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Report No: PAD5364

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A
PROPOSED CREDIT
IN THE AMOUNT OF US\$45 MILLION

AND A
GRANT
IN THE AMOUNT OF US\$5 MILLION
FROM THE

GLOBAL PARTNERSHIP FOR SUSTAINABLE AND RESILIENT LANDSCAPES (PROGREEN)

AND A
GRANT
IN THE AMOUNT OF US\$2.4 MILLION
FROM THE
KOREA-WORLD BANK PARTNERSHIP FACILITY (KWPF)

TO THE
KYRGYZ REPUBLIC

FOR A

RESILAND CA+ PROGRAM: KYRGYZ REPUBLIC RESILIENT LANDSCAPE RESTORATION PROJECT
(P177407)

February 5, 2024

Environment, Natural Resources & the Blue Economy
Europe and Central Asia

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CURRENCY EQUIVALENTS

(Exchange Rate Effective November 30, 2023)

Currency Unit = **Kyrgyzstan Som
(KGS)**

KGS 89.06 = US\$1

US\$0.011 = KGS 1

FISCAL YEAR

January 1 - December 31

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ABBREVIATIONS AND ACRONYMS

AM	Accountability Mechanism
CAIAG	Central Asian Institute of Applied Geosciences
CAREC	Regional Environmental Centre for Central Asia
CPF	Country Partnership Framework
CRI	Corporate Results Indicator
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
E&S	Environmental and Social
EIRR	Economic Internal Rate of Return
ENPV	Economic Net Present Value
ERIK	Enhancing Resilience in Kyrgyzstan Project
ESF	Environmental and Social Framework
ESMF	Environment and Social Management Framework
ESS	Environmental and Social Standard
EX-ACT	Ex-Ante Carbon-balance Tool
FAO	Food and Agriculture Organization of the United Nations
FM	Financial Management
FY	Fiscal Year
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
GIZ	German Society for International Cooperation
GLOF	Glacial Lake Outburst Flood
GRS	Grievance Redress Service
GWP	Green Wager Program
HMFD	Hazard Monitoring and Forecasting Department
ICT	Information and Communication Technology
IDA	International Development Association
IFR	Interim Financial Report
IWP	Institute of Water Problems and Hydropower
JICA	Japan International Cooperation Agency
KGS	Kyrgyzstan Som
KHM	KyrgyzHydromet
KR	Kyrgyz Republic
KWPF	Korea-World Bank Partnership Facility
M&E	Monitoring and Evaluation
MoES	Ministry of Emergency Situations
MoF	Ministry of Finance
MoU	Memorandum of Understanding
NAS	National Academy of Sciences of the Kyrgyz Republic
NBS	Nature-based Solution
NDC	Nationally Determined Contribution

O&M	Operation and Maintenance
OVOP	One Village One Product
PDO	Project Development Objective
PIU	Project Implementation Unit
POM	Project Operations Manual
PP	Procurement Plan
PPL	Public Procurement Law
PPSD	Project Procurement Strategy for Development
PROGREEN	Global Partnership for Sustainable and Resilient Landscapes
REFCA	Regional Engagement Framework for Central Asia
RESILAND CA+ Program	Central Asia Resilient Landscape Restoration Program
SEP	Stakeholder Engagement Plan
STEP	Systematic Tracking of Exchanges in Procurement
TSASC	Tien Shan Alpine Scientific Center
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
USCMFE	Unified System of Comprehensive Monitoring and Forecasting of Emergencies
WBG	World Bank Group
WFP	World Food Programme

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**DATASHEET****BASIC INFORMATION**

Project Beneficiary(ies) Kazakhstan, Kyrgyz Republic, Tajikistan, Uzbekistan	Operation Name RESILAND CA+ Program: Kyrgyz Republic Resilient Landscape Restoration Project		
Operation ID P177407	Financing Instrument Investment Project Financing (IPF)	Environmental and Social Risk Classification Moderate	

Financing & Implementation Modalities

<input type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input type="checkbox"/> Contingent Emergency Response Component (CERC)
<input type="checkbox"/> Series of Projects (SOP)	<input type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Performance-Based Conditions (PBCs)	<input type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input type="checkbox"/> Responding to Natural or Man-made Disaster
<input type="checkbox"/> Alternative Procurement Arrangements (APA)	<input type="checkbox"/> Hands-on Expanded Implementation Support (HEIS)

Expected Approval Date 27-Feb-2024	Expected Closing Date 29-Jun-2029
Bank/IFC Collaboration No	

Proposed Development Objective(s)

The objectives of the project are: (i) to increase the area under sustainable landscape management in Selected Locations in the Kyrgyz Republic; and (ii) to promote Kyrgyz Republic's collaboration with other Central Asian countries on transboundary landscape restoration.



The World Bank

RESILAND CA+ Program: Kyrgyz Republic Resilient Landscape Restoration Project (P177407)

Components

Component Name	Cost (US\$)
Strengthening Institutions and Regional Collaboration	10,900,000.00
Enhancing Resilient Landscapes and Livelihoods	40,000,000.00
Project Management and Coordination	1,500,000.00

Organizations

Borrower: Kyrgyz Republic
 Implementing Agency: Ministry of Emergency Situations

PROJECT FINANCING DATA (US\$, Millions)

Maximizing Finance for Development

Is this an MFD-Enabling Project (MFD-EP)? No

Is this project Private Capital Enabling (PCE)? No

SUMMARY

Total Operation Cost	52.40
Total Financing	52.40
of which IBRD/IDA	45.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	45.00
IDA Credit	45.00

Non-World Bank Group Financing

Trust Funds	7.40
Global P'ship for Sust. and Resilient Landscapes - PROGREEN	5.00



Korea WB Partnership Facility	2.40
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IDA Resources (US\$, Millions)

	Credit Amount	Grant Amount	SML Amount	Guarantee Amount	Total Amount
Kyrgyz Republic	45.00	0.00	0.00	0.00	45.00
National Performance-Based Allocations (PBA)	15.00	0.00	0.00	0.00	15.00
Regional	30.00	0.00	0.00	0.00	30.00
Total	45.00	0.00	0.00	0.00	45.00

Expected Disbursements (US\$, Millions)

WB Fiscal Year	2025	2026	2027	2028	2029	2030
Annual	2.54	13.12	11.82	22.01	2.91	0.00
Cumulative	2.54	15.66	27.48	49.49	52.40	52.40

PRACTICE AREA(S)**Practice Area (Lead)**

Environment, Natural Resources & the Blue Economy

Contributing Practice Areas

Urban, Resilience and Land; Water; Agriculture and Food; Social Protection & Jobs

CLIMATE**Climate Change and Disaster Screening**

Yes, it has been screened and the results are discussed in the Operation Document

**SYSTEMATIC OPERATIONS RISK- RATING TOOL (SORT)**

Risk Category	Rating
1. Political and Governance	● Substantial
2. Macroeconomic	● Substantial
3. Sector Strategies and Policies	● Moderate
4. Technical Design of Project or Program	● Substantial
5. Institutional Capacity for Implementation and Sustainability	● Substantial
6. Fiduciary	● Substantial
7. Environment and Social	● Moderate
8. Stakeholders	● Moderate
9. Other	
10. Overall	● Substantial

POLICY COMPLIANCE**Policy**

Does the project depart from the CPF in content or in other significant respects?

[] Yes [✓] No

Does the project require any waivers of Bank policies?

[✓] Yes [] No

Have these been approved by Bank management?

[✓] Yes [] No

Is approval for any policy waiver sought from the Board?

[] Yes [✓] No

ENVIRONMENTAL AND SOCIAL**Environmental and Social Standards Relevance Given its Context at the Time of Appraisal**

E & S Standards	Relevance



ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	Relevant
ESS 10: Stakeholder Engagement and Information Disclosure	Relevant
ESS 2: Labor and Working Conditions	Relevant
ESS 3: Resource Efficiency and Pollution Prevention and Management	Relevant
ESS 4: Community Health and Safety	Relevant
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Not Currently Relevant
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
ESS 8: Cultural Heritage	Relevant
ESS 9: Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

LEGAL

Legal Covenants

Sections and Description

Schedule 2. Section I.A.1: The Recipient, through MoES, shall be responsible for overall Project implementation and maintain throughout Project implementation a PIU to be responsible for performing key project management functions, including coordination, fiduciary, monitoring and evaluation, social and environmental standards management and reporting functions, with mandates, functions, responsibilities, structures, resources and staff, all as further described in the POM and acceptable to the Association.

Schedule 2. Section I.A.2: To facilitate the carrying out of the Part 1.3(a) of the Project, the Recipient, through MoES, shall enter into an agreement, prior to the start of activities under Part 1.3 (a) of the Project, with an entity that is duly qualified to support regional cooperation on sustainable development issues in Central Asia, under terms and conditions acceptable to the Association ("Cooperation Agreement").

Schedule 2. Section I.A.4: To facilitate carrying out Part 2.1(ii) of the Project, the Recipient, through MoES, shall enter into an agreement, prior to the start of activities under Part 2.1(ii) of the Project, with an entity with experience in close collaboration with the MoES in selecting, engaging, and retaining community members for small-scale works related to NBS, such as tree planting, green stream bank protections, using the Green Wager approach, under terms and conditions acceptable to the Association, which shall include, inter alia, detailed selection criteria for community members ("Green Wager Agreement").

Schedule 2. Section I.A.6: To facilitate the carrying out of the Part 2.1(iii) of the Project, the Recipient, through MoES, shall enter into an agreement within ninety (90) days of the Effective Date with a Kyrgyz-based entity with solid



expertise in the OVOP Method, under terms and conditions acceptable to the Association, which shall include, inter alia, detailed selection criteria for community members ("OVOP Agreement").

Schedule 2. Section I.C.1: The Recipient, through MoES, shall ensure that the Project is carried out in accordance with the Environmental and Social Standards, in a manner acceptable to the Association.

Schedule 2. Section I.C.2: Without limitation upon paragraph 1 above, the Recipient, through MoES, shall ensure that the Project is implemented in accordance with the Environmental and Social Commitment Plan ("ESCP"), in a manner acceptable to the Association.

Schedule 2. Section 1.D. 1-3: Prior to procurement and/or use of drones or unmanned aerial vehicles under the Project, the Recipient shall: (a) notify the Association of such proposed procurement and/or use, and afford the Association a reasonable opportunity to assess any risks related to such procurement and/or use, including operational, legal and regulatory, institutional, technical, social and environmental, and fiduciary risks, and to recommend appropriate mitigation measures; and (b) develop a risk mitigation plan for the procurement and/or use of drones or unmanned aerial vehicles, in form and substance acceptable to the Association. The Recipient shall ensure that no drones or unmanned aerial vehicles shall be procured and/or used under the Project unless the Recipient has implemented the risk mitigation measures in accordance with paragraph 1 above, the POM, and the ESCP, in form and manner satisfactory to the Association. No drones or unmanned aerial vehicles procured under the Project shall be used for any purpose other than those set out in Parts 1.1 and 1.2 of the Project and for which the risk mitigation plan referred to in paragraph 1(b) above has been developed and implemented, except where the Association has provided its prior approval in writing for such use based on: (a) assessment of the risks involved; and (b) implementation of appropriate risk mitigation measures.

Schedule 2. Section 1.E: Prior to the carrying out of any Personal Data collection and processing activities under the Project, the Recipient, though MoES, shall ensure that its staff, staff of any other unit or entity involved in the implementation of the Project and any third party contracted for the purpose, follow adequate data protection standards and protocols, in accordance with applicable national law and good international practice and acceptable to the Association, as such standards and protocols shall be incorporated in the POM and, where appropriate, the applicable terms of reference.

Conditions

Type	Citation	Description	Financing Source
Effectiveness	Article IV 4.01 (a)	The Recipient, through MoES, has adopted the POM, in form and substance satisfactory to the Association	IBRD/IDA, Trust Funds
Effectiveness	Article IV 4.01 (b)	The PROGREEN Grant Agreement has been executed and delivered and all conditions precedent to its effectiveness or to the right of the Recipient to make withdrawals under it (other than the	IBRD/IDA, Trust Funds



		effectiveness of this Agreement) have been fulfilled	
Effectiveness	Article IV 4.01 (c)	The KWPF Grant Agreement has been executed and delivered and all conditions precedent to its effectiveness or to the right of the Recipient to make withdrawals under it (other than the effectiveness of this Agreement) have been fulfilled	IBRD/IDA, Trust Funds



I. STRATEGIC CONTEXT

A. Country Context

Regional context

1. **Drylands in Central Asia¹ are one of the most rapidly degrading and climate vulnerable areas in the world.²**

A mix of natural arid conditions and increasing anthropogenic pressures, such as conversion of land to intensified commercial agriculture, logging, and grazing, have led to land degradation, deforestation, erosion, loss of vegetation cover, and loss of biodiversity. This, in turn, has affected the productivity of agriculture, the resilience of infrastructure, and the potential for tourism development, while increasing the fragility of the region. The region is increasingly exposed to intense weather events and natural disasters, which further degrade the landscapes, people's living conditions and economic opportunities, and infrastructure. Furthermore, in Central Asia, land degradation is a critical trigger of migration in search of livelihoods.³ Climate change impacts are expected to worsen the condition of countries' natural resources and the overall resilience of their populations and ecosystems. Glaciers in Central Asia, accounting for 10 percent of the annual streamflow in the Amu Darya and Syr Darya basins, have already shrunk by one third in volume since the beginning of the 20th century.⁴ Glacier and snow cover melt in upstream countries due to climate change will lead to an increase in mudflows, floods, and risk of glacial lake outburst flood (GLOF), that will impact both upstream and downstream countries.⁵

2. **According to the most recent estimates, the annual cost of land degradation in Central Asia due to land use and land cover changes between 2001 and 2009 was about US\$6 billion,** around 6 percent of countries' average Gross Domestic Product (GDP), and every dollar invested in sustainable landscape restoration practices can yield four dollars of returns over a 30-year period.⁶ The increased frequency of landslides and mudflows costs the five Central Asian countries 1.2-2.2 percent of GDP annually.⁷ Arresting the degradation of regional public goods, such as water and land, will improve the livelihoods and climate resilience of the poor, and increase global interest in Central Asia's vast and largely pristine natural resource endowment for "clean and green" agricultural exports and tourism.

3. **Land degradation and deforestation are particularly prevalent in Central Asia's border areas, causing increased vulnerability of natural ecosystems and acute regional externalities.** Countries face similar border land management challenges due to high populations in these areas and resulting impacts of animal husbandry and irrigated agriculture activities (see Figure 3.1 in Annex 3). Border areas also experience degradation-related natural disasters, such as landslides, mudflows, and floods, which in turn impact key transboundary infrastructure, such as roads, railways, transboundary watersheds (Amu Darya and Sir Darya River basins), and impact transboundary trade and tourism along the region's Silk Road. The region's transboundary biodiversity corridors, home to some globally

¹ Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan.

² Magero. C. 2019. Drylands and Climate Change – Synthesis Paper; and World Bank. 2019. <https://blogs.worldbank.org/voices/fighting-climate-change-planting-trees-sea>.

³ <https://www.unccd.int/news-stories/stories/new-study-links-climate-change-land-degradation-and-migration-central-asia>.

⁴ World Bank. 2015. <https://www.worldbank.org/en/news/press-release/2015/11/03/world-bank-supports-climate-resilience-in-central-asia>.

⁵ For instance, 88 percent of outburst lakes posing risks to Uzbekistan are in the Kyrgyz Republic. Source: Uzhydromet data http://193.7.160.230/web/neacc/neacof5/Zayceva_neacof5.pdf.

⁶ Mirzabaev, A., Goedecke, J., Dubovik, 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*. Springer. Retrieved on [2016, 01/11] from [DOI 10.1007/978-3-319-19168-3_10].

⁷ World Bank. 2023. Regional Engagement Framework for Central Asia. January 2023 Update. Washington, DC.



important migratory routes and critically and highly endangered species, such as the Asiatic cheetah and the Saiga antelope, are also affected in their ability to conserve biodiversity.⁸

4. The World Bank Central Asia Resilient Landscape Restoration Program (RESILAND CA+ Program) was formed in 2019 to provide Central Asian countries with a regional framework to increase the resilience of regional landscapes and people through landscape restoration. This umbrella program finances analytics and advisory on landscape restoration, and supports investment projects in Central Asian countries, namely the Uzbekistan Resilient Landscapes Restoration Project (P174135, approved in June 2022) and the Tajikistan Resilient Landscape Restoration Project (P171524, approved in February 2022), glued together by a Regional Exchange Platform for high-level dialog on landscape restoration. Each RESILAND CA+ project addresses landscape restoration using country-relevant entry points: Uzbekistan focuses on tree-based systems, protected areas, and nature-based tourism, while Tajikistan focuses on forest, protected area, and pasture management. The collective, harmonized, and regional approach of the RESILAND CA+ Program, where shared regional cooperation goals are delivered through country-based engagements, is considered the most effective method for landscape restoration with shared border areas being hotspots of land degradation, deforestation, and poverty, making national approaches less effective. The Program is also aligned with a regional vision of addressing the degradation of regional public goods by working together as one region.

