accessible to all project stakeholders in the intervention areas and among the institutions at a national level.	1-CS-FOR: % of people aware of materials in project areas and in the target institutions (disaggregated by sex)	Data will be collected via a series of independent household / institutions surveys (baseline, mid-term and closure) <b>Measurement Unit: # and %</b>
	2-CS-FOR: # of institutions accessing and using project's data.	
1.1.2: By Y5 Community Landscape Management Groups (CLMGs) are established and operative	3-CS-FOR: # of groups regularly meeting.	
	4-CS-FOR: # of meetings of GLMG out of the project's framework and timeframe	
1.1.3: By Y5 targeted key institutions have capacity to make evidence based decisions on CC/NRM	5-CS-FOR: # of decisions (institutional/regional/local) related to CC and NRM supported modified and approved.	The project will collect and analyze official documents from involved/exposed institutions. Data will be collected via a series of independent institutions' surveys (baseline, mid-term and closure) Results will be disaggregated per institutions, district and community. Results will be presented at Mid Term and Project's Completion. <b>Measurement Unit: #</b>
1.1.4: By Y5 Recommendations for enforcement of sustainable management and use of forest-rangeland ecosystems, including technical, legal and institutional approaches to advance public-private partnership, are proposed to stakeholders for reflection in policy and legislation.	6-CS-FOR: # of enforcement recommendations / harmonization revisions approved by deputed institutions	
1.1.5: Y7 Concept for management, including legal arrangements for management and use of municipal forest of municipal forest developed / presented to the Government / Parliament for approval.	7-CS-FOR: One approved concept for management of municipal forest development approved by the National Platform and adopted by deputed institutions	
	8-CS-FOR: % of people benefitting of project activities reporting that their capacity in engaging with relevant institutions has increased thanks to project interventions	
1.2.1: By Y3 One Evidence-based integrated NRM Climate Resilience Plans' Planning, Monitoring and Evaluation and communication protocol is active at Community Landscape Management Group (CLMG) level in the target areas.	9-CS-FOR: 80% of annual working plans and budgets of involved local institutions parts of CLMGs in target areas include results of the transferred evidence based practice	The project will collect and analyze official documents from involved/exposed institutions (mainly from the signatories of the Kyrgyzstan National Spatial Infrastructure Memorandum of Understanding). Data will be collected via a series of independent PUU surveys (baseline, mid-term and closure). Results will be disaggregated per institutions, PUU, SFF, district and community and will be presented at Mid Term and Project's Completion. <b>Measurement Unit: # and %</b>
1.2.2: By Y2 Forest and rangeland resources monitoring system developed and presented to the Government / Parliament.	10-CS-FOR: One handover document from the project to involved authorities	
1.3.1: By Y2 All Leskozes / Pasture Committees/AOs involved in CLMG in target areas are mobilized and receive adequate and adapted	11-CS-FOR: # of institutions and local organizations / committees involved during	Data will be collected via a series of independent HH and institutions' surveys (baseline, mid-term and closure) Results will be disaggregated per institutions, district and municipality

Expected Result	Indicator	Detailed Means of Verification (MoV)
training in technical and managerial aspects related to the design and implementation of the INRMCRP, including on climate change mitigation and adaptation	the formulation of the INRMCRP	and presented at Mid Term and Project's Completion. <b>Measurement Unit: # and %</b>
1.3.2: By Y4 INRMCRP are developed, negotiated and agreed within all Community Landscape Management Groups (CLMGs) and the plans are ready for implementation and monitoring.	12-CS-FOR: # of INRMCRP agreed in target areas	
	13-CS-FOR: # of INRMCRP operational in target areas	
Output: 2.1: Green investments for forests and rangelands rehabilitation are made available		
Project Monitoring Sub Outputs and related indicators		
2.1.1. By Y6, relevant local institutions from the target districts are able to execute the INRMCRPs	14- CF-FOR: % of INRMCRP executed and related O&M mechanisms are in place	Data will be collected via a series of independent surveys (baseline, mid-term and closure). Results will be disaggregated per institutions (eg, PUU, SFF, district and community) and will be presented at Mid Term and Project's Completion. <b>Measurement Unit: # and %</b>
2.2.1. By Y8, at least 62.359 ha of forest lands are afforested/ reforested/ restored (3,000 ha of mostly dry high-altitude deforested/severely degraded forests afforested/ reforested; 3,000 ha of degraded forests (Tree Cover – TC- < 10%) restored via natural forest enrichment practices; and 56,359 ha of forests under improved management; 644,595 ha at least 644,595 ha of rangelands under improved management)	15-CS-FOR: # of hectares afforested / reforested with survival rate > 65%	Georeferencing of activities and geospatial analysis (Earth Map) will provide the project with data on investments' distribution and effectiveness and improvements against baseline (LPD, NDVI, Hansen Forest Cover Change). Results will be disaggregated per district, community and type of investment. Results will be presented on an annual base and will be included in the Project Annual Report. <b>Measurement Unit: hectares</b>  Data will also be collected via a series of independent HH and institutions' surveys (baseline, mid-term and closure) Results will be disaggregated per institutions, district and community and presented at Mid Term and Project's Completion. <b>Measurement Unit: # and % - Liters - Kg</b>
	16-CS-FOR: # of hectares reporting TC > 10% in targeted areas.	
	17-CS-FOR: # of hectares reporting improved LPD values	
	18-CS-FOR: # of hectares reporting improved LPD values	
	19-CS-FOR: Average milk yields (l/animal/day) increased by at least 40%,	
	20-CS-FOR: Average animal live weight (kg/animal) increased by at least 15%	
Output 3.1: Selected value chains are climate sensitive and producers adopt carbon optimization technologies and practices		
Project Monitoring Sub Outputs and related indicators		
3.1.1. By Y8 the number of producers adopting carbon optimization technologies and practices is increased by 20%.	23-CS-FOR: # of additional leaseholders (HH) certified by voluntary sustainable management standards	Certification body (register of certificates) and Kyrgyz Statistic Committee survey. <b>Measurement Unit: # and %</b>
	24-CS-FOR: # of additional ha of forests used and managed under voluntary sustainable management standards	Independent Household Livelihood (baseline, mid term and closure) and Kyrgyz Statistic Committee Survey
	25-CS-FOR: # of additional ha planted on permanent orchards and plantations using drip irrigation	Data will also be collected via a series of independent HH surveys (baseline, mid term and closure) focused on livelihood. Results will be disaggregated per district, community, gender, age and type of product and will be presented at Mid Term and Project's Completion. <b>Measurement Unit: hectares - # - tons – USD</b>  Improved Emission intensity will be monitored processing data collected by the project with FAO-GLEAM. Results will be disaggregated per district, community, type of product and will be presented at Mid Term and Project's Completion. <b>Measurement Unit: tCO2eq/kg of animal protein (Milk and Meat)</b>
	26-CS-FOR: % of the total volume and value of products (including live animals) sourced by entrepreneurs participating in sub-component 3.2	
	27-CS-FOR: % of targeted animal owners achieving improved emissions intensity by at least 15% per unit of animal protein	
3.1.2. By Y8 entrepreneurs and producers in selected agricultural value chains are able to access and utilize the information provided in the end-market assessments.	28-CS-FOR: % of target entrepreneurs / producers requesting financial assistance (disaggregated by sex)	M&E Archive and reports from partners and involved stakeholders. HH Livelihood Survey and Kyrgyz Statistic Committee Survey. Data will be collected from Dried Fruits and Nuts business platform, RKDF business plans depository, Survey of Kyrgyz agribusinesses. <b>Measurement Unit: #</b>
3.2.1. By Y8 US\$ 15 000 000 worth loans from component 3.2	29-CS-FOR: Value of loans disbursed by RKDF and partner banks in the framework of sub-component 3.2	RKDF data. RKDF data; this output is under the full responsibility of RKDF, co-financier of the project. <b>Measurement Unit: # and USD</b>

#### B.4.2 Contribution to SDGs Indicators

20. In addition to the described indicators, CS-FOR will also contribute to several SDGs Indicators. The M&E unit will ensure data collection and description of each of the selected indicators. Table 3 present SDGs contributions.

**Table 3: CS-FOR contributions to SDGs**

CS-FOR CONTRIBUTION TO SDGs				
#	SDG	Targets	Indicators	CS-FOR Contribution
12	<b>Responsible Consumption and Production: Ensure sustainable consumption and production patterns</b>	12.2 By 2030, achieve the sustainable management and efficient use of natural resources	12.2.1 Material footprint, material footprint per capita, and material footprint per GDP	Improvement of livestock productivity and certification of NTFPs value chains for will contribute to sustainable management of natural resources - especially through national-level governance commitment and, at the local level, through INRMCRPs.
		12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	12.8.1 Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment	The evidence based approach of CS-FOR will provide accurate and up-to-date information to inform and train stakeholders in and monitoring of activities including ecosystems' control
13	<b>Climate Action: Take urgent action to combat climate change and its impacts</b>	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	13.1.3 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	All relevant stakeholders (including local government, PUUs, etc.) in the four target oblasts are involved in mitigation activities and development and implementation of INRMCRPs. At national level, goals are strengthened institutional and regulatory systems for climate-responsive and low-emission planning and development.
			13.1.1 Number of deaths, missing persons and persons affected by disaster per 100,000 people	Mitigation activities will increase ecosystem resilience, reducing exposure and vulnerability to impacts of extreme weather events on human lives.
15	<b>Life on Land: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss:</b>	15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	15.1.1 Forest area as a proportion of total land area	CS-FOR objectives: the project will contribute in increasing forest cover (density > 10%) in Target Areas by at least 3%
		15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	15.2.1 Progress towards sustainable forest management	CS-FOR will contribute to Sustainable Forest Management in over 93,000 ha, restore over 3000 hectares of degraded forests and add additional 3000 ha of newly planted forests.

CS-FOR CONTRIBUTION TO SDGs				
#	SDG	Targets	Indicators	CS-FOR Contribution
		15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	15.3.1 Proportion of land that is degraded over total land area	This will be achieved by restoring / improving ecosystem functions and resilience through afforestation/ reforestation / forest enrichment / pasture management.
		15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development	15.4.2 Mountain Green Cover Index	This will be achieved by restoring / improving forest ecosystems and pastures especially in mountainous areas.
		15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts	15.9.1 Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020	Aligned georeferencing (and including vegetation cover indices), FAO Earth Map, and project implementation monitoring and reporting all contribute to national integrated evidence-based NR monitoring system; giving up-to-date information to national-level stakeholders, to use in national monitoring (and reporting) to international processes.
		15.a Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems	15.A.1 Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems	CS-FOR has been and will continue to be engaged with other donors throughout the project - both technically but also for exploring funding opportunities (e.g. IFAD, RDF, RKDF). Biodiversity and ecosystem conservation and sustainable use has been identified as important, by the Kyrgyz Government (ref. national commitments to international processes).
		15.b Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation	15.B.1 Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems	CS-FOR has been and will continue to be engaged with other donors throughout the project - both technically but also for exploring funding opportunities (e.g. IFAD, RDF, RKDF). Forest maintenance / improvement / restoration has been identified as important, by the Kyrgyz Government (ref. national commitments to international processes).
ADDITIONAL CONTRIBUTION				
#	SDG	Targets	Indicators	CS-FOR Contribution
1	End poverty in all its forms everywhere	1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.	1.5.2 Direct disaster economic loss in relation to global gross domestic product (GDP)	Increasing CC resilience through afforestation / reforestation/ forest enrichment activities will improve ecosystem functions enabling reduction of exposure.
2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and	2.4.1 Proportion of agricultural area under productive and sustainable agriculture	Ecosystem-based approach in CS-FOR involves increasing CC resilience together with (sustainable) adaptation practices.



CS-FOR CONTRIBUTION TO SDGs				
#	SDG	Targets	Indicators	CS-FOR Contribution
		other disasters and that progressively improve land and soil quality		
5	<b>Achieve gender equality and empower all women and girls</b>	5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	5.5.2 Proportion of women in managerial positions	Gender considerations in CC adaptation is important in national adaptation planning. In CS-FOR women are supported to actively participate in local level participatory processes including development and implementation of INRMCRPs (ref. gender action plan).
6	<b>Ensure availability and sustainable management of water and sanitation for all</b>	6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	6.6.1 Change in the extent of water-related ecosystems over time	Through reforestation/afforestation and pasture improvement activities, in particular in mountain and forest ecosystems.
8	<b>Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all</b>	8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labor-intensive sectors	8.2.1 Annual growth rate of real GDP per employed person	Investment in Climate-sensitive value chains will support the development of selected value chains' participants towards higher efficiency and competitiveness of the marketed product. Diversification of activities will reduce pressure on and degradation of natural resources (especially pastures).
11	<b>Make cities and human settlements inclusive, safe, resilient and sustainable</b>	11.A Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning	11.A.1 Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city	Downstream benefits of mitigation activities; income diversification through investments in Climate-sensitive value chains.

### B.4.3 Monitoring Strategy

21. Data will be collected by the M&E unit according to the means of verifications described in the previous sections. Data will originate from described sources and will be organized in the georeferenced M&E database. Data will be presented annually according to milestones fixed by each approved AWPB. Specific wrap section will be organized and supported by FAO at midterm and completion so to secure data availability to external evaluators.

22. Within the set of activities planned in the AWPB and approved by the AE, the PMU will ensure that each no objection requests related to project's expenditures contains clear maps reporting investments' coordinates as well as georeferenced cadaster maps (if available) describing the areas of intervention. Absence of coordinates and maps will negatively affect the process denying automatically the authorization to proceed with expenditures. Project's data and information will be georeferenced and provided in in ArcGIS compatible formats, shapefile if vector format and GeoTIFF if raster. Each dataset and information, including maps attached to the no objection process, will be also reported as KML file for uploading and sharing via Google Earth Pro. Produced datasets will be uploaded in Earth Map where geospatial algorithms are already available and fine-tuned for Kyrgyzstan in order to perform a large spectrum of remote sensing analysis. Analysis via Earth Map will support analysis of achievements and impacts in target areas.

23. Coordinates will be taken in a unique and known reference system, which by preference should be the geographic coordinate system (datum WGS84 and unit in decimal degrees). The full set of coordinates and KMZ files will represent the geographical location and distribution of the interventions

in the project areas and will be included in the “Project’s Atlas”. Produced maps will be provided in digital format (ArcGIS or equivalent) with all the metadata and sources of information. Maps shall be reported as well as in KML/KMZ format.

24. Involved institution and stakeholders (including the Steering Committee) will be involved both directly and indirectly via dedicated communication and training processes. PMU-M&E unit will ensure communication via the annual reporting processes, national ownership workshops and via the project atlas. Communication documents will be constantly updated at the disposal of stakeholders, AE as well as donors. FAO will provide stakeholders with at least 9 training session to secure full mastering and ownership of the promoted process.

25. The process is in line with the objective of the NSDI MOU on Spatial Data Sharing. The project will share data and apply standards according to Kyrgyz Republic strategies and will provide technical assistance and data in order to facilitate such objectives and to ensure mainstreaming of georeferencing among national institutions and other actors relevant in the field of Climate Change and Natural Resource Management.

26. Finally, the project will ensure coordination and complementarity with past and current projects/programs supporting the Country in the field of GIS, remote sensing and mapping funded by donors such as GIZ, the WB, IFAD and ADB.

### B.5 Reporting, Supervision and Evaluation:

27. FAO as accredited entity of the project will ensure annual reporting to the GCF. The report will include as well the audit report that will be commissioned by FAO to an independent firm according to FAO covenants, rules and standards. Project’s reporting will consist of four elements:

- **Technical Reports (TRs) prepared by Partners / Service Providers.** TRs will describe executed activities and involved beneficiaries according to M&E indicators (including the M&E indicators of the gender and social inclusion action plan) as reported in section H of CS-FOR full funding proposal. Partners and service providers will ensure Georeferencing of each executed activity and will present TRs on a quarterly base to the M&E Unit.
- **Quarterly reports (QRs) prepared by the M&E.** QR will present the work and achievements of activities and cross-cutting issues presented in the AWPB. It will include among the others data, comments and information from the beneficiaries and other involved stakeholders. QR are prepared by the M&E team for the PMU and will contribute to the annual report.
- **Annual reports (ARs) prepared by the M&E for the SC and FAO.** ARs will present the work and achievements reported by the PMU via the QRs and will include implementation and fiduciary chapters. ARs will include findings and recommendations of FAO supervision reports (SRs). ARs will include as well independent annual audit reports (AARs) and the “Project’s Implementation Atlas<sup>207</sup>” presenting the maps and charts obtained thanks to the georeferencing of project activities. Both will be presented as annexes of the AR. ARs are prepared by the M&E Unit, validated by the SC and FAO and are transmitted to the GCF by FAO.
- **Evaluation Reports are commissioned by FAO to an external and independent entity according to FAO covenants, rules and standards.** Evaluation Reports are shared with the Executive Committee, the Steering Committee and the PMU for comments and sent to the Green Climate Fund at midterm (Interim Independent Evaluation) and within six (6) months from project’s closure (Final Independent Evaluation). In accordance to the FAO procedures for the evaluation of initiatives funded by voluntary contributions,<sup>208</sup> the project will undertake:
  - a. **An Interim Independent Evaluation**, when delivery will reach 50% of the initial total budget and/or mid-point of scheduled project duration, to review efficiency and effectiveness of implementation in terms of achieving project objective, outcomes and delivering outputs. The MTE will be instrumental for contributing through operational and strategic recommendations to

<sup>207</sup> The project implementation atlas will be available as well via Google Earth so to appreciate in real time changes induced by the project. Its preparation will start with the baseline and will evolve with the project.

<sup>208</sup> This report is available in electronic format at: <http://www.fao.org/evaluation>.



improved implementation for the remaining period of the project's life. FAO Office of Evaluation, in consultation with project stakeholders, will be responsible for organizing and backstopping the Interim Independent Evaluation, including: finalizing the ToR, selecting and backstopping the team and Quality Assurance of the final report.

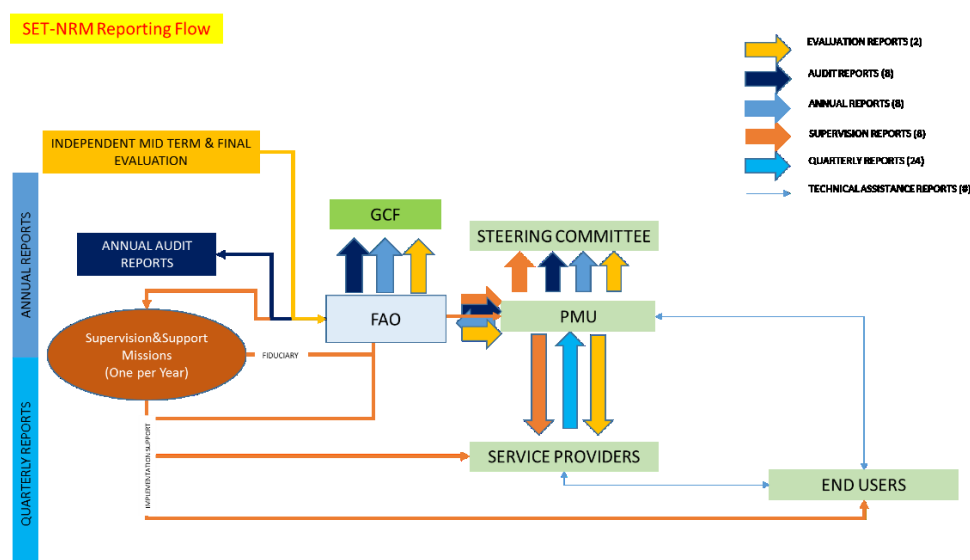
- b. **A Final Independent Evaluation**, within six months prior to the actual completion date (NTE date) of the project. It will aim at identifying project outcomes, their sustainability and actual or potential impacts. It will also have the purpose of indicating future actions needed to assure continuity of the process developed through the project. FAO Office of Evaluation, in consultation with project stakeholders, will be responsible for organizing and backstopping the Final Independent Evaluation, including: finalizing the ToR, selecting and backstopping the team and Quality Assurance of the final report.

