



Strengthening the Resilience of Central Asian Countries by Enabling Regional Cooperation to Assess High Altitude Glacio-nival Systems to Develop Integrated Methods for Sustainable Development and Adaptation to Climate Change

Part I: Project Information

GEF ID

10077

Project Type

FSP

Type of Trust Fund

GET

CBIT/NGI

☐ CBIT

☐ NGI

Project Title

Strengthening the Resilience of Central Asian Countries by Enabling Regional Cooperation to Assess High Altitude Glacio-nival Systems to Develop Integrated Methods for Sustainable Development and Adaptation to Climate Change

Countries

Regional, Kazakhstan, Tajikistan, Turkmenistan

Agency(ies)

UNDP

Other Executing Partner(s)

UNESCO International Hydrological Programme

Executing Partner Type

Others

GEF Focal Area

International Waters

Taxonomy

International Waters, Focal Areas, Transboundary Diagnostic Analysis and Strategic Action Plan Preparation, Freshwater, River Basin, Strategic Action Plan Implementation, Climate Change, Demonstrate innovative approach, Influencing models, Transform policy and regulatory environments, Strengthen institutional capacity and decision-making, Convene multi-stakeholder alliances, Communications, Stakeholders, Public Campaigns, Awareness Raising, Education, Type of Engagement, Information Dissemination, Partnership, Consultation, Beneficiaries, Gender Mainstreaming, Gender Equality, Women groups, Knowledge Generation, Capacity, Knowledge and Research, Learning, Knowledge Exchange, Capacity Development, Innovation

Rio Markers**Climate Change Mitigation**

Climate Change Mitigation 0

Climate Change Adaptation

Climate Change Adaptation 1

Submission Date

12/17/2020

Expected Implementation Start

1/1/2021

Expected Completion Date

1/31/2025

Duration

4In Months

Agency Fee(\$)

588,306.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
IW-3-5		GET	3,981,018.00	12,468,890.00
IW-3-6		GET	2,211,676.00	17,750,000.00
Total Project Cost(\$)			6,192,694.00	30,218,890.00

B. Project description summary

Project Objective

Strengthening the adaptation capacity of Central Asian countries to climate change impacts on the cryosphere through assessment, promotion of regional cooperation, and stakeholder engagement

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
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Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 1: Consolidating common knowledge in an integrated cryosphere information database in CA countries	Technical Assistance	<p>Outcome 1.1: <i>Science-based consensus among the countries on major challenges from melting glacier snow and permafrost and consequent water availability in the upstream-downstream in CA region</i></p> <p>Outcome 1.2: <i>Stakeholders have enhanced knowledge and understanding of changes in the cryosphere and expected implications of climate change for the region</i></p>	<p>Output 1.1.1: Diagnostic analysis (DA) of the current state of the cryosphere system and its impact on water availability in five countries in Central Asia identifying root and immediate causes of the challenges facing the changes in the cryosphere system</p> <p>Output 1.2.1 A standardized regional database on the status and changes of the cryosphere in CA established and updated regularly</p> <p>Output 1.2.2 Research synthesized on national monitoring of environmental and non-environmental vulnerability factors of the</p>	GET	780,546.00	3,396,148.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 2: Building the foundation for regional cooperation on the cryosphere in Central Asian Countries	Technical Assistance	<i>Outcome 2.1: Countries have national action plans and a regional strategic action programme (SAP)</i>	Output 2.1.1 National Action Plans (NAPs) for each of the participating countries prepared and adopted	GET	780,546.00	4,099,800.00
		<i>Outcome 2.2: National and regional institutions are in place to implement national action plans and the SAP</i>	Output 2.1.2 Strategic Action Program agreed between countries and signed on ministerial level.			
			Output 2.2.1 Partnership Conference conducted in alignment with SAP investment priorities.			
			Output 2.2.2 Functional national inter-ministerial committees established in each of the participating countries, or existing national mechanisms strengthened			
			Output 2.2.3 National and Regional			