5. Regional cooperation offers a promising trend to address landscape degradation. January 2023 saw the signing of a historic border agreement between Uzbekistan and the Kyrgyz Republic, adding to the signing of more than 20 other agreements in the past several years. Uzbekistan and Kazakhstan convened a summit of Central Asian heads of state in Astana, Kazakhstan in March 2018 where they signed the Astana Resolution on reinforced cooperation on landscape restoration. Additionally, in 2019, the countries joined the ECCA30 Initiative to support landscape restoration efforts in partnership with European states and prominent development partners, and in 2020, the countries endorsed a 10-year Regional Environmental Program for Sustainable Development under the auspices of the Interstate Commission on Sustainable Development and signed a Joint Declaration of intent to cooperate on climate and security within the framework of Green Central Asia. The 2021 Summit's Joint Statement stressed the importance of "a dialogue platform to discuss urgent issues of regional cooperation" to address "climate change mitigation and adaptation, desertification control, rational use of water and energy resources, environmental protection and ecology" among other issues.⁹ This regional vision is key for ensuring policy harmonization between the countries on transboundary landscape restoration with a potential for positive regional spillovers, such as improved connectivity, resilience of cross-border infrastructure, resilience of transboundary communities, capability for early warning, and peace.

Country context

6. Economic growth in the Kyrgyz Republic has been volatile in the past decade due to overdependency on gold production and remittances, political instability, and a lack of a competitive private sector. The poverty rate (at US\$3.65/day) is expected to decline from 17.2 percent in 2021 to 15.5 percent in 2022, and GDP growth is expected to moderate to 3.5 percent in 2023 as gold production contracts and the agriculture sector experiences a slowdown. Poverty levels are expected to decline by 0.6 percent to 14.9 percent, reflecting the positive effect of increased social protection programs and wage increases exceeding the negative impact of falling remittances and slower growth. Yet, risks to this outlook remain significant: a deterioration of the Russian economy may lead to added decline in

⁸ UN Environment. 2020. Convention on Migratory Species, February 2020; Report on Transboundary Conservation Hotspots for Central Asia Mammals Initiative.

⁹ Turkmenistan. 2021. Joint Statement following the Consultative Meeting of the Heads of State of Central Asia.



remittances, and stricter application of the existing international sanctions on Russia, or imposition of secondary sanctions against Kyrgyz-based companies might significantly impact trade and domestic economic activity.¹⁰

7. The country is an important source of water for the region. The Kyrgyz Republic is located between two major mountain systems, the Tien Shan, and the Pamirs, and is bordered by Kazakhstan to the north, China to the east, Uzbekistan to the west, and Tajikistan to the southwest. In this highly mountainous country, most people live in the foothills of mountains, centered around two urban conurbations - the capital Bishkek in the north and the Fergana Valley between Osh and Jalal-Abad oblasts (regions) in the west. Of the total land area of about 200,000 square kilometers, 94 percent is covered by mountains of an average height of 2,750 meters above sea level.¹¹ The Kyrgyz Republic's high-elevation glaciers, known as the "Water Tower of Central Asia", feed many of Central Asia region's rivers through a combination of ice-snow melt in high mountains, precipitation in mid-mountain forests, and fissure water in low mountains. The glaciers produce water in the hottest and driest periods of the year and compensate for periods of low precipitation - crucial to the region's agricultural economy (93 percent of the total freshwater use¹²) and the production of hydroelectric power. The Kyrgyz Republic consumes about 20 percent of its surface water resources¹³, while the rest flows to downstream countries such as Kazakhstan, Tajikistan, and Uzbekistan.

8. The Kyrgyz Republic is highly vulnerable to climate change impacts, ranking 65 out of 185 countries in the 2021 ND-GAIN Index.¹⁴ The country has identified climate change impacts as significant challenges to its development goals with its commitment to climate change adaptation outlined in the country's First Nationally Determined Contribution (NDC, 2016) and Updated NDC (2021). In 2016, the Kyrgyz Republic released its Third National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), identifying water, energy, agriculture, and infrastructure sectors as the most vulnerable to climate change impacts.¹⁵ Between 1970 and 2000, the country lost about 17 percent of its glaciers and some forecasts suggest that the Kyrgyz Republic may lose about 50 percent of its glaciers by 2050¹⁶, leading to intense floods and droughts that will in turn affect the entire Central Asia region.

B. Sectoral and Institutional Context

9. The geography of the Kyrgyz Republic makes it highly prone to natural disasters. On average, the country experiences 200 natural disasters each year, including avalanches, earthquakes, floods, mudflows, landslides, and droughts.¹⁷ In recent years, and with the support of the World Bank-funded Enhancing Resilience in Kyrgyz Project (ERIK, P162635), the country has improved its capacity to mitigate, and respond to natural disasters by developing a framework for a Unified System of Comprehensive Monitoring and Forecasting of Emergencies (USCMFE) - a geospatial platform that includes information on policies, infrastructure, data, tools, and capacity building to support efficient decision making for disaster risk management (DRM), maintained by the Ministry of Emergency Situations (MoES) Hazard Monitoring and Forecasting Department (HMFD). The platform is part of the country's newly established Crisis Management Center with early warning and damage and loss assessment capabilities. However, a national system and consistent methodology to monitor natural and climate-induced disasters (such as mudflows,

¹⁰ World Bank Kyrgyz Republic Macro Poverty Outlook, October 2023.

¹¹ <https://mfa.gov.kg/en/Menu---Foreign-/about-country/about-Kyrgyzstan>.

¹² <https://www.un-page.org/static/5bae010ac61b99a0e71f4ab989306e1c/2017-kyrgyz-republic-green-economy-stocktaking-report-rus.pdf>.

¹³ Water Resources Service, 2023. <https://news.un.org/ru/interview/2023/03/1439172>.

¹⁴ University of Notre Dame. 2020. Notre Dame Global Adaptation Initiative. <https://gain.nd.edu/our-work/country-index/>.

¹⁵ Kyrgyz Republic. 2016. Third National Communication to the UNFCCC. <https://unfccc.int/sites/default/files/resource/>.

¹⁶ NC3_Kyrgyzstan_English_24Jan2017_0.pdf.

¹⁶ Central Asian Institute of Applied Geosciences (CAIAG).

¹⁷ MoES, March 2023. https://24.kg/obschestvo/261746_opolzni_seli_lavinyi_kto_inbspkak_spasaet_nas_otnbspchrezvyichaynyih_situatsiy/.



glaciers, flash floods, and snow cover) is lacking and such data are not fed into the USCMFE, thus limiting the possibilities of the USCMFE in decision making and planning of DRM and response actions that would benefit the Kyrgyz Republic and the region.

10. Land degradation, mountainous terrain, and impacts of climate change make the country particularly vulnerable to mudflows that further degrade its landscapes and impact communities and infrastructure. The combination of degraded land, topography, and adverse climate conditions, especially heavy precipitation events after prolonged drought periods and rapid glacier and snow melt, resulted in 920 mudflow events in 2010-2022, accounting for 35 percent of all disasters in the country. Each year, 17,000 people were affected on average, costing the economy US\$38 million.¹⁸ The mudflows eroded soils, removed vegetation, destroyed infrastructure, houses, agriculture activities, and other economic assets, and put at risk the lives and livelihoods of downstream communities. Climate change impacts are projected to increase mudflow frequency and intensity in the range of 5-15 percent by 2050.¹⁹

11. Land degradation has been estimated to cost the Kyrgyz Republic US\$601 million annually (base year 2007), translating into 16 percent of GDP.²⁰ According to a report submitted by the Kyrgyz Republic to the United Nations Convention to Combat Desertification (UNCCD) in March 2023, the proportion of degraded land over the total land area in 2015-2019 was 9.6 percent, equivalent to 18,319 square kilometres of degraded land across the country, and close to two million people were exposed to land degradation in 2015-2019.²¹ Rural communities, in particular transboundary communities and low-income groups, are most impacted as land degradation affects water, pasture, and agricultural land, 45.7 percent of which is already considered vulnerable to degradation due to unsustainable practices and climate change.²²

12. MoES is the main entity responsible for disaster risk reduction (DRR), DRM, and hydrometeorology, and is therefore a key partner for strengthening landscapes resilience and reducing land degradation in the Kyrgyz Republic. MoES has departments at national and oblast levels, working in collaboration with other ministries and agencies, including the Ministry of Agriculture and the Ministry of Natural Resources, Environment and Technical Supervision. KyrgyzHydromet (KHM) is the MoES agency responsible for meteorological and hydrological monitoring and forecasting, and the MoES' HMFD receives the data and combines them with exposure and vulnerability data to guide decision-making for disaster preparedness, warning, response, and risk reduction. The Institute of Water Problems of the National Academy of Sciences of the Kyrgyz Republic (NAS) has research capacity and conducts monitoring and forecast of mudflows. Currently, the KHM, the Tien Shan Alpine Scientific Center (TSASC) under NAS, and the Central Asian Institute of Applied Geosciences (CAIAG) monitor the dynamics of specific glaciers in the country using varied approaches and methodologies, with limited coordination and staff capacity.

13. MoES has some experience in using green solutions and nature-based solutions (NBS) in DRM activities. Between 2014 and 2020, MoES carried out upstream planting in 1,200 hectares of mudflow-prone areas as part of a Green Project, led by its Department for Protection of Population and Territories, aiming at slope stabilization pilots in landslide prone areas. The planting was carried out by local communities following a Green Wager Program (GWP)²³

¹⁸ WRI. 2018. AQUEDUCT Global Flood Analyzer. <https://floods.wri.org/>.

¹⁹ World Bank Climate Risk Country Profile for Kyrgyz Republic. 2021. Havenith, H. B., Torgoev, I., Meleshko, A., Alioshin, Y., Torgoev, A., & Danneels, G. 2006. Landslides in the Mailuu-Suu Valley, Kyrgyzstan—Hazards and Impacts. *Landslides*, 3(2), 137–147.

²⁰ Global Mechanism of the UNCCD. 2018. Country Profile of Kyrgyzstan. Investing in Land Degradation Neutrality: Making the Case. An Overview of Indicators and Assessments. Bonn, Germany.

²¹ UNCCD Kyrgyz Republic Country Profile. <https://www.unccd.int/our-work-impact/country-profiles/kyrgyzstan>.

²² Shamshiev B. N. Teshebaeva Z. A. and Ismailova J. A. 2017. Degradation of Land in Kyrgyzstan and the Ways of their Solutions. Report. Bishkek: KNAU.

²³ The Green Wager concept is broadly described as temporary labor-intensive activities in natural resource management for which



approach in collaboration with local authorities and the technical support of the United Nations World Food Programme (WFP), which mobilized and trained communities and compensated them for labor. The Green Project was frozen in 2021-2022 for lack of public funding and it resumed in 2023 at a small scale. MoES has implemented small-scale structural NBS solutions in streams prone to mudflows, such as retention ponds or groynes (to reduce transportation of mud to downstream areas during floods) and green stream bank protection measures, such as riprap. While MoES recognizes the value of planting and NBS for disaster prevention and community engagement, it lacks sufficient knowledge on solid methodology and scientific approach, possible solutions, experience, and funding to scale them up to make a real impact on increasing resilience against mudflows and other natural and climate-induced disasters.

C. Relevance to Higher Level Objectives

14. **The project supports the World Bank Group (WBG) Regional Engagement Framework for Central Asia (REFCA, January 2023 update), Pillar 2 (Regional Public Goods) and its focus on “Climate, Environment, and Disaster Risk Management”.** The REFCA considers the RESILAND CA+ Program and its national projects key components of the WBG medium-term program in the region, noting important contributions to fragility mitigation, improved human wellbeing, and food security. The REFCA notes the impact of land degradation on road connectivity, critical hydropower dams, and environmental investments, which is a key factor in the selection of project sites.

15. **The project is aligned with the WBG Evolution Roadmap as reflected in the “Ending Poverty on a Livable Planet: Report to Governors on World Bank Evolution” and with the current Country Partnership Framework for FY24-28 (CPF).**²⁴ The project will contribute to the achievement of the WBG Evolution Roadmap goals in the Kyrgyz Republic as it would restore degraded land on which poor communities are dependent and reduce the impacts of mudflows on landscapes and poor communities downstream. The project will support the FY24-28 CPF Higher Level Objective 2: Improved Access to Sustainably Managed Natural Resources, Objective 2.3: Strengthen Infrastructure Resilience to Climate and Disaster Risks through proactive measures to reverse land degradation and strengthen government capacity to monitor and respond to mudflows. The project will also support Higher Level Objective 3: Enhanced Human Capital and Empowerment of Vulnerable Populations, Objective 3.2: Enhance Economic Empowerment and Voice of Vulnerable Groups, through a livelihoods program targeting women that will provide them with required training, including on business and finance planning.

16. **The project supports the Kyrgyz Republic’s international and national commitments on landscape restoration and DRM,** including the UNCCD Land Degradation Neutrality commitment to adopt sustainable land management practices in 100,000 hectares of land and land improvement works across 10,000 hectares²⁵; the President-signed national 2023 decree declaring 2023–2027 as Five Years of Action for the Development of Mountain Regions in the Kyrgyz Republic²⁶; the National Development Strategy for 2018–2040, which defined strategic goals, objectives, and actions in DRM and adaptation to climate change; the NDC, which defines reduction of risk of emergencies caused by climate change among adaptation measures, and expansion of the perennial plantations areas as mitigation and adaptation measures, amongst others; as well as several international treaties and conventions on

participants are paid a direct wage under standard labor rates, resulting in long-term benefits for the environment and society.

²⁴ Country Partnership Framework for the Kyrgyz Republic for the Period FY24–28, Report No. 182689-KG, discussed by the World Bank Board of Executive Directors on October 31, 2023.

²⁵ <https://www.unccd.int/our-work-impact/country-profiles/kyrgyzstan>.

²⁶ This followed the President’s announcement at the United Nations General Assembly of a global framework for the Five Years of Action for the Development of Mountain Regions 2023–2027, developed with the Mountain Partnership and partners. The Mountain Partnership is a United Nations alliance dedicated to mountains. See <https://www.fao.org/mountain-partnership/en/>.



DRM and climate change, including the UNFCCC, the Sendai Framework for DRR, and the Paris Agreement, to which the Kyrgyz Republic is party.

17. **The project leverages grant resources from the Global Partnership for Sustainable and Resilient Landscapes (PROGREEN) umbrella trust fund and Korea-World Bank Partnership Facility (KWPF) trust fund and supports their goals.** The project will support PROGREEN's Pillar 1 "Management of Terrestrial Ecosystems", which seeks to support the strengthening of integrated and sustainable management of natural resources of terrestrial ecosystems in landscapes and corridors, and PROGREEN cross-cutting issues related to engaging communities and vulnerable groups and addressing climate change mitigation and resilience needs. The project will support the KWPF's objective of assisting WBG developing member countries to achieve inclusive and sustainable economic growth and to foster broader dialogue on economic development issues, including through knowledge and experience exchange.

II. PROJECT DESCRIPTION

A. Project Development Objective

18. **The project is part of the RESILAND CA+ Program, whose goal is to increase resilience of regional landscapes in Central Asia.** The regional impact of the Program will be measured by aggregating the results of individual RESILAND CA+ Program country projects and monitoring the results of regional activities. Accordingly, the Project Development Objective (PDO) and PDO-level Indicators are harmonized across the RESILAND CA+ Program country projects.

PDO Statement

19. The objectives of the project are: (i) to increase the area under sustainable landscape management in Selected Locations in the Kyrgyz Republic²⁷; and (ii) to promote Kyrgyz Republic's collaboration with other Central Asian countries on transboundary landscape restoration.

PDO Level Indicators

20. **The following indicators will measure the achievement of the PDO:**

- (a) Land area under sustainable landscape management practices (Corporate Results Indicator [CRI], Hectare)
- (b) People benefiting from landscape management practices (Number, sex disaggregated)
- (c) Transboundary sustainable landscape management policies harmonized (Number)²⁸

B. Project Components

21. **Project approach.** The project's regional objective will be achieved by generating and disseminating landscape restoration, climate change resilience, and DRM knowledge in support of policy harmonization across the region - a necessary step toward transboundary landscape restoration. At the national level, the project will enhance the country's mudflow, glacier, and snow cover monitoring systems to inform decision making in mitigating the impacts of mudflows and snow melt in the long term. Within the targeted mudflow-prone areas, the project will support a

²⁷ Sustainable landscape management practices vary among the Central Asia countries based on context and needs. In the Kyrgyz Republic, the entry point for sustainable landscape management is the nexus of landscape restoration and building resilience of landscapes and communities to natural/climate-related disasters and hazards with a focus on mudflows.

²⁸ Sub-component 1.3 explains how the respective regional activities of the RESILAND projects will result in this outcome, and Section VI describes the target.



combination of upstream (upper part of target catchments) and downstream (lower part of the catchments, in floodplains) climate-resilient NBS and green, grey, and hybrid solutions where grey solutions provide immediate mudflow mitigation benefits while NBS and green solutions provide these benefits in the medium- and long-terms. The project approach has immediate and direct regional spillover effects as the target areas in the south of the country are located upstream of transboundary rivers. The implementation of green solutions will have a strong focus on community participation through a GWP approach to create green jobs and enhance community buy-in of interventions. It will be accompanied by support to resilient livelihoods for the communities through training and market linkages using the One Village One Product (OVOP) method²⁹, which has been proven effective in the Kyrgyz Republic, to reduce the pressure off natural resources, and ensure sustainable job creation and community buy-in of interventions.

22. **Project intervention areas.** The project will be implemented in the northern oblasts of Naryn and Issyk-Kul, bordering Kazakhstan, and the southern oblasts of Jalal-Abad and Osh within the transboundary (with Uzbekistan) Kara-Darya River basin, in particular within the Kara-Unkur River sub-basin and the Kugart River sub-basin. The majority of the intervention sites (13) will be in Osh and Jalal-Abad oblasts, which present the highest concentration of mudflow high risk sites.³⁰ Three intervention sites will be in Issyk-Kul and Naryn oblasts in the north – sites that present high mudflow risk levels with considerable protection impact of households and agricultural land. Green and NBS interventions and specific locations will be identified by an ongoing World Bank-financed technical study. The sites and their selection process are presented in Annex 3.