**Table 4: CS-FOR Reporting Framework.**

Report Type:	Prepared By:	Approved By:	Proposed Timeframe:	Diffusion:
Technical Report	Service Providers/Partners	PIU-M&E	Upon conclusion of activities	Internal
Quarterly Report	PIU-M&E	PIU	3 Reports per year	Internal
Supervision Report	FAO	FAO	On an annual basis	Public
Audit Report	External Independent Auditor	FAO	On an annual basis	Internal
Annual Report/AWPB	PIU-M&E	SC-FAO	On an annual basis	Public
Mid Term Review	Independent External Evaluator	FAO	Fourth year	Public
Completion Report	PIU-M&E	SC-FAO	Eighth year	Public
Terminal Evaluation	Independent External Evaluator	FAO	Eighth year	Public
Impact Evaluation	GCF	GCF	To be determined	Public

28. The M&E and reporting process (table 4) will also form the foundation of CS-FOR communication and knowledge sharing strategy. Thanks to data collected and analyzed during the whole project, stakeholders and general public will be constantly exposed to best practices and lessons learned so to capitalize on CS-FOR experience and to magnify impacts in target areas as well as in others not directly involved in the project. Thanks to a pressing communication activity and key formal events at Start-up, Mid Term and Completion CS-FOR will ensure a constant flow of knowledge that will as well increase ownership of stakeholders and enhance its capacity to support an effective and efficient change into the policy making environment of Kyrgyzstan. Figure 3 below presents the combined flow of reporting and knowledge sharing.

**Figure 3: CS-FOR Reporting Flow**



29. FAO will support the SC and the PMU in reviewing and analyzing progress reports and assessing performances against baseline and targets. In addition to the support provided from FAO-Kyrgyzstan, FAO-HQ will organize two or more (depending on needs) supervision mission per year.

### B.6 M&E Outputs

30. Results of the process will be available to stakeholders and partners in both project reports and Google Earth Pro Files<sup>209</sup>. In order to execute evidence based and result management approach the project will ensure hiring of a dedicate M&E unit that will work under the direct supervision of the Project's Director. Targets of the M&E strategy will be reached according to the timeframe presented in Annex 7.

### B.7 Budget

31. Budget of the M&E function of CS-FOR should be comprised between 2% and 7%. Budget should include the cost of human resources, equipment as well as the cost of data collection and processing. Additionally, it should contain adequate resources to ensure activities with communities as well as with administrations and stakeholders. Cost of the process should also include the cost of Mid Term Evaluation and Terminal Evaluation. Both will be outsourced to specialized companies / professionals. The cost per year of the process is detailed in the CS-FOR budget and will included all costs related to Planning, Learning and Knowledge Management as reported in table 6.

**Table 5: CS-FOR Planning, M&E, Learning and Knowledge management budget summary.**

Activity	#	Unit Cost	Total
Workshops	35	\$ 2,028.00	\$ 70,980.00
AWPB Consultation and Mainstreaming	28	\$ 1,500.00	\$ 42,000.00
M&E Data Collection and Processing	7	\$ 6,000.00	\$ 42,000.00
Community Participation in M&E	32	\$ 500.00	\$ 16,000.00
Georeferencing TA	8	\$ 12,893.75	\$ 103,150.00
Impact Assessment TA	2	\$ 21,850.00	\$ 43,700.00
Mid Term Evaluation	1	\$ 88,020.00	\$ 88,020.00
Mid term Household/Institutions Survey	1	\$ 60,000.00	\$ 50,000.00
Final Household/Institutions Survey	1	\$ 60,000.00	\$ 50,000.00
Terminal Evaluation	1	\$ 88,020.00	\$ 88,020.00
Communication Events	1	\$ 46,050.00	\$ 46,050.00

<sup>209</sup> Details of the process are available in the georeferencing strategy of the project as well as in the following section of the chapter

Activity	#	Unit Cost	Total
M&E Leader	87	\$ 1,300.00	\$ 113,100.00
M&E Officer	87	\$ 1,150.00	\$ 100,050.00
GIS Officer	87	\$ 1,150.00	\$ 100,050.00
KM/Communication Officer	96	\$ 1,150.00	\$ 110,400.00
Training (M&E Unit)	1	\$ 77,500.00	\$ 77,500.00
Miscellaneous	8	\$ 1,500.00	\$ 12,000.00
Logistic	85	\$ 950.00	\$ 80,750.00
<b>Total</b>			<b>\$ 1,253,770.00</b>

## V. Learning and Knowledge Management

32. Learning and knowledge management represents a paramount element of CS-FOR. The project will aim at transferring not only information and knowledge generated during execution of activities but also tools and skills that will support stakeholders in factoring in climate change into the decision making process (institutions and private sector) and into livelihood strategies (communities).

33. The project will ensure transfer of knowledge to stakeholders across the 3 identified components via trainings and knowledge sharing events well identified on a yearly bases in the AWPBs and described in each of the components. To this end stakeholders' involvement from planning to monitoring will be among the main objectives of the project. Each of the identified components will support the Learning and Knowledge Management process with specific trainings targeting both communities and institutions. Key objective of the learning and knowledge management process is to mainstream NRM policy framework and climate change related information to all the stakeholders involved in project's activities as well as to the public.

34. Additionally, the project foresees to organize at least 5 engagement workshops per year (1 national and 1 per district) to enhance stakeholders' participation and exchange of information between communities and institutions as well as to create opportunities for local and international media to understand the project and report on its achievements. Finally, it will also allow a more stringent and precise follow up of the Environmental and Social Safeguards and the FAO Policy on gender equality. The gender and social development specialist will regularly present in these workshops lessons learned and promising practices on gender mainstreaming and social inclusion resulting from the activities of the project (as well as external experiences) that will help the project team, implementing partners and other relevant stakeholders to improve their skills on gender mainstreaming and strengthening the implementation of the gender mainstreaming and social inclusion action plan of the project.

35. To ensure sound and effective management of learning and knowledge processes the project will hire a communication and KM specialist that will be assigned to the M&E unit of CS-FOR. The specialist will ensure – among the others - socialization of project's data and information, communication with the media, and coordination of the national engagement process.



## Chapter 7: Economic and Financial Analysis

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## Introduction

1. The goal of the Carbon Sequestration through Climate Investments in Forests and Pastures (CS-FOR) is to contribute to the development of a low carbon-emission and climate-resilient economy. The core intervention area of the project will comprise the four districts of Ak-Talaa, Toguz-Toro, Suzak and Uzgen, among the most vulnerable to the combined effects of direct and indirect impacts of climate change. The project will intervene in key hot spots of target areas with adapted forest and pasture investments aimed to clearly transform management of pasture and forest resources at the national and local levels to ecosystem-based sustainable NRM. The integrated approach used to facilitate the investment decisions will be inclusive to ensure participation and cohesion of the various stakeholders involved at local level, and will mainstream the need to enhance communities' climate change adaptation and responsiveness. While CS-FOR will focus on the selected target areas (see chapter 1), the interventions and the knowledge generated through the evidence-based approach will allow the country to scale-up the approach to additional priority districts, cycle (also depending on availability of financing), and will have a parallel country-wide and demand-driven outreach, in order to stimulate the economic incentives and ensure long term impact beyond the project's investment.

2. **Direct beneficiaries** of the project include 432,450 individuals (7% of the country's population) of which 246,497 are women in the Project Area. They will benefit from the significant increase of forest coverage and rangeland rehabilitation in hotspots with high risks of hazards, as well as the agribusinesses and their raw material suppliers participating in the supported value chains.

- (a) **Institutions at local level**, namely the stakeholders involved in the Community Landscape Management Groups (CLMGs) including State Forest Enterprises (Leskhozoes), National Parks, self-government bodies (Municipalities and their institutions, such as ayil okmutu and ayil kenesh), the Pasture Users' Unions, other natural resources users groups and all relevant stakeholders.
- (b) **Institutions at national level**, including the State Agency for Environmental Protection and Forestry (SAEPF), the Ministry of Agriculture, Food Industry and Melioration (MAFIM), the Ministry of Emergency Situations (MES), the State Agency for Local Self Government and Interethnic Relations (SALSGIR), the Climate Finance Center (CFC), other relevant ministries, research and educational institutions, non-governmental organizations (NGOs) and others.

3. The proposed project promotes an innovative approach to leveraging investment in ecosystem-based NRM through a set of instruments which take into account both economic incentives and environmental services. The project will support investment in afforestation/reforestation, forest enrichment and improved management, and pasture rehabilitation. The project will leverage the private sector's investments in ecosystem-based NRM by creating an enabling institutional environment for 'Climate-sensitive Value Chains' that will provide economic incentives to the required diversification and enhanced efficiency, productivity and competitiveness of existing economic activities in the highly degraded target areas. Innovative technologies and monitoring tools (including geospatial referencing and analysis) will be used to ensure an informed decision-making process and planning, as well as for objective assessments of the project's contributions to climate change mitigation and adaptation, and for knowledge sharing. Such tools will be designed in a way that helps the country and all stakeholders to progressively move towards evidence-based policy dialogue and institutionalization of public support.

4. The project's investments and activities will be executed through three components, in addition to Project Management:

- (a) Component 1. Evidence-based strengthening of NRM governance
- (b) Component 2. Green Investments for Forest and Pasture Rehabilitation
- (c) Component 3. Climate-sensitive Value Chains Development

5. **Investment Delivery approach.** The project will support carbon emission reduction and enhance carbon storage (carbon sinks) through various channels: the implementation of the Integrated NRM and climate-resilience plans (INRMCRP), including investment in afforestation, reforestation and forest restoration; preservation of pastures and prevention of further degradation; the potential progressive reduction of the number of livestock, representing a reduction in the carbon emissions; and the adoption of climate-sensitive technologies through competitive grants. The implementation of INRMCRPs and the positive results obtained by the technologies introduced in the agrifood sector will be amongst the main drivers for replication beyond the project. The country will thus shift from a carbon insensitive agrifood sector to a low-carbon emission economy.

6. Traditional financial models are a useful but not sufficient tool for measuring the Project's objective of mobilizing investments to accelerate the adoption of climate smart technologies that are conducive to carbon sequestration besides creating economic development and employment opportunities. The models presented are for demonstration purposes only and to be used as building blocks for the analysis. The analysis presents typical Afforestation / reforestation models household/farm and enterprise models that then compose the representative agricultural production and processing value chains.

### Project Benefits

7. In the core intervention districts, the CS-FOR will target the population living in the four intervention districts for an approximate population of about 520,000 individuals. Additionally, the project will involve various national institutions, 3 regional administrations, 4 districts, 50 municipalities that include 49 pasture user unions (PUU) and the civil society. Under the INRMCRP the project will contribute to ensuring capturing about 19.8 million tons of CO<sub>2</sub> equivalent via reforestation-afforestation of 6,000 ha of severely damaged forests, the rehabilitation of about 644,000 hectares of degraded pastures, and the improved management of about 56,349 ha of forests. It will also contribute to increase the resilience levels for about 70% of the population in the area. The estimated cost per ton of CO<sub>2</sub>eq (total investment cost/expected lifetime emission reductions) is around US\$ 2.5 per ton (or US\$1.5 per ton considering only the GCF grant). Sustainability and replicability of project activities will be ensured by the newly established sustainable NRM governance at the community level and by the establishment of an improved legal and regulatory environment.

8. As an additional and significant benefit, the interventions of the project will help to reduce risk and losses due to disasters – from both geo-physical and meteorological hazards. The ecosystem-based approach to forestry and pasture management is a cost-effective and locally sustainable way to diversify livelihoods, while also protecting poverty-reduction progress from recurring (and increasing from climate change) risk to high temperatures, drought, wildfire, and landslides. Reducing risk to these hazards is also in line with Kyrgyzstan's commitment in their National Disaster Risk Reduction Strategy and the commitments to the Sendai Framework for Action, while reducing risk of wildfire (a top contributor to CO<sub>2</sub> emissions) will protect communities, their land, and contribute to the national and global agenda (Paris Agreement) to limit global warming.

### Financial Analysis

9. The analysis focuses on a number of indicative economic activities identified during the project design and that would be potentially supported by the CS-FOR. Following the Project structure, particularly Component 2 and Component 3, two blocks with illustrative models were prepared to demonstrate the financial viability of potential investments:

- (a) **Grant-financed activities: Green investments for forest and rangeland rehabilitation (Component 2):**
  - (i) Afforestation, reforestation, forest enrichment
  - (ii) Pasture restoration
- (b) **Loan-financed activities: Climate-sensitive value chains (Component 3):**
  - (i) Fruit / nut orchard



- (ii) Nursery
- (iii) Conservation agriculture for cereals
- (iv) Greenhouse
- (v) Beekeeping
- (vi) Broiler
- (vii) Turkey
- (viii) Cold storage
- (ix) Solar dryer
- (x) Vacuum dryer

10. The **investment in forestry**, including afforestation / reforestation and forest restoration in the target area through the INRMCRPs present expectedly poor financial results (except for walnut plantations). This is associated to the low pace of growth in the local conditions of the adapted tree species selected as most suitable for the investment (see Chapter 4 and its Appendix for more details).

11. **Investment in improved rangeland** present better results, with positive financial returns, and with higher resistance in with-project scenario to climate stresses. Both categories of investment present substantial results under the economic analysis, which takes into account the valuation of carbon sequestration and the ecosystem benefits. In order to ensure financial viability of these investments, the project will provide significant level of concessionality.

12. **Investment in Climate-sensitive Value chains.** Concerning the investment under component 3, mostly focusing on improved competitiveness of the agricultural sector with associated increased employment and livelihoods diversification opportunities, all value chain models show substantially positive financial benefits and rate of return. These results are derived from the increased access to the required financing (loans) – which will be made available by the CS-FOR co-financing, coupled with training, demonstrations and advisory services, provided by the project.

13. Investments in Climate-sensitive value chains will be primarily driven concessional loans funded by the Russian-Kyrgyz Development Fund (RKDF), provided at 10% interest rate in Kyrgyz som (half of the prevailing market interest rate) since there is lack of access to affordable funding for medium scale economic actors. RKDF has a strong development mandate and is interested in channeling funds in the agriculture sector – one of the priority sectors – and to entrepreneurs in rural areas. The technical assistance under component 3 and the market incentives generated by the loans will progressively increase the access to higher segments of the market and increase overall access to financial products.

14. Within the CS-FOR project, climate investments for carbon sequestration through forest and rangeland rehabilitation (Component 2) will be implemented with highly concessional terms (on average, 80% of the costs will be covered by the GCF grant). On the other hand, investments into climate-sensitive value chains (Component 3) will be financed through loans from RKDF and supported by Project technical assistance (the project will deploy technical assistance for an amount equivalent to 15%-20% of the cost of the investments).

## Key Assumptions

15. The parameters for the models are based on information gathered during the design: interviews with farmers and entrepreneurs, information from the donor agencies operating in Kyrgyzstan and mission estimates. In particular, information on labor and input requirements for various operations, capital costs, prevailing wages, yields, farm gate and market prices of commodities, input and farm-to-market transport costs were collected. Conservative assumptions were made both for inputs and outputs, and take account of possible risks.

16. **Prices.** Prices for commodities/inputs reflect annual average farm-gate prices and those actually paid/received by the farmer/entrepreneur, and imply potential risks. A list of prices used in the analysis can be found in the spreadsheet “Prices” of the Integrated Financial Model document.

17. **Interest.** CS-FOR loans will be provided at an interest rate of 10% in a local currency (and 5% in USD) as general rule of the Russian-Kyrgyz Development Fund (RKDF) funded credit lines. The 10% interest rate was used in the analysis to model the financial viability of the agricultural loans within the Climate-sensitive value chains component.

18. **Lending Terms.** The length of the loans is five years. Loans are expected to be repaid in equal instalments over a five-year period. The loans were assumed to have a one-year grace period. Interest on the entire amount outstanding would be paid during the grace period.

19. **Adoption rate.** Aggregated benefit cash flows are calculated taking into account 80% of adoption rate<sup>210</sup>. This represents conservative benefits projections assuming that at least 80% of Project investments will succeed.

20. **Models Characteristics.** All models aim to identify incremental costs and revenues related to the introduction of new technologies or practices and associated to the investments carried out on the first year. However, due to the absence of some activities in the Project core area without project (WOP) values for some models (e.g., processing) are set at null. In most cases, the result of the investment translates into additional demand from primary producers and new permanent jobs: investments into climate-sensitive value chains may generate more than 3 300 full-time equivalent jobs at full capacity (Table 12).

21. **The impact of climate pattern.** Based on the findings described in Chapter 1 of the Feasibility study and reported in the project ATLAS (various sources), the main climate change related stressors to agriculture comprise generalized temperature and water stress recurrence. The consequences of these stressors are applied on both, the WOP and with project (WP) streams of incremental costs and benefits, for all models (except for greenhouse and agrifood processing models<sup>211</sup>).

22. The impact of climate pattern for pasture improvement was built based on considerations of the Third National Communication of the Kyrgyz Republic which concludes that “on the whole there is a slight increase in the yield of hayfields and pastures of all types”, but there is another stronger factor which mostly and adversely impacts the yield – the load on pastures. Both factors are taken into account for the analysis of the model for pasture rehabilitation.

23. For such models as afforestation / reforestation, forest enrichment, intensive poultry and beekeeping, the impact pattern was applied based on the assumption of having 20% decline in incremental benefits due to drought and late frosts impacts (once in every 4 years)

24. For models of fruit / nut orchards, nursery and conservation agriculture where climate resilient technologies (drip irrigation and no-till) are utilized, only 5% decline in WP benefits due to drought and late frosts impacts (once in every 4 years) is projected.

25. Comparative yields under Without and With project scenarios (including climate change influenced yields) are presented in Table 1.

**Table 1. Comparative yields of selected agricultural crops/products under Without and With project scenarios at maturity<sup>212</sup>**

Crop / Product	Unit	WoP yield	WP yield	Yield (WOP) under high climatic stresses years	Yield (WP) under high climatic stresses years
Wheat	t/ha	2.1	2.7	1.7	2.6
Corn	t/ha	6.0	7.8	4.8	7.5
Alfalfa	t/ha	2.5	3.3	2.0	3.1
Barley	t/ha	1.8	2.4	1.5	2.3
Honey	kg/bee-family	24.0	28.0	20.0	22.4
Meat sold for grazing livestock	kg/LU/year	15.8	22.2	13.5	21.1

<sup>210</sup> Aggregated benefits are reduced by 20%, while aggregated costs are the same.

<sup>211</sup> It is assumed that performance of these models can be affected by climate change impacts at a very limited scale since the activities are performed in closed environments.

<sup>212</sup> Source: WOP values are based on existing data and experts' opinions; WP values are estimated by authors based on experts' opinions and local experiences.

Crop / Product	Unit	WoP yield	WP yield	Yield (WOP) under high climatic stresses years	Yield (WP) under high climatic stresses years
Milk production for grazing livestock	<i>l/LU/day</i>	5.3	6.0	4.5	5.7
Cucumber (open field WOP vs greenhouse WP)	<i>t/ha</i>	40.0	150.0	20.0	150.0
Tomato (open field WOP vs greenhouse WP)	<i>t/ha</i>	40.0	120.0	20.0	40.0
Nursery	<i>'000 seedling/100m2</i>	1.0	2.5	0.8	2.4
<b>Orchards<sup>213</sup></b>					
Apple	<i>t/ha</i>	10.0	14.5	8.0	13.7
Apricot	<i>t/ha</i>	7.0	12.8	5.0	12.2
Cherry	<i>t/ha</i>	4.5	6.0	3.3	5.7
Almond	<i>t/ha</i>	0.5	1.9	0.4	1.8
Pistachio	<i>t/ha</i>	0.3	0.9	0.1	0.9
Walnut	<i>t/ha</i>	1.0	4.8	0.7	4.5

26. The technologies supported by the project are more suitable to the climate change context and produce higher benefits in the local context despite they have a higher cost.