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 3: Strengthening the capacity in Central Asian countries to monitor the cryosphere	Technical Assistance	<p><i>Outcome 3.1: Countries use a standard approach to monitor the cryosphere in Central Asia</i></p> <p><i>Outcome 3.2: Countries have increased capacity to undertake monitoring and apply skills in Integrated Water Resources Management (IWRM) and resilience to cope with cryosphere hazards</i></p>	<p>Output 3.1.1 Regional agreement on a monitoring program for the cryosphere with common, harmonized protocols adopted by relevant countries</p> <p>Output 3.1.2 National cryosphere monitoring programs in participating countries established and supported</p> <p>Output 3.2.1 Regional network of national institutions competent in the assessment of climate change impacts on the cryosphere established</p> <p>Output 3.2.2: South-south knowledge exchanges and scientific cooperation among high-altitude</p>	GET	1,352,946.00	4,248,352.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 4: Demonstrating technologies and best practices for integrated water resources management and adaptation to climate change in glacier snow-fed river basins	Technical Assistance	<i>Outcome 4.1: Countries utilize innovative technologies and best practices for integrated resource management in the cryosphere</i>	<p>Output 4.1.1 Replicable adaptation projects in each of the CA countries implemented</p> <p>Output 4.1.2 Stakeholders engaged in training programs at the local level</p>	GET	2,450,914.00	14,423,444.00
Component 5: Increasing awareness and involvement of key stakeholders	Technical Assistance	<i>Outcome 5.1: Decision-makers and the public at the national, regional, and global level are increasingly aware of the economic and social costs of retreating high-altitude glaciers and the changing cryosphere more generally</i>	<p>Output 5.1.1 Project experiences and lessons disseminated regionally and globally</p> <p>Output 5.1.2 Key stakeholders and the public involved in a gender-responsive way</p>	GET	347,072.00	1,943,073.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 6: Monitoring and evaluation (M&E) and project learning	Technical Assistance	<i>Outcome 6.1: Project management and approaches to country reporting are informed by M&E</i>	<p>Output 6.1.1 Project monitored to inform adaptive management for successfully delivery of project results.</p> <p>Output 6.1.2. Knowledge and lessons learned generated</p>	GET	185,780.00	748,073.00
Sub Total (\$)					5,897,804.00	28,858,890.00
Project Management Cost (PMC)						
GET			294,890.00		1,360,000.00	
Sub Total(\$)			294,890.00		1,360,000.00	
Total Project Cost(\$)			6,192,694.00		30,218,890.00	

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

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
GEF Agency	UNDP	In-kind	Recurrent expenditures	300,000.00
Other	UNESCO	In-kind	Recurrent expenditures	700,000.00
Recipient Country Government	Government of Kazakhstan	In-kind	Recurrent expenditures	3,700,000.00
Recipient Country Government	Government of Kyrgyzstan	In-kind	Recurrent expenditures	5,000,000.00
Recipient Country Government	Government of Tajikistan	In-kind	Recurrent expenditures	1,000,000.00
Recipient Country Government	Government of Turkmenistan	In-kind	Recurrent expenditures	11,400,000.00
Recipient Country Government	Government of Uzbekistan	In-kind	Recurrent expenditures	2,000,000.00
Donor Agency	Adaptation Fund (UNESCO-AF)	In-kind	Recurrent expenditures	4,858,244.00
Civil Society Organization	CICADA (University of Fribourg)	In-kind	Recurrent expenditures	868,646.00
Civil Society Organization	Global Water Futures	In-kind	Recurrent expenditures	392,000.00
Total Co-Financing(\$)				30,218,890.00

Describe how any "Investment Mobilized" was identified

Support for long-term cryosphere monitoring in Central Asia under CICADA will be provided, which will increase global monitoring capacities.