23. **Complementarity with RESILAND CA+ Program operations.** The RESILAND CA+ Program focuses on different forms of landscape management approaches to achieve landscape restoration based on country-specific priority and degradation challenges as noted above. In the Kyrgyz Republic, the landscape restoration mechanism will focus on the nexus of landscape degradation and DRM through a combination of NBS and grey, green, and hybrid solutions in high-risk locations. The regional program framework provides an opportunity for countries to learn from each other while benefiting from their individual restoration efforts. The countries also present complementarities in the regional activities that they support (see sub-component 1.3).

24. The project will be financed by US\$45 million International Development Association (IDA) credit, US\$5 million PROGREEN grant, and US\$2.4 million KWPF grant, and will comprise three inter-related components to be implemented over a five-year period.³¹

Component 1: Strengthening Institutions and Regional Collaboration (*US\$6.5 million from IDA; US\$2.0 million from PROGREEN; US\$2.4 million from KWPF*)

25. Component 1 has a national and regional focus, financing activities that enhance government capacity for forecasting, monitoring, and preparedness for reducing and mitigating impacts of natural and climate-induced disasters, thereby enhancing resilience of landscapes and their restoration (sub-components 1.1 and 1.2) and activities that improve regional awareness, capacity, and cooperation on transboundary resilience of landscapes (sub-

²⁹ The OVOP method was introduced by JICA and is based on the concept of developing one village by promoting at least one product where regional resources such as local agricultural products, specialty products, and tourism resources are accepted not just locally but worldwide. This approach has already been successfully implemented in several oblasts in the Kyrgyz Republic, including Issyk-Kul, Osh, and Jalal-Abad.

³⁰ According to MoES, with the possible occurrence of catastrophic events (1st degree) and destructive events with flows between 100 to 1,000 m³/s (2nd degree).

³¹ The PROGREEN and KWPF grants will close before the project's closing date due to their respective trust fund closing timeline. Discussions are ongoing with the donors on potential extensions to align with the project's closing date.



component 1.3). National-level activities will have regional spillover effects on water resources assessment and forecasting, which is of a strategic importance for the Central Asia region.

Sub-component 1.1: Strengthening Institutions and Climate-induced Hazard Monitoring Capacity (*US\$6.50 million from IDA*)

26. To enhance glacier and snow cover monitoring, the sub-component will strengthen the capacities of KHM under MoES, the Institute of Water Problems and Hydropower (IWP), and TSASC under NAS to conduct monitoring and forecast of glaciers. KHM will be supported with: (i) development and operationalization of a national glacier and snow cover monitoring system, with associated activities, such as preparation of standard monitoring and modeling methodologies, integration of glacier inventories, and information and communication technology (ICT) equipment; (ii) monitoring field equipment and other goods for relevant MoES units, including HMFD and KyrgyzHydromet; (iii) hands-on training of junior staff and partners; (iv) operating costs of field expeditions to monitor glaciers at Kungei Ala-Too range in Chok-Tal and Chon-Aksuu river basin in Issyk-Kul Oblast; and (v) construction of an avalanche station at a priority location. TSASC will be supported with: (i) modern equipment and operating costs for field investigations and vertical sounding and related expenses to allow it to conduct and update its glacier studies; and (ii) goods, consultancies, and training to help it conduct climate and hydrological modeling of glaciers as well as assessments of glacial hazard risks, such as avalanches and GLOF. TSASC will support KHM in the establishment of the national glacier and snow cover monitoring system.

27. To enhance mudflow monitoring, the sub-component will support MoES's HMFD, which operates the USCMFE, and IWP, which monitors mudflows and floods and issues forecasts of water availability. HMFD will be supported with (i) procurement of monitoring equipment such as mobile monitoring points, laser scanners, unmanned aerial vehicles, drones, satellite data, and equipment for field investigation, (ii) installation of 1-2 automated monitoring stations in the Kara-Darya river basin; and (iii) training of MoES staff on the use of the new equipment and systems. IWP will undertake the development of methodologies and guidelines for predicting, modeling, and assessing mudflow hazards to be endorsed by MoES. The activities will be supported by a field monitoring study for monitoring glacial lakes with high risk of outburst flood and procurement of monitoring equipment, technical assistance, and Geographic Information System (GIS) training to strengthen their digitalization, updating of maps, and field validation capabilities.

28. The sub-component will also finance the installation of hydrological and meteorological posts to measure the effectiveness of downstream interventions at each site, and sediment transport monitoring equipment to inform and validate the design of climate-resilient mudflow mitigation measures.

Sub-component 1.2: ICT for Disaster Risk Management in Degraded Landscapes (*US\$2.4 million from KWPF*)

29. The sub-component will finance ICT system design, technical support, software, equipment, and experience exchange with expert agencies from Korea to develop a data-driven and user-oriented ICT tool for mudflow monitoring in degraded landscapes and incorporate it into the mudflow monitoring system and USCMFE under HMFD. The USCMFE will consequently feature advance geospatial and mapping capability, a satellite data utility, and functions to analyze the interface between land degradation, land cover, and mudflows, as well as features that facilitate inter-government data sharing for a more accurate and quick forecasting of mudflows and decision making. While the USCMFE modernization will be led by HMFD, the MoES' Mudflow Protection Service will be supported to develop an asset management system, which will host historical mudflow data, such as locations and affected number



of people, and infrastrucutre inventory (for example, embankment and gryones) with respect to its GIS information, conditions, record of repairs, etc.

30. ICT software and equipment will be provided to HMFD and MoES' Mudflow Protection Service and its regional offices, and relevant governmental agencies will be given access to the system. The sub-component will also finance the development of manuals and enhance the capacity of HMFD and other relevant departments to operate and maintain the ICT tool, including a study tour to/from Korea by experts, and other ICT equipment for HMFD to help it access and analyze field data gathered by its field offices. The sub-component will finance ICT equipment (GIS software, drones, Global Positioning System equipment, PC equipment) and information technology and GIS-related expertise for the Ministry of Agriculture's Kyrgyz Design Institute on Land Management (Giprozem), which is in charge of maintaining national land degradation maps. This equipment will help Giprozem produce digital land degradation maps and other technical reports that will be integrated into the national mudflow monitoring system to enable more robust data availability for forecasting. A field survey will be conducted in project areas to verify the maps and refine the process. The systems will feature the latest high efficiency and low emission technologies in line with World Bank guidelines for ICT/monitoring equipment.

31. The World Bank's Guidance on Managing the Risks of Unmanned Aircraft Operations in Development Projects (the "UAO Guidance") will be applied to the project, and the Project Operations Manual (POM) will specify the allowed modalities for the operationalization of drones, including a risk mitigation plan for the procurement, use, and management of drones.

Sub-component 1.3: Strengthening Regional Collaboration (*US\$2.0 million from PROGREEN*)

32. The sub-component will finance two sets of activities:

- (a) Set 1 (US\$1 million): (i) development of an online catalog of current and future climate-induced disasters of a transboundary nature in Central Asia, to inform the region's governments on priority areas needing attention and actions to help mitigate the impact of such disasters on landscape degradation; (ii) preparation of an NBS manual and guidelines to expand the use of NBS against mudflows, flashfloods, landslides, and other climate-induced events in Central Asia; (iii) development of a regional roadmap for mudflow mitigation, including an investment plan; and (iv) regional coordination activities of knowledge exchange, joint research, field visits, and training. As in the RESILAND CA+ projects in Tajikistan and Uzbekistan, these activities will be executed by the Regional Environmental Centre for Central Asia (CAREC) under a contract with MoES.³² The generated knowledge will be shared regionally through the regional exchange and knowledge platforms financed by RESILAND Tajikistan and Uzbekistan, respectively, the USCMFE under HMFD, and other data sharing mechanisms assessed by CAREC as effective. CAREC may subcontract other entities for the execution of specific activities.
- (b) Set 2 (US\$1 million): (i) support regional and global efforts to promote mountain landscapes and communities under the framework of the Second Global Bishkek Mountain Summit, Bishkek+25 by financing logistics, travel and accommodation for participants, technical support in preparing sessions, translation, printing, transportation, meals, and an event organizer³³; (ii) support the development of coordinated approaches by regional scientific and educational entities to research of glaciers, water resources,

³² CAREC is an independent, non-political, non-for-profit international organization, established in 2001 by all five Central Asia countries, the European Union, and UNDP. It is headquartered in Almaty, Kazakhstan, with country offices in all Central Asia capitals.

³³ With additional resources provided by the government of the Kyrgyz Republic.



ecosystems, and mountain communities in Central Asia and develop educational programs by financing round tables, knowledge exchange, research, studies, and IT support; (iii) finance technical assistance to mountain communities in Central Asia on the development of mountain products, including undertaking a gap analysis, product selection, training, and marketing; and (iv) finance a full-time technical expert to support the Mountain Partnership Secretariat in Bishkek (housed by the Ministry of Foreign Affairs) and liaise on regional and national activities with the Mountain Partnership's global secretariat, hosted by the Food and Agriculture Organization of the United Nations (FAO) in Rome.

33. The knowledge generated by these activities will complement a regional exchange platform financed by RESILAND Tajikistan and a regional online database on sustainable landscape management and restoration financed by RESILAND Uzbekistan. While each country is accountable for its respective regional deliverables, these exchanges and knowledge products combined are expected to result in bilateral and/or multilateral agreements between the Central Asian countries on harmonized transboundary sustainable landscape management policies, memoranda of understanding (MoUs), plans, or protocols (a menu of options is presented in Annex 3).

Component 2: Enhancing Resilient Landscapes and Livelihoods (*US\$37.0 million from IDA; US\$3.00 million from PROGREEN*)

34. Component 2 will finance upstream and downstream nature-based, grey, green, and hybrid solutions for reducing the impact of mudflows on communities, landscapes, and infrastructure in the targeted transboundary areas. These solutions will not result in land use change that would lead to the loss of carbon capture or an increase in emissions. It will also provide short-term local green jobs through a GWP and long-term livelihood opportunities to communities as further support for landscape restoration by securing local communities' ownership of planting activities and removing additional pressure from the landscape, respectively. As most of the proposed interventions will occur within the transboundary Kara-Darya basin (which traverses Uzbekistan), activities are expected to have positive regional spillovers, including on communities, landscapes, and infrastructure, including flood and mudflow protection, sediment retention and water infiltration improvement, protection of transboundary infrastructure, and livelihood resilience.

Sub-component 2.1: Landscape Restoration through Climate-resilient Green Solutions (*US\$1.0 million from IDA; US\$3.00 million from PROGREEN*)

35. The sub-component will finance afforestation, enrichment planting, live crib walls, fencing, water retention structures, and irrigation works required to maintain the planted areas. Innovations, including the combination of fast-growing poplar trees with fodder species, will be demonstrated in suitable areas. Materials, hand tools, and equipment, temporary seasonal watering, irrigation works, and water harvesting structures will be financed, including sourcing of seedlings from state and private nurseries.

36. To maximize the impact of the project on affected local communities, a GWP approach will be implemented where community members will receive wages through e-wallets for their participation in planting, fencing, digging ditches, watering, and other green solution-related activities. The target group will include vulnerable members of communities that are willing to participate in the GWP. Since MoES does not have a legislative basis to pay communities for labor, an entity with experience in close collaboration with MoES in implementing small-scale works related to NBS (for example, WFP³⁴ or any other organization) will be contracted to establish participant lists

³⁴ At the project appraisal stage, WFP was considered an entity to implement the described activities and assessed accordingly. This was based on its experience with the MoES and in the context of no other alternatives under discussion at the time.



(mostly vulnerable households) jointly with the Ministry of Labor, Social Protection, and Migration and village-level representative body (*ayil kenesh*), conduct community mobilization, provide training, including on monitoring of seedlings' survival, and provide payments to the GWP participants for their labor, in collaboration with the relevant municipalities. In terms of locations, a multi-criteria analysis approach will be taken to select project municipalities on an objective basis. Working within select target areas in each municipality, experts will conduct an ecological site classification to support the selection of degraded or semi-degraded lands suitable for restoration, silviculture, and management measures. Experts in forestry, dendrology, and geology from NAS will be engaged to study the types of vegetation to be planted and suitability of planting for identified sites. Land within leskhoz or protected areas will be excluded, and interventions will be climate-proofed and made sure that they meet communities' needs and provide an incentive for them to value these sites, once planted. The Department of People Protection and Territory under MoES will oversee the GWP activity at local and central levels.

37. MoES will contract OVOP Kyrgyzstan - a local organization working on rural development throughout the Kyrgyz Republic by utilizing the OVOP method - to mobilize and train mudflow-impacted community members in making non-timber products using locally available and leftover raw/waste and natural materials, such as fruit, nuts, wool, herbal plants, etc. OVOP Kyrgyzstan will also be responsible for product identification and recommendation, technological processes, branding support, and procurement of tools for production, sales, and training. Training will be provided on business planning, standards and quality control, and value addition. As per the OVOP method, OVOP Kyrgyzstan will mobilize interested individuals (while ensuring at least equal participation of females), provide them with technical training on specific products based on market analysis and available material, and ensure end-product quality. Participating community members will collectively purchase the raw materials and any required equipment and machinery, while the organization will purchase the final products from the producers and sell them through existing local, national, and international outlets. The GWP and livelihood activities will be coordinated to maximize the impact on local communities, targeting the same communities and thus ensuring short-term and longer-term employment opportunities. This activity will enhance the effects of the landscape restoration activities by supporting the diversification of communities' economic activities and thus reducing their pressure on the landscape. Further, the interventions are expected to secure the communities' buy in of the physical intervention in support of sustainability.

Sub-component 2.2: Landscape Restoration through Climate-resilient Nature-based and Grey Solutions (US\$36.0 million from IDA)

38. This sub-component will increase the resilience of landscapes, reduce land degradation, and protect communities, agricultural land, and infrastructure such as transboundary irrigation canals and roads from mudflows in 16 sites using climate resilient NBS and grey interventions. The sites selection under component 2 is grounded on the occurrence of mudflows, downstream transboundary impacts, intensity and impacts on households and landscapes. Thirteen sites are in Osh and Jalal-Abad (bordering Uzbekistan) along mudflow-prone tributaries of the Kara-Darya transboundary river, such as Kugart, Kara-UNKUR, and Aravan-Sai. The remaining three sites will be in Issyk-Kul (bordering Kazakhstan) and Naryn oblasts in the north in areas that present high mudflow risk levels with a considerable protection impact on transboundary road infrastructure, households, and environmental safety in Issyk-Kul oblast, and households and agricultural land in Naryn oblast. The first site is located near Balykchy city at the Bishkek-Tyup-Kegen road³⁵ connection to Kazakhstan. The second site is located near Cholpon-Ata city with the largest

³⁵ The Tyup-Kegen regional road link section is currently under rehabilitation by the Third Phase of the Central Asia Regional Program (P159220).



sewerage treatment facility in Issyk-Kul which is threatened by mudflows that could lead to the pollution of the Issyk-Kul Lake³⁶ and its ecosystem.

39. These interventions will mainly consist of repairing and/or restoring existing priority flood protection features (embankments) that were built during the Soviet time. Priority functioning defective embankments will be repaired, and dysfunctional embankments will be restored. Combined with conventional grey solutions, climate-resilient NBS interventions, such as minor works in riverbank protection with vegetated riprap and flood retention ponds as well as other nature-based flood management and erosion control interventions, will be financed to capture eroded sediment from mudflows and slow flood peak flows. Additional NBS sites upstream and/or downstream will be identified based on the severity of land degradation, historical mudflow records, topographical and soil features, and proximity to beneficiary communities who will help maintain the NBS interventions. The NBS may be cascaded or clustered; and/or combined with tree planting to maximize impacts at the micro-watershed level.

40. To ensure routine preventative maintenance of critical infrastructure, including embankments and other river erosion prevention structures by MoES, the sub-component will finance the purchase of machinery, inspection tools, associated equipment, and vehicles for MoES' Mudflow Protection Service in Issyk-Kul, Jalal-Abad, Naryn, and Osh oblasts. Heavy machinery and equipment will be also provided to MoES' Emergencies Prevention and Response Service for regular O&M of the structures. It will also finance feasibility studies and detailed designs for proposed interventions and supervision costs.

Component 3: Project Management and Coordination (*US\$1.5 million from IDA*)

41. The component will finance the incremental operating costs and other eligible expenses associated with project implementation. The MoES existing Project Implementation Unit (PIU) will carry out project management functions, such as procurement, financial management (FM), environmental and social (E&S) risk management, monitoring and evaluation (M&E), reporting, communication, and grievance redress. The PIU will also be responsible for preparing annual work plans and budgets for MoES and Ministry of Finance (MoF) approval, respectively, hiring of external auditors, and ensuring that a strong focus on gender inclusion and citizen engagement is maintained in project activities. In addition to the PIU core staff, technical specialists will be contracted by the project to provide technical and operational support in MoES' Bishkek office and in project oblast branch offices, including on the design and implementation of NBS. See Annex 3 for a summary of project costs.