27. **Gradual increases in capacity utilization** are applied to greenhouse, broiler and turkey management and agrifood processing models starting from first years of operation.

28. **Financial Discount Rate.** The Financial Discount Rate of 8% is used in this analysis to assess the viability and robustness of investments. The Discount Rate is used as complementary selection criterion to consider viability for the project's all investments with an IRR above the opportunity cost of capital, i.e. 8%<sup>214</sup>.

29. **Analysis period.** All models were analyzed in two time horizons: 10 years to show the financial prospects under market conditions, and 20 years, which coincides with the capitalization period of the investment for carbon sequestration. At aggregated level, the costs and benefits streams are presented for 10- and 20-year periods, while results of individual models are presented for a 10-year period. More details on production and financial parameters for the models are found in the Integrated Financial Model spreadsheet linked at the end of this chapter.

30. **Results of the Analysis.** The period of analysis is 10 and 20 years to account for the phasing and gestation period of the proposed interventions. Given the above benefit and cost streams, the FIRR is -1.9% for 10 years and is estimated at 20.3% for 20 years. The net present value (NPV) of the project's net benefit stream, discounted at 8%, is US\$ -12.5 million for 10 years and US\$ 55.4 million for 20 years. Detailed calculations of aggregated financial IRR and NPV are presented in the "Summary" spreadsheet of the Integrated Financial Model.

### Sensitivity analysis on financial performance

31. **Climate change impacts on economic activities.** All models take into account the effect of climate change in their baseline scenario and adjust the costs and benefits streams according to the expected effect of climate change under baseline conditions (i.e., from the Third Communication to UNFCCC (reference to Chapter 1 of the Feasibility Study). The EFA sensitivity analysis (more details are available in spreadsheet "Sensitivity" of the Integrated Financial Model) assessed the effect of variations in benefits and costs in the realization of benefits. In this analysis costs and benefits variations are considered due to climate change impacts which may affect the overall performance of the models, summarized in two channels:

<sup>213</sup> (i) Only for reference, as the model does not envisage improved practice, but the establishment of orchards on unproductive land; (ii) for WOP scenarios yields of fruit trees are based on household harvests, while yields of nut trees are based on wild harvests in forests.

<sup>214</sup> Weighted average rate of deposits of individuals in local currency in the beginning of 2018 (Source: National Bank of the Kyrgyz Republic)

- (a) **Decreasing yields / productivity:** capturing the impact of more intense droughts on yields of fruit and nut trees, pasture productivity and crop production
- (b) **Increasing costs:** including the need for replanting seedlings due to the influence of higher frequency of temperature and rainfall related stresses (or droughts), or the effect of landslides and mudslides on forests and rangeland infrastructures.

32. The detailed results are presented below in Table 2. An increase in total project costs by 60% and a fall in total project benefits by 40% would reduce the base IRR to 8.1% and 7.0% respectively for the 20-year period. In the case of 40% decline in aggregated benefits, NPV is estimated at US\$ -3.5 million.

**Table 2: Financial parameters in different scenarios due to climate change impacts**

Scenario	IRR (%)	NPV (million US\$)	IRR (%)	NPV (million US\$)
	10-year period		20-year period	
Base scenario	-1,9%	-12,5	20,3%	55,4
Increase of costs due climate change impacts by 60%	NA	-51,7	8,1%	0,3
Decrease of benefits due climate change impacts by 40%	NA	-33,6	7,0%	-3,5

### Impacts of macroeconomic developments on economic activities

33. In addition to climate change impacts, the analysis considered the possible effects of macroeconomic developments (e.g. high inflation, grow of capital cost, ad-hoc trade barriers) to the Project results. The effects of change in such parameters as a discount rate, interest rate (for RKDF loans) and adoption rate are presented below:

**Table 3: Financial parameters in different scenarios due to change of macroeconomic situation**

Scenario		IRR (%)	NPV (million US\$)	IRR (%)	NPV (million US\$)
		10-year period		20-year period	
DISCOUNT RATE					
Base case	8%	-1,9%	-12,5	20,3%	55,4
	12%	-1,9%	-13,9	20,3%	25,6
INTEREST RATE (RKDF LOANS)					
Base case	10%	-1,9%	-12,5	20,3%	55,4
	15%	-2,9%	-14,1	19,7%	53,9
	20%	-3,9%	-15,7	19,1%	52,3
ADOPTION RATE					
Base case	80%	-1,9%	-12,5	20,3%	55,4
	70%	-8,2%	-19,1	16,7%	37,0
	50%	NA	-32,3	8,1%	0,2

34. CS-FOR 20-year results are sensitive to the further reduction in adoption rate of benefits and increase in the discount rate: 50% adoption rate reduces base IRR to 8.1% and NPV to US\$ 0.2 million, while 12% discount rate provides NPV of US\$ 25.6 million. Increase in the interest rate of RKDF loans to from 10% to 20% slightly reduces base IRR to 19.1% and NPV US\$ 52.3 million.

35. Finally, the impact of **institutional and organizational aspects** may negatively affect the Project results through delay in implementation of activities, e.g., 2-year delay results in IRR of 12.2% and NPV of US\$ 22.1 million for 1 20-year horizon (Table 4).

**Table 4: Financial parameters in different scenarios due to delay in project activities**

Scenario	IRR (%)	NPV (million US\$)	IRR (%)	NPV (million US\$)
	10-year period		20-year period	
Base scenario	-1,9%	-12,5	20,3%	55,4
1 year delay	-14,2%	-27,3	15,7%	38,1
2 year delay	NA	-40,2	12,2%	22,1

## Summary of Models Overview

36. A detailed description of models is provided within the sections below.

37. **Summary.** The main result of the financial analysis provides: (i) mixed financial results for forestry-pasture investments (e.g., negative NPV for spruce forestry operations associated with long-term benefits and positive NPV with walnut related activities); (ii) a significant increase in gross and net returns from the most of climate-sensitive value chain models compared with and without-project situation illustrating the worthiness of the investments.

38. 10-year financial IRR and NPV for aggregated cash flows of Component 2 (forests and rangelands) investment are -20.9% and US\$ -13.3 million respectively, while economic IRR and NPV achieve 8.8% and US\$ 1.3 million USD in 20 years. This underlines weak attractiveness of forest and pasture interventions from a private sector view.

39. The indicative models show a positive impact on employment. Hired labour details for each of the models are described below. Favourable cash flows from the possible programme financed investments indicated that the improvements in incomes at the farm/ enterprise levels would be sufficient to ensure uptake of the proposed activities. Also, a beneficiary's contribution is likely to translate into a high degree of economic attractiveness. Detailed business proposals would be required for each value chain investment in the "Jobs" spreadsheet of the Integrated Financial Model document.

## Integrated forestry – pasture rehabilitation

40. Component 2 constitutes the bulk of investment for carbon sequestration via investment in restoration and improvement of forests and pastures in the target area through the INRMCRP developed based on ecosystem and climate-smart agriculture approaches.

41. Pastures and forests, as keystones of the supply chain, should be managed responsibly in compliance with environmental, social, and economically sustainable good practices and with a specific attention to climate change impacts, thus making sure that local communities' needs, rights and responsibilities are well factored in the ecosystem management equation of target areas to ensure improved natural resource management.

42. Allegedly, current prevailing practices of reforestation/afforestation, and the restoration of pasture and forest ecosystems have not been leading to the desired result. Overexploitation of forests is due to illegal felling and fuel-wood harvesting, and of pastures on both forest and municipal land is due to the unsustainable number of livestock heads, poor incentive schemes leading to inappropriate management practices, and insufficient capacity of the leskhozoes (forest institutions) to secure survival of planted species, control resources, and to effectively involve communities in the process. For example, some species (pistachio and almond) are eaten up by cattle, and some trampled (walnut). In this regard, there is an urgent need to revise the approach to management of natural resources as well as in shifting from an economy of pure exploitation - with high dependency from natural stocks and low level of climate resilience - to a greener one resulting from sustainable management of available resources (natural, financial and human) supported by processes of productivity enhancement via increased quality and efficiency. It is therefore necessary to involve private sector and local communities in this process to stimulate approaches

and management/control practices so to shift incentives from pure exploitation of the commons to sustainable management of community's resources.

#### a. Forestry

43. The proposed investments aim at ensuring carbon sequestration by collaborative and more effective afforestation/reforestation on degraded forest areas. The investment are also beneficial to mitigate forest conversion and degradation, and to start replenishing the forest cover. The investment will impact on ecosystems and produce benefits in the form of alternative sources of income to reduce the over-dependence on livestock and its related heavy toll on natural balance of sustainable landscapes.

44. The INRMCRP will include investments in following activities: (i) afforestation/reforestation and (ii) forest enrichment.

45. **Afforestation/Reforestation.** The models include investment in prevailing and adapted and tree species, including spruce, juniper, poplar, walnut, pistachio and other forests (mixed). The implementation will require interaction between leskhoz, private sector and local communities in the process of creating new approaches and management/control practices to shift incentives from pure exploitation of the commons to sustainable management of community's resources based on the INRMCRP. Based on the current tenure of pasture and forests, leskhozes will concentrate on supervision and monitoring duties, leaving the forest-related economic functions to communities and private sector.

46. The Project will support the identification of opportunities for forest investment according to three prevalent models that take into account the altitude, dominant tree species, forest legal status, custodianship and the main partners, as follows. The investment models will include: **(a)** Leskhoz investments in high-altitude spruce and juniper forests; **(b)** collaborative forest management through long-term leasing of walnut and pistachio forests on state forest fund (SFF) lands from leskhozes; **(c)** individuals investing in tree-planting on municipal under-developed state land fund (SLF) lands, with long-term leases tendered from aiyl okmotus (AO) (poplar and mixed broadleaved trees).

47. Based on the participatory INRMCRP planning, areas for forestry activities will be identified where private sector and local communities will be willing to invest. In this case, the Project will provide co-financing (up to 65% of total costs) – this is justified by the fact that these species are not as productive as commercial orchards and the main benefit is the carbon sequestration potential. On the other side, the Project will cover up to 90% of total costs of investment in areas with low attractiveness for the private sector, but with high vulnerability to the impacts of climate change. The investment will be phased as illustrated in Table 5.

**Table 5. Afforestation / reforestation / Forest Enrichment phased investment**

TOTAL TARGET	Area, ha	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8
<b>Forest resources:</b>									
<b>Afforestation/Reforestation</b>			5%	20%	25%	25%	25%		
Spruce	650	-	33	130	163	163	163	-	-
Juniper	400	-	20	80	100	100	100	-	-
Poplar	190	-	10	38	48	48	48	-	-
Walnut	1,000	-	50	200	250	250	250	-	-
Pistachio	200	-	10	40	50	50	50	-	-
Mixed forests	770	-	39	154	193	193	193	-	-
<b>TOTAL</b>	<b>3,210</b>	-	<b>161</b>	<b>642</b>	<b>803</b>	<b>803</b>	<b>803</b>	-	-
<b>Forest resources: Forest enrichment</b>									
Spruce	1,400	-	70	280	350	350	350	-	-
Juniper	230	-	12	46	58	58	58	-	-
Walnut	1,370	-	69	274	343	343	343	-	-
<b>TOTAL</b>	<b>3,000</b>	-	<b>150</b>	<b>600</b>	<b>750</b>	<b>750</b>	<b>750</b>	-	-
<b>TOTAL FORESTRY</b>	<b>6,210</b>	-	<b>311</b>	<b>1,242</b>	<b>1,553</b>	<b>1,553</b>	<b>1,553</b>	-	-



48. The involvement of private sector and local communities in forestry activities will be ensured through the above incentives and linking their co-financing with both types of lands. Key financial and social results of forestry activities are presented in the Table 6.

**Table 6. Summary of financial results for forestry activities for 10-year period.**

	Adoption area	Investments per ha	Total investment	GCF	Beneficiaries	IRR	NPV	Number of beneficiaries
Unit	ha	US\$/ha	Million US\$	Million US\$	Million US\$	%	US\$/ha	Households
<b>Forest resources: Afforestation/Reforestation</b>								
Walnut	1 000	2 603	2,6	1,7	0,9	19%	900	1000
Pistachio	200	2 214	0,4	0,3	0,2	1%	-254	200
Mixed forests	770	1 502	1,2	1,0	0,1	-12%	-121	0
Poplar	190	2 421	0,5	0,4	0,0	-19%	-162	0
Spruce	650	2 262	1,5	1,3	0,1	-46%	-213	0
Juniper	400	3 170	1,3	1,1	0,1	NA	-301	0
<b>Total</b>	<b>3 210</b>		<b>7,4</b>	<b>5,9</b>	<b>1,5</b>			<b>1 200</b>
<b>Forest resources: Forest enrichment</b>								
Walnut	1 370	682	0,9	0,6	0,3	21%	304	1370
Juniper	230	1 010	0,2	0,2	0,0	NA	-92	0
Spruce	1 400	1 098	1,5	1,4	0,2	NA	-99	0
<b>Total</b>	<b>3 000</b>		<b>2,7</b>	<b>2,2</b>	<b>0,5</b>			<b>1 370</b>
<b>TOTAL FORESTRY</b>	<b>6 210</b>		<b>10,1</b>	<b>8,1</b>	<b>2,0</b>			<b>2 570</b>

49. About 3,000 ha of deforested or severely degraded forest lands inside and outside existing SFF lands is planned to be afforested/reforested and 3,000 ha of degraded forests are projected to be restored (enriched) with the total investment needs estimated at US\$10.1 million. In this analysis the investment costs include all total costs incl. labor, seedlings, and fencing, which is removable and reusable every 5 years.

50. Given the pressure of livestock and climate change impacts on forests, the focus will be on ensuring high survival rate of planned interventions through channeling investments to (i) fencing plantations to secure survival of planted seedlings and seeds; (ii) use of climate resilient and locally adapted tree species; (iii) shift towards producing and planting larger amounts of closed-root seedlings; (iv) regular weeding and soil loosening, and on poor soils adding organic fertilizer/mulch; and (v) limited and efficient irrigation without incremental investments or increase in the water use per hectare above the current practices (without Project).

51. **The impact of climate pattern** due to droughts (once in every a 4-year period) has been applied for the streams of benefits of all forestry models. In addition, we have calculated the potential increase in costs due to drought impacts. For example, if the drought hits in the first year 161 ha forest plantations, in year two the incremental cost of seedling replanting is estimated at US\$85,100 (Table 7 below shows the different additional costs related to the impact of droughts or high temperatures with low rainfall stresses during critical years of plantation).

**Table 7. Additional cost due to drought / climate stresses on A/R area**

US\$		Y2	Y3	Y4	Y5	Y6	Y7	Y8
If a drought occurs in the A/R area in one of these years (USD):	Y2	0,00	85 056					
	Y3	0,00		348 729				
	Y4	0,00			459 301			
	Y5	0,00				467 807		
	Y6	0,00					467 807	
	Y7	0,00						42 528
<b>Total cost</b>	<b>1,871,227</b>		85 056	348 729	459 301	467 807	467 807	42 528



52. The opportunity cost of grazing was incorporated into financial models as the WOP scenario since forestry activities are planned to be implemented mostly on degraded SFF lands currently used for grazing.

53. Negative IRR and NPV for spruce, juniper and mixed forests are explained by long rotations of these species (80-120 years) and existing moratorium for harvesting high value species like juniper and walnut. Similarly, assuming the rotation period of poplar at 20 years, financial results are negative. Benefits from walnut and pistachio are associated exclusively to their nuts without timber and fuelwood harvesting. In overall, financial results for forestry activities are poor justifying the high level of concessionality.

54. Given the existing practices of leasing relatively small-scale forest plots to each household and Project inclusiveness, the number of beneficiaries based on 1-ha lease plots is estimated at 2,570 households. The Project will further analyze and design its interventions into forestry operations taking into account interests and scale of the private sector and local community's interventions in forestry. Best practices both from international and local experiences will be utilized to design relevant PPP approaches with analysis of risks and opportunities.

#### b. Rangeland management

55. The livestock/pasture ecosystem is trapped in a vicious cycle of productivity collapse: overgrazing and degradation cause lower levels of available forage, which reduces animal productivity, causing households to own more animals to compensate for productivity declines, which in turn increases grazing pressure and leads to more degradation. The pasture degradation process is connected to a net loss of carbon stored in plants and soil. Only a drastic change in grazing management practices can reverse the degradation trend and increase carbon sequestration.

56. Degraded pastures present a rapid rehabilitation under improved grazing management due to the promotion of integrated ecosystem management of local pastures on both SLF and SFF lands. The main investment comprise:

- a. **promotion of rotational grazing (pasture rotation)** as the first and most important activity for achieving higher pasture production, and therefore greater carbon sequestration
- b. **planting of trees as shelterbelt** on municipal pastures and Leskhoz land (for the generation of ecosystem services at landscape level) to provide shade and reduce wind velocity, which improve both livestock and forage production, and contribute overall to resilience and climate change adaptation
- c. **broadcasting seed of desirable perennial plants** that can accelerate pasture Improvement; supporting the establishment of seed-multiplication fields in Rayons, manage seed harvest and cleaning, and testing methods of broadcasting seed with or without light cultivation
- d. **inter-breeding with better-performing livestock breeds** that can increase production per animal and allow smaller herds to achieve equivalent household livestock production (fewer livestock will ease the grazing pressure on pastures); culling and sale of low-productive or barren cows.

57. Application of the above practices will allow to achieve following benefits: (i) a greater amount of standing vegetation, increasing Carbon stocks and protecting the soil surface, (ii) ground cover by vegetation increases rainwater infiltration and reduces erosion, (iii) a shift in species composition of the vegetation towards greater plant diversity, including palatable perennial species, (iv) more forage of better quality available for grazing, (v) higher grazing capacity, (vi) bigger animals, including a faster growth rate of young calves, foals, lambs and kids, (vii) higher milk yield, up to 100% increase in peak milk production and 20% in average, (viii) healthier animals ascribed in part to better nutrition, (ix) internal parasite loads drop, partly due to long rest periods interrupting stages of the life cycle of internal parasites outside the host, (x) more cows conceive and deliver a calf every year, (xi) a rising population of productive cows due to higher birth rate and lower mortality, (xii) higher income for village households.

58. For the analysis, household and pasture user union (PUU) models were designed:

59. **Household livestock production model.** The model describes the interrelationships between households (livestock owners) and Pasture Committee (a governing body of PUU) from the household perspective. In the analysis an average household keeps 4 livestock units (2 cattle, 1 horse and 5 sheep). It is projected that by investing in improved breeds and providing financial contribution to the PUU for rehabilitation of pastures, household will gain benefits in terms of increased meat and milk productivity due to improved pasture conditions from year two of the pasture investments. In addition, improved pastures will be more resilient to climate change impacts and thus contribute less to decrease in meat and milk productivity due to, for example, droughts.

60. The expected annual NPV of net benefits in financial terms is expected at US\$ 33 per household. This amount of benefits will not make households richer but most importantly may provide incentives to improved pasture and livestock management.