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

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
UNDP	GET	Regional	International Waters	International Waters	6,192,694	588,306
Total Grant Resources(\$)					6,192,694.00	588,306.00

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required

☐

PPG Amount (\$)

200,000

PPG Agency Fee (\$)

19,000

Agency	Trust Fund	Country	Focal Area	Programmin g of Funds	Amount(\$)	Fee(\$)
UNDP	GET	Regional	International Waters	International Waters	200,000	19,000
Total Project Costs(\$)					200,000.00	19,000.00

Core Indicators

Indicator 7 Number of shared water ecosystems (fresh or marine) under new or improved cooperative management

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Shared water Ecosystem	Amu-Darya, Illi River, Syr Darya			
Count	3	0	0	0

Indicator 7.1 Level of Transboundary Diagnostic Analysis and Strategic Action Program (TDA/SAP) formulation and implementation (scale of 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Amu-Darya Select SWE	1			<input type="checkbox"/>
Illi River Select SWE	1			<input type="checkbox"/>
Syr Darya Select SWE	1			<input type="checkbox"/>

Indicator 7.2 Level of Regional Legal Agreements and Regional management institution(s) (RMI) to support its implementation (scale of 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Amu-Darya Select SWE	1			<input type="checkbox"/>
Illi River Select SWE	1			<input type="checkbox"/>

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Syr Darya	1			
Select SWE				<input type="checkbox"/>

Indicator 7.3 Level of National/Local reforms and active participation of Inter-Ministeral Committees (IMC; scale 1 to 4; See Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Illi River	1			
Select SWE				<input type="checkbox"/>
Amu-Darya	1			
Select SWE				<input type="checkbox"/>
Syr Darya	1			
Select SWE				<input type="checkbox"/>

Indicator 7.4 Level of engagement in IWLEARN through participation and delivery of key products(scale 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Amu-Darya	1			
Select SWE				<input type="checkbox"/>
Illi River	1			
Select SWE				<input type="checkbox"/>
Syr Darya	1			
Select SWE				<input type="checkbox"/>

Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female		750		
Male		750		
Total	0	1500	0	0

Part II. Project Justification

1a. Project Description

The project is *fully aligned* with the project design proposed in the PIF.

Since the approval of the PIF, **two additional countries** have joined the project as proposed: the Republic of Kyrgyzstan and the Republic of Uzbekistan. The funding requested from the GEF has remained the same, but co-financing has increased.

Modifications in the project approach and activities during the project preparation period can be summarized as follows: 1) Activities and deliverables reflect input from cryosphere experts on monitoring priorities and adaptive measures; 2) Wording has been updated in places to reflect OECD-DAC terminology and current international scientific usage, such as the use of the term "cryosphere" in place of "glacio-nival systems and permafrost;" and 3) The number of outcomes has been reduced from 12 to 9 in order to streamline project management and clarify the project approach, with outcomes and outputs now numbered to correspond to components.

The design of the project approach and activities has also been assessed to ensure that it will take the short-term and longer-term implications of the COVID-19 global pandemic into consideration. Annex 16 of the accompanying UNDP Project Document now includes a table that summarizes how these considerations have been incorporated into various project elements.

The table below summarizes changes in the wording of project components, outcomes, and outputs.

PIF stage	Proposal	Explanation
Project Objective		
Strengthening the adaptation capacity of Central Asian countries to climate change impacts on glacio-nival systems through assessment, promotion of regional cooperation, and stakeholder engagement.	Strengthening the adaptation capacity of Central Asian countries to climate change impacts on <u>the cryosphere</u> through assessment, promotion of regional cooperation, and stakeholder engagement.	"Cryosphere" used to reflect current usage.
Component 1		
Component 1: Consolidating common knowledge in an integrated glacio-nival systems and permafrost information database in CA countries	Consolidating common knowledge in an integrated <u>cryosphere</u> information database in CA countries	"Cryosphere" used to reflect current usage.