42. **Climate Co-benefits.** The project will generate significant climate co-benefits by contributing to both climate change mitigation and adaptation. Carbon sequestration will be enhanced through planting as part of the green jobs under the GWP, incorporation of vegetation as NBS, and a livelihood program that focuses on non-timber products, while adaptation to climate change will be strongly supported by including grey and hybrid solutions to reduce impacts from climate-induced mudflows in high-risk areas, thus reducing landscape vulnerability to climate change impacts and enhancing the resilience of downstream communities, landscapes, and infrastructure. An ex-ante assessment has been conducted employing the FAO Ex-Ante Carbon-balance Tool (EX-ACT) tool to determine the potential project impact on greenhouse gas (GHG) emissions. The total net carbon balance (from sub-components 2.1 and 2.2) is estimated at 30,139 tCO₂-eq of mitigated emissions or 602,787 tCO₂-eq during the project lifetime. Considering the estimated shadow price of carbon that will evolve from year to year according to the World Bank Shadow Price of Carbon Guidance Note, 2017 (Carbon Pricing Instrument adjusted prices, US\$, 2022), the overall project Economic Internal Rate of Return (EIRR) and the Economic Net Present Value (ENPV) were re-calculated, and the results are presented in Annex 2.

³⁶ The area around Issyk-Kul Lake is a UNESCO Biosphere Reserve.



43. **Gender.** According to a 2023 Country Gender Assessment carried out by the World Bank and UKAid, in 2022, labor force participation for women was 44.1 percent compared to 74.5 percent for men in the Kyrgyz Republic. Women in the Kyrgyz Republic face multiple barriers to paid employment and starting businesses, including lack of skills in high demand, lack of training and access to credit, legal barriers, and others. The project will put strong emphasis on women, youth, and vulnerable groups' equal economic participation in its local economic development activities—the GWP and livelihoods program under sub-component 2.1 by providing them with required training, including on business and finance planning. A 50 percent female target will be monitored to ensure the closing of the employment gender gap. Participation will be secured by using the Ministry of Labor, Social Protection, and Migration and local authorities' databases of vulnerable households and approaching them directly to solicit their participation. Women's participation will be facilitated, for example, by providing space for childcare, and locating activities in ways that do not disrupt women's household responsibilities.

Table 1: Summary of Gender Gaps, Actions, and Indicators

Gap	Action	Indicator
Low participation of women in the labor force	Ensuring at least 50 percent share of females in newly created green jobs under sub-component 2.1 by providing them with required training, including on business and finance planning	Green jobs created (Number) - Share of green jobs created - Female (Percent)

44. **Citizen Engagement.** The project will ensure continuous and effective participation of stakeholders in the planning and implementation of activities. It will review the causes of mudflows and their impacts on people, landscapes, and infrastructure in a participatory way and solicit citizen feedback for the development of NBS and grey and green solutions. Citizens will be empowered to engage in the implementation of agreed solutions, including in planting activities through the GWP, and to expand their livelihood options. A survey at mid-term by a third-party entity will monitor beneficiaries' level of satisfaction with project-financed livelihood opportunities and DRM interventions to finetune these activities according to an adaptive management approach and to close the two-way feedback loop. The survey will be repeated at closing to reassess the effectiveness of corrective actions and the satisfaction rate will be monitored as part of the project's results framework. The project's Stakeholder Engagement Plan (SEP) outlines mechanisms and actions to foster a two-way dialogue with local citizens and ensure their participation throughout the project's life cycle. The SEP also includes a grievance mechanism, through which citizen and beneficiary feedback will be received and addressed within a timeline publicly stipulated by the project, measured by the project results framework.

C. Project Beneficiaries

45. **The direct beneficiaries of the project will be rural communities, including women and vulnerable groups and water user groups, within the upstream and downstream target catchments in Jalal-Abad, Osh, Issyk-Kul, and Naryn oblasts.** Individuals and households will benefit from increased protection from mudflows, more resilient assets and infrastructure, temporary employment through the GWP, and long-term livelihood opportunities through the livelihoods program. Restored landscapes will provide ecosystem services to upstream and downstream catchment communities, such as water infiltration, retention and regulation, surface soil retention and protection, buffering against climate risks and natural disasters, carbon capture, biodiversity conservation, improved air quality, and resources for local socio-economic development. Central and local staff of MoES and its various departments, as well as staff of the Giprozem, CAIAG, and NAS, will benefit from improved monitoring systems, ICT tools, data, guidelines, equipment, and capacities to monitor, forecast, plan, implement, and manage grey, green, and hybrid DRM solutions for landscape restoration. At the regional level, the governments of the five Central Asian countries will gain knowledge about current and future climate-induced disasters of a transboundary nature in Central Asia, effective

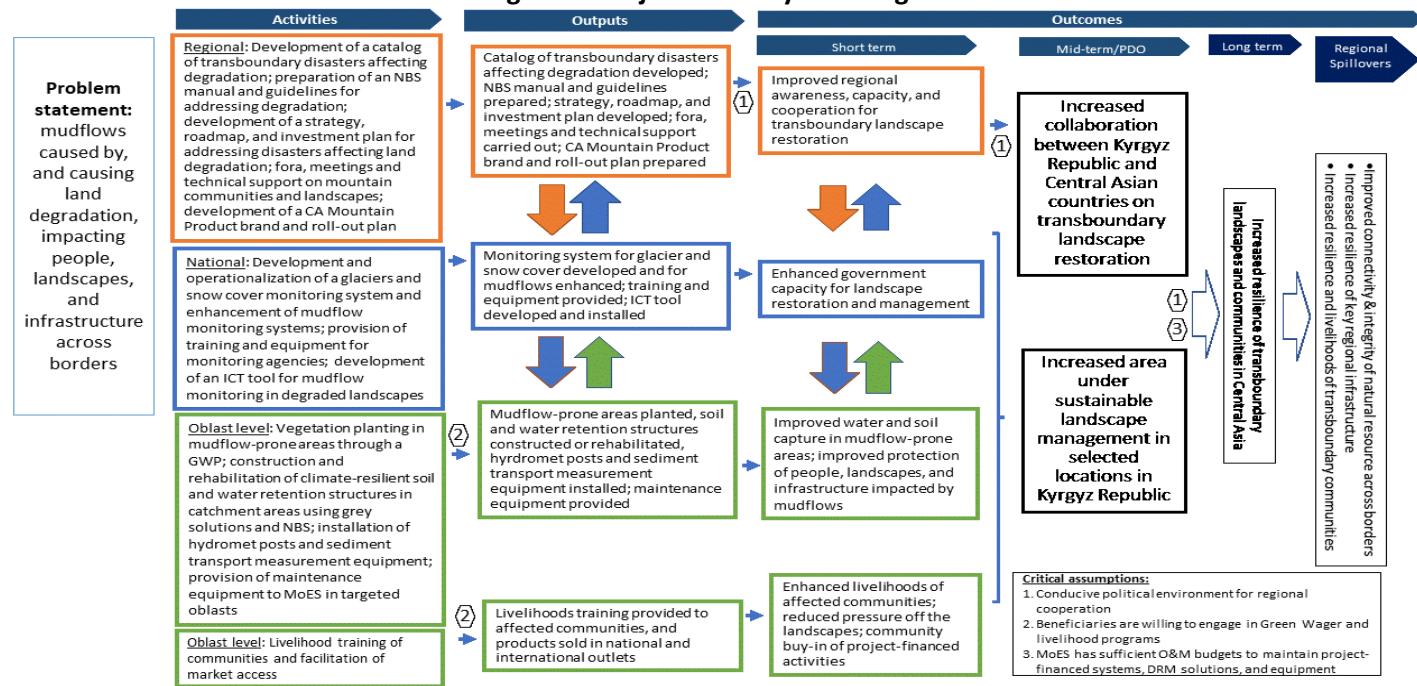


NBS and grey, green, and hybrid solutions for DRM and landscape restoration, and a framework for effectively supporting mountain communities' livelihoods and landscapes.

D. Results Chain

46. To achieve the PDO's first outcome, the project will: (a) enhance the government's capacity for landscape restoration and management by developing a monitoring system for glacier and snow cover, enhancing the country's mudflow monitoring system, and providing training, equipment, and technologies to relevant entities; (b) improve water and soil capture in mudflow-prone areas by planting vegetation in upstream areas, constructing upstream and downstream soil and water retention structures, installing hydromet posts and sediment transport measurement equipment, and ensuring maintenance of O&M equipment; and (c) enhance the livelihoods of affected communities to reduce the pressure off the landscapes and ensure community buy-in of project-financed activities through a livelihoods program. To achieve the second outcome, the project will improve the regional awareness of Central Asia countries and their capacity for transboundary landscape restoration by developing and endorsing regionally analytical products looking at the impact of transboundary disasters on degradation and means for addressing them, and providing Central Asian mountain communities with means to develop products to reduce their pressure off the landscape.

Figure 1: Project's Theory of Change



E. Rationale for Bank Involvement and Role of Partners

47. **Rationale for World Bank Involvement.** The World Bank has accumulated significant global experience in integrated landscape management and restoration approaches including from programs in China, Ethiopia, Lao PDR, and Türkiye, and extensive experience in DRM in Afghanistan, Tajikistan, and Türkiye. The World Bank has a history of collaboration with the Kyrgyz Republic's natural resource management, landscape restoration, and DRR sectors, notably the Integrated Forest Ecosystem Management Project (P151102), Water Management Improvement Project



(P088671), Enhancing Resilience in Kyrgyzstan Project (P162635), and Regional Economic Development Project (P167428). The World Bank has similar global experience, including in Central Asia, in advising governments on integrated systems for forecasting and monitoring of climate-induced and natural disasters. It also has been engaged in landscape restoration projects in the region, including the Resilient Landscapes Restoration projects in Kazakhstan and Tajikistan (P171577 and P171524), and the Central Asia Hydrometeorology Modernization Project (P164780). The World Bank will also add value by supporting regional dialogs for transboundary landscape, DRR, and natural resource-related issues that can be reinforced through the World Bank-led RESILAND CA+ Program.

48. **Role of Partners.** There are several prominent development partners operating in the sector in the Kyrgyz Republic, with whom MoES will collaborate during implementation. The project will collaborate with the Asian Development Bank, whose disaster mitigation measures and monitoring will inform actions under components 1 and 2; Japan International Cooperation Agency (JICA) on its community engagement model under sub-component 2.1; and the German Federal Foreign Office and German Society for International Cooperation (GIZ) on bringing in international experience and instruments for harmonizing climate change-related policies under sub-component 1.3 and on glacier monitoring under sub-component 1.1. The PROGREEN co-financing will increase the scale and impact of the project, particularly green solutions to mudflows, livelihood support, and regional technical assistance and strategic analytical work. PROGREEN grant resources will help the Kyrgyz Republic deliver on its Astana Resolution and ECCA30 commitments toward landscape restoration in an integrated and cost-effective manner, and support cross sectoral improvements in landscape management and restoration, agriculture sustainability, and livelihoods.

F. Lessons Learned and Reflected in the Project Design³⁷

- (a) **Political economy and national interests are dominant drivers of regional programs.** This lesson prompted the inclusion of a regional sub-component in the design of the project and in other RESILAND CA+ Program projects, and having it executed by CAREC, a widely endorsed and recognized regional organization in the field of environment and climate change, among others.
- (b) **Projects that support physical interventions in transboundary areas are most effective when:** (i) they also support economic and social activities that create opportunities for the population in the region; (ii) regional issues are addressed through national projects with regional dimensions; (iii) transboundary issues are part of the project design; and (iv) there is evidence of transboundary collaboration and dialog among the countries. The project incorporates these aspects in the design of components 1 and 2.
- (c) **The importance of addressing the underlying factors to natural resource degradation in addition to physical restoration.** The project supports the enabling environment for effective mudflow mitigation under Component 1 and upstream physical interventions to do the same under Component 2, backed by securing the buy-in of local communities and relevant stakeholders in the planning and execution of activities.
- (d) **Utilizing a phased approach to setting up and deploying new IT solutions in the Kyrgyz Republic to ensure sustainability.** This project will phase the development of a national glacier and snow cover monitoring system

³⁷ As discussed in (i) World Bank Independent Evaluation Group. 2021. The Natural Resource Degradation and Vulnerability Nexus: An Evaluation of the WB's Support for Sustainable and Inclusive Natural Resource Management (2009–19); (ii) Independent Evaluation Group. 2019. Two to Tango: An Evaluation of the WBG Support to Fostering Regional Integration; (iii) WBG 2023 Climate and Development Brief on NBS for Climate Resilience and Adaptation; and (iv) Implementation Completion and Results Reports of the Integrated Forest Ecosystem Management Project (P151102, Report No. ICR00006131), Building Resilience through Innovation, Communication and Knowledge Services (P130888, Report No. ICR00004839), and First Phase of the Central Asia Road Links Program (CARS-I) (P132270, Report No. ICR00004743).



and a national mudflow monitoring system to be financed under sub-component 1.1 and the ICT tool under sub-component 1.2.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

49. **Implementing agency and project management.** The implementing agency of the project will be MoES. The existing PIU at MoES will be responsible for project management, with experience in managing World Bank-financed projects since 2011, including the ERIK Project, Central Asia Hydrometeorology Modernization Project, Emergency COVID-19 Response Project (P173766), and others. The PIU will carry out project management and coordination functions by assigning its core staff and hiring additional specific technical experts, with the aim to transfer knowledge to local MoES staff. It will prepare work plans and budgets for the approval of MoES and MoF, and support gender, citizen engagement, fiduciary, and Environmental and Social Framework (ESF)-related aspects in compliance with World Bank procedures.

50. **Implementation of regional, national, and oblast-level activities.** The first set of regional activities under sub-component 1.3 will be executed by CAREC under a direct contract with MoES. CAREC will coordinate with Central Asia research entities and may subcontract other entities for execution of specific activities. The second set of activities will be implemented by the MoES PIU in coordination with the Mountain Partnership Secretariat at the Ministry of Foreign Affairs. The development of the national glacier and snow cover monitoring system will be led by MoES KHM in collaboration with NAS and CAIAG, and the development of the national mudflow monitoring system and ICT tool will be led by MoES HMFD in collaboration with KHM, NAS, and Giprozem. Technical working groups that were established by MoES during project preparation for green solutions and NBS and for the monitoring systems will continue to operate during implementation to provide guidance on technical issues. Dedicated specialists and subject matter specialists, including IT and GIS experts, will be hired as needed. The GWP under sub-component 2.1 will be implemented by an entity with experience in close collaboration with MoES in implementing small-scale works related to NBS through a contract with MoES and in collaboration with the relevant municipalities and branches of the Ministry Labor, Social Protection, and Migration. This entity will mobilize community participants, provide training, and pay participants, while MoES will purchase the seedlings, fencing material, and other required goods through tenders. Forestry, dendrology, and geology experts will be hired to carry out ecological site classification to identify the target areas and types of vegetation to be planted. Contracts between individual households and local municipality will be signed in the case of each assigned sub-plot. The livelihoods training program will be carried out by OVOP Kyrgyzstan through a direct contract with MoES and in collaboration with the relevant municipalities. NBS and grey interventions under sub-component 2.2 will be implemented by contractors in coordination with MoES' offices in the four oblasts. MoES will distribute the procured heavy machinery and equipment to the Osh, Jalal-Abad, Issyk-Kul and Naryn regional mechanized division offices of the Emergency Prevention and Response Service of MoES, which carries out routine engineering activities and will be involved in the operation and maintenance (O&M) of project-financed activities.

B. Results Monitoring and Evaluation Arrangements

51. **Monitoring and Evaluation.** The PIU will coordinate M&E activities and prepare semi-annual progress reports, which it will submit to MoF and the World Bank, containing information on project progress as measured by the results framework. Progress reports will also report on gender participation, citizen engagement, grievance redress, and compliance with World Bank E&S Standards and highlight any implementation risks and issues. The PIU will carry out in-depth mid-term and completion assessments where the achievement of project outcomes and impacts will be



assessed, including beneficiary satisfaction surveys. The mid-term review will assess the overall implementation progress and identify and propose solutions for any key issues affecting implementation. A final evaluation will be carried out at the end of the project as an input to the World Bank Implementation Completion and Results Report to evaluate end results, assess overall performance, and capture key lessons. The M&E system will be anchored in the project's results framework, which includes annual outcome and result targets. The incremental costs for project M&E arrangements will be covered under Component 3. PROGREEN and KWPF indicators are reflected in the results framework at the PDO and intermediate result levels as described in the monitoring plan in Section VI. The plan also explains the pro-rata contribution of PROGREEN resources to the expected results.

C. Sustainability

52. In terms of environmental sustainability, locations for interventions will be determined by a science-based feasibility assessment and modeling to ensure their long-lasting impact on communities, landscapes, and infrastructure in terms of mitigating the impacts of mudflows. For planting activities, the choice of sites, tree and shrub species through an ecological site classification will ensure their adaptability to local soil and water conditions, and to current and future climate conditions, and the value they bring to communities in terms of resilience to climate change impacts, income, food, and protection from natural disasters. Moreover, all planted species: (i) will be native to the Kyrgyz Republic and the specific planting zone or (ii) if non-native, they will be carefully screened to ensure that they do not become invasive and displace native species. The Kyrgyz Republic NAS will be engaged to ensure these aspects. In terms of O&M, MoES will regularly maintain project structures by using its own budget as per its mandate. Purchased heavy machinery and equipment to be provided to local MoES branches will be maintained by MoES' Emergency Prevention and Response Service. At the community level, mobilized and trained community members are expected to generate revenue from their businesses, to allow for continuity and sustained functioning after the project.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

Technical Analysis

53. **A World Bank-financed technical study will inform and confirm the types, scale, and location of NBS and grey and green interventions.** The study, commissioned in May 2023 with MoES' engagement³⁸, covers (i) a detailed mudflow and flood hazards and risks modelling for the Kara-Darya River Basin³⁹ to better understand the existing situation and determine leading causes and impacts (both direct and indirect) and (ii) assessment of upstream and downstream NBS and hybrid solutions that will result in optimal benefits. The proposed solutions will demonstrate integration with existing or planned grey structures to optimize the benefits and sustainability of project interventions. The proposed NBS and hybrid solutions will be further evaluated and prioritized with MoES and the working groups before MoES can initiate feasibility, detailed design, and construction of NBS civil works under sub-component 2.2.