61. **PUU model.** The PUU model aggregates benefits and costs of the household model and additionally introduces a set of following investments: (i) excavator for road infrastructure improvement, (ii) bridges, (iii) water points, (iv) equipment and medicine for veterinary clinics, (v) shade shelters, (vi) wind breaks, (vii) seed increase production field, (viii) a set of additional equipment to PUU and (ix) technical support for integrated and improved pasture management. In addition, the PUU model incorporates co-management of leskhoz grazing areas in accordance with recently adopted Regulation No. 192 approved on April 10, 2018 titled "Regulation on use and control of SFF lands". The total investment per PUU is estimated at US\$107 thousand, 75% of which would be financed by the Project and 25% co-financed by PUU members (households).

62. Livestock productivity gains and associated benefits from rehabilitated pastures – indicated in Table 8 – were proposed based on previous experiences of livestock development projects in the country (e.g., the IFAD-funded "Livestock and Market Development Project" or the more recent "Access to Markets Programme") and experts' opinions. In addition to that, livestock benefits in terms of meat and milk productivity has been linked to the impact of climate pattern (temperature and water stress recurrence) on pasture productivity under WOP and WP scenarios.

**Table 8. Benefits under WOP and WP scenarios**

Technical parameters	Unit	WOP	WP
Share of meat to sell	%	20%	25%
Meat productivity gain in pastures	%	5%	15%
Share of milk to sell	%	30%	35%
Milk productivity gain in pastures	%	5%	20%

63. In order to evaluate the possibility of decreasing livestock unit number in the Project core area which is one of the key threats for pasture rehabilitation, following three scenarios have been tested:

**Table 9. Change of livestock unit number and share of bulls and cows from Year 1 to Year 20**

Scenarios	WOP	WP
Scenario 1 – no herd control	Livestock herd number increases by 10% (8.3 thousand livestock units (LU)), share of bulls and cows is equal to 50% each within cattle herd	Constant livestock herd number (7.5 thousand LU) and increasing share of cows from 50% to 70% within cattle herd
Scenario 2 – herd control	Livestock herd number increases by 10% (8.3 thousand LU), share of bulls and cows is equal to 50% each within cattle herd	Decreasing livestock herd number by 10% (6.8 thousand LU) and increasing share of cows from 50% to 70% within cattle herd
Scenario 3 – smart herd control	Livestock herd number increases by 10% (8.3 thousand LU), share of bulls and cows is equal to 50% each within cattle herd	Decreasing livestock herd number by 20% (6.0 thousand LU) and increasing share of cows from 50% to 70% within cattle herd

64. Within a 10-year period, three scenarios show positive and almost similar financial results implying the financial feasibility of decreasing livestock herd number (Table 10), thus reducing pressure on pasture.

**Table 10. Financial results of pasture restoration activities for 10-year period**

Scenarios	IRR (%)	NPV (thousand US\$)
Scenario 1	46.3%	227.3
Scenario 2	45.8%	214.7
Scenario 3	48.3%	216.6

65. The potential number of beneficiaries from pasture rehabilitation investments is expected to reach all 105,000 households who live in the Project core area and are involved in livestock grazing on rangeland in SLF and SFF.

## Climate-sensitive Value Chain Models

66. The Component 3 will support the development of the selected value chains' participants towards higher efficiency and competitiveness of the marketed product. The main selection criteria for the value chains will include low carbon footprint, market potential, financial viability and raw material sourcing area within the core project area (current or planned). Examples, inter alia, include tree nuts (walnuts, almonds, pistachio), dried fruits (dried apricot, dried plum), and fruit orchards (cherries, apples).

67. By implementing innovative climate-smart agricultural practices, value addition must be achieved using resource-efficient technologies such as solar dryers, drip irrigation, solar pumps, no-till technique, etc. The Project will also support livestock operations that aim to reduce pressure on pastures and improve their health (e.g., apiculture, rational feeding practices). Necessary investment and technical assistance to ensure compliant slaughter of animals will be supported by other ongoing projects in the domain including the recently approved IFAD-funded "Access to Markets Project".

68. The role of Climate-sensitive value chain investments is to strengthen the sustainability of the investment in carbon sequestration carried out for forest and pasture rehabilitation by creating economic opportunities with limited risk, in order to decrease pressure on and degradation of natural resources in the project intervention areas, thus contributing also to the enhanced resilience. More specifically, investments will focus on decreasing the pressure on pastures by promoting income diversification and more productive livestock generating higher returns. Small and medium enterprises supported by the technical assistance will have access to the credit lines of Russian-Kyrgyz Development Fund (RKDF). The loans will be provided at 5% p.a. in USD and at 10% in local currency, for a term of about 3-5 years, to existing enterprises representing eligible value chains. The financial IRR for aggregated Climate-sensitive value chain investments for 20 years is estimated at 28.1% exceeding the expected rate of return of RKDF loans (10%). The financial results for 10 years are as follows: NPV is estimated at US\$ 0.7 million, while IRR is 9.0%.

69. In order to reduce forest and pasture degradation and to change the behavior of keeping an alarming number of unproductive animals as a source of cash income for safety net, communities need a parallel path towards increased efficiency and productivity of the livestock production system along with a progressive continuous creation of alternative (to livestock) income opportunities able to offer at least the same incentives for economic return (e.g., orchards and high value non-timber forest products). This shift will not only reduce the pressure on resources (increased carbon sink and enhanced ecosystem benefits) but also reduce emissions (as more productive animals raised using good practices emit less).

70. These models shall be regarded as a potential set of project investments and this set can be flexibly adapted within the project implementation.

71. In a 10-year horizon all Climate-sensitive value chain models provide positive financial results (IRR ranges from 21% to 39%) – in the range of similar economic activities and investment operations in the region, implying the financial attractiveness for investments. The summary of the possible production / processing models representative of the Climate-sensitive value chain component activities is presented in Table 11. The table summarizes the hypothetical cases of individual enterprises, but may not represent the final portfolio of investment.

72. **Fruit and nut orchards.** For the purpose of the analysis, an area of about 3,100 ha of fruit and nut orchards was considered as potential investment with project support, for a total amount estimated at US\$ 11.2 million. In this analysis the investment cost includes seedlings, fencing and drip irrigation. The opportunity cost of grazing was incorporated into financial models since low productive lands can be used that are currently used for grazing. The rotation period of fruit and nut orchards is well above 10 years, i.e. the analyzed period. Despite the short period of analysis, fruit / nut orchards models show very positive results: IRR ranges from 22% to 39%. The number of beneficiaries based on 1-ha was estimated at 3100 households assuming small scale (1-ha) orchards.

73. Investments in **nursery** establishment aim at producing high quality seedlings in the Project core area both for commercial and restoration purposes. The investment package will mainly include young seedlings, drip irrigation, fence and fertilizers. It is planned to support 100 business cases with the establishment of relatively small-scale nurseries (100 m<sup>2</sup>). IRR at 28% signals about financial attractiveness of such business under the condition of access to markets. 100 beneficiaries are expected to benefit from these activities.

74. **Solar and vacuum dryers** are aimed at processing of fruits and nuts which production will be strongly supported under component 2 (as investment in Afforestation/reforestation, forest enrichment of nut trees) and component 3 (as commercial investment). While solar dryers are oriented towards small-sale households, vacuum dryers (or electric dryers) will be utilized by at least medium-scale entrepreneurs. The investments include dryer facilities, technological equipment and technical assistance. Models show attractive financial results. Solar dryer investments will target 100 beneficiaries, while vacuum dryer investments would focus on at least 10 entrepreneurs with 265 small-scale suppliers.

75. **Cold Storage** model builds on the interrelationships between above non-timber forest products (NTFP) and other producers and end consumers. The financial viability of the model will be ensured with the access to markets and shops in big cities through their own distribution chain. The total investment of the Cold storage facility would be around US\$64.0 thousand, including in a Cold storage facility construction, technological and laboratory equipment purchase and technical assistance. This would allow the enterprise to annually store 80 tons of agriculture products. The financial modelling with conservative assumptions shows that cold storage is financially attractive (IRR of 35%). 10 cold storage facilities plan to source from 2 260 small-scale suppliers annually.

76. **Conservation agriculture.** The Project may facilitate crop production using the conservation agriculture practices (no-till, crop rotation, soil cover) which reduce operational costs (incl. fuel consumption) and strengthen the crop resilience to drought impacts which were applied for WOP and WP scenarios. To enhance the promotion of conservation agriculture practices, technical assistance and access to finance will be ensured. The tentative set of investments includes tractor, hydropneumatic subsoiler, direct seeder and technical assistance for a total amount of US\$60.8 thousand. Financial results are positive with IRR at 23%. The number of potential adopters is estimated at 400. Each of these adopters is assumed to manage at least 10-ha agricultural land.

77. **Two greenhouse models for vegetable production** have been analyzed (1000 m<sup>2</sup> and 300 m<sup>2</sup>), mostly for adoption in Uzgen and Suzak districts. The investment package will mainly include greenhouse construction, energy efficient heater and drip irrigation equipment. Greenhouse itself is regarded as climate resilient technology. The IRR for 300 m<sup>2</sup> greenhouse (28%) is higher than for 1000 m<sup>2</sup> greenhouse (21%) due to use of family labor (0 value in the financial analysis). The number of beneficiaries is expected to achieve 70 households or entrepreneurs.

78. **Beekeeping, broiler and turkey raising** models show economic incentives to the required diversification from a predominantly ruminant composition, and enhanced efficiency, productivity and competitiveness of existing economic activities in order to reduce livestock pressure on pastures by providing alternative sources of income generation for local households and entrepreneurs. Investments with such activities are associated with facility construction, equipment, purchase of animals and technical assistance. All models show high IRRs ranging from 23% to 36%. The total number of direct beneficiaries is accounted for 220 households/entrepreneurs.

**Table 11. Summary of financial results for Climate-sensitive value chain investments for 10-year period.**

	Adoption	Investments per unit of adoption	Total investments	Loan (RKDF)	Beneficiaries	TA (GCF)	IRR	NPV	Number of entrepreneurs
<i>Unit</i>	<i>Area, ha</i>	<i>US\$/ha</i>	<i>'000 US\$</i>	<i>'000 US\$</i>	<i>'000 US\$</i>	<i>'000 US\$</i>	<i>%</i>	<i>US\$/ha</i>	<i>Entrepreneurs</i>
Fruit and nut orchards									
Apple	300	6 462	1 939	1 318	291	330	39%	21 403	300
Cherry	100	6 462	646	439	97	110	34%	14 140	100
Apricot	100	6 119	612	416	92	104	34%	12 839	100
Walnut	2 000	3 352	6 703	4 558	1 005	1 140	32%	11 150	2 000
Almond	300	2 337	701	477	105	119	25%	5 812	300
Pistachio	300	1 918	575	391	86	98	22%	5 844	300
<i>Unit</i>	<i># of business</i>	<i>USD/business</i>	<i>'000 US\$</i>	<i>'000 US\$</i>	<i>'000US\$</i>	<i>'000 US\$</i>	<i>%</i>	<i>US\$/business</i>	<i>Entrepreneurs</i>
Beekeeping (60 bee-families)	20	17 485	350	238	59	52	36%	6 100	20
Cold storage facility	10	64 040	640	435	109	96	35%	39 279	10
Vacuum dryer	5	85 077	851	579	145	128	30%	36 818	10
Greenhouse (300 m <sup>2</sup> )	50	14 673	714	485	121	107	28%	4 184	50
Nursery	100	655	65	45	11	10	28%	898	100
Turkey	50	5 603	299	203	51	45	24%	935	50
Conservation agriculture	30	60 757	1 823	1 239	310	273	23%	26 903	300
Beekeeping (30 bee-families)	50	9 750	488	332	83	73	23%	2 166	50
Broiler	100	20 410	1 790	1 217	304	268	23%	1 784	100
Greenhouse (1000 m <sup>2</sup> )	20	44 558	866	589	147	130	21%	8 146	20
Solar dryer	100	2 234	223	152	38	34	21%	408	100
<b>TOTAL SUSTAINABLE CHAINS</b>			<b>19 286</b>	<b>13 114</b>	<b>3 279</b>	<b>2 893</b>			<b>3 910</b>

## Economic Analysis

79. The CS-FOR is based on the economic analysis of development projects, i.e. to aggregate benefits from specific models of households taking up pre-defined packages of interventions as compared to project costs.

80. Considering that presented models as representative, it is estimated that in terms of hardware investments (credit and grants) the Project would reach all 105,000 rural households in the core area through pasture rehabilitation activities; 9,200 beneficiaries, including 2,800 small-scale suppliers, will also benefit from green investments in forestry and value chain activities. In terms of labor it is expected that Project investments in Climate-sensitive value chains will generate more than 3,300 full-time equivalent jobs at full capacity of the provided investments (Table 12).

**Table 12. Full-time jobs created at full capacity (number of incremental jobs\*)**

Activities	Jobs per ha	Adoption area, ha	Total jobs
<b>Fruit/Nut orchards</b>			
Apple	1,1	300	340
Apricot	0,8	100	85
Cherry	0,9	100	88
Almond	0,6	300	194
Pistachio	0,6	300	172
Walnut	1,1	2 000	2159
Activities	Jobs per case	Adoption, case	Total jobs
Honey (60 bee-families)	1,0	20	20
Honey (30 bee-families)	0,4	50	21
Greenhouse (1000 m2)	1,0	20	20
Greenhouse (300 m2)	0,5	50	25
Nursery	0,2	100	17
Broiler	0,9	100	92
Turkey	0,7	50	33
Solar dryer	0,3	100	25
Vacuum dryer	2,7	10	27
Cold storage facility	3,0	10	30
<b>TOTAL</b>			<b>3 346</b>

\* full time equivalent hired labour

81. The economic discount rate of 4.75% based on the current refinancing rate of the National Bank of the Kyrgyz Republic is used in this analysis.

82. The shadow exchange rate (SER) has been calculated at 1 USD = 73.4 KGS. Overall conversion factors for inputs and outputs vary between 0.70 and 1.19. An average conversion factor of 0.89 has been applied when converting financial prices into economic prices. The derivation and a summary of economic prices are presented in the conversion factor ("CF") spreadsheet of the Integrated Financial Model.

83. **Benefit Stream.** The analysis attempts to identify quantifiable benefits that relate directly to the activities undertaken following implementation of the components, or that can be attributed to the project's implementation.

84. The illustrative models described above have been used for the calculation of the overall benefit stream on the basis of economic prices.

85. In calculating the overall benefits from the models, the following was taken into account:

- Incremental net benefit was calculated for all models.
- Impacts of climate change have been incorporated to the calculation of benefit stream of relevant models.

- c. Gradual capacity utilization was applied for greenhouse, broiler, turkey and processing models
- d. A 75%-80% success rate was applied to the pasture rehabilitation model and 90% survival rate for afforestation and reforestation activities.
- e. The benefits are calculated for the period of 20 years.
- f. No financing flows have been undertaken in the calculations as they are either already reflected in the Project costs (the CS-FOR financing and beneficiary's contribution for the investment costs) or represent transfer payments (taxes).

86. **Cost Stream.** The incremental costs in economic prices have been calculated by the removal of price contingencies and taxes/duties. There are recurrent costs (i.e. operational costs) after the CS-FOR completion. The Project costs not directly associated with investments have been added to the cost stream.

87. **Valuation of CO<sub>2</sub> equivalent sequestration potential.** Under the Integrated NRM and climate-resilience plans the project will contribute to ensuring capturing about 19.8 million tonnes of CO<sub>2</sub> equivalent via reforestation-afforestation of 6,000 ha of severely damaged forests, the rehabilitation of about 644,000 hectares of degraded pastures, and the improved management of about 56,000 ha of forests. More details are available in the Carbon Accounting Section of the Feasibility Study. The analysis considered the shadow price of US\$ 40/tCO<sub>2</sub> as the social value of carbon (as estimated by the World Bank, 2017).<sup>215</sup>

88. **Economic benefit from ecosystem services.** The incremental economic benefits for the project are from the improvement and restoration of ecosystem services in the rehabilitated forest and pasture areas with the Project support. These ecosystem services represent public goods, which are not captured by markets or by the Gross Domestic Product (GDP) and do not monetarily contribute to farmers.<sup>216</sup>

89. A regional report prepared by The Economics of Land Degradation (ELD)<sup>217</sup> Initiative to value land degradation looked beyond the market value for crops; the ELD also looked at ecosystem services benefits including from carbon storage and sequestration to nutrient provision and cycling. The country case study looked at three pilot sites with summer pastures, based on high levels of land degradation together with local dependence on land and land-based ecosystems for subsistence and income. Of the three study sites, the one geographically closest to the CS-FOR target areas is Kyzyl Ungur municipality, which is located in the south. Kyzyl Ungur municipality is characterized by a mix of forest and pastures, in silvo-pastoral systems which serve as the primary source of income, particularly the walnut forests. Out of the indicated ecosystem services in the study, the only relevant ones for our analysis are non-timber products and drinking water (Table 13) since the other services such as pasture and forest carbon storage and sequestration, fodder, walnuts were already integrated in financial and economic analysis. For other ecosystem services like erosion control, pollination, water flow regulation and habitat provision, no economic values were found in the country. Therefore, they were not considered in the economic analysis.

**Table 13. Monetary values for ecosystem services (US\$/ha/year)**

Ecosystem Service	Value
Non-timber products	6.5
Drinking water	0.3
Total (US\$/ha/year)	6.8

90. **Results of the Analysis.** The period of analysis is 10 and 20 years to account for the phasing and gestation period of the proposed interventions. Given the above benefit and cost streams, the base case economic rate of return (ERR) is estimated at 68.0% and 71.3% for 10 and 20 years respectively. The base case net present value of the project's net benefit stream in economic terms, discounted at 4.75%, is US\$ 113.5 million for 10 years and US\$ 353.7 million for 20 years.

<sup>215</sup> World Bank, 2017. Guidance note on shadow price of carbon in economic analysis.

<sup>216</sup> See Appendix to this Chapter: Value of forest and pasture-related ecosystem services in Kyrgyzstan.

<sup>217</sup> Sabyrbekov, R., & Abdiev, A. (2016). Economics of Land Degradation (ELD) Initiative: Kyrgyzstan Case Study. Evaluating ecosystem services of highland pastures. Report for the ELD Initiative from the Consultative International Group on Agricultural Research (CGIAR): Amman, Jordan



91. **Sensitivity Analysis.** Sensitivity analysis assessed the effect of variations in benefits and costs. The analysis is undertaken to show the potential climate change impacts on revenues and costs. An example is that costs increase due to higher climate related stresses, for example additional replanting costs in reforestation and afforestation activities due to temperature and water stresses. In terms of benefits, late frosts and droughts adversely impact the yield of fruit and nut trees, while pasture productivity and crop yields may suffer from frequent droughts. This combined with low adoption of climate smart practices and technologies may have adverse impacts on Project's interventions (Table 14).

92. For a 20-year period, a fall in total project benefits by 30% and an increase in total project costs by the same proportion would reduce the base economic NPV to US\$ 170.7 million and US\$ 291.5 million respectively.. Economic IRR and NPV will decline to 32.8% and US\$ 41.2 million due to 30% fall in benefits, 30% increase in costs will reduce base IRR and NPV to 35.4% and US\$ 73.2 million and within a 10-year period. Detailed calculations of aggregated economic IRR and NPV are presented in the "Summary" spreadsheet of the Integrated Economic Model.

**Table 14: Sensitivity Analysis to costs and benefits changes due to climate change impacts**

Scenario	Economic IRR (%)	Economic NPV (million US\$)	Economic IRR (%)	Economic NPV (million US\$)
	10-year period		20-year period	
Base scenario	68,0%	113,5	71,3%	353,7
Increase of costs due climate change impacts by 20%	54,5%	100,1	59,2%	333,0
Increase of costs due climate change impacts by 30%	35,4%	73,2	43,2%	291,5
Decrease of benefits due climate change impacts by 20%	51,7%	77,4	56,8%	262,2
Decrease of benefits due climate change impacts by 30%	32,8%	41,2	41,2%	170,7

93. In addition, sensitivity analysis was conducted for the price of CO<sub>2</sub>, sequestration potential of pasture soils in terms of CO<sub>2</sub>eq value per ha and pasture area (Table 15). The fluctuations in capacity of pasture soils to sequester carbon shall be regarded as a function to possible climate change impacts, particularly temperature and water stresses.