Outcome 1: Science-based consensus among the countries on major problems of glacio-nival systems and permafrost of the key CA glaciers, reached through joint exchange of information	Outcome 1.1: Science-based consensus among the countries on major challenges from melting glacier snow and permafrost <u>and consequent water availability in the upstream-downstream in CA region</u>	Reflects participation of downstream regions and Turkmenistan. Outcomes re-numbered to correspond to component.
Output 1.1 Diagnostic analysis of the current state of glacio-nival systems and permafrost in four countries in Central Asia identifying root and immediate causes of the challenges	Output 1.1.1: Diagnostic analysis (DA) of the current state <u>of the cryosphere system and its impact on water availability in five countries in Central Asia</u> identifying root and immediate causes of the challenges facing the changes in the cryosphere system	DA will include Turkmenistan; Kyrgyzstan has joined the project.
Outcome 2: Enhanced knowledge and understanding of the glaciers' change and expected implications of climate change on glacio-nival systems and permafrost in each country of CA	Outcome 1.2: <u>Stakeholders have enhanced knowledge</u> and understanding of changes <u>in the cryosphere</u> and expected implications of climate change for the region	Wording updated for consistency.
Output 2.1 A consolidated national and regional catalogue on the status and changes of glacio-nival systems of CA	Output 1.2.1 A standardized regional <u>database on the status and changes of the cryosphere in CA established and updated regularly</u>	Wording updated for consistency, specificity.
Output 2.2 Synthesis research results based on national monitoring on environmental and non-environmental vulnerability factors of glacio-nival systems and permafrost on climate change, key determinants of vulnerability and adaptive capacity	Output 1.2.2 Research synthesized on national monitoring of environmental and non-environmental vulnerability factors <u>of the cryosphere</u> to climate change, key determinants of vulnerability, and adaptive capacity	Wording updated for consistency.
Output 2.3 Scenarios of glacio-nival and permafrost changes in response to climate change in glacier systems of each country in Central Asia	Output 1.2.3 Scenarios of changes in the cryosphere in response to climate change in Central Asia developed	Wording updated for consistency.
Output 2.4 Governance analysis on the status and needs of national and regional strategies for sustainable management of glacier systems under climate change to inform Strategic Action Programme (SAP) development process.	Output 1.2.4 Governance analysis conducted on the status and needs of national and regional strategies for <u>addressing changes in the cryosphere</u> under climate change	Wording updated to reflect current usage
	Output 1.2.5: Gender considerations in vulnerability, adaptive capacity and governance arrangements for addressing the impacts of changes in the cryosphere identified	A project output was added to address gender considerations in the diagnostic analysis and inform the NAPs and SAP.
Component 2		
Component 2: Building the foundation for regional cooperation on glacio-nival systems and permafrost of Central Asian Countries	Component 2: Building the foundation for regional cooperation <u>in the cryosphere in</u> Central Asian Countries	Wording updated for consistency.

Outcome 3: Based on enriched knowledge countries agree on national plans and regional strategic action programme -SAP	Outcome 2.1: <u>Countries have</u> national action plans and a regional strategic action programme (SAP)	Wording updated for consistency.
Output 3.1 Preparation and adoption of National Action Plans for each of the participating countries	Output 2.1.1 National Action Plans (NAPs) for each of the participating countries <u>prepared and adopted</u>	Wording updated for consistency.
Outcome 4: Multi-country agreement on implementation mechanism for the SAP	Outcome 2.2: <u>National and regional institutions are in place to implement national action plans and the SAP</u>	Clarification.
Output 4.3 Facilitate the establishment of and reinforce the National and Regional Glacial Centers	Output 2.2.3 National and Regional Glacier Centers <u>established or strengthened</u>	Wording updated for consistency.
Output 4.4 Establishment and support of the national and regional stakeholder's forums.	Output 2.2.4 National and regional stakeholder forums established and supported	Wording updated for consistency.
Output 4.5 Tailored training programmes at the national level		Now reflected in Output 3.2.3 in order to reflect the two target groups (cryosphere professionals) and 4.1.2 (community stakeholders)
Component 3		
Component 3: Strengthening the capacity of Central Asian countries to monitor the glacio-nival systems and permafrost	Component 3: Strengthening the capacity in Central Asian countries to monitor the <u>cryosphere</u>	Wording updated.
Outcome 5: Consensus on the monitoring programme of the glacio-nival systems and permafrost in Central Asia countries	Outcome 3.1: Countries use a standard approach to monitor <u>the cryosphere</u> in Central Asia	Wording updated.
Output 5.1 Regional agreement on glacier monitoring programme and adoption of common harmonized monitoring protocols.	Output 3.1.1 Regional agreement on <u>a monitoring program for the cryosphere</u> with common, harmonized protocols adopted by relevant countries	Clarifies: only 4 of the 5 countries have glaciers and will participate in cryosphere monitoring
Output 5.2 National monitoring programme of glacio-nival systems and permafrost in Central Asia	Output 3.1.2 National <u>cryosphere</u> monitoring programs in participating countries established and supported	Wording updated.
Outcome 6 Countries capacities built for improved monitoring	Outcome 3.2: Countries have increased capacity to <u>undertake monitoring and apply skills in Integrated Water Resources Management (IWRM) and resilience to cope with cryosphere hazards</u>	Wording now reflects participation of downstream regions and Turkmenistan.
	Output 3.2.2: South-south knowledge exchanges and scientific cooperation among high-altitude glacier basins introduced	Previously Outcome 10. Moved to Component 3 to be with other capacity-strengthening measures for cryosphere professionals and their institutions.