54. **The project will implement a combination of climate-resilient non-structural green measures and NBS with traditional, engineered grey infrastructure for maximum impact and benefits.** Research highlights that NBS could provide around 30 percent of cost-effective mitigation measures needed by 2030 to stabilize warming to below 2°C. Estimates indicate that NBS in combination with other climate-resilient protective measures can secure more than

³⁸ The World-Bank-executed study, funded by the Global Facility for Disaster Risk Reduction (GFDRR).

³⁹ Within Kara Darya Basin, specific hydraulic and sediment transport focus is given to catchments of Kara Unkur, Aravan Sai, and Changet where a major mudflow event occurred recently, while hydrologic modeling will be conducted for entire Kara Darya Basin within Kyrgyz Republic.



300,000 hectares of vulnerable land, and potentially avoid US\$765 million damage cost.^{40,41} In many cases, NBS combined with physical infrastructure in green-grey approaches can increase development benefits, reduce lifecycle costs, contribute to carbon sequestration, and improve environmental outcomes. The project will move away from disaster response and recovery and focus on prevention and mitigation of disaster risks through an integrated approach, which will also help communities adapt to climate change impacts by engaging in green jobs.

Economic and Financial Analysis

55. **The project EIRR, stemming from Component 2, is calculated at 16.4 percent and the ENPV, with a 6 percent discount rate, is estimated at around US\$70.6 million, which proves the project's overall economic viability.** Economic benefits are expected from multiple sources related to the type and scale of interventions. Benefits are both direct and indirect, though not all are quantified: (i) avoided costs associated with infrastructure maintenance after potential mudflows (such as irrigation canals, roads, bridges, administrative and other buildings, etc.); (ii) avoided costs related to household assets, including agricultural lands in case of mudflows; (iii) benefits from introduction of new rice fields; (iv) benefits from horticulture and nuts production; (v) benefits from firewood collection (a limited amount from pruning and thinning); (vi) benefits from sedimentation removal; (vii) cost of inaction related to land degradation and soil fertility loss; and (viii) benefits from GHG mitigation. Annex 2 provides more details on the economic and financial analysis, along with the sensitivity analysis' results.

Paris Alignment

56. **The project will support the Kyrgyz Republic in achieving its NDC targets and contribute to efforts of climate change mitigation and adaptation, consistent with the country's strategies on climate change.** Among the key mitigation actions identified in the 2021 NDC is the expansion of perennial plantation areas to increase carbon sinks, to which the proposed project will contribute by financing planting activities as one of the solutions to mudflows and land degradation. On climate adaptation, by putting in place mechanisms to mitigate climate-induced mudflows, the project will improve land use practices in the face of climate change, strengthen climate resilience of infrastructure, reduce the vulnerability of the population to injuries caused by adverse weather conditions, provide scientific justification for response and prevention of hydrometeorological emergencies, raise awareness and knowledge of the population and emergency prevention sector, modernize the hydro and glaciological monitoring systems, strengthen the response and prevention of climate emergencies, and implement green solutions and NBS to reduce the vulnerability of ecosystems, people, and assets. The project is informed by an assessment of target areas' current and future vulnerability to mudflows and other climate change-induced hazards, and interventions address these vulnerabilities and are themselves resilient to climate change impacts. The Kyrgyz Republic National Adaptation Plan is being prepared with the support of the United Nations Development Program and the country does not yet have a long-term low GHG emission and resilient development strategy.

57. **The project is aligned with the goals of the Paris Agreement on both mitigation and adaptation.** Financed activities are on the universally aligned activity list under the Agriculture, Forestry, Land Use and Fisheries Sector ('Afforestation, reforestation, sustainable forest management, forest conservation, soil health improvement') as mitigation measures; and 'Flood management and protection, coastal protection, urban drainage' as adaptation measures. The project monitoring systems are also aligned on mitigation. NBS solutions will reduce disaster risk, build

⁴⁰ Kyrgyz Republic Ministry of Emergency Situations, July 2022.

⁴¹ The government spends US\$30-35 million annually on disaster response, while rehabilitation of mudflow protection infrastructure is allocated only about 1 percent of the needs. MoES has identified a need to rehabilitate 152 kilometers (estimated at US\$25 million) and build 265 kilometers of river embankment (estimated at about US\$126 million) to protect 40,000 households and 37,000 hectares of agricultural land.



climate resilience, and provide benefits, such as flood risk and heat stress reduction while increasing carbon sinks. The project design ensures that the use of NBS avoids expansion or promote expansion into areas of high carbon stocks or high biodiversity areas. The main climate and disaster risks likely to affect the project investments are flashfloods and mudflows triggered by heavy rainfall and/or rapid snowmelt. The design takes into consideration precipitation and flooding risks that threaten outcomes. Specifically, climate change risks and vulnerability to floods will be managed and mitigated through targeted adaptation measures incorporated into the design, using fast growing plant species with deep roots combined with structures whose engineering and design would withstand such climate events, integrating climate information, such as precipitation and hydrology projections, into planning. These interventions will not only reduce upstream and downstream communities' vulnerability to mudflows but also increase the resilience of the interventions themselves. In summary, the project design adequately reduces the physical climate risks to outcomes, and the project's climate resilience and adaptation design considerations limit the exposure to a low level of residual risk. On mitigation, the operation has a low risk of preventing the country's transition to low-carbon development pathways, given its contribution to expanding the use of NBS for mudflow prevention and increase in plantation area through planting activities. Specifically, the project is expected to mitigate gross GHG emissions as discussed.

B. Fiduciary

58. **Financial Management.** The residual FM risk rating is Moderate. The PIU at MoES will be responsible for implementing FM functions, including budgeting, flow of funds and disbursements, accounting, financial reporting, internal controls, and auditing. It has extensive prior experience in the implementation of World Bank-financed projects, and the FM arrangements of these projects have been assessed as adequate and satisfactory to the World Bank. Nonetheless, they will need to be strengthened by several actions detailed in Annex 1. Annual audited project financial statements will be submitted to the World Bank within six months after the end of each fiscal year, and at project closing. The PIU will produce interim financial reports (IFRs) on a quarterly basis and submit them to the World Bank no later than 45 days after a calendar quarter end. Disbursements from the credit and grant accounts will follow a transaction-based method—traditional World Bank procedures, including advances to the Designated Account, Direct Payments, Special Commitments, and Reimbursement. The adequacy of FM arrangements will be monitored during project implementation, and adjustments will be made as necessary to ensure fiduciary compliance.

59. **Procurement.** The residual procurement risk is Substantial. The key risks and the corresponding mitigation measures are discussed in Annex 1. Procurement functions will be implemented by the MoES PIU with the assistance of technical consultants and staff of other relevant units. The PIU has adequate capacity and personnel to support project implementation and application of procurement rules and procedures of international donor organizations. The PIU will assign one qualified procurement specialist to handle all procurement-related project implementation matters. Procurement will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers, dated September 2023 (Procurement Regulations). Specific procurement procedures to be followed for managing project resources will be documented in the POM. The PIU developed a Project Procurement Strategy for Development (PPSD) and a Procurement Plan (PP), reviewed and agreed with the World Bank before negotiations. The PPSD will be regularly updated during project implementation to provide necessary justifications for procurement arrangements, PP, and its updates. For each contract financed by the World Bank, the procurement method, market approach, cost estimate, World Bank review requirements, and timeframe for implementation will be agreed between the borrower and the World Bank and duly reflected in the most updated PP. The PIU will use the World Bank's Systematic Tracking of Exchanges in Procurement (STEP) online tool for planning and tracking of all procurement transactions.



C. Legal Operational Policies

60. The World Bank OP 7.50 is applicable because some activities use or risk polluting the waters of the Syr Darya River, an international waterway, which is shared by the Kyrgyz Republic, Kazakhstan, Tajikistan, and Uzbekistan. The project will not adversely change the quantity or quality of water flows to other riparians and will not be adversely affected by the other riparian countries' possible water use, and any works under the project will not change the nature of the original flood protection features (for example, embankment height will not be raised). The project will not cause appreciable harm; therefore, the exception to the notification requirement under paragraph 7(a) applies. The conclusion was reached after a few potential intervention sites were removed from the project due to their perceived harm to water flows to riparian countries based on observations from the two site visits conducted jointly by the World Bank Team and MoES. The memorandum on exception to the riparian notification requirement under OP 7.50 was approved by the World Bank Regional Vice President on September 13, 2023.

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Area OP 7.60	No

D. Environmental and Social

61. The project's environmental risks and impacts are moderate, mainly attributed to the physical interventions associated with the resilient landscapes and livelihoods enhancement activities under Component 2. These interventions may result in air, soil, or water pollution, habitat loss and habitat disturbances, possible spread of invasive tree or shrub species, risks associated with genetically modified plant seeds, water stress, agriculture waste, and occupational health and safety. These risks are of low to medium impact and are predictable, avoidable, or reversible through available international mitigation practices and measures. The project's social risks are considered moderate as well. The Environment and Social Management Framework (ESMF) identifies risks related to exclusion of vulnerable and marginalized groups, such as women, the elderly, ethnic minorities, etc., from project activities, particularly the sustainable livelihood activities of sub-component 2.1, and proposes general mitigation measures, to be detailed in Environmental and Social Management Plans where appropriate. To address these risks, the following instruments were prepared, reviewed, consulted upon, and disclosed on December 6, 2023: ESMF, SEP, and Labor Management Procedures. A Resettlement Framework/Process Framework may also be prepared during project implementation, as required. The ESMF outlines the guiding principles of E&S screening, assessment, review, management, and monitoring procedures for landscape restoration activities. It also provides guidance and checklists on preparing any necessary site-specific E&S instruments.

V. GRIEVANCE REDRESS SERVICES

62. **Grievance Redress.** Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank non-compliance with its policies and procedures, and the Dispute



Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the attention of Bank Management and after Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's GRS, visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the Bank's AM, visit <https://accountability.worldbank.org>.

VI. KEY RISKS

63. The overall project risk is Substantial in view of the following key risks:

64. **Political and Governance** (Substantial). The Kyrgyz Republic has experienced several political upheavals resulting in extensive reorganizations of the government, as well as frequent changes of ministerial staff and absence of officials during prolonged periods. These resulted in a high turnover of staff and erosion of institutional knowledge and leadership, affecting decision-making and project implementation at central and local levels. There is also a risk of a lengthy project ratification process by the parliament judging from previous experience. These risks are taken into consideration in the project's implementation timelines. Further, the World Bank will ensure that the POM is of high quality and detailed enough to quickly onboard new management and staff, and proactively discuss the need for restructurings or extensions as soon as the need arises. Risks related to the political environment becoming less conducive for regional cooperation will be mitigated to the extent possible through continuous joint meetings and exchanges between the countries stressing the multiple values of collaboration.

65. **Macroeconomic** (Substantial). The constrained macroeconomic context may result in lower availability of public funds for landscape restoration and climate resilience-related activities. Investments will result in avoided future costs related to, for example, infrastructure maintenance, economic losses from natural disasters, etc. Reduction in the fiscal capacity of the government due to economic disruptions and slowdown may reduce the ability of the government to allocate resources for projects targeting environmental outcomes. The project does not warrant substantial co-financing from the government and is fully financed through IDA credit and PROGREEN and KWPF grants. The evolving macro-economic situation, especially increasing inflation and supply chain disruptions may affect the overall implementation cost of the project. This will be mitigated by ensuring sufficient contingencies in the project's costing and studying the project's economics under high-cost scenarios. Government fiscal constraints may lead to delays in the release of funds. To mitigate this, the World Bank will provide 100 percent financing for project investments where feasible. Project management and operational costs are included in the project's costs.

66. **Technical Design** (Substantial). There is a risk of a potential slow uptake of NBS for DRM by central and local staff, which may cause implementation delays and sidelining of NBS and green solutions in favor of traditional grey solutions. The technical study is expected to recommend site-specific NBS and showcase their effectiveness through modeling, which will secure MoES' buy-in and inform detailed designs and costings. Recommendations will be validated using MoES' mudflow risk data and other globally available tools. The project will also finance site visits and knowledge exchanges to enhance awareness of NBS benefits. MoES also lacks local staff with community mobilization experience and skills. Such activities will be contracted out to experienced organizations, in collaboration with the local authorities. A lack of platforms for data sharing between the countries will be mitigated through the regional exchange and knowledge platforms financed by RESILAND Tajikistan and Uzbekistan and other platforms as noted.

67. **Institutional Capacity for Implementation and Sustainability** (Substantial). MoES and the PIU have limited NBS experience and there are O&M challenges related to new hydromet equipment, IT systems, and green solutions. To mitigate these risks, NBS capacity will be enhanced by developing NBS guidelines and supplementing the PIU with an



expert that has NBS experience. Hydromet equipment and IT systems will be operated and maintained with the guidance of the providers and later with the support of the upcoming Central Asia Hydrometeorology Modernization Project II (P500796). Planted vegetation will be fenced to secure a strong survival rate.

68. **Fiduciary** risk is Substantial to reflect potential implementation delays because of the limited NBS procurement experience within MoES. The noted hiring of specialists with NBS experience is expected to mitigate this risk.



VII. RESULTS FRAMEWORK AND MONITORING

PDO Indicators by PDO Outcomes

Baseline	Period 1	Period 2	Period 3	Period 4	Closing Period
Increase the area under sustainable landscape management in Selected Locations in the KR					
Land area under sustainable landscape management practices (Hectare(Ha)) CRI					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	300	2900	5000	7500	9558
People benefiting from landscape management practices (Number)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	1,680	16,000	28,000	42,000	53,397
➤ People benefiting from landscape management practices - Female (Number)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	8,040	8,000	14,000	21,000	26,700
Promote KR's collaboration with other Central Asian countries on transboundary landscape restoration					
Transboundary sustainable landscape management policies harmonized (Number)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	1	2	3	4	5.00

Intermediate Indicators by Components

Baseline	Period 1	Period 2	Period 3	Period 4	Closing Period
Strengthening Institutions and Regional Collaboration					
National glacier and snow cover monitoring system established and operationalized (Text)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
System not in place	System not in place	System not in place	System established	Sytem operationalized	System operationalized
Mudflow and land degradation monitoring systems upgraded with ICT and operationalized (Text)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029



Systems not upgraded	Systems not upgraded	Systems not upgraded	Land degradation system upgraded	Land degradation and mudflow systems upgraded	Land degradation and mudflow systems upgraded
Central Asia Mountain Product business plan developed (Text)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
Product business plan not in place	Product business plan not in place	Product business plan drafted	Draft business plan discussed with stakeholders	Product business plan finalized	Product business plan finalized
Instruments for regional climate induced disasters developed (Number)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0	0	0	1	2	3
Enhancing Resilient Landscapes and Livelihoods					
Green jobs created (Number)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0	0	200	1,000	1,800	2,800
➤ Share of green jobs created - Female (Percentage)					
0	0	50	50	50	50
➤ Short-term Green Wager Program jobs created (Number)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0	0	100	600	1,200	2,000
➤ Long-term livelihoods program jobs created (Number)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0	0	100	400	600	800
(Upstream) Land area under climate-resilient vegetative and structural management measures (Hectare(Ha))					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	40	400	700	1,100	1,425
(Downstream) Land area under climate-resilient structural management measures (Hectare(Ha))					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	260	2,500	4,300	6,400	8,133
(Upstream) Community members benefitting from climate-resilient landscape restoration measures (Number)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	300	2,900	5,000	7,600	9,765
➤(Upstream) Community members benefitting from climate-resilient landscape restoration measures – female (Number)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029



0.00	150	1,450	2,500	3,800	4,883
(Downstream) Community members benefitting from climate-resilient landscape restoration measures (Number)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	1,380	13,100	23,000	34,400	43,632
➤(Downstream) Community members benefitting from climate-resilient landscape restoration measures – Female (Number)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	690	6,550	11,500	17,200	21,816
Embankment restored or repaired (Kilometers)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	0.00	2.00	8.00	12.00	16.00
Beneficiaries satisfied with project-supported services (Percentage)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	0	0	70.00	0	75.00
➤Beneficiaries satisfied with project-supported services - Female (Percentage)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	0	0	70.00	0	75.00
Project Management and Coordination					
Grievances registered related to delivery of project benefits that are addressed (Percentage)					
Jun/2024	Jun/2025	Jun/2026	Jun/2027	Jun/2028	Jun/2029
0.00	90	90	90	90	90.00