**Table 15: Economic parameters in different scenarios due to change in CO<sub>2</sub>eq price and carbon sequestration potential by rangeland**

Scenario		IRR (%)	Economic NPV (million US\$)	IRR (%)	Economic NPV (million US\$)
		10-year period		20-year period	
Carbon sequestration in rangeland , tCO2eq					
Base case	1,25	68,0%	113,5	71,3%	353,7
	0,3	27,1%	34,7	37,8%	180,4
	0,8	49,7%	76,1	55,4%	271,4
CO2 price, USD/tCO2					
Base case	40	68,0%	113,5	71,3%	353,7
	20	42,1%	61,5	49,1%	238,4
	80	112,4%	217,6	113,3%	584,3
Ha of rehabilitated rangelands with potential to sequester carbon, thousand ha					
Base case	644	68,0%	113,5	71,3%	353,7
	500	56,8%	90,3	61,4%	302,6
	300	40.3%	58.2	47.7%	231.9

94. For a 10-year horizon, an extreme fall in carbon sequestration potential by rangelands to 0.3 tCO<sub>2</sub>eq/ha provides economic IRR of 27.1% and economic NPV of US\$ 34.7 million, while decline of CO<sub>2</sub> price to US\$ 20 leads to economic NPV of US\$ 61.5 million. In a case if only 500 thousand ha is rehabilitated, i.e. is able to sequester carbon, economic IRR will decline to 56.8% and NPV reduces to US\$ 90.3 million.

95. For a 20-year period, an extreme fall in carbon sequestration value to 0.3 tCO<sub>2</sub>e/ha leads to the reduction of economic IRR to 37.8% and NPV to US\$ 180.4 million. Increase in CO<sub>2</sub> price from US\$ 40 to US\$ 80 per ton almost doubles IRR, while the net present value of economic benefits almost reaches US\$ 600 million. Only 300 thousand ha of rehabilitated pastures will bring down economic IRR and NPV to 47.7% and US\$ 231.9 million respectively.

96. In addition to climate change impacts, the analysis considered the possible effects of macroeconomic developments to the Project economic results. The effects of change in such parameters as a discount rate, interest rate (for RKDF loans) and adoption rate are presented below:

**Table 16: Financial parameters in different scenarios due to change of macroeconomic situation**

Scenario		Economic IRR (%)	Economic NPV (million US\$)	Economic IRR (%)	Economic NPV (million US\$)
		10-year period		20-year period	
DISCOUNT RATE					
Base case	4,8%	68,0%	113,5	71,3%	353,7
	10%	68,0%	74,4	71,3%	189,7
INTEREST RATE (RKDF LOANS)					
Base case	10%	68,0%	113,5	71,3%	353,7
	20%	64,1%	110,5	67,8%	350,7
ADOPTION RATE					
Base case	80%	68,0%	113,5	71,3%	353,7
	70%	58,0%	90,9	62,3%	296,5
	50%	35,4%	45,7	43,2%	182,2

97. CS-FOR 20-year results are sensitive to the further reduction in adoption rate of benefits and increase in the discount rate: 50% adoption rate and 10% discount rate decrease economic NPV to US\$ 182.2 million and US\$ 189.7 million respectively. Increase in the interest rate of RKDF loans to 20% reduces base economic NPV to US\$ 350.7 million. 10-year results change similarly.

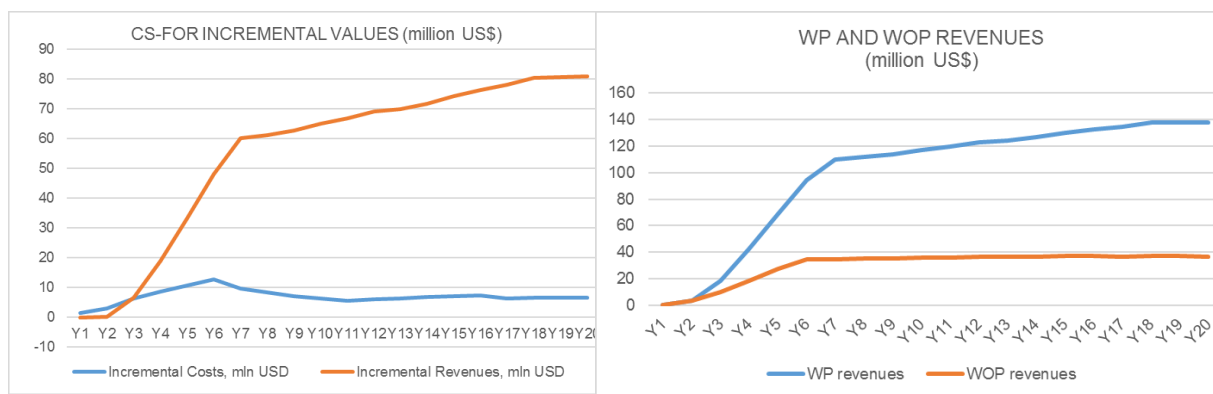
98. Finally, the impact of **institutional and organizational aspects** may negatively affect the Project results through delay in implementation of activities, e.g., 2-year delay results in economic IRR of 21.8% and NPV of US\$ 37.8 million for 10-year period (Table 17).

**Table 17: Financial parameters in different scenarios due to delay in project activities**

Scenario	IRR (%)	NPV (million US\$)	IRR (%)	NPV (million US\$)
	10-year period		20-year period	
Base scenario	68,0%	113,5	71,3%	353,7
1 year delay	39,2%	74,2	47,4%	311,0
2 year delay	21,8%	37,8	36,0%	270,3

99. CS-FOR will provide substantially high and positive economic net incremental revenues starting from Year 4. Compared to the WOP scenario, it is able to accelerate revenues by 2 times and almost triple revenues starting from Year 5 (Chart 1).

**Chart 1. CS-FOR economic revenues**



## Economic and financial analysis spreadsheet

Financial analysis spreadsheets available in Annex 3

Economic analysis spreadsheets available in Annex 3

## Appendix 1 to Chapter 7- Value of forest and pasture-related ecosystem services in Kyrgyzstan

Mitigation and adaptation to climate change are CS-FOR benefits, to be achieved through ecosystem-based transformation, including through nature-based solutions. In particular, Component 2 targets biophysical aspects of ecosystem enhancement/melioration through investment in restoration and improvement of forests and pastures. Regenerating forests increases vegetative cover and biodiversity, and reduces land degradation; improving pastures also increases vegetative cover and slows down the process of land degradation. These actions contribute to enhancing/stabilizing ecosystem services and their functions, which in turn increases the resilience of ecosystems to the impacts of climate change. In addition to carbon sequestration and carbon storage benefits, and primary production functions (such as food and fibre), other ecosystem services that benefit from rehabilitation/restoration of degraded forest and pasture lands include soil fertility, water flow regulation and habitat and forage provision for animals including bees.

The monetary costs of the degradation of ecosystem services is high and is not accounted for in farmers' perceptions of "value", which can affect management choices; in agroforestry for example, it was found that a major challenge impeding agroforestry adoption in Kyrgyzstan was farmers' perception that engaging in agroforestry would "lead to the loss of valuable arable land and deprive the farmers of other subsistence agricultural opportunities" (Djanibekov *et al.*, 2016<sup>218</sup>). Insufficient fodder production in the mountainous areas of Kyrgyzstan and Tajikistan resulted in grazing in forests, contributing to forest degradation; between 2001 and 2009, the monetary value of deforestation was estimated at about 0.32 billion USD (*Ibid.*<sup>219</sup>).

A study undertaken in 2016 in Central Asia estimated that for the period between 2001-2009, the annual cost of land degradation in the region due to land use and cover change was USD 5.85 billion - most of which was due primarily to rangeland degradation (USD 4.6 billion), then desertification (USD 0.8 billion), deforestation (USD 0.3 billion), and finally, abandonment of croplands (USD 0.1 billion) (Mirzabaev *et al.*, 2016<sup>220</sup>).

Specifically for Kyrgyzstan, for the period between 2001-2009, costs of land degradation through land use and cover change only (i.e. without costs of land degradation from lower soil and land productivity within the same land use), were estimated at USD 0.55 billion (annual cost of land degradation); USD 822 (annual cost of land degradation per capita); USD 5 billion (GDP in 2009); and 11% (as share of 2009 GDP). Cost of action *versus* inaction were also calculated, in USD billion: 4 (annual total economic value for cost of land degradation (2009)); 2 (annual provisional cost of land degradation); 6 (cost of action (6 years)); 6 (cost of action (30 years)); 22 (cost of inaction (6 years)); and 29 (cost of inaction (30 years)) (*Ibid.*)<sup>221</sup>.

A regional report<sup>222</sup> prepared by The Economics of Land Degradation (ELD) Initiative to value land degradation looked beyond the market value for crops (normally the metric used as an indicator for land value); the ELD also looked at ecosystem services benefits including from carbon storage and sequestration to nutrient provision and cycling. Country case studies provided supporting information for the Central Asia Regional Report, including for Kyrgyzstan<sup>223</sup>. This is the first study that assessed the value of pasture ecosystems with cost-benefit analysis. The country case study looked at three pilot sites with summer pastures, based on high levels of land degradation together with local dependence on land and land-based ecosystems for subsistence and income. The pilot sites were: Chon Aksuu watershed, Kyzyl Unkur municipality and Son Kol Lake highland pastures. Cost-benefit analyses were performed on three scenarios: baseline, and two alternatives: i) higher pasture yields through improved

<sup>218</sup> Djanibekov, U.; Villamor, G.; Dzhakypbekova, K.; Chamberlain, J.; Xu, J. Adoption of Sustainable Land Uses in Post-Soviet Central Asia: The Case for Agroforestry. Sustainability 2016, 8(10), <http://www.mdpi.com/2071-1050/8/10/1030>.

<sup>219</sup> *Ibid.*

<sup>220</sup> Mirzabaev, A., Goedecke, J., Dubovyk, O., Djanibekov, U., Quang, B.L., & Aw-Hassan, A. (2016). Economics of land degradation in Central Asia. In Nkonya, E. et al (Eds), Economics of Land Degradation and improvement – a global assessment for sustainable development. [https://link.springer.com/content/pdf/10.1007%2F978-3-319-19168-3\\_10.pdf](https://link.springer.com/content/pdf/10.1007%2F978-3-319-19168-3_10.pdf)

<sup>221</sup> *Ibid.*

<sup>222</sup> Quillérou, E., Thomas, R.J., Guchgeldiyev, O., Ettling, S., Etter, H., & Stewart, N. (2016). Economics of Land Degradation (ELD) Initiative: Broadening options for improved economic sustainability in Central Asia. Synthesis report. Report for the ELD Initiative from the Dryland Systems Program of CGIAR c/o ICARDA, Amman, Jordan. Available from [www.eld-initiative.org](http://www.eld-initiative.org)

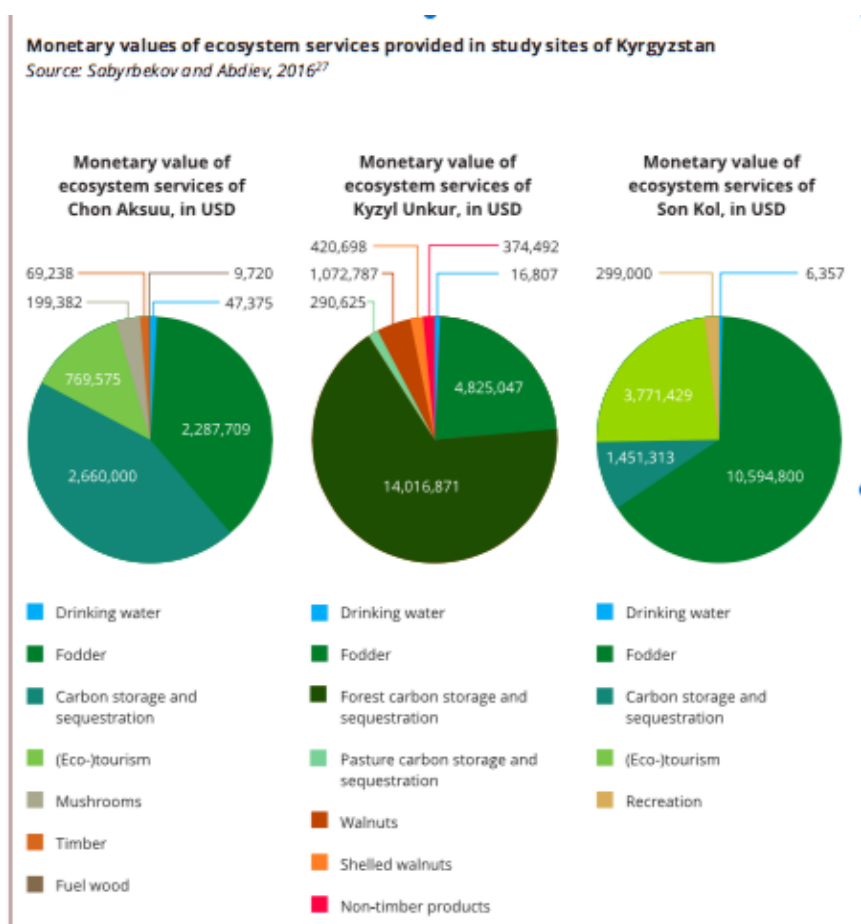
<sup>223</sup> Sabyrbekov, R., & Abdiev, A. (2016). Economics of Land Degradation (ELD) Initiative: Kyrgyzstan Case Study. Evaluating ecosystem services of highland pastures. Report for the ELD Initiative from the Consultative International Group on Agricultural Research (CGIAR): Amman, Jordan.

pasture management, with favourable weather, and ii) moderate pasture yields through improved pasture management alongside unfavourable weather, both scenarios inclusive of carbon storage and sequestration.

Yields in the baseline scenario decrease by 2.5%/yr. Conversely, in the first alternative, yields increased by 5%/yr., and in the second alternative yields increased by 2.5%/yr. Of the three study sites, the one geographically closest to the CS-FOR target areas is Kyzyl Unkur municipality, which is located in the south. Kyzyl Unkur municipality is characterized by a mix of forest and pastures, in silvo-pastoral systems which serve as the primary source of income, particularly the walnut forests.

In the first scenario, the cost-benefit analysis shows a net present value of USD 4.1 million at a 10% discount rate. In the second scenario, the cost benefit analysis shows a net present value of USD 1.6 million at a 10% discount rate. The introduction of tourism could see up to USD 1.1 million after 10 years – however, tourism in the pilot area is lacking, due to poor access to potential sites.

Below is a screen shot taken from the ELD Central Asia Regional Report, based on the Kyrgyzstan case study, illustrating the monetary values of ecosystem services for the three pilot sites (including, amongst others, carbon storage and sequestration; water flow regulation and habitat provision are not included).



Very recently, the Intergovernmental Platform on Ecosystem Services and Biodiversity made public the summary for policy makers of the regional assessment report on biodiversity and ecosystem services for Europe and Central Asia<sup>224</sup> (including Western, Central and Eastern Europe, and the five Central Asian countries). The full report is currently not available will be, shortly. The summary policy makers states that: “In Europe and Central Asia, which has an area of 31 million square kilometers, the regulation of freshwater quality has a median value of \$1,965 per hectare per year. Other important

<sup>224</sup> IPBES (2018): Summary for policymakers of the regional assessment report on biodiversity and ecosystem services for Europe and Central Asia of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. M. Fischer, M. Rounsevell, A. Torre-Marín, A. Mader, A. Church, M. Elbakidze, V. Elias, T. Hahn, P.A. Harrison, J. Hauck, B. Martín-López, I. Ring, C. Sandström, I. Sousa Pinto, P. Visconti, N.E. Zimmermann and M. Christie (eds.). IPBES secretariat, Bonn, Germany. [ ] pages.

regulating services include habitat maintenance (\$765 per hectare per year); the regulation of climate (\$464 per hectare per year); and the regulation of air quality (\$289 per hectare per year).

In 2016, IPBES also released the Summary for policymakers of the assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production<sup>225</sup>. In this summary, it was stated that: Given that pollinator-dependent crops rely on animal pollination to varying degrees, it is estimated that 5-8 per cent of current global crop production, with an annual market value of \$235 billion-\$577 billion (in 2015, United States dollars<sup>226</sup>) worldwide, is directly attributable to animal pollination”.

While not specifically mentioning Kyrgyzstan, in 2007, the publication *Climate change and terrestrial carbon sequestration in Central Asia*<sup>227</sup> found that “Aggregate losses to the national economies across the Aral Sea Basin caused by high groundwater level and secondary salinization are estimated at USD 1750 million annually, approximately equal to 32% of the market value of potential agricultural crop produce”.

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<sup>225</sup> IPBES (2016): Summary for policymakers of the assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production. S.G. Potts, V. L. Imperatriz-Fonseca, H. T. Ngo, J. C. Biesmeijer, T. D. Breeze, L. V. Dicks, L. A. Garibaldi, R. Hill, J. Settele, A. J. Vanbergen, M. A. Aizen, S. A. Cunningham, C. Eardley, B. M. Freitas, N. Gallai, P. G. Kevan, A. Kovács-Hostyánszki, P. K. Kwapong, J. Li, X. Li, D. J. Martins, G. Nates-Parra, J. S. Pettis, R. Rader, and B. F. Viana (eds.). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 36 pages.

<sup>226</sup> Value adjusted to 2015 United States dollars taking into account inflation only.

<sup>227</sup> R. Lal; M. Suleimenov; B.A. Stewart; D.O Hansen; P. Doraiswamy. 2007. *Climate change and terrestrial carbon sequestration in Central Asia*. Taylor & Francis Group, London, UK



## Appendix 2 to Chapter 7 – Market assessments of selected value chains

### Estimated margins along the beef value chain

Case of Naryn Province, mixed production system (6 months – intensive feeding, 3 – grazing).  
Prices based on industry data (April 2018).

**TABLE 1- DAILY FEEDING NEEDS OF ONE HEAD OF CATTLE FROM THE AGE OF 1 TO 20 MONTHS (LW 520 KG)**

Feed	Daily need, kg	Duration in days	Total needs, kg	Price, KGS/kg	Sub-totals, KGS
Milk	2	60	120	16,0	1.920
Fodder lime	0,0401	540	22	50,0	1.083
Salt	0,06	540	32	8,0	259
Grass meal/chopped hay	1	60	540	10,0	5.400
Grazing on pastures, DM intake	3	240	720	0,3	216
Wild grasses hay, DM	1,5	300	450	32,0	14.400
Grains	4	150	600	10,0	6.000
Number of days		600			29.278

**TABLE 2– PRODUCTION COSTS OF GROWING ONE HEAD OF CATTLE (LW 520 KG)**

Costing item	Qty	Price, KGS/unit	Sub-totals, KGS
Feeding	1		29.278
Vet services, vaccinations	8	50	400
Health control, lab tests	2	20	40
Drugs (anti-acaricide treatment of pastures), times	1	300	300
Transport of animal, trip	1	600	600
Labour <sup>228</sup> , months	6	4.832	28.992
<b>Total:</b>			<b>59.610</b>

Some farmers reach up to 65-70 thousand KGS of production costs.

**TABLE 3– BEEF PROCUREMENT PRICES**

Buyer	Price, KGS/kg LW	Price, KGS/kg
Middleman (animal trader)	115	250
Slaughterhouse (corporate business)	120	260

Source: real prices as of 20 April 2018.