	Output 3.2.3: Experts in participating countries trained to monitor the cryosphere and climate impacts	Previously covered under part of Output 4.5 in the PIF; moved for specificity.
Component 4		
Component 4: Demonstration projects to introduce technologies and best practices for integrated management in glacio-nival systems systems, and for climate change adaptation	Component 4: Demonstrating technologies and best practices for <u>integrated water resources management and adaptation to climate change in glacier snow-fed river basins</u>	Wording updated for consistency and scope of activities.
Outcome 7: Demonstration and testing of innovative technologies and best practices for integrated management in the glacio-nival systems with an objective to preserve mountain ecosystems	Outcome 4.1: Countries utilize innovative technologies and best practices <u>for integrated resource management in the cryosphere</u>	Wording updated to better reflect the corresponding activities.
Output 7.1 Replicable demonstration projects in each of the CA countries	Output 4.1.1 Replicable adaptation projects in each of the CA countries implemented	Wording updated.
	Output 4.1.2 Stakeholders engaged in training programs at the local level	Previously covered under part of Output 4.5 in the PIF; moved for specificity.
Component 5		
Component 5: Awareness raising of stakeholders, development of a knowledge platform	Component 5: Increasing awareness <u>and involvement</u> of key stakeholders	The knowledge platform is now an output; involvement has been added to reflect the stakeholder engagement activities and output.
	Outcome 5.1: Decision-makers and the public at the national, regional, and global level are increasingly aware of the economic and social costs of retreating high-altitude glaciers and the changing cryosphere more generally	This outcome replaces Outcome 9 from the PIF
Outcome 8: Project experiences and lessons disseminated regionally and globally	Output 5.1.1 Project experiences and lessons disseminated regionally and globally	This outcome has been relabeled an output to reflect its scope.
Output 8.1 Information, Communication, and Outreach Strategy		This output is now contained as an activity under Output 5.1.1.
Outcome 9: Increased local and international awareness of the economic and social costs of high altitude glaciers retreat		Now Outcome 5.1
Output 9.1 Stakeholder involvement and Public Participation Strategy		This output is now contained as an activity under Output 5.1.2

	Output 5.1.2 Key stakeholders and the public involved in a gender-responsive way	This output now covers stakeholder engagement activities, and it is worded in order to ensure women's meaningful and equitable participation.
Outcome 10: South-south knowledge exchanges and scientific cooperation among high altitude glacier basins Output 10.1 Knowledge sharing through twinning programmes		Moved to Output 3.2.2. in order to be located with other capacity-strengthening activities for cryosphere professionals.
Outcome 11: Adaptive management measure developed Output 11.1 Project monitoring to inform adaptive management for successfully delivery of project results.		Project monitoring is included under the M&E activities now in Component 6 to streamline outcomes.
Output 11.2 Project knowledge captured and disseminated through Internet-based platform and website, including sharing experiences through IW LEARN, IWC's and COPs		These activities are carried out under Output 5.1.1.
Outcome 12: Selection of national institutions for conducting capacity-building activities in partnership with stakeholders at the local level. 12.1 Stakeholders engaged in training programmes at local level		These activities are carried out under Output 4.1.2.
	<p>Component 6: Monitoring and evaluation (M&E) and project learning</p> <p>Outcome 6.1: Project management and approaches to country reporting are informed by M&E</p> <p>Output 6.1.1 Project monitored to inform adaptive management for successfully delivery of project results.</p> <p>Output 6.1.2. Knowledge and lessons learned generated</p>	M&E is a distinct output (Output 6.1) to facilitate management and budgeting for M&E activities.