Monitoring & Evaluation Plan: PDO Indicators by PDO Outcomes

Increase the area under sustainable landscape management in Selected Locations in the KR	
Land area under sustainable landscape management practices (Hectare(Ha)) CRI	
Description	SLM practices are climate-resilient vegetative and structural management measures in upstream and downstream degraded landscapes. The targets is based on 1,425 hectares under green solutions, 7,633 hectares under grey solutions, and 500 hectares under NBS interventions. This indicator corresponds with the PROGREEN Pillar 1 cross-cutting indicator: "Landscapes with improved climate resilience (ha)". Direct PROGREEN contribution: 908 hectares. <i>The PROGREEN contributions to this project are based on prorating the PROGREEN co-financing to the project.</i>
Frequency	Semi-annually
Data source	MoES and entity contracted to implement the GWP
Methodology for Data Collection	Collection of data from entity contracted to implement the GWP and MoES reports
Responsibility for Data Collection	MoES PIU
People benefiting from landscape management practices (Number)	
➤ People benefiting from landscape management practices - Female (Number)	
Description	The target reflects upstream and downstream community members benefiting from climate-resilient landscape restoration measures under sub-components 2.1 (9,765) and 2.2 (37,632 from grey solutions and 6,000 from NBS interventions) – see calculation methodology under the respective Intermediate Result Indicators. This indicator corresponds with the PROGREEN indicator: "People in targeted landscapes with increased benefits (Number)". Direct PROGREEN contribution: 5,073 people. The female target reflects 50% of beneficiaries. This indicator corresponds with the PROGREEN indicator: "People in targeted landscapes with increased benefits (Number)". Direct PROGREEN contribution: 2,536 females.
Frequency	Semi-annually
Data source	MoES and entity contracted to implement the GWP
Methodology for Data Collection	Collection of beneficiary data from entity contracted to implement the GWP and MoES
Responsibility for Data Collection	MoES PIU
Promote KR's collaboration with other Central Asian countries on transboundary landscape restoration	
Transboundary sustainable landscape management policies harmonized (Number)	
Description	See Annex 3 for a menu of policies. When results are aggregated at the RESILAND CA+ level, this result will not be double counted. "Harmonized" means agreed on between at least two Central Asian countries.
Frequency	Semi-annually
Data source	CAREC and MoES
Methodology for Data Collection	Enumeration of transboundary MoUs/protocols/agreements, etc. agreed on
Responsibility for Data Collection	MoES PIU

Monitoring & Evaluation Plan: Intermediate Results Indicators by Components

Strengthening Institutions and Regional Collaboration	
National glacier and snow cover monitoring system established and operationalized (Yes/No)	
Description	Central database that integrates glacier and snow cover monitoring information from different agencies, integrated into the USCMFE, and capable of preparing standard monitoring and modeling reports. This indicator corresponds with the PROGREEN indicator for pillars 1+2: "Countries with policy and institutional framework improved (Number)".
Frequency	Semi-annually



Data source	MoES KMS
Methodology for Data Collection	Review of system
Responsibility for Data Collection	MoES PIU
Mudflow and land degradation monitoring systems upgraded with ICT and operationalized (Yes/No)	
Description	The systems will feature: (i) an ICT tool/model for a degraded landscapes disaster management system, (ii) user friendly guidelines for the use of the ICT tool/model in English, Russian, and Kyrgyz, and (iii) a minimum of five MoES offices where the ICT equipment and software will be updated. The systems will feature an advanced geospatial and mapping capability, a satellite data utility, and functions to analyze the interface between land degradation, land cover, and mudflows in the country, as well as features that facilitate inter-government data sharing. "Operationalized" will be measured through the delivery of at least ten training sessions and capacity building activities to MoES staff on the systems, and the consequent use of the systems by MoES. This indicator corresponds with the PROGREEN indicator for pillars 1+2: "Countries with policy and institutional framework improved (Number)".
Frequency	Semi-annually
Data source	HMFD and MoES regional offices
Methodology for Data Collection	Review of systems
Responsibility for Data Collection	MoES PIU
Central Asia Mountain Product business plan developed (Yes/No)	
Description	Agreed by the relevant Central Asian countries. The business plan will include an outline of a training plan for mountain communities.
Frequency	Semi-annually
Data source	Mountain Partnership Secretariat in Bishkek
Methodology for Data Collection	Review of business plan and training module
Responsibility for Data Collection	MoES PIU
Instruments for regional climate induced disasters developed (Number)	
Description	The instruments are: (i) regional roadmap for mudflow mitigation with an investment plan, (ii) regional NBS manual and guidelines for mudflows and other climate induced disasters, and (iii) catalog of current and future climate-induced disasters of a transboundary nature in Central Asia. This indicator corresponds with the PROGREEN Indicator for pillars 1+2: "Countries with policy and institutional framework improved (Number)".
Frequency	Semi-annually
Data source	CAREC
Methodology for Data Collection	Review of instruments
Responsibility for Data Collection	MoES PIU
Enhancing Resilient Landscapes and Livelihoods	
(Upstream) Land area under climate-resilient vegetative and structural management measures (Hectare(Ha))	
Description	The target reflects 1,425 hectares of planting of fruit (415 ha), pistachio and almond (430 ha), saxaul (140 ha), walnut (145 ha), and willow (295 ha) trees. The type of trees and their respective areas may change. This indicator corresponds with the PROGREEN Pillar 1 indicator: "Land area under restoration (ha)". Direct PROGREEN contribution: 136 hectares; and the PROGREEN Pillar 2 indicator: "Area under agroecological food production (ha)". Direct PROGREEN contribution: 136 hectares.
Frequency	Semi-annually
Data source	entity contracted to implement the GWP
Methodology for Data	Collection of planted area data from entity contracted to implement the GWP



Collection	
Responsibility for Data Collection	MoES PIU
(Downstream) Land area under climate-resilient structural management measures (Hectare(Ha))	
Description	The target reflects the area of protected agriculture land, infrastructure, and residential area protected by restored/repaired embankments and drainage channels and NBS: 7,633 ha of grey interventions and 500 ha of NBS interventions. This indicator corresponds with the PROGREEN Pillar 1 Cross-pillar indicator: "Innovative NBS solutions used in production landscapes (number)". Direct PROGREEN contribution: approximately five NBS solutions across 47 hectares; Pillar 2 Cross-cutting issue indicators: "Area of food production systems with improved climate resilience (ha)". Direct PROGREEN contribution: 773 hectares; and "Trees in production landscapes outside of forests (ha)". Direct PROGREEN contribution: 773 hectares.
Frequency	Semi-annually
Data source	MoES regional branches
Methodology for Data Collection	Collection of data from MoES regional branches
Responsibility for Data Collection	MoES PIU
(Upstream) Community members benefitting from climate-resilient landscape restoration measures (Number)	
➤ (Upstream) Community members benefitting from climate-resilient landscape restoration measures – female (Number)	
Description	Rural communities within upstream intervention areas (1,425 ha), 50 percent females
Frequency	Semi-annually
Data source	entity contracted to implement the GWP
Methodology for Data Collection	Collection of beneficiary data from entity contracted to implement the GWP
Responsibility for Data Collection	MoES PIU
(Downstream) Community members benefitting from climate-resilient landscape restoration measures (Number)	
➤ (Downstream) Community members benefitting from climate-resilient landscape restoration measures – Female (Number)	
Description	People benefiting from protection of agricultural land infrastructure, and residential area protected due to restored/repaired embankments and drainage channels and NBS, 50 percent female. 37,632 resulting from sub-component 2.2 grey interventions (9,408 households with an average household size of 4) and 6,000 resulting from sub-component 2.2 NBS interventions (50 locations x 30 households x average household size of 4)
Frequency	Semi-annually
Data source	MoES regional branches
Methodology for Data Collection	Collection of data from MoES regional branches
Responsibility for Data Collection	MoES PIU
Embankment restored or repaired (Kilometers)	
Description	Functioning defective embankments will be repaired and dysfunctional embankments will be restored among the total of 30 km of embankments/riverbanks that need to be rehabilitated. The restoration and repair will be mainly with stones and gabions (rather than concrete walls).
Frequency	Semi-annually
Data source	MoES regional branches
Methodology for Data Collection	Collection of data from MoES regional branches and field visits
Responsibility for Data Collection	MoES PIU
Green jobs created (Number)	
➤ Share of green jobs created - Female (Percentage)	



> Short-term Green Wager Program jobs created (Number)	
> Long-term livelihoods program jobs created (Number)	
Description	Participants in the short-term jobs as part of the GWP (2,000) and in long-term jobs as part of the livelihoods program (800). This indicator corresponds with the PROGREEN Pillar 1 Cross-cutting indicator: "Women and youth with increased benefits from landscape-based value chains (Number)". Direct PROGREEN contribution: 266.
Frequency	Semi-annually
Data source	entity contracted to implement the GWP and OVOP Kyrgyzstan
Methodology for Data Collection	Review of participation records
Responsibility for Data Collection	MoES PIU
Beneficiaries satisfied with project-supported services (Percentage)	
> Beneficiaries satisfied with project-supported services - Female (Percentage)	
Description	Rate of satisfaction of female and male beneficiaries of upstream and downstream activities, GWP, and livelihoods program
Frequency	Mid-term and closing
Data source	Satisfaction survey
Methodology for Data Collection	Survey of a representative group of beneficiaries/participants
Responsibility for Data Collection	MoES PIU
Project Management and Coordination	
Grievances registered related to delivery of project benefits that are addressed (Percentage)	
Description	"Addressed" means resolved to the satisfaction of all parties and closed
Frequency	Semi-annually
Data source	MoES PIU
Methodology for Data Collection	Review of GRM records
Responsibility for Data Collection	MoES PIU

**ANNEX 1: Implementation Arrangements and Support Plan****COUNTRY: Kyrgyz Republic****RESILAND CA+ Program: Kyrgyz Republic Resilient Landscape Restoration Project****Implementation Arrangements**

1. MoES is the project Implementing Agency, which hosts a PIU that has extensive experience with World Bank projects. The MoES PIU will manage and coordinate the project with additional hired technical specialists as needed.
2. **Sub-component 1.1:** This sub-component will be led by MoES in collaboration with KHM, Giprozem, and Institute of Water Problems on the mudflow monitoring system; and on glacier monitoring system MoES will work with KHM, TSASC, and CAIAG. The relevant thematic working groups will provide technical inputs throughout the project implementation period. All fiduciary, ESF, monitoring, and reporting functions will be implemented by the PIU at MoES.
3. **Sub-component 1.2:** This sub-component will be led by MoES in collaboration with Giprozem. All fiduciary, ESF, monitoring, and reporting functions will be implemented by the PIU at MoES.
4. **Sub-component 1.3:** Activities related to regional collaboration will be executed by CAREC under a direct contract with MoES, following TOR agreed with MoES and the World Bank. CAREC may subcontract other entities for the execution of specific activities as needed, to be agreed in the TOR. Activities related to supporting implementation of the Five-year Plan on the Development of Mountains Regions will be implemented by the MoES PIU in coordination with the Secretariat for Mountains Regions Development.
5. **Sub-component 2.1:** Upstream planting, fencing and other related activities will be carried out as a GWP where MoES will contract an entity with experience in close collaboration with MoES in implementing small-scale works related to NBS⁴². Vulnerable and poor community members will be mobilized using the municipality's social vulnerability records. Communities will be trained on planting, fencing, monitoring of survival rate and related activities, and compensated with daily wages, while MoES will purchase the seedlings, fencing materials, and other required goods through tenders. This activity will be undertaken in collaboration with the Ministry of Labor, Social Protection and Migration. Experts in the disciplines of forestry, dendrology, and geology (for example, from NAS) will be engaged through a direct contract to study the types of vegetation to be planted in the upstream target areas. Contracts between individual households and each local municipality will be signed in the case of each assigned sub-plot and the agency will assist the municipalities in agreeing on the contracts and in supporting both parties in implementing the contract over the period of the project. The livelihoods training program will be carried out by OVOP Kyrgyzstan.
6. **Sub-component 2.2:** MoES is responsible for implementing this sub-component, for which it will work with its departments (for example, Mudflow Protection Service and HFMD). NBS and grey interventions will be implemented by contractors in coordination with MoES' offices in the four oblasts. The sub-component has downstream interventions and procurement and distribution of heavy machinery. In coordination with HMFD, the Mudflow Protection Service will be responsible for preparatory studies (namely, a feasibility study and a detailed design for each intervention site) and

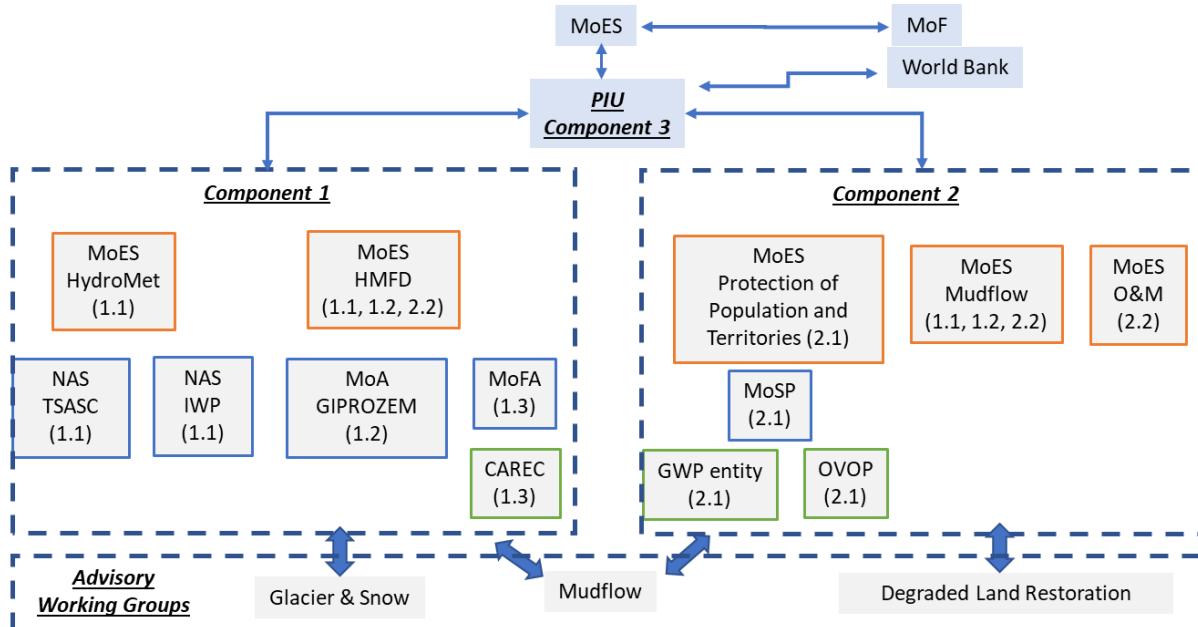
⁴² At the project appraisal stage, in the context of no other available alternatives, an option of direct contracting WFP by MoES was considered. This was justified by more than a decade of WFP experience in mobilizing, training, and paying communities for green labour in the Kyrgyz Republic, having partnered with MoES in the implementation of its Green Project and with other government partners. WFP has an established nation-wide collaboration mechanism with national and local government counterparts and local communities.



construction supervision. The Maintenance Branch will distribute the procured heavy machinery to the Osh, Jalal-Abad, Issyk-Kul, and Naryn regional mechanized division offices (the Service) of the Emergency Prevention and Response Service of MoES, which carries out routine engineering activities, such as performing preventive and response activities, and subsequently will be involved in the maintenance of engineering activities.

7. Component 3: The PIU under MoES will be responsible for all functions under Component 3.

Figure 1.1. Project Implementation Arrangements



Note: MoFA = Ministry of Foreign Affairs; MoSP = Ministry of Labor, Social Protection, and Migration

8. Implementation Support Plan. The World Bank will provide implementation support to MoES and oversee the implementation of the project, in line with World Bank procedures, standards, and requirements. The World Bank has put in place a task team comprising of a diverse skill mix from various Global Practices, including Environment, Natural Resources and Blue Economy; Social Sustainability and Inclusion; and Urban, Disaster Risk Management, Resilience and Land, among others. Skill sets required for continuous effective implementation support include, among others, policy development, NBS and landscape restoration, DRM, community development, ICT, climate resilience, project management, M&E, procurement, FM, gender, communications, citizen engagement, E&S risks management, and legal. It is expected that implementation support by the World Bank team will be more intense during the first two years of project operation. Project reports will be reviewed periodically by the World Bank as part of project implementation support missions to be carried out at least twice a

Financial Management

9. The FM arrangements of the PIU at MoES were found to be adequate and acceptable to the World Bank. The overall FM risk for implementation of the project was assessed to be Moderate as: (a) the PIU MoES has experience in implementing several the World Bank-financed Projects and (b) regular risk-based FM supervisions of the existing projects confirmed satisfactory FM arrangements in place.



10. The World Bank will continue to apply a risk-based approach when planning FM Implementation Support and Supervision Missions, with the first one to be conducted within six months after the first disbursement. The adequacy of FM arrangements will be continuously monitored during risk-based missions, and adjustments will be made when necessary to ensure fiduciary compliance.

11. **Staffing of FM function.** While the PIU is staffed with an experienced FM Manager, a Disbursement Specialist, and an Assistant Accountant who will work for the project once it becomes effective, it is agreed that an additional Disbursement Specialist will be hired for this project at a later stage as needed.

12. **Budgeting.** The PIU will follow the government budget cycle for preparation and submission of annual budgets, based on the PP and operating cost estimates. The approved budgets will be entered into the project accounting software and used for monitoring of variance between planned and actual expenditures.

13. **Accounting.** The PIU will maintain accounting records in the automated accounting system, which will be enhanced to include a module for the proposed project within 45 days of project effectiveness. The project accounting records will be maintained in accordance with the International Public Sector Accounting Standards (cash basis).

14. **Financial reporting.** The PIU will prepare IFRs, starting with the quarter in which the first disbursement occurs. The IFRs will be submitted to the World Bank on a quarterly basis within 45 days after the end of each calendar quarter and will include information on the sources and uses of funds, detailed use of funds by each activity and the budget category, as well as movements and balances in the Designated Account. The format of IFRs will be included into the POM. The IFRs will be automatically generated by the project accounting software.