**TABLE 4– ESTIMATED GROSS MARGIN OF FARMER**

COP of farmer, 1 head of cattle	59.610
LW of marketed cattle	520
COP of farmer, KGS/1 kg (LW)	114,6
Average trader price, KGS/1 kg LW	115
Gross margin of farmer, KGS/1 kg LW	0,4
Gross margin of farmer, KGS/head	190

<sup>228</sup> Based on minimum salary scale (4,832 KGS/month)

**TABLE 5– DISTRIBUTION OF THE MARGIN ALONG THE CHAIN (1 CARCASS OF 540 KG LW, DRESSING COEF. 46%, MEAT OUTPUT 240 KG OF BEEF)**

	Cost of Prod.	Trader	Primary processor	Retail
Price, KGS/kg	248	250	260	290
Margin, KGS/kg	2	10	30	

Therefore, while farmers profit is close to zero (190 KGS per head with 60 thousand KGS of production costs), animal traders' profit is 2400 KGS/carcass.

**Table 6-Current area under orchards and greenhouses in the project area**

Province	District	Fruit orchards			Greenhouses, ha
		Specialization	Total, ha	Drip irrigation, ha	
Osh			430	320 (74%)	20
Jalal-Abad	Suzak		25	25 (100%)	0
Jalal-Abad	Toguz-Toro	Apple	180	160 (89%)	20
	Uzgen		203	135 (67%)	1
Naryn	Ak-Taala	Apple, plum, cherry, black current			

Source: district branches of MAFIM

**Table 7-Assessment of lost market opportunities for nuts and dried fruits on nearby markets**

Market outlet	Wholesale price, Kyrgyzstan, US\$/kg	Export quantity, kg	Wholesale price, destination country, US\$/kg	Opportunity cost, US\$
<b>Uzbekistan</b>				
Walnut, in shell	0,5	550.000	2,8	1.265.000
Dried fruits, in bulk	3,5	2.700.000	12	22.950.000
<b>Tajikistan</b>				
Walnut, in shell	0,6	20.000	2,8	44.000
Dried fruits, in bulk	1,4	16.000.000	12	169.600.000
<b>Total:</b>				<b>193.859.000</b>

Source: interviews at Massy and Batkent markets, [Gateway](#) information portal, RDF study and WB forestry project data.

### **Economic effect of direct sales of animals to slaughterhouse**

Nation-wise, the need for holding paddocks has been assessed as follows: Naryn – 4 districts (Ak-Taala – 1); Talas – 2; Suzak – 1; Uzgen – 1; and Issyk-Kul – 2. Toguz-Toro has insufficient stock of animals. Initial investment cost is about 100.000 USD and some 10 ha of nearby pastures and land are required for feed provision and organization of paddock. Meat processors (slaughterhouses) will be interested in taking loans to accompany such investment provided the project is able to build the capacity at community level, in particular with regards to local administration and support to mediator network development.

The proposed scheme consists in aggregation of live animals at the commune level with the organized procurement directly by a slaughterhouse. Animals are aggregated and kept in a holding paddock of approximate capacity of 500 heads of sheep and serve to justify logistical costs for processors (large quantities), flatten supply seasonality (year-round supply of animals) and ensure all biosecurity protocols are complied with.

The project will foster direct linkages and relations of trust between herders and processors with four main objectives:

1. Increased animal offtake at community level;
2. Improved animal productivity driven by quality-based pricing and relations of trust;
3. Increased of herders' margins by eliminating the risks of "losses" due to mistreatment by traders (e.g. reduced weight or fattiness category);
4. Increased income of local authorities thanks to locally collected income tax from formal business transactions.

**TABLE 8 – ESTIMATED ECONOMIC EFFECT OF SALES OF CATTLE (II FATTINESS CATEGORY)**

	WOP	WP
Estimated LW, kg	430	440
Average procurement price, KGS/kg LW	115	120
Revenue from sales of cattle	49.450	52.800

As shown above, traders usually "reduce" the weight of live animals by at least 10 kg. With current prices, this is about 1150 KGS of "lost" income. If adding incremental revenue from direct sales (WP), farmer's gross revenue goes up to 4.500 KGS per head.

Assumed, one community sells a batch of 10,000 kg (about 50 heads) and mediator's fee is of 3 KGS/kg, local administration will leverage an incremental income of 3.000 KGS (10 percent tax on profit for legal entities).



## Chapter 8: Project cost and financing

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## A. Introduction

1. This section describes the assumptions underlying the derivation of Project costs, estimated Project costs and financing plan. The Project costs are based on April 2018 prices. Some of the key parameters are presented below.
2. Project Period. The proposed project would be financed over an eight-year period.
3. Exchange Rate. The Base Exchange rate for this analysis has been set at KGS 68.02 to US\$1 as an official exchange rate prevailing in January-April 2018 (Source: National Bank of the Kyrgyz Republic). The Project costs are presented in US\$.

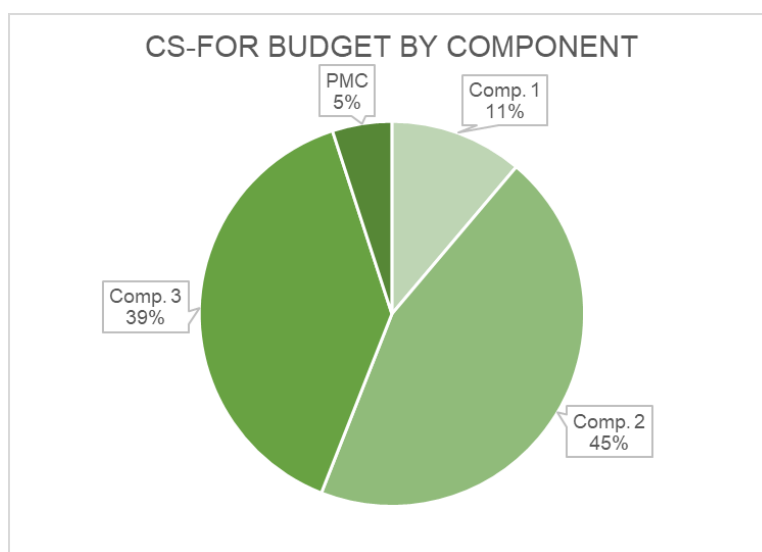
## B. Project Costs

4. The total investment and incremental recurrent Project costs, including physical and price contingencies, are estimated at about US\$ 49.99 million. The project management cost makes about 5% of the total Project costs. The summary and detailed cost tables (spreadsheet) are presented in Appendix to this Chapter. Table 1 and Figure 1 present the breakdown of costs by component.

**Table 1: Breakdown of costs by component**

CS-FOR Budget	GCF Financing	Total project cost
		TOTAL
	%	USD
Comp. 1. Evidence-based strengthening of NRM governance	93%	5,581,937
Comp. 2. Green investments for forest and pasture rehabilitation	91%	22,397,168
Comp. 3. Climate-sensitive value chains development	15%	19,512,965
Comp. 4. Project Management Component	60%	2,497,930
TOTAL CS-FOR PROJECT		49,990,000

**Figure 1: Project budget by component**



## C. Financing

5. The project will be funded by a GCF grant for the amount of US\$ 29.99 million, or 60.0% of the total CS-FOR costs. The GCF grant will finance: 93% of the Evidence-based strengthening of NRM governance Component (US\$5.2 million), 91% of the Green investments for forest and pasture rehabilitation Component (US\$20.3 million), 15% of the Climate-sensitive value chains development Component (US\$3.0 million); and 60% of the Project Management Component (US\$1.5 million).

6. RKDF co-financing amounts to US\$15.0 million, or 30% of the total CS-FOR costs. The co-financing will cover 77% of the Climate-sensitive value chains development Component (US\$ 15.0 million).

7. SAEPF, ARIS and MAFIM will provide an in-kind contribution of US\$ 0.3 million each (or about 0.7% of the total Project costs by each entity), covering 40% of the project management component.

8. The project beneficiaries are expected to cover part of the project investment. Their contribution is estimated at US\$ 3.6 million, or 7% of the total Project costs. Their contribution will cover: 9% of the Green investments for forest and pasture rehabilitation Component (US\$2.1 million), and 8% of the Climate-sensitive value chains development Component (US\$1.5 million).

9. Tables 2 and 3 below provide summaries by the Project components by financier and Financing parameters and Figure 2 provides a graphic representation of financiers' contributions to the project components and their share by components.

**Table 2: Financing Plan by Components (US\$)**

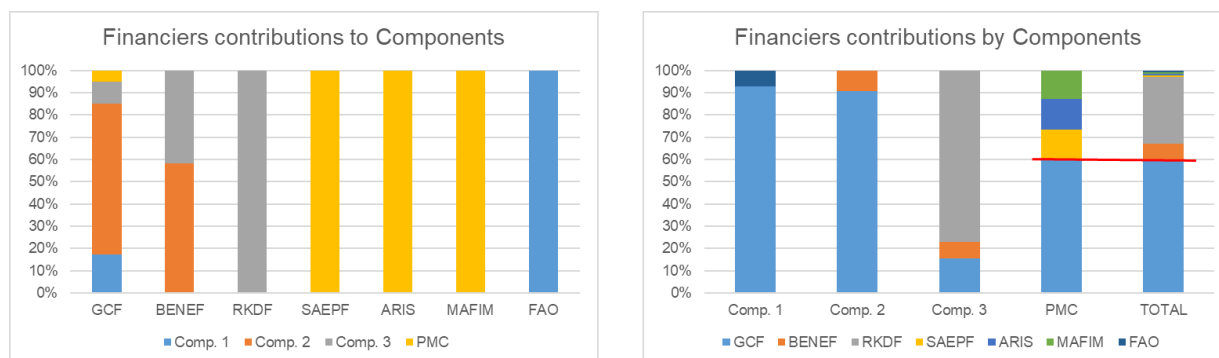
M USD	%	GCF	Benef	RKDF	SAEPF	ARIS	MAFIM	FAO	TOTAL
Component 1.	11%	5.18	-	-	-	-	-	0.40	5.58
Component 2.	45%	20.30	2.10	-	-	-	-	-	22.40
Component 3.	39%	3.01	1.50	15.00	-	-	-	-	19.51
Component 4.	5%	1.50	-	-	0.34	0.34	0.32	-	2.50
<b>TOTAL</b>		<b>29.99</b>	<b>3.60</b>	<b>15.00</b>	<b>0.34</b>	<b>0.34</b>	<b>0.32</b>	<b>0.40</b>	<b>49.99</b>



**Table 3: Project financing parameters**

Financing Parameters	%
GCF grant share on Total Project Cost	60%
RKDF Co-financing on Total Project Cost	30%
Govt contribution on Total Project Cost	2%
Beneficiaries contribution on Total Project Cost	7%
GCF grant contribution to Component 1	93%
GCF grant contribution to Component 2	91%
GCF grant contribution to Component 3	15%
GCF grant contribution to Component 4	60%

**Figure 2: Financiers contributions by component**



## D. Project budget spreadsheets

CS-FOR project budget spreadsheet available in the Annex 3.b



## Chapter 9 – Carbon Estimations

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## I. Executive summary

1. This document is reflecting a carbon *ex-ante estimation* of the project interventions with a direct carbon sequestration potential. The different types of interventions within the project implementation are targeting a total area of 709,174 ha.
2. Other components relating to the legislation, the institutional coordination and cooperation mechanisms, and to creating partnerships between the public sector forest guardians (leskhozes, aiyl okmotus, and rayon administrations), the private sector and communities are primordial to ensure the achievement and success of the on-site activities and the development of NRM practices.

**Table 1. Project Structure - With Project/Without Project- all GHG are expressed in ton of CO<sub>2</sub> eq (tCO<sub>2</sub> eq). Positive result means source while negative result means sink.**

PROJECT STRUCTURE		Activity	With Project Scenario	BAU Scenario <sup>229</sup>
The whole CS-FOR approach	Component 2: Green investments for forest and pasture rehabilitation	Afforestation	3,440 hectares <sup>230</sup> of degraded land converted into forest land could capture -36,480 tCO <sub>2</sub> -e per year. -729,608 tCO <sub>2</sub> -e sequestered for the entire duration of the analysis (20 years) <sup>231</sup> .	3,440 hectares of degraded land would remain degraded.
		Grassland management	646,275 ha of existing grassland system are subject to the promotion of better grassland management practices, and could capture -746,168 tCO <sub>2</sub> -e per year. -14,923,368 tCO <sub>2</sub> -e sequestered over 20 years.	Grassland would remain at the same state of degradation and no improved practices will be developed. <sup>232</sup>
		Livestock management	849,226 head of cattle and other ruminant would be subject to improved herd management, improved feeding and improved manure management and could avoid -7,477 tCO <sub>2</sub> -e per year. -149,545 tCO <sub>2</sub> -e avoided over 20 years.	No management practices will be improved and the number of livestock will increase by 20 percent.
	Component 3: Climate-sensitive value chain development	Perennial cropland	3,100 ha of perennial crops would be developed on degraded land and could capture -31,519 tCO <sub>2</sub> -e per year. -630,373 tCO <sub>2</sub> -e sequestered over 20 years.	3,100 ha of degraded land.
		Agricultural inputs	About 1009 tonnes of nitrogen, 496 tonnes of phosphorus and 248 tonnes of potassium will be	No fertilizers consumption

<sup>229</sup> Without the project scenario or baseline/ business-as-usual scenario, which corresponds to a description of expected conditions in the project boundaries in the absence of project activities.

<sup>230</sup> Corresponding to 3,000 ha under Afforestation/Reforestation and 3,000 ha under forest enrichment (where the enrichment would correspond to an equivalent of about 440 ha under Afforestation/Reforestation).

<sup>231</sup> The 20 years period (accounting duration) is in line with the idea that even after the point at which a new equilibrium in land use and practices is reached at the end of the implementation phase, further changes may occur as the result of the preceding interventions. For instance, for the soil C estimates, the default values are based on default references for soil organic C (SOC) stocks for mineral soils to a depth of 30 cm (Table 2.3 of IPCC 2006). When SOC changes over time (land use change or management change), it is assumed a default time period for transition between an equilibrium of 20 years. These values are used either in IPCC 1996 or 2006 Guidelines and are gathered from a large compilation of observations and long-term monitoring.

<sup>232</sup> The increase in the number of livestock means more pressure on grassland and probably means more degradation, thus the hypothesis is conservative on the level of degradation of grassland without the project implementation.

PROJECT STRUCTURE		Activity	With Project Scenario	BAU Scenario <sup>229</sup>
			<p>annually applied (orchards and conservation agriculture). About 0.9 tonne per year of herbicides will be applied in conservation agriculture.</p> <p>This leads to GHG emissions at an annual rate of 8,048 tCO<sub>2</sub>-e or -160,958 tCO<sub>2</sub>-e for the entire accounting duration of the analysis.</p>	
		<b>Forest management</b>	<p>Sustainable forest management activities on 56,359 ha of forest land could capture -173,971 tCO<sub>2</sub>-e per year.</p> <p>-3,479,418 tCO<sub>2</sub>-e sequestered over 20 years.</p>	Level of degradation remains similar to the initial state.
<b>Overall carbon balance</b>		<p><b>Integrated Natural Resources Management activities (including livestock) benefiting about 709,074 hectares with a potential of mitigation of -987,567 tCO<sub>2</sub>-e per year.</b></p> <p><b>Thus for the entire duration of the project -19,751,354 tCO<sub>2</sub>-e are captured or avoided.</b></p>		

## II. Methodology

### a. FAO EX-ACT tool

3. EX-ACT was developed using the IPCC 2006 Guidelines for National Greenhouse Gas Inventories (IPCC, 2006) and augmented with the wetlands supplement (IPCC, 2014). These equip EX-ACT with recognized default values for emission factors and carbon values – the so-called Tier 1 level of precision.

4. EX-ACT is also based on Chapter 8 of the Fourth Assessment Report from Working Group III of the IPCC (Smith et al., 2007) to account for more specific mitigation options not covered in IPCC 2006. Other required coefficients are taken from published reviews or international databases. For instance, greenhouse gas (GHG) emission values for farm operations, transportation of inputs, and irrigation systems implementation are derived from Lal (2004). Electricity emission factors are based on data from the International Energy Agency (2013).

5. Each tier of analysis represents a level of methodological complexity that is used to estimate GHG emissions, according to the definitions in IPCC 2006. Tier 1 methods rely on default values and entail less complexity. Tier 2 methods require region-specific carbon stock values and emission coefficients, demanding higher data requirements but offering higher precision. Whilst users may use the Tier 1 default values provided, EX-ACT encourages users to substitute these values for more location-specific Tier 2 data to improve the accuracy of the analysis.

6. Typically, GHG carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) emissions are reported in units of carbon dioxide equivalent (CO<sub>2</sub>-e). Gases are converted to CO<sub>2</sub>-e by multiplying by their respective Global Warming Potential (GWP)<sup>233</sup>. The emission factors listed in this document have been converted to CO<sub>2</sub>-e automatically by EX-ACT using the GWP listed in the table below.

Gas	100-year GWP
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<sup>233</sup> Global Warming Potentials: The Global Warming Potentials (GWP) used for presentation of CH<sub>4</sub> and N<sub>2</sub>O in terms of CO<sub>2</sub> equivalent are 25 and 298, respectively. For HFCs, PFCs, and SF<sub>6</sub> the GWP values for a 100 year time horizon have been used. (Source of Global Warming Potentials: Climate Change 1995: The Science of Climate Change, table 4, p. 22, Intergovernmental Panel on Climate Change, 1996).

CO <sub>2</sub>	1
CH <sub>4</sub>	25
N <sub>2</sub> O	298

Source: Intergovernmental Panel on Climate Change (IPCC), fourth Assessment Report (ar4), 2007. See the footnote for further explanation.

### III. GLEAM-i

7. The ex-ante assessment of the project's impact on animal production and GHG emissions is based on the tool GLEAM-i (or Global Livestock Environmental Assessment Model – interactive) developed by FAO.

8. GLEAM-i is a user-friendly and interactive version of the FAO GLEAM, a biophysical model of livestock supply chains that calculates animal herd dynamics, feed rations, production and GHG emissions with Tier 2 methodology (IPCC, 2006), with a life cycle approach.

9. GLEAM identifies three main groups of emissions along production chains. Upstream emissions include those related with feed production, processing and transportation. Animal production emissions comprises emissions from enteric fermentation, manure management and on-farm energy use. Downstream emissions are caused by the processing and post-farm transport of livestock commodities.

10. GLEAM-i ([www.fao.org/gleam/resources](http://www.fao.org/gleam/resources)) brings the core functionalities of GLEAM to the public in a single Excel file. The current version of GLEAM-i allows the direct comparison between Baseline and Scenario conditions, includes feedlot systems for cattle and incorporates the 2010 default data from GLEAM. GLEAM-i is the first open, user-friendly and livestock specific tool designed to support governments, project planners, producers, industry and civil society organizations to calculate emissions from livestock supply chains using Tier 2 methods. GLEAM-i can be used in the preparation of national inventories and in ex-ante project evaluation for the assessment of intervention scenarios in animal husbandry, feed and manure management.

11. GLEAM-i works by default at country level for the entire national herds and flocks and offers the possibility to revise the baseline parameters when available in the country/project area. New baseline parameters for herd, feed and manure management were collected specifically by FAO in Kyrgyzstan, for cattle and small ruminants. Significant changes were found compared to the default values, including on herd parameters (fertility and mortality rates, weights, milk yields...), feed rations and manure management systems.