1a. Project Description. Elaborate on: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description); 2) the baseline scenario and any associated baseline projects; 3) the proposed alternative scenario with a brief description of expected outcomes and components of the project; 4) alignment with GEF focal area and/or Impact Program strategies; 5) incremental/additional cost reasoning and expected contributions from the baseline, the

GEFTF, LDCF, SCCF, and co-financing; 6) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and 7) innovativeness, sustainability and potential for scaling up. ?

1.1 Systems Description

Increasing water scarcity is a looming threat to sustainable development across the planet. There are escalating demands, while supplies are becoming increasingly scarce. Of the planet's total water resources, less than 1% is accessible as surface and groundwater. Economic development trends and expanding human population growth rates will result in growing demands on water resources for domestic and municipal uses, industrial processes, agricultural production and hydropower energy. Competing demands for water resources in many sectors are expected to grow, while corresponding water resources, including those from *melting snow and glaciers* are becoming scarcer.[1]¹

Melting glaciers will have widespread consequences for high-mountain and lowland ecosystems of global relevance for biodiversity and ecosystem services. Human health and ecosystem impacts are likely to result from the environmental impacts of changes in the hydrological systems, of which the cryosphere is a component. There may be too much water in the short term in the form of floods but with increased frequency, which may overwhelm local water and sanitation systems and raise the risk of diarrheal and other diseases, ruin agricultural crops and infrastructure, destroy livelihoods, and increase health risks from standing water that may be breeding grounds for disease vectors. There may be too little water in the form of longer times between rains or increased aridity, which will result in less water available for drinking, sanitation, and food and hand washing ? all raising health risks. Less water will be available for crops and ecosystems. Pollutant concentrations will be proportionately greater in less water. Scarcity of water also means that more time must be devoted to finding and carrying water.

In many parts of the world, glaciers have been retreating since the end of the Little Ice Age in the mid-nineteenth century?a tendency that has accelerated since the 1970s. The most recent special report from the IPCC states: ?Observations show general decline in low-elevation snow cover (high confidence), glaciers (very high confidence), and permafrost (high confidence) due to climate change in recent decades.?[2]² The cryosphere in Central Asia has also followed worldwide patterns of a rapid decline in mass. It is estimated that in the last 50 years, due to climate change impacts, the glaciers of Central Asia have shrunk by 20 to 30% in volume.[3]³ Because of climate change, shrinking glaciers first supply ample quantities of water in the form of increased glacial runoff, but reduced glacier volume will ultimately result in a decrease in both glacier-fed and total runoff in their basins. Thus, for example, as a consequence of this process, continued glacier degradation will eventually transform glacio-nival runoff regimes in the Tien Shan into nival?pluvial regimes, which are dependent on snowfall and rain and therefore have a much higher year-to-year variability in water yields. This alteration in runoff may not only intensify ecological problems, such as the drying of the Aral Sea Basin, but may also add to political instability in Central Asia. It is important to note that the water

yield from high-altitude basins has increased due to the reduction of water stored as ice. Under present conditions, flood risks are at a high level, and will remain that way, as storm events are likely to increase intensity in the future. With continued global warming, the glaciers will eventually disappear. In drought years, water yield will be reduced drastically.

This project will focus on the cryosphere system of the Tien Shan and Pamir mountain ranges of Central Asia and its impact on water availability in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. The mountain ranges cover an array of habitats from sub-tropical to tundra and glaciers, including semi-arid, forest, and mountain ecosystems. It is necessary to understand national and regional interlinkages in the cryosphere and its associated basins in participating countries to formulate national and regional adaptation strategies. Therefore, this project will strengthen regional cooperation, expand cooperation among local scientists and institutions, and enhance knowledge sharing and dialogue. Glacier monitoring will inform efforts to increase the resilience of populations that depend on natural resources from the cryosphere or downstream areas that are affected by hazards related to its changes.