15. **Internal controls.** The PIU will establish an internal control system capable of providing reliable and adequate controls over FM and disbursement processes and procedures. These include controls for safeguarding of assets, due and balanced segregation of duties, authorization of transactions, review and approval of invoices, and contract management. The internal control system to be implemented and maintained by the PIU, including the budgeting, planning, financial reporting and accounting, and auditing requirements, will be documented in the POM, which will be adopted by the PIU in the form and substance acceptable to the World Bank.

16. **External audit.** The PIU will be responsible for arranging an independent annual audit of the project's financial statements. Audit of the proposed project will be conducted (i) by an independent auditor acceptable to the World Bank under TOR acceptable to the World Bank and (ii) in accordance with International Standards on Audit issued by the International Auditing and Assurance Standards Board. The annual audited project financial statements will be submitted to the World Bank within six months of the end of each fiscal year and at the closing of the project. The audit of project financial statements will be financed from proceeds of the grants/credit. The audited project financial statements will be publicly disclosed in accordance with the World Bank's Access to Information Policy.

Flow of Funds and Disbursement Arrangements

17. **Disbursements from the credit and grants' accounts** will follow the transaction-based method, that is, traditional World Bank procedures, including advances to the Designated Account, Direct Payments, Special Commitments, and Reimbursements (with full documentation and against Statements of Expenditures). Disbursement arrangements details will be provided in the Disbursement and Financial Information Letter.



Procurement

18. **Applicable procurement framework.** Procurement of all contracts will be conducted through the procedures as specified in the World Bank's Procurement Regulations for IPF Recipients – Procurement in Investment Project Financing Goods, Works, Non-Consulting and Consulting Services, dated September 2023. The Guidelines on Preventing and Combating Fraud and Corruption in projects financed by IBRD Loans and IDA Credits and Grants, dated October 15, 2006, and revised January 2011 and as of July 1, 2016, shall apply to this project. The procurement and contract management processes will be tracked through the STEP system.

19. **Country procurement environment.** MoF has introduced several measures to improve transparency of procurement processes at government entities. One such measure is the adoption of the new Public Procurement Law (PPL) in 2022, which introduced key procurement principles and included a list of permitted procurement methods and their practical application procedures. To address transparency issues, the PPL introduced tools for contract administration, three instances of complaint management procedure, and gives civil society the opportunity to participate in the tender procedures. Currently, all procuring entities are required to use the zakupki.gov.kg platform to announce tenders. Meanwhile, there is a tendency to make frequent changes in the PPL and increased cases when direct contracting, as a non-competitive procurement method, may be used.

20. **Institutional and implementation arrangements.** The project, including procurement, will be implemented by MoES' PIU with the assistance of technical consultants and staff of other relevant units of MoES. A qualified procurement specialist will be assigned to handle day to day procurement activities. The technical staff of the relevant MoES units will be responsible for working with external consultants and monitoring their work. In addition, they will be responsible for accepting and approving outputs prepared by selected consultants.

21. **Procurement risk analysis.** A procurement capacity assessment was performed by the World Bank using the Procurement Risk Assessment and Management System. Based on the assessment and considering the overall procurement environment in the country, the residual project risk for procurement is assessed as Substantial.

Box 1.1. Procurement Risks

- **Procurement planning.** Increase of gas or oil price will affect the price of the end product and may increase cost estimates.
- **Procurement process.** The possibility of influence attempts by influential government officials on procurement decisions increases the risk of procurement decisions' accountability. Project beneficiaries have limited capacity to prepare detailed designs and technical specifications for the defined investments.
- **Potential procurement delays.** Experience suggests that procurement delays should be expected due to the lack of procurement capacity and market limitations. in addition, local currency depreciation may result in the unwillingness of potential bidders to submit bids and quotations in the local currency.
- **Potential contract implementation delays.** Current difficulties in all aspects of logistical services, including goods transportation, directly affect goods delivery from the Commonwealth of Independent States and other European zone countries.
- **Overall procurement environment.** Overall unstable procurement environment and frequent changes of PPL as well as high level of corruption as measured by Transparency International.

22. To mitigate the risks, the following actions have been identified:

**Box 1.2. Preliminary Risk Mitigation Measures**

- All procurement activities will be carried out following World Bank procurement procedures, including the related prior- or ex-post reviews. The World Bank good governance and anticorruption safeguards, particularly the transparency and disclosure provisions, will be promoted and enforced.
- With the support of additional consultants, the PIU will be responsible to prepare bidding documents, and the World Bank will provide intensive implementation support.
- Realistic procurement planning, up-to-date cost estimates, and scheduling, including timely preparation of technical specifications or TOR with World Bank close supervision and monitoring, particularly from the country office, will be required. Early engagement with market and business outreach will be required for critical packages.
- The POM should have clear deadlines and timelines for each step in the procurement process for both consultant selection and goods and technical services' procurement to avoid unnecessary delays during implementation.
- USD/EUR currency will be used for submission of bids in problematic procurement packages, while the payment will be in the local currency.
- More emphasis on and training in appropriate contract management are required, supplemented by regular physical inspections during World Bank implementation support missions. The delivery terms will be carefully reviewed with the aim of avoiding transportation through conflict-affected zones and seeking alternative routes.
- Application of World Bank Anti-Corruption Guidelines and close supervision by World Bank staff will be ensured.

23. **Summary of PPSD.** As required by the Procurement Regulations, the PPSD is developed, based on which a PP is prepared, setting out the selection methods to be followed by the borrower during project implementation when procuring goods, works, and non-consulting and consulting services financed by the World Bank. The procurement approaches for key packages have been determined in the PPSD as described in the following paragraphs.

24. **Procurement approach for key goods, works, and non-consulting services contracts.** Civil works under the project will include the following activities: construction of an avalanche station on the alternative road Balykchy-Kazarman-Jalal-Abad, and modernization of hydrological posts and construction work (gray solutions), which will be procured through Request for Bids. For procurement of the civil works packages, the World Bank's Standard Procurement Documents for Small works shall be used. Goods and non-consulting services will include the following activities: planting (green solutions) and procurement of engineering equipment, which will be procured through Request for Bids. For procurement of goods on the national market, national Procurement Procedures may be used in accordance with Items 5.3 to 5.6 of the Procurement Regulations. Applicable procurement methods according to the PPL for packages below US\$150,000 is Request for Quotations and for packages above US\$150,000 and below US\$1,500,000 is unlimited, single stage two envelope. Other cases shall be agreed with the World Bank.

25. Considering the size and complexity of the components, lack of clarity about the potential interest of the market, and the need to combine procurement packages to reach economies of scale while minimizing the need for supervision, a two-envelope procurement approach with post-qualification may be used for main civil works packages. This will help engage the market and mitigate the price pressure during the evaluation. The market can meet the procurement needs of the project. The government agrees that additional efforts will be required in terms of continuous consultations with the industry, a careful approach to developing procurement documentation, and deliberate efforts to widely advertise tenders to ensure appropriate levels of participation by both local and international vendors.

26. Procurement approach for key consultancy contracts. Key consulting packages will include implementation of the activities related to strengthening regional cooperation. As in the RESILAND CA+ projects in Tajikistan and Uzbekistan, these activities to be executed in part by CAREC. The proposed procurement method is Direct Selection according to item 7.14 (a, c, f) of the Procurement Regulations.



27. CAREC is recognized by national, regional, and international partners, and has a regional mandate to assist governments as well as regional and international stakeholders in addressing environmental and sustainability challenges across the Central Asia region and Afghanistan. With 20 years of experience, CAREC is today a leading regional knowledge hub in the field of environment, climate change, water management and sustainable development, combined with capacity development, which can be effectively leveraged for the execution of regional activities. CAREC has implemented projects financed by the World Bank, Asian Development Bank, European Union, GIZ, FAO, United Nations Development Program, United Nations Environment Program, and others, placing it in a unique position to execute the regional collaboration sub-component.

28. Also, key consulting services will include conduction of livelihoods activities by OVOP Kyrgyzstan with MoES and in close collaboration with the relevant municipalities. The proposed procurement method is Direct Selection according to item 7.14 (d, f, g) of the Procurement Regulations.

29. OVOP Kyrgyzstan was founded as a project of JICA and began to operate in 2007 in Issyk-Kul oblast, expanding to additional oblasts in the following years, producing and selling products in collaboration with more than 3,500 producers. Thanks to its success, in 2023 the President of the Kyrgyz Republic called for the expansion of the organization's activities across the country. The organization is therefore uniquely positioned to implement the project's resilient livelihood activity. For more information on OVOP Kyrgyzstan, see <https://ovopkg.com/aboutus.php>.

30. For the implementation of the GWP under sub-component 2.1, it is planned to engage an entity with experience in close collaboration with MoES in implementing small-scale works related to NBS. This entity will be responsible to mobilize community participants, provide training, including on monitoring seedling survival, and pay participants, while MoES will purchase the seedlings, fencing materials, and other required goods through tenders. Forestry, dendrology, and geology experts will be hired to carry out ecological site classification to identify the target areas and types of vegetation to be planted.

31. Consulting services will also include design and survey work and expertise (feasibility studies and detailed engineering design) and the proposed selection method is Quality and Cost-Based Selection.

32. Key conclusions from the market analysis. The market offers the possibility of satisfactory competition, which could be achieved by an open competitive approach to the market, attracting international and national contractors and consultants with wide experience in the respective field to achieve best fit for purpose and value for money in procurement. Considering the size and complexity of components, lack of clarity about potential market interest, and the need to combine procurement packages to reach economies of scale while minimizing the need for supervision, two envelope procurement approaches with post qualification will be conducted for the main packages for works. This will help engage the market and mitigate the price pressure during the evaluation. The market can meet the procurement needs of the project. The government agrees that additional efforts will be required in terms of continuous consultations with the industry, careful approach to the development of procurement documentation, and deliberate efforts to widely advertise tenders to ensure appropriate levels of participation by both local and international vendors.

33. Training and operating costs. The project will finance the operating costs for the PIU. When required, the PIU personnel will be selected based on experience, qualifications, and capability to carry out the assignment. The selection will be carried out through comparison of the relevant overall capacity of at least three qualified candidates among those who express interest in the assignment. Detailed procedures will be outlined in the POM. The PIU will develop a detailed



training plan and prepare an annual operational budget for World Bank review and clearance. Operating costs and training will be financed according to the annual budget approved by the World Bank.

34. Record keeping. All records pertaining to award of tenders, including bid notification, register pertaining to sale and receipt of bids, bid opening minutes, and bid evaluation reports and all correspondence pertaining to bid evaluation, communication sent to and with the World Bank in the process, bid securities, and approval of invitation and evaluation of bids will be retained by the respective agencies and uploaded to the STEP tool.

35. Disclosure of procurement information. The following documents will be disclosed: (a) PP and updates; (b) an invitation for bids for goods and works for all contracts; (c) request for expression of interest for selection and hiring of consulting services; and (d) contract awards for goods, works, and non-consulting and consulting services. The following details will also be published on the United Nations Development Business online and the World Bank's external website: (i) an invitation for bids for procurement of goods and works following open international market approaches; (ii) request for expression of interest for selection of consulting services following open international market approaches; and (iii) contract award details of all procurement of goods and works and selection of consultants.

36. Fiduciary oversight by the World Bank and procurement supervision. The World Bank will prior review contracts according to the prior review thresholds set out in the PPSD and PP. All contracts not covered under prior review by the World Bank will be subjected to post review during implementation support missions and/or special post review missions, including missions by consultants hired by the World Bank. Two half-yearly missions are envisaged for procurement support and supervision of the proposed project. A World Bank procurement specialist will be a member of the project team throughout the project cycle. During implementation, the Accredited Procurement Specialist will join regular World Bank implementation support missions. The frequency of procurement supervision will be twice a year.

37. Use of National Procurement Procedures. In accordance with paragraph 5.3 of the Procurement Regulations, when approaching the national market, the PIU may use the procedures set out in the PPL. The provisions of the PPL are partially consistent with the World Bank Procurement Regulations Section V – Para 5.4 National Procurement Procedures, subject to conditions specified in the PPSD and PP. To promote transparency, efficiency, and value for money under the country-public procurement system, the PPL provides for an e-procurement system. The e-procurement system is assessed by the World Bank and the project may use it for procurement of simple goods and small works.



ANNEX 2: Economic and Financial Analysis

COUNTRY: Kyrgyz Republic

RESILAND CA+ Program: Kyrgyz Republic Resilient Landscape Restoration Project

Introduction

1. Project targeted intervention areas are strategically distributed across various oblasts within the Kyrgyz Republic, with a distinct focus on regions facing unique challenges and opportunities for sustainable landscape management and livelihood improvement. Specifically, these areas encompass the northern oblasts of Naryn and Issyk-Kul, which share borders with Kazakhstan, and the southern oblasts of Jalal-Abad and Osh, which share borders with Uzbekistan and are situated within the transboundary Kara-Darya River basin.

2. The majority of intervention sites (13 out of 16) will be concentrated in Osh and Jalal-Abad oblasts in the southern part of the country. These areas, characterized by the highest population density, are also associated with a heightened risk of mudflows and floods, as classified by MoES. They are categorized as presenting a high degree of mudflow and flood danger, with the potential for catastrophic events (1st degree) and destructive events involving flows ranging from 100 to 1,000 m³/s (2nd degree). Three additional intervention sites will be located in the northern oblasts of Issyk-Kul and Naryn. These sites are characterized by elevated mudflow risk levels and hold significant potential for safeguarding households and agricultural land. The precise locations for implementing green and NBS interventions will be determined through an ongoing technical study financed by the World Bank.

Methodology and assumptions

3. The Economic and Financial Analysis employs a Cost-Benefit Analysis approach. This analysis specifically focuses on a subset of anticipated project benefits that can be quantified. The financial analysis aims to quantify incremental benefits attributable to the development impacts expected to be generated by comparing “with-project” and “without-project” scenarios. This ensures that the benefits quantified are actually the ‘incremental or additional impacts’. It is important to note that all quantifiable benefits are anticipated to arise from Component 2.

4. Benefits are expected to derive from multiple sources related to the type and scale of interventions implemented. Benefits are both direct and indirect, though not all have been quantified: (i) avoided costs associated with infrastructure maintenance after potential mudflows (such as irrigation canals, roads, bridges, administrative and other buildings, etc.); (ii) avoided costs related to household assets, including agricultural lands in case of mudflows; (iii) benefits from introduction of new rice fields; (iv) benefits from horticulture and nuts production; (v) benefits from firewood collection (limited amount from pruning and thinning); (vi) benefits from reduced erosion or sediment runoff; (vii) cost of inaction related to land degradation and soil fertility loss; and (viii) benefits from GHG mitigation.

5. Values are expressed in constant 2023 prices and exclude inflation. Prices were converted into economic values in the analysis by applying conversion factors received from calculating import and export parity prices based on the World Bank’s Pink Sheet projections and UN ComTrade data. A standard conversion factor used in the analysis – 0.89. The Financial Discount Rate of 13.0 percent⁴³ is used in this analysis to assess the viability and robustness of investments, which is the current Opportunity Cost of Capital to a beneficiary. The selection criterion for the IRR is to accept all projects

⁴³ Policy rate as of October 2023. National Bank of the Kyrgyz Republic, <https://www.nbkr.kg/>.



for which the IRR is above the opportunity cost of capital. The economic or Social Discount Rate of 6.0 percent⁴⁴ is applied for the economic analysis, which is a Social Opportunity Cost. The exchange rate used in the financial and economic analysis is fixed at US\$1= KGS 88.7, with a strong assumption that future inflation of inputs will be outweighed by increase in output prices.

Financial Analysis

6. Sub-component 2.1 will have a primary goal to enhance water and soil retention in areas prone to mudflows through the implementation of green solutions and NBS, all while creating local employment opportunities and bolstering resilient livelihoods for communities. This sub-component will allocate funding for activities, such as afforestation, enrichment planting, the construction of live crib walls, fencing, water retention structures, and necessary irrigation works to sustain the newly planted areas. Innovative approaches, such as integrating fast-growing poplar trees with fodder species, will be piloted in suitable locations.

7. The project will finance essential resources, such as materials, hand tools, equipment, temporary seasonal watering, irrigation infrastructure, and water harvesting structures. This includes the procurement of seedlings from both state and private nurseries. Most of these interventions will be concentrated in the upper catchment areas of the Kara-Darya River and its tributaries, such as the Kugart and Kara-Unkur Rivers. Preliminary sites will be identified and prioritized through an ongoing technical study conducted by the World Bank. Subsequently, a multidisciplinary team, in collaboration with community input, will conduct site-specific analysis and planning. For the analysis, five indicative models and the potential scope of planting based on funding availability were used to quantify the estimated benefit streams (see Table 2.1).

Table 2.1. Indicative Green Solutions

#	Green solutions	Area (ha)
1	Fruits (apple, cherry, peach, apricot etc.) (model 3x4)	415
2	Pistachio and almond (5x5)	430
3	Saxaul	140
4	Walnut (model 6x6)	145
5	Willow (model 8x8)	295
Total		1,425

8. The expected outcomes of upstream interventions encompass reduced soil erosion, improved soil stability, enhanced soil nutrient levels, greater biodiversity, and improved water infiltration within the upstream areas. Downstream, these interventions are anticipated to result in a reduction in mudflow risk and sediment volumes, thereby enhancing the climate resilience of both communities and assets and mitigating land degradation. Additionally, these interventions are poised to yield other ecosystem service benefits, including the provision of fuelwood, freshwater, fruits, nuts, herbs, enhanced food security, shading effects, and carbon sequestration. The results of the financial analysis of the indicative green solutions per hectare models are presented in Table 2.2. All models are financially viable.