### IV. Detailed project analysis per activity for Carbon Sequestration through Climate Investment in Forests and Rangelands in Kyrgyzstan (CS-FOR)

#### a. Key project Activities acting on GHG

12. The project targets afforestation, forest management, grassland management, perennial crops and agro-forestry development activities on a total area of 709,074 ha and on 849,226 head of cattle and other ruminant. The project area is subject to the improvement of land management practices, forest restoration and afforestation and forest areas brought under forest management plans, as follows:

#### b. Afforestation/Reforestation/Forest enrichment (3,440 ha)

13. The project aims at reversing the forest area decline by collaborative and more effective

afforestation/reforestation on degraded lands by planting forest trees, mainly spruce forest (*Picea schrenkiana*), juniper forest (*wooden juniperus*), poplar forest (*Pópulus*), walnut forest<sup>234</sup> (*Júglans régia*), pistachio forest (*Pistacia vera* L), and various leaf forests (4 to 6 planted subtropical mountains species). With the project implementation, the afforestation/restoration activities would take place on at least 3,440 ha, of which 3,000 ha of direct afforestation/reforestation (A/R) activities and 440 ha with forest enrichment activities (covering an area of about 3,000 ha). Under the baseline scenario, no afforestation activities would take place.

14. The afforestation activities are summarized in the below tables.

**Table 2. Type of planted vegetation and corresponding superficies**

№	Total target	Area (ha)	Previous land use	Species
	Forest resources: Afforestation/Reforestation/Enrichment			
1	Spruce	597	Degraded Land	<i>Picea schrenkiana</i>
	Spruce (forest enrichment)	160		
2	Juniper	221		<i>Juniperus (wooden juniperus)</i>
	Juniper (forest enrichment)	153		
4	Poplar	179		<i>Pópulus</i>
5	Walnut	1,018		<i>Júglans régia</i>
	Walnut (forest enrichment)	127		
3	Pistachio	204		<i>Pistacia vera</i> L
6	Various leaf forests	781		Other planted deciduous forest (4 to 6 species)
<b>Total</b>		3,440		

15. Based on FAO's Global Ecological Zones (FAO, 2011), experts' consultation and relevant publications, the forest in the area of influence have the following characteristics:

**Table 3. Aboveground and belowground biomass growth rate, soil carbon content and carbon fraction per type of vegetation**

Species	Growth rates ABG up to 20 years (t d.m./ha/yr)	Growth rates ABG after 20 years (t d.m./ha/yr)	Growth rates BGB up to 20 years (t d.m./ha/yr)	Growth rates BGB after 20 years (t d.m./ha/yr)	Ratio of roots to the stem <sup>6</sup>	Soil carbon (t C/ha)	Carbon Fraction (t C/t d.m.)
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<sup>234</sup> Walnut-fruit forests occupying the northern and north-eastern slopes of the Fergana valley. Under this term, a range of forest ecosystems dominated by fruit bearing woody species is subsumed, including walnut (*Juglans regia* L.), apple (*Malus* spp.), hawthorn (*Crataegus* spp.), plumb (*Prunus* spp.), rose species (*Rosa* spp.), almond (*Prunus amygdalus* Stokes) and pistachio (*Pistacia vera* L.). Forest stands of walnut and its accompanying species grow in the valleys and hills in altitudes between 800 and 2,400 m.a.s.l., whereas pistachio forests and almond stands grow in dryer, lower parts of the hills. The walnut-fruit forests of Kyrgyzstan are considered to be the biggest remaining areas of this particular forest type worldwide and therefore to be of global significance for biodiversity conservation.



Picea schrenkiana <sup>235</sup>	0.48	1.67	0.16	0.57	0.34	38	0.49
Juniperus (wooden juniperus) <sup>6</sup>	0.09	0.45	0.02	0.2	0.45	38	0.48
Pópulus <sup>6</sup>	1.01	2.19	3.43	0.54	0.25	38	0.46
Júglans régia <sup>6</sup>	0.59	1.61	0.83	0.48	0.30	38	0.46
Pistacia vera L <sup>236</sup>	1.32	3.6	1.65	1.08	0.3	38	0.46
Various leaf forests (subtropical mountain system) <sup>237</sup>	2.82	0.7	0.76	0.2	0.27	38	0.5

ABG: above ground biomass, BGB: below ground biomass, t d.m.: ton of dry matter

16. In line with the practice adopted by the State Forest Institutions (leskhoze) – the government body entrusted with the management of forest at local level – and conformingly with the CS-FOR Environmental and Social Management Framework, no fire will be used for the conversion. Thus, the plantation of forest trees, which concerns 3,440 hectares of degraded land could sequester -36,480 tons of CO<sub>2</sub>-e per year (tCO<sub>2</sub>-e yr<sup>-1</sup>) or -729,608 tCO<sub>2</sub>-e for the entire duration of the project. Details per type of vegetation are described in the table below:

**Table 4. Carbon balance and annual emission factors per type of vegetation**

Species	Area (ha)	Carbon Balance tCO <sub>2</sub> -e	Carbon Balance tCO <sub>2</sub> -e.year <sup>-1</sup>	Emission Factor tCO <sub>2</sub> -e.year <sup>-1</sup> .ha <sup>-1</sup>
Picea schrenkiana	757	-135,135	-6,757	-8.9
Juniperus (wooden juniperus)	374	-61,042	-3,052	-8.2
Pópulus	179	-50,109	-2,505	-14
Glans régia	1,145	-227,210	-11,361	-9.9
Pistacia vera L	204	-49,014	-2,451	-12
Various leaf forests (subtropical mountain system)	781	-207,098	-10,355	-13.3
<b>Total</b>	<b>3,440</b>	<b>-729,716</b>	<b>-36,480</b>	

### c. Development of fruit and nut orchards cropland (3,100 ha)

17. The project aims to support climate-sensitive livelihood opportunities to decrease pressure on degraded land in the target areas, through the development of tree crops on a total area of 3,100 ha. The activity will be supported by the provision of technical assistance and the increase of access to credit.

<sup>235</sup> Assessment of emissions and sinks of greenhouse gases on forest lands and the impact of climate change on forest ecosystems of the Kyrgyz Republic (2017). In publishing 2018. Climate Change Center in Kyrgyz Republic, with the financial support of the FAO/GEF project "Sustainable management of mountain forests and land management in a changing climate Kyrgyzstan".

<sup>236</sup> Feasibility study for the establishment of pistachio growing centers in Tashkent province in Ugam Chatkal National Park / Uzbekistan,

[http://www.succowstiftung.de/tl\\_files/pdfs\\_downloads/Berichte/Feasibility%20study%20pistachio%20growing%20center\\_lq.pdf](http://www.succowstiftung.de/tl_files/pdfs_downloads/Berichte/Feasibility%20study%20pistachio%20growing%20center_lq.pdf)

<sup>237</sup> Based on experts' consultation, the various leaf forest was identified as Subtropical mountain system. Default values are used (IPCC, 2006).

Without the project implementation no perennial crops would be developed (table 5). This could sequester carbon at an annual rate of -31,519 tCO<sub>2</sub>-e or -630,373 tCO<sub>2</sub>-e sequestered for the entire duration of the project.

**Table 5. Fruit/nut orchards development, corresponding areas and description of the initial land use**

TOTAL TARGET	Initial Land Use Change	Area transformed (ha)	
Fruit/Nut orchards		without	with
<b>Apple</b>	Degraded Land	0	300
<b>Apricot</b>	Degraded Land	0	100
<b>Cherry</b>	Degraded Land	0	100
<b>Almond</b>	Degraded Land	0	300
<b>Pistachio</b>	Degraded Land	0	300
<b>Walnut</b>	Degraded Land	0	2,000
<b>TOTAL</b>		<b>0</b>	<b>3,100</b>

#### **d. Grassland management (646,275 ha)**

18. The four districts comprised in the project's core intervention area include a total of 827,000 ha of pasture under State Land Fund (municipal pasture, under management of Pasture Users Unions) and 96,400 ha of grazing land in forest area under management of the State Forest Fund, for a total of 923,250 ha. The project interventions' outreach will comprise the entire areas for grazing and assumes a successful improvement of grassland in at least 70 percent of the outreach area. The table below presents a disaggregation of the project outreach grassland according to the Land Productivity Dynamics (LDP).

LPD grassland degradation classification (under SFF and SLF)	CS-FOR Outreach (ha)	Successful adoption on at least 70 percent of the outreach (ha)
<b>Severely degraded:</b> areas with major long-term loss of productivity and vegetation cover	123,839	86,687
<b>Moderately degraded:</b> areas with somewhat reduced productivity (relative to the native or nominally managed grasslands) that receives no management inputs	161,404	112,983
<b>Not degraded:</b> areas under sustainable management, but with significant potential for management improvements	638,007	446,605
<b>Total</b>	<b>923,250</b>	<b>646,275</b>

19. Overall, the project will aim to bring under sustainable management an area of at least 646,275 ha of grassland, including:

- (i) 86,687 hectares of *severely degraded pasture*;
- (i) 112,983 hectares of *moderately degraded pasture*;
- (ii) 446,605 hectares of *non-degraded pasture*.

20. With the project intervention, the targeted superficies will be sustainably managed through improved seeds, herd management, shelterbelt, wind breaker, water point. Without the project implementation, grassland will remain at the same state of degradation and no improved practices would be developed. Detailed description of the grassland management plan is indicated in the below table:

**Table 6. Grassland degradation and management activities**

Improvement of pastures			
Area (ha)	Initial state of pasture <sup>238</sup>	Final state of degradation without the project	Final state of degradation with the project
86,687	Severe level of degradation	Severe level of degradation	Degradation is absent due to improvement of pastures through rational use in degraded areas
112,983	Moderate degree of degradation	Moderate degree of degradation	Degradation is absent due to improvement of pastures through rational use in degraded areas
446,605	Nominally managed (non-degraded)	Nominally managed (non-degraded)	Improvement of pastures through rational use in degraded areas

21. Thus, promoting better grassland management practices on 646,275 hectares, CS-FOR would contribute to the sequestration of -746,168 tCO<sub>2</sub>-e yr<sup>-1</sup> or -14,923,368 tCO<sub>2</sub>-e over 20 years.

**Table 7. Carbon balance and annual emission factors per pasture**

Initial level of pasture	Area (ha)	Carbon Balance tCO <sub>2</sub> -e	Carbon Balance tCO <sub>2</sub> -e.yr <sup>-1</sup>	Carbon Balance tCO <sub>2</sub> -e at CS-FOR Mid-Term (year-4)	Carbon Balance tCO <sub>2</sub> -e at CS-FOR Completion (year-8)	Emission Factor tCO <sub>2</sub> -e.year <sup>-1</sup> .ha <sup>-1</sup>
Severely degraded pasture	86,687	-3,409,124	-170,456	-681,825	-1,363,650	-1.97
Moderately degraded pasture	112,983	-2,231,055	-111,553	-446,211	-892,422	-0.99
None degraded pasture	446,605	-9,283,189	-464,159	-1,856,638	-3,713,275	-1.04
<b>Total</b>	<b>646,275</b>	<b>-</b> <b>14,923,368</b>	<b>-746,168</b>	<b>-2,984,674</b>	<b>-5,969,347</b>	

22. A detailed explanation on soil organic carbon stock for the different degradation, improvement states and associated carbon sequestration is documented in the supporting information (end of the present document).

<sup>238</sup> Baseline scenario was estimated by applying the UNCCD LPD methodology in target districts. Details of approaches and methodology is available in Chapter I of the feasibility study.

#### e. Forest degradation and management (56,359 ha)

23. The project aims to implement sustainable forest management activities on 56,359 hectares of forest, subject to periodic damage from reduced precipitations, increased temperatures, wildfires and overexploitation. The project will support communities and administrations in target areas in reducing drivers (overexploitation and grazing) of forest degradation related to livelihood and weak management of natural resources<sup>239</sup>.

24. The management activities are targeting different species mainly represented under subtropical mountain systems. Without the project implementation, no change in the level of forest degradation is foreseen. With the project implementation, it is expected that the degradation level and the corresponding percentage of total biomass lost affecting all carbon pools would be improved.

25. The state of degradation level (with and without the project implementation) as well as the main carbon forest characteristics are summarized in tables 8 and 9 below.

**Table 8. Type of vegetation, corresponding area and degradation level**

Type of vegetation that will be degraded	Species	Degradation level of the vegetation			Area (ha)
		Initial State <sup>240</sup>	Without Project	With Project	
Subtropical mountain systems (Juglans regia, Acer Exochorda, Crataegus, Malus, Aflatunia, Prunus dulcis Other tree-shrub) <sup>241</sup>		Large	Large	Moderate degraded	13,943
		Moderate	Moderate	Low degraded	8,722
		Non degraded	Very low	Non degraded	33,694
Total area (ha)					56,359

**Table 9. Carbon sequestration potential for the targeted forest species**

Type of vegetation that will be degraded	Species	Above-ground biomass (tC/ha)	Below ground biomass (tC/ha)
Subtropical mountains systems	Juglans regia, Acer Exochorda, Crataegus, Malus, Aflatunia, Prunus dulcis Other tree-shrub	63.5	17.1

26. Thus, the management of 56,359 ha of forest areas could sequester carbon at an annual rate of -173,971 tCO<sub>2</sub>-e or -3,479,418 tCO<sub>2</sub>-e for the entire accounting duration of the analysis.

#### f. Livestock management (849,226 head)

27. The project aims to improve the production efficiency of 849,226 head of cattle and other ruminants

<sup>239</sup> Detailed description of approaches and activities is available both in the full fund proposal and in chapter 4 of the feasibility study.

<sup>240</sup> Forest's level of degradation is estimated by applying the UNCCD LPD methodology in target districts. Details of approaches and methodology is available in Chapter I of the feasibility study

<sup>241</sup> based on expert's consultation and FAO's Global Ecological Zones (FAO, 2011)

(176,954 cattle, 623,417 sheep and 48,855 goats) through **improved herd management, improved feeding and improved manure management** (no herd control scenario, see section III), as follows:

- Improvements of herd management practices: include better care for animals, better animal health and disease control and better reproduction management, without any control on animal numbers.
- Improvements of feeding practices: by a i) reducing of fresh grass, hay and cereal straw in the ration to increase the proportion of grass-legumes mix, alfalfa, and maize and cereals to a lesser extent (1 to 2% increase) for cattle, and ii) increasing of grains (+5% in average) and by-products (+3.5% in average) in the feed mix, while reducing crop residues for sheep.
- Improvements of manure management: by increasing the proportion of manure stored in solid form with bedding while proportionally reducing the proportion of manure deposited in pastures, piled without bedding or burnt for fuel.

28. With the project implementation, a 20 percent growth in animal numbers is expected without any gains in productivity. This could avoid emissions at an annual rate of -7,477.25 tCO<sub>2</sub>-e or -149,545 tCO<sub>2</sub>-e for the entire accounting duration of the analysis.

29. Results are summarized in Table 10, for all ruminants and for cattle, as they represent the largest part of emissions and production.

**Table 10. Results of GLEAM-i simulations for all ruminants and for cattle**

Subsectors	Scenarios	Absolute values			Change compared to BAU			Change compared to current situation		
		Emissions (tCO <sub>2</sub> -e/year)	Production* (t protein/year)	Emission intensity (tCO <sub>2</sub> -e /t protein)	Emissions	Production	Emission intensity	Emissions	Production	Emission intensity
All ruminants	Current situation	788,551	5,448	145	-17%	-17%	0%	-	-	-
	BAU (+20% herd)	945,779	6,537	145	-	-	-	20%	20%	0%
	Project no herd control	930,825	7,372	126	-2%	13%	-13%	18%	35%	-13%
Of which cattle	Current situation	568,947	4,931	115	-17%	-17%	0%	-	-	-
	BAU (+20% herd)	682,760	5,917	115	-	-	-	20%	20%	0%
	Project no herd control	587,536	5,648	104	-14%	-5%	-10%	3%	15%	-10%

\* Meat and milk

### g. Agricultural inputs

30. Agricultural inputs, nitrogen, phosphorus and potassium fertilizers (NPK with the following composition 57, 28, 14) and herbicides, will be used as part of orchards (apple, apricot, cherry, almond, pistachio and walnut), nurseries and conservation agriculture. In total about 1009 of nitrogen, 496 of phosphorus and 248 of potassium will be annually applied. About 0.9 ton per year of herbicides will be applied in conservation agriculture (wheat, corn, barley and alfalfa).

31. Thus, the agricultural inputs lead to GHG emissions at an annual rate of 8,048 tCO<sub>2</sub>-e or -160,958 tCO<sub>2</sub>-e for the entire accounting duration of the analysis.

## V. Carbon monitoring system based on EX-ACT and GLEAM-i for NRM, Kyrgyzstan

32. Table 11 describes the carbon balance of each project activity. It covers the activities deployed in the project, which comprise a better forest management, a better grassland and livestock management, the conversion of degraded land into perennial cropland, and afforestation activities.

33. The highest carbon sinks will result from the grassland management (-14,923,368 of tCO<sub>2</sub>) followed by forest management and degradation activities (-3,479,418 of tCO<sub>2</sub>), perennial system (-873,500 tCO<sub>2</sub>, 1,117,520 tCO<sub>2</sub>-e taking into account carbon sequestration from the conversion of degraded land to perennial system), afforestation activities (- 729,608 tCO<sub>2</sub>), and livestock management (-149,545 tCO<sub>2</sub>). Agricultural inputs are a minor source of GHG (160,958 tCO<sub>2</sub>-e).

**Table 11. Carbon balance and Emission Factor from Carbon Sequestration through Climate Investment in Forests and Rangelands in Kyrgyzstan**

EX-ACT Module	Activities	Area (ha) and other unit Results	C balance (tCO <sub>2</sub> -e)	C Balance (tCO <sub>2</sub> -e.yr <sup>-1</sup> )	Emission Factor (tCO <sub>2</sub> -e.yr <sup>-1</sup> .ha <sup>-1</sup> or per year per unit)
<b>Afforestation (under LUC)</b>	<i>Afforestation</i>	3,440	-729,608	-36,480	-10.60
<b>Agriculture (under LUC/ Crop Production)</b>	<i>Perennial crops</i>	3,100	-630,373	-31,519	-10.2
<b>Grassland</b>	<i>Improved management of degraded grassland</i>	646,275	-14,923,368	-746,168	-1.2
<b>Livestock</b>	<i>Improved livestock's practices</i>	849,226 head	-149,545	-7,477	-0.008/head
<b>Forest Degradation and management</b>	<i>Improved management of degraded forest lands</i>	56,359	-3,479,418	-173,971	-3.1
<b>Agricultural and investments</b>	<i>Fertilizers and herbicides for orchards and conservation agriculture</i>	1,771 tonne	160,958	8,048	4,5/tonne
<b>Net Carbon Balance</b>			<b><u>19,751,842</u></b>		

#### a. Results provided by EX-ACT

34. All calculations done in the EX-ACT tool are reported in the results module. After a short reminder of the description module (name of the appraised project, its duration, the continent, the dominant climate, and the soil chosen by the user) including the total area of the project, the following table (table 12) summarizes the GHGs sequestration and the share of the balance per GHG from the adopted scenario. The balance is the difference of GHG gross fluxes between the with-project situation and the without project situation. Results are given in ton of CO<sub>2</sub> equivalent (tCO<sub>2</sub>-e). Positive numbers represent sources of CO<sub>2</sub>-e emissions while negative numbers represent sinks. The left table section summarizes estimated gross fluxes and CO<sub>2</sub>-e emissions and sinks from the scenario without-project (left column), from the scenario with-project (middle column) and the total balance (right column). The middle table details the carbon-balance under project implementation, showing the GHG fluxes from the different modules. The right table details annual CO<sub>2</sub>-e fluxes for the different activities without and with-project implementation, and for the carbon-balance.

35. The carbon-balance of the project, which consists in the difference of tCO<sub>2</sub>-e emitted or sequestered between a scenario with project and a scenario business-as-usual (BAU or baseline scenario), demonstrates the benefits of implementing the project and its different components in terms of mitigation potential. For this project (livestock excluded in the following discussion since computed separately with the Gleam-i tool) which covers 20 years in EX-ACT (8 years of implementation and 12 years of capitalization), the net carbon balance is -19,601,809 tCO<sub>2</sub>-e, which means a mitigation potential of -1,4 tCO<sub>2</sub>-e per hectare and per year compared to a scenario "without project" (Business-as-usual, BAU scenario).