Glaciers are highly important long-term reserves of fresh water in Central Asia. Glaciers also provide critical water supply during drought years. The main river systems of Central Asia and the drainage from the Aral Sea Basin are heavily dependent on the melting of snow and ice from their headwaters. The total glacier area, comprised of two glacier systems (Pamir, Tien Shan), together with the river basins to which these glacier systems contribute water (Amu Darya, Zeravshan, Syr Darya, Aral Sea, Chu-Talas, Ili, Lake Balqash, Murgab and Tejen), extends over 5 countries (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan). The glaciated area of the catchments of the Amu Darya and Syr Darya basins differs significantly. In the Amu Darya Basin, glaciers cover 15,500 km² (2% of the area); whereas in the Syr Darya Basin they spread over only 1,800 km² (0.15% of the area). Massive glaciers are located in the Pamir Mountains in Tajikistan.[4]⁴ For the Amu Darya River, glacial melt is an important contributor to its total flow, especially in smaller streams at higher elevations. Total water resources generated in the upstream parts of the Aral Sea Basin indicate that for the upstream Amu Darya, almost 40% of total flow is generated by glacial melt, while for the upstream Syr Darya, this figure is just over 10%. In order to address these issues, it is important to develop a platform where Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan will share their knowledge and experience with cryosphere monitoring and water availability related to melting glaciers and provide scientific feedback mechanisms to formulate national and regional adaptation strategies addressing their degradation.

There are a number of different root causes for changes in the cryosphere, and the process of degradation is itself both complex and indirect, involving multiple interactions and factors that can give rise to unexpected consequences. Among the main contributors to this complex process are the following:

? Mountain ecosystems are under additional stress due to urbanization, commercial activity, and recreational development that often fails to take environmental issues into consideration. Development and urbanization have led to the construction of buildings and roads on the unstable slopes of foothills around the alluvial fans of glaciers. This issue is closely linked to governance issues, as system of practical measures for the rehabilitation of disturbed landscapes and the regulation of economic and recreational loads on mountain ecosystems will be essential to adapting to climate change and ensuring sustainable development in the high-mountain areas of the cryosphere.

? As glaciers melt, creating more and larger glacial lakes, there is increased risk that lakes will overflow and dams breached, as already happened before during the 1960s and 1970s. Water yield from glacierized basins has increased due to the reduction of glacier mass. Under current conditions, flood hazard is at a high level, and will remain high in conjunction with increasing climate variability.

However, in the long run, with continued global warming, the glacier contribution to runoff will be minimum. As a result, water yield will be reduced sharply during drought years.

? An arid climate, combined with a history of weak environmental management and a lack of climate change adaptation measures, has created a region that is increasingly vulnerable to the effects of rising temperatures, changing rainfall patterns, increased aridity, and increasing frequency of extreme events.

? Various governance issues contribute to current vulnerabilities that glacier melting impacts may exacerbate. There is a strong need to build national capacities in the areas of scientific cooperation, national and regional institutions, and policies and measures need to be implemented to ensure that these institutions can carry out their work.

Barriers to be removed include the following:

? *Lack of information for decision-making:* Information barriers are two-fold: 1) There is a lack of adequate available data on glacier mass balance, snow coverage, permafrost and contribution to water availability for the region as a whole, and data availability is distributed unevenly across countries. Although large amounts of data were collected in Central Asia under the Soviet Union, the World Glacier Monitoring Service (WGMS) reports that 90 percent of these observation series were discontinued by 1991, and only about a dozen series have reported information in the past two decades. The distribution of mass balance series in space and time shows a similar pattern: only 6 out of 35 series include more than 15 years of data. After the collapse of the Soviet Union and the related economic decline of the region, national hydrometeorological services were unable to ensure continued monitoring activity at many high-mountain stations in the upper reaches of rivers, and