⁴⁴ The Social Discount Rate used for the economic analysis is based on World Bank's estimations, proposed by a standardized methodology. See Discounting Costs and Benefits in Economic Analysis of World Bank Projects, OPSPQ. May 9, 2016.

**Table 2.2. Financial Analysis Summary**

Model	Estimated Investment Costs (US\$)	Annual Net Benefits (US\$)			Annual Inc. net benefits per 1US\$ of Inv.	IRR (%)	NPV (US\$)	Benefit-to-cost ratio
		Without Project	W. Project - Full Dvt	Incremental				
Fruits model (1ha)	3,815	0	925	925	0.24	22.95%	995	1.43
Pistachio model (1ha)	1,981	0	344	344	0.17	16.95%	177	1.17
Saxaul model (1ha)	2,329	0	443	443	0.19	11.99%	106	1.06
Walnut model (1ha)	1,780	0	325	325	0.18	15.84%	131	1.14
Willow model (1ha)	1,595	0	295	295	0.18	13.73%	89	1.28

9. **Green Wager Program.** Local communities will be actively engaged in the tree planting and fencing efforts applying the GWP approach. Given the imminent threat posed by these unstable slopes, communities willingly contribute their labour to mitigate the associated risks. The primary method of identifying beneficiaries and laborers relies on lists maintained by the Ministry of Labour, Social Security, and Migration at the municipal level. To implement the green solutions, an estimated total of 47,320 person-days will be required to cover the planting of 1,425 hectares of land. Translating this labour effort into monetary terms, it amounts to US\$217,672, based on an average remuneration rate of US\$4.6 per day (design mission's findings) in the specific target areas where this type of activity is conducted.

Economic Analysis

10. The economic analysis aims to assess project impact at the national level by aggregating all project costs and projected benefits. It includes the following six steps: (i) converting financial prices into economic values in the indicative green solutions models (sub-component 2.1) to assess the real costs and benefits from the country point of view; (ii) estimating the aggregated economic benefits from the investment into sixteen intervention sites (sub-component 2.2); (iii) undertaking economic analysis of the overall project by aggregating all costs and benefits; and (iv) performing a sensitivity analysis.

11. In the economic analysis, financial prices were transformed into economic values to rectify any potential distortions caused by national price variations. This conversion process involved applying conversion factors derived from the calculation of import and export parity prices, using data from the World Bank's Pink Sheet⁴⁵ projections and UN ComTrade⁴⁶ data as references. A standard conversion factor of 0.89 was applied in the analysis for this purpose. A 12 percent VAT allowance was excluded from the economic analysis because it does not represent national costs, but simply redistribution among national agents. Costs and benefits were conservatively aggregated over a 20-year period (minimum economic lifetime of infrastructure) to calculate the EIRR and the ENPV assuming a 6 percent Social Discount Rate.

12. Throughout the project's duration, all benefits are planned to be distributed gradually in alignment with the project cost tables. Typically, the construction of infrastructure is anticipated to span a four-year period, and the actual benefits are expected to start materializing in the fifth year of the project. While there might be some limited benefits accrued during the construction phase, these are considered relatively minor. Therefore, the assumption is that the substantial benefits will only begin to accumulate once the construction phase is successfully concluded (Year 6, after the project completion).

⁴⁵ WB Commodities Price Data, <https://thedocs.worldbank.org/en/doc/5d903e848db1d1b83e0ec8f744e55570-0350012021/related/CMO-Pink-Sheet-September-2023.pdf>.

⁴⁶ UN Comtrade Database, <https://comtradeplus.un.org/>, accessed in September 2023.



Economic benefits from sub-component 2.2

13. Climate-resilient NBS and grey solutions will be represented by different types of river embankment measures. The associated benefits are estimated based on flood and mudflow modelling, which provides an estimate of the area flooded in hectares for a range of land use categories, including households, agricultural lands, and administrative buildings. The area under each land use category is estimated on the received data (see Table 2.3) from MoES. The designated target area is expected to encompass a total of approximately 9,408 protected households and cover 7,633 hectares of agricultural land.

**Table 2.3. Total Households, Agricultural land, and Administrative Buildings Protected due to Project Interventions
(source: MoES)**

#	Site/intervention type	Cost (million US\$)	Protected households (#)	Protected agri.land (ha)	Protected adm. buildings (m2)
1	Embankment No.6 on Karaunkursay river, Kyrgyzstan site, a/a Sakaldy, Nooken rayon	2.45	673	970	0
2	Embankment No.2 on Kara-Unkur-Sai river, "Aral" site, a/a Aral Nooken rayon	2.92	1,110	2,138	0
3	Embankment No.15 on Karaunkursay river, Khajirabad site, a/a Seydikum, Bazar-Korgon rayon	1.83	688	97	0
4	Embankment on Karaunkursay river, "Kokcho-Koz" site, city of Bazar-Korgon, Bazar-Korgon rayon	1.04	929	110	4
5	Embankment on Kugart river, "Jygach-Korgon" site, a/a Lenin, Suzak rayon	0.91	912	2,121	6,500
6	Embankment dam on Kugart river, "Kyzyl-Tuu" site, a/a Kyzyl-Tuu, Suzak rayon'	2.82	200	90	6,300
7	Embankment on Aravan-Sai river, "Kessek" site, a/a Mangyt, Aravan region	0.33	100	70	0
8	Embankment on Aravan-Sai river, "Pahta-dobo" plot, Zhany-Aravan site, a/a A. Anarov, Aravan region	0.63	2,250	600	4500
9	Embankment on Kara-Darya river, the site "Below the road bridge Osh-Bishkek" a/a Bash-Dobo, Uzgen rayon	2.24	262	216	400
10	Embankment on Kara-Darya river, the site "Below the road bridge Osh-Bishkek" a/a Karool, Uzgen rayon	2.24	520	457	400
11	Embankment on Kara-Darya river, "Chynbai" site, a/a Don-Bulak Uzgen region	1.68	250	300	350
12	Embankment on Yassy river, Working town site, a/a Zhazi Uzgen region	0.94	212	84	200
13	Embankment on Yassy river. Kyzyl-Charba site, a/a Salam-Alik Uzgen district	0.66	253	150	420
14	Construction of a protective embankment on the At-Bashi River in the village of Bash-Kaiyndy in the At-Bashy district of Naryn region	0.94	315	60	4135
15	Construction of a self-protective channel east of the city of Cholpon-Ata in Issyk-Kul district of Issyk-Kul region (Stage 3)	0.26	234	50	342
16	Mudflow protection dam in the city of Balykchi (north-eastern part) Issyk-Kul oblast	2.00	500	120	88
	Total	23.86	9,408	7,633	23,639

14. In line with national procedures, following an emergency event, the government extends support to affected individuals by providing KGS 600,000 (equivalent to US\$6,803) to each rural household for the purpose of restoring their living facilities. Additionally, an amount of KGS 200,000 (equivalent to US\$2,268) is allocated for each hectare of agricultural land that has been destroyed. It is important to note that the approved compensation values for households and agricultural land are considerably lower than their actual market worth. This deliberate undervaluation serves to maintain a conservative approach in the assumptions made. Additionally, the target area also incorporates 23,639 square meters of administrative buildings and infrastructure, which includes structures like schools, mosques, bridges, roads, and more. The estimated cost for rebuilding one square meter of such infrastructure averages around KGS 20,000, considering variations in construction complexity. In the absence of a detailed inventory, valuation, and historical flood and mudflow damage assessment of such assets, they have not been included in the analysis. The analysis assumes that each of these sites would encounter an emergency event at least once in the upcoming 20 years in the without-project scenario and based on the Expected Annual Avoided Damage approach. However, empirical data reveals that such events occur every few years, varying in magnitude. This empirical evidence underscores the conservative nature of the assumption made in the analysis.

15. **Unquantifiable benefits.** The activities under sub-component 2.1 will lead to avoided cost of inaction related to land degradation and soil fertility loss. Evidence⁴⁷ suggests that every dollar invested in sustainable landscape restoration

⁴⁷ 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*. Springer. Retrieved on



practices can yield four dollars of returns over a 30-year period. Construction of river embankments will help reduce the vulnerability of local communities and boost their confidence levels, thereby stimulating increased investment in the area. Farmers are likely to embrace more intensive cultivation practices, including the use of improved crop varieties and more efficient input utilization, resulting in higher agricultural yields. Consequently, agricultural productivity will encourage investments in agribusinesses involved in supplying inputs and processing and marketing agricultural outputs. Improved income levels of farming households, which form a significant part of the project area, will further drive investment into various business ventures and the provision of related services. Subsequently, economic, and social infrastructure investments are expected to follow suit. The NBS interventions under sub-component 2.2 will lead to avoided cost of reduced severity or frequency of mudflows to the communities nearby, especially immediately downstream. This avoided cost is not quantified for the economic analysis.

Overall Economic Analysis

16. The overall (sub-components 2.1 and 2.2 combined) EIRR is calculated at 16.4 percent and the ENPV (with a 6 percent discount rate) is estimated at around US\$70.6 million, which proves the project's overall economic viability.

Sensitivity Analysis

17. Economic returns were tested against changes in benefits and costs and for various lags in the realization of benefits. In relative terms, the EIRR is equally sensitive to changes in costs and benefits. In absolute terms, these changes do not have a significant impact on the EIRR, and the economic viability is not threatened by both a 20 percent decline in benefits and by a 20 percent increase in costs, since the EIRR in both cases remains well above the discount rate. A two-year delay in Project benefits reduces the EIRR to 10.7 percent. The analysis establishes that the estimated benefits will be greater than the costs of the Project.

Table 2.4. Sensitivity Analysis

Sensitivity Analysis (20-year period)	Base case	Costs Increase			Increase of Benefits		Decrease of Benefits			Delay of Benefits	
		+10%	+20%	+50%	+10%	+20%	-10%	-20%	-30%	1 year	2 years
EIRR	16.4%	15.3%	14.4%	12.1%	17.5%	18.5%	15.2%	14.0%	12.6%	13.2%	10.7%
ENPV (000'USD)	70,619	66,803	62,987	51,540	81,497	92,374	59,741	48,863	37,986	40,866	24,531

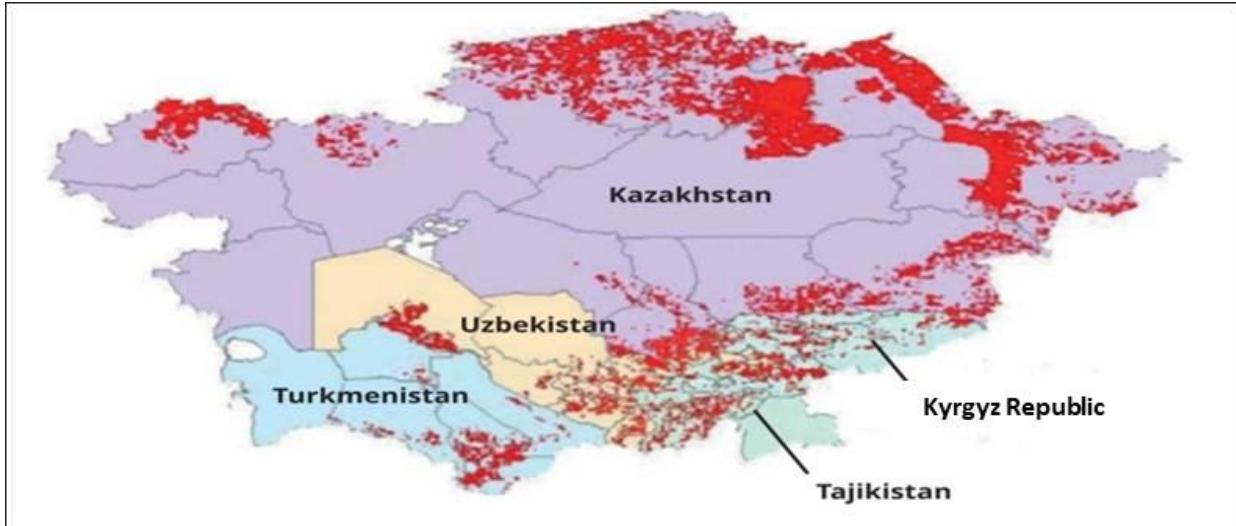
Investments sustainability

18. Sustainability of investments is mostly dependent on effective O&M of the infrastructure. MoES will regularly maintain project structures by using its own budget as per its mandate. Purchased heavy machinery and equipment to be provided to local MoES branches will be maintained by MoES' Emergency Prevention and Response Service.

**ANNEX 3: Project Maps, Figures, and Tables****COUNTRY: Kyrgyz Republic**

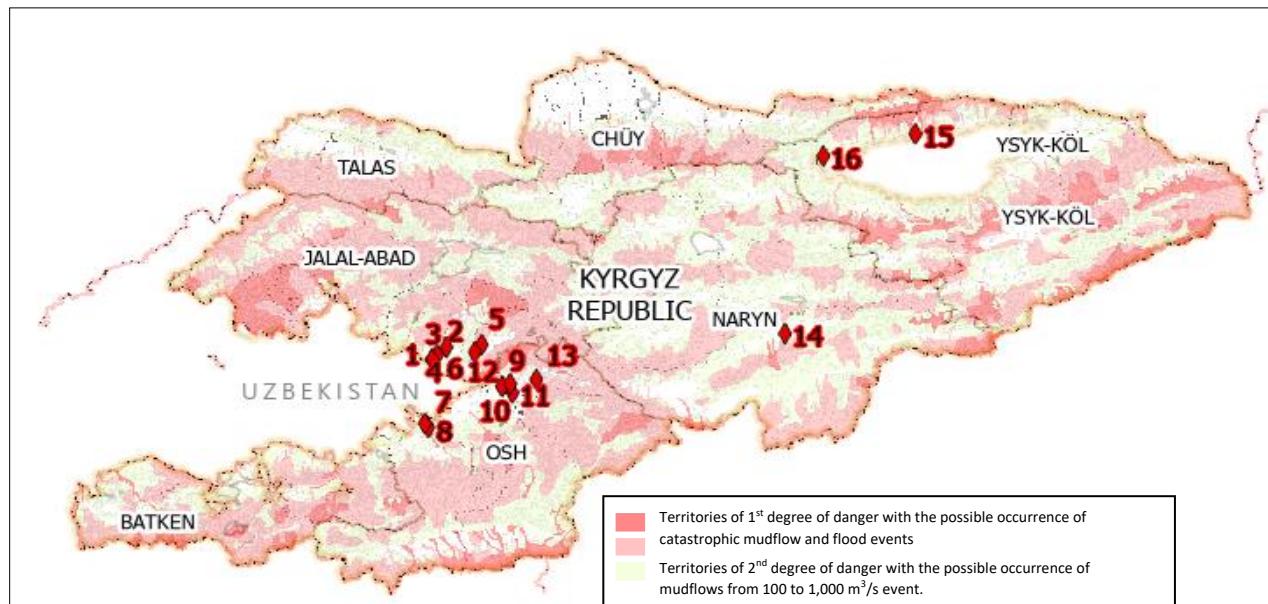
RESILAND CA+ Program: Kyrgyz Republic Resilient Landscape Restoration Project

**Figure 3.1. Hotspots of Land Degradation in Central Asia Region
(Determined by changes in Normalized Different Vegetation Index in the Region)**



Source: Nkonya, E. et al. 2016 (Eds), Economics of Land Degradation and Improvement – a Global Assessment for Sustainable Development. World Bank map clearance dated December 5, 2023.

Figure 3.2. Location of Project Sites for NBS and Green and Grey Interventions



Source: MoES. World Bank map clearance dated December 5, 2023.

Site selection process. These sites were prioritized by MoES given their high-risk status and screened by the World



Bank for impact. Sites which have the following characteristics will not be included in the project: (i) embankments in need of repair that are in socially sensitive locations and where either resettlement and/or land acquisition is anticipated and (ii) embankments where repair may result in potential negative impacts to riparian downstream countries (restoration of embankment on Kyrgyz Republic side of the riverbank that runs parallel to the border with Uzbekistan).

Table 3.1. Summary of Project Costs

	Financiers			
	IDA Credit	PROGREEN Grant	KWPF Grant	Total
	Amount ('000 US\$)	Amount ('000 US\$)	Amount ('000 US\$)	Amount ('000 US\$)
Component 1. Strengthening Institutions and Regional Collaboration	6,500	2,000	2,400	10,900
Sub-component 1.1: Strengthening Institutions and Climate-induced Hazard Monitoring Capacity	6,500	-	-	6,500
Sub-component 1.2: ICT for Disaster Risk Management in Degraded Landscapes	-	-	2,400	2,400
Sub-component 1.3: Strengthening Regional Collaboration	-	2,000	-	2,000
Component 2. Enhancing Resilient Landscapes and Livelihoods	37,000	3,000	-	40,000
Sub-component 2.1: Landscape Restoration through Climate-resilient Green Solutions	1,000	3,000	-	4,000
Sub-component 2.2: Landscape Restoration through Climate-resilient Nature-based and Grey Solutions	36,000	-	-	36,000
Component 3. Project Management and Coordination	1,500	-	-	1,500
Total	45,000	5,000	2,400	52,400

Table 3.2. Menu of Potential Transboundary Sustainable Landscape Management Policies to be Agreed on under the RESILAND CA+ Program⁴⁸

1. MoU for restoration of transboundary landscape corridors in Central Asia
2. Regional methodology for ecosystem classification and inventory
3. MoU for the designation of transboundary "peace parks"
4. Protocol for tourism across transboundary protected areas
5. NBS protocol

⁴⁸ Agreement would be between at least two Central Asian countries. This is a proposed list; others could be agreed on.