36. The right describes the carbon balance of each project activity. It covers the activities deployed in the project, which comprise a better forest management, a better grassland management, the conversion of grassland into silvopastoral system, and the conversion of annual cropland into agroforestry system.

37. The highest carbon sinks will result from the grassland management (-14,923,368 tCO<sub>2</sub>-e) followed by forest management and degradation activities (-3,479,418 tCO<sub>2</sub>-e), afforestation activates (-729,608 tCO<sub>2</sub>-e), and perennial system (-244,020 tCO<sub>2</sub>-e from the conversion of degraded land into perennial systems and -386,353 tCO<sub>2</sub>-e from perennial development). Agricultural inputs are a minor source of GHG (160,958 tCO<sub>2</sub>-e).



**Table 12. EX-ACT results. All GHG are expressed in tCO<sub>2</sub>-e. Positive result means source while negative result means sink.<sup>242</sup>**

Project Name	CS FOR (Kyrgyzstan)	Climate	Warm Temperate (Dry)	Duration of the Project (Years)		20			
Continent	Asia (Continent)	Dominant Regional Soil Type	HAC Soils	Total area (ha)		709174			
Components of the project	Gross fluxes		Share per GHG of the Balance			Result per year			
	Without	With	Balance	All GHG in tCO2eq			Without	With	Balance
	All GHG in tCO2eq			CO2	N2O	CH4			
	Positive = source / negative = sink			Biomass	Soil	Other			
Land use changes									
Deforestation	0	0	0	0	0	0	0	0	0
Afforestation	0	-729,608	-729,608	-472,700	-256,908	0	0	-36,480	-36,480
Other LUC	0	-244,020	-244,020	-12,503	-231,516	0	0	-12,201	-12,201
Agriculture									
Annual	0	0	0	0	0	0	0	0	0
Perennial	0	-386,353	-386,353	-369,985	-16,368	0	0	-19,318	-19,318
Rice	0	0	0	0	0	0	0	0	0
Grassland & Livestocks									
Grassland	0	-14,923,368	-14,923,368	0	-14,923,368	0	0	-746,168	-746,168
Livestocks	0	0	0	0	0	0	0	0	0
Degradation & Management	1,483,543	-1,995,875	-3,479,418	-3,038,990	-440,427	0	0	-99,794	-173,971
Coastal wetlands	0	0	0	0	0	0	0	0	0
Inputs & Investments	0	160,958	160,958	85,356	75,601	0	0	8,048	8,048
Fishery & Aquaculture	0	0	0	0	0	0	0	0	0
Total	1,483,543	-18,118,266	-19,601,809	-3,894,179	-15,868,588	85,356	75,601	0	0
Per hectare	2	-26	-28	-5.4	-22.4	0.1	0.1	0.0	0.0
Per hectare per year	0.1	-1.3	-1.4	-0.3	-1.1	0.0	0.0	0.0	0.0

### b. Results provided by GLEAM-i

38. The current situation was first run in GLEAM-i with revised baseline parameters and the animal numbers concerned by the project (176,954 cattle, 623,417 sheep and 48,855 goats, Table 13).

39. Then, several scenarios were considered, for a project timeframe of 20 years. First, a Business As Usual (BAU) scenario was run as a carry on of past trends with a 20% increase of cattle, sheep and goat total numbers, and without project implementation, which was assumed to result in no changes in management or productivity.

40. Second, a scenario of project with improved practices was modeled, without any control on animal numbers. The project aims to improve efficiency in cattle and ruminant production through improved herd management, improved feeding and improved manure management. Improved herd management practices include better care for animals, better animal health and disease control and better reproduction management. These improvements are summarized in Table 13 for a number of parameters in GLEAM-i, including fertility and mortality rates, animal weights and milk yields.

41. Improvements of feed rations correspond to modest changes in the composition of the feed ration. For cattle, this was achieved by a reduction of fresh grass, hay and cereal straw in the ration to increase the proportion of grass-legumes mix, alfalfa, and maize and cereals to a lesser extent (1 to 2% increase). For sheep, the improvements were similar, with an increase of grains (+5% in average) and by-products (+3.5% in average) in the feed mix, while crop residues were proportionally reduced.

42. Changes in manure management were reflected by increasing the proportion of manure stored in solid form with bedding while proportionally reducing the proportion of manure deposited in pastures, piled without bedding or burnt for fuel.

43. Finally, a third scenario was modeled which was based on implementing the project and improved practices but controlling the growth of the herd that results from gains in productivity at herd level (mainly from improved fertility, reduced mortality and increase in average litter size for sheep). In practices, the number of adult females was reduced by 10% in each specie compared to the current situation. This results in a decrease of total cattle herd and goat herd of 4% and 13% respectively. Given the high gains in productivity at herd level in sheep production, total number of sheep still increased by 20% despite the decrease of 10% in the number of adult females.

**Results: between 149,545 and 1,077,451 tons of carbon saved over 20 years**

<sup>242</sup> The spreadsheet represented in the table does not take into account the Carbon Sequestration estimates related to the livestock activities, as these are estimated through GLEAM-i.

44. Results are summarized in Table 14, for all ruminants and for cattle, as they represent the largest part of emissions and production. BAU results in an increase in emissions and production of 20% compared to the current situation, due to the growth in animal numbers without any gains in productivity.

45. With project's improved practices, emissions increase by 18% and production increases by 35% compared to current situation, which results in a decrease of emissions per kg of protein by 13%. This is due to the fact that improved practices result in an increase of productive animals per reproductive animals (less mortality and higher fertility, and larger litter size for sheep). With project, emissions are 2% under those without project in BAU, while production increases by 13% due to gains in productivity.

46. If a relative control in animal numbers is carried out to avoid this growth resulting from higher fertility and lower mortality, emissions would be only 6% higher than in the current situation but with a 22% increase in production, resulting in a decrease of 13% in emissions per kg of protein. Compared to the BAU situation without improvement, implementing the project with a relative reduction in animal numbers (20%) emissions would result in approximately the same level of production but an 11% reduction in emissions.

47. When projecting these results over the total lifespan of the project (20 years), and adding the differences in emissions and production for each year, implementing the project results in saving 149,545 tCO<sub>2</sub>-e, and a total extra 8,346 tons of protein produced. With the relative herd control, the project would result in saving 1,077,451 tCO<sub>2</sub>-e, for an extra 974 tons of protein produced. This corresponds to saving between 19% and 137% of the sector's annual emissions in the current situation.

**Table 13. Herd Parameters –Baseline and Project target**

Parameter	Description	Unit	Cattle grazing	Sheep grazing	Sheep mixed	Goats
<b>Number of animals in project</b>	Total number of animals in the project, including reproductive adults, replacements animals and fattening animals.	Heads	176,954	311,709	311,709	48,555
<b>Age at first parturition</b>	Average age at which adult females have their first parturition, either it is a successful one or not.	Months	27 25	20 20	20 20	15 15
<b>Fertility of adult females</b>	Average fertility rate, expressed as % of calving adult females over the total amount of adult females. This includes born calves that die before reaching maturity.	Percentage	70 75	80 100	80 100	65 65
<b>Parturition interval</b>	Average interval between two parturitions.	Days	- -	365 365	365 365	365 365
<b>Litter size</b>	Average number of lambs born in each parturition, including the ones that die before reaching maturity.	Heads	- -	1 1.2	1 1.2	1.3 1.3
<b>Mortality of young females</b>	Annual average percentage of non-intended deaths of female animals before reaching maturity.	Percentage	20 7	30 15	30 15	20 15
<b>Mortality of young males</b>	Annual average percentage of non-intended deaths of male animals before reaching maturity.	Percentage	18 7	30 15	30 15	20 15
<b>Mortality of adult animals</b>	Annual average percentage of non-intended deaths of animals (males and females), after reaching maturity.	Percentage	6 5	8 6	8 5	6 3
<b>Adult females replacement</b>	Annual average percentage of adult females' replacement.	Percentage	20 20	20 15	20 15	20 20
<b>Weight at birth</b>	Average live weight of calves at birth.	kg/animal	27 30	6 7	6 7	3.5 3.5
<b>Weight of adult females</b>	Average live weight of cows once they reach maturity.	kg/animal	350 430	40 50	45 50	35 38

<b>Weight of adult males</b>	Average live weight of bulls once they reach maturity.	kg/animal	400	65	75	37
			450	65	75	40
<b>Weight of fattening females</b>	Average live weight at slaughter of adult females culled for meat.	kg/animal	350	28	30	36
			380	40	45	35
<b>Weight of fattening males</b>	Average live weight at slaughter of adult males culled for meat.	kg/animal	400	35	40	40
			450	50	55	35
<b>Milk yield</b>	Annual average milk yield per milking cow.	kg/animal	1,500	-	-	-
			1,800	-	-	-
<b>Milk fat/protein</b>	Average milk total fat/protein content.	Percentage	3.9/3.6	-	-	-
			3.9/3.6	-	-	-

**Table 14. Results of GLEAM-i simulations for all ruminants and for cattle**

Subsectors	Scenarios	Absolute values			Change compared to BAU			Change compared to current situation		
		Emissions (tCO <sub>2</sub> -e.year <sup>-1</sup> )	Production <sup>243</sup> (t protein.year <sup>-1</sup> )	Emission intensity (tCO <sub>2</sub> -e /t protein)	Emissions	Production	Emission intensity	Emissions	Production	Emission intensity
All ruminants	Current situation	788,551	5,448	145	-17%	-17%	0%	-	-	-
	BAU (+20% herd)	945,779	6,537	145	-	-	-	20%	20%	0%
	Project no herd control	930,825	7,372	126	-2%	13%	-13%	18%	35%	-13%
	Project + herd control**	838,034	6,635	126	-11%	1%	-13%	6%	22%	-13%
Of which cattle	Current situation	568,947	4,931	115	-17%	-17%	0%	-	-	-
	BAU (+20% herd)	682,760	5,917	115	-	-	-	20%	20%	0%
	Project no herd control	587,536	5,648	104	-14%	-5%	-10%	3%	15%	-10%
	Project + herd control <sup>244</sup>	587,536	5,648	104	-14%	-5%	-10%	3%	15%	-10%

**Table 15. Results of GLEAM-i over project lifespan (20 years)**

	Emissions (tCO <sub>2</sub> -e)	Production* (t protein)
Year 1	788,551	5,448
Year 20 BAU	945,779	6,537
Year 20 Project no herd control	142,273	1,924
Year 20 Project with herd control	49,483	1,187
Cumulative difference to BAU - Project no herd control	-149,545	8,346
Cumulative difference to BAU - Project with herd control**	-1,077,451	974

<sup>243</sup> Meat and milk

<sup>244</sup> Reduce reproductive female herd by 10%.

## Appendix 1 to Chapter 9: More information about the FAO tools used for the analysis

### a. Ex-Ante Carbon-balance Tool (EX-ACT)<sup>245</sup>

48. The EX-Ante Carbon-balance Tool (EX-ACT) was developed by FAO in 2010 to assess a project's net carbon-balance. This is the net balance of ton of CO<sub>2</sub> equivalent (tCO<sub>2</sub>-e) GHGs that were emitted or carbon sequestered as a result of project implementation compared to a "without project" scenario. EX-ACT captures project activities in the following five modules: land use change, crop production, livestock and grassland, land degradation, inputs and investment. EX-ACT estimates the carbon stock changes as well as GHG emissions per unit of land, expressed in tCO<sub>2</sub>-e per hectare per year. Negative results correspond to the sequestration of carbon or reduction in CO<sub>2</sub>-e emissions, while positive results correspond to the emission of CO<sub>2</sub>-e.

49. EX-ACT is particularly applicable for Integrated Landscape Management as it offers the following advantages:

- Simple, user friendly, interactive, and participatory;
- Robust and offers a broad scope of GHG analysis;
- Flexible in terms of requirements for coefficients and site-specific data;
- Can handle land use conversion, changes in forest and grassland management practices and projections over long time horizons;
- Its outputs can also be used in the financial and economic analyses of projects.

### b. Global Livestock Environmental Assessment Model<sup>246</sup>

50. The Global Livestock Environmental Assessment Model (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.

51. GLEAM is designed to analyze multiple environmental dimensions, such as feed use, GHG emissions, land use and land degradation, nutrient and water use and interaction with biodiversity. The main features of the current version of GLEAM are:

- Systematic, global coverage of six livestock species and their edible products: meat and milk from cattle, buffalo, sheep and goats; meat from pigs and meat and eggs from chicken.
- Spatially explicit modelling of livestock distribution, climatic data, feed yields and biophysical processes that allow the capture of local production drivers and/or constraints, environmental impacts and identification of intervention measures.
- Estimation of greenhouse gas emissions from each stage of production. The model covers emissions of methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>) and nitrous oxide (N<sub>2</sub>O), using an IPCC Tier 2 methodology, providing more accurate information on how animal feeding, herd and manure management options can help in mitigation.
- Can be used to run scenarios of interventions in the livestock sector and can be coupled with other models (e.g. grassland models for sequestration, economic data for cost of mitigation etc.).

<sup>245</sup> EX-ACT Tool - FAO available at: <http://www.fao.org/tc/exact/ex-act-home/en/>

<sup>246</sup> <http://www.fao.org/gleam/resources/en/> User Guide for GLEAM-i available at: [http://www.fao.org/fileadmin/user\\_upload/gleam/docs/GLEAM-i\\_User\\_guide\\_2\\_Revision\\_3.pdf](http://www.fao.org/fileadmin/user_upload/gleam/docs/GLEAM-i_User_guide_2_Revision_3.pdf)

### c. Supplemental information on grassland soil carbon stock changes

52. The IPCC methodology on grasslands is based on soil organic carbon (SOC) stock changes between a nominal state and an improved or degraded state (IPCC 2006 Volume 4 chapter 6), according to a management factor. Indeed on a non-degraded soil improvement with inputs management would lead to an increase of about 1.27 percent of SOC stock, while a non-degraded soil turning into severely degraded state soil would lead to a decrease of 30 percent of the nominal SOC stock (as defined by IPCC). Following the IPCC methodology, EX-ACT gives the SOC stock of the different states according to the non-degraded soil, as shown in the below figure (tier 1 data).

Corresponding soil C stocks	(tC/ha)	
	Default	Tier 2
Non degraded	38.0	
Severely Degraded	26.6	
Moderately Degraded	36.1	
Improved without inputs management	43.3	
Improved with inputs improvement	48.1	

53. In their study of the semiarid region of Central East Kazakhstan, Causarano et al 2010 reported soil bulk density and percentage of organic carbon down to 50 cm for Kazakhstan. We derived a SOC stock for non-degraded grassland from this study, since climate and ecological zones are similar with the present project area. Stated this, soil carbon stock down to 30 cm depth is about 26.7 tC per hectare, as compared to the 38 tC per hectare from the IPCC. We assumed this value to be representative of a non-degraded grassland.

54. Following the IPCC methodology and management factor we derived from the SOC stock of non-degraded grassland ( $SOC_{initial}$ ) the expected SOC stock ( $SOC_{final}$ ) from sustainable grassland management, i.e. improved seeds, herd management, shelterbelt, wind breaker, water point, defined as improved with inputs improvement in the IPCC methodology, equation (1):

$$\text{Equation (1)} \quad SOC_{final} = SOC_{initial} \cdot 1.14 \cdot 1.11$$

where 1.14 is the relative stock change factor (management factor) for improved temperate grassland, and 1.11 the management factor for improvement with input, see table 6.2 IPCC 2006, volume 4, chapter 6. The final SOC is 33.8 tC per hectare.

55. The SOC stock for severely degraded grassland and moderately grassland, are respectively 70% and 95% of the SOC of a non-degraded grassland ( $SOC_{initial}$ ), still following the IPCC methodology and management factors. Since these area will be sustainably managed as the non-degraded grassland, final SOC is 32.1 tC per hectare. This value was entered into EX-ACT under “improved without inputs management”.

Corresponding soil C stocks	(tC/ha)	
	Default	Tier 2
Non degraded	38.0	26.7
Severely Degraded	26.6	18.7
Moderately Degraded	36.1	25.4
Improved without inputs management	43.3	32.1
Improved with inputs improvement	48.1	33.8

56. Although this approach and assumptions could be criticized, we feel this was the best and conservative trade-off to be done. Indeed using the default data from the IPCC the carbon sequestration would have been about 22 million tCO<sub>2</sub>-e over the entire period, as compare to about 15 million tCO<sub>2</sub>-e with derived tier 2 data.



## References

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## Annex: References and working papers

Folder <sup>247</sup>	Files
<b>1. NDA No-objection letter</b>	SAEPF-NDA-No Objection letter-20June2018 SAEPF- NDA letter and memo on complementarities FAO-WFP
<b>2. Feasibility Study</b>	CS-FOR Kyrgyzstan - Feasibility Study (3 October 2019)
<b>2.a. Gender Assessment and Action Plan</b>	CS-FOR - Gender and Social Inclusion Action Plan CS-FOR - Gender Assessment
<b>2.b. Stakeholders Engagement Report</b>	CS-FOR - Stakeholders Engagement Report
<b>3. Integrated Financial-Economic Models</b>	CS-FOR - Economic and Financial Analysis (text) CS-FOR - Integrated Economic Model (spreadsheet) CS-FOR - Integrated Financial Model (spreadsheet)
<b>3.a. Carbon Accounting (EX-ACT)</b>	CS-FOR - Carbon Accounting (spreadsheet)
<b>3.b. Cost Tables</b>	CS-FOR - Budget Plan in GCF format CS-FOR - Procurement plan in GCF format
<b>4. Letter of commitment for co-financing</b>	ARIS-12Jun2018-Letter of confirmation for co-financing commitment; ARIS -15JUL2019-Letter of re-confirmation for co-financing commitment; FAO - 05November2018-Letter of Intent for co-financing; MAFIM-13June2018-Letter of confirmation for co-financing commitment; MAFIM-15July2019-Letter of re-confirmation for co-financing commitment; RKDF-Oct2019-Letter of confirmation for co-financing commitment; SAEPF-08Jun2018-Letter of confirmation for co-financing commitment; SAEPF-25SEP2019-Letter of re-confirmation for co-financing commitment
<b>4.b. Operational Partners' Capacity Assessment</b>	ARIS Kyrgyzstan - Micro-assessment report – final SAEPF PIU Kyrgyzstan - MDLF - Micro-assessment report - final
<b>5. ESMF</b>	CS-FOR - Environmental and Social Management Framework FAO Environmental and Social Management Guidelines_2015
<b>6. Map of Project Areas</b>	CS-FOR Map of Intervention areas
<b>6.b. CS-FOR Project ATLAS and Earth-Map</b>	CS-FOR Baseline Atlas CS-FOR Atlas Report CS-FOR - FAO Earth Map Presentation
<b>7. Timetable of Implementation</b>	CS-FOR - Timetable of implementation
<b>8. References for climate scenarios</b>	CS FOR - References for Climate Scenario
<b>9. Working Papers</b>	CS-FOR WP - Climate change and ecosystem-based NRM CS-FOR WP - Forestry CS-FOR WP - Georeferencing Strategy CS-FOR WP - Livestock Development CS-FOR WP - NRM Policy and Governance CS-FOR WP - Pastures Sector and Recommendations for CS-FOR Project CS-FOR WP - Value Chain Finance CS-FOR WP - Value Chains Development CS-FOR WP - Walnuts Value Chain CS-FOR WP - Resilience Analysis in the project target areas

<sup>247</sup> All documents are available in the respective folder of the submission package, as indicated in the Table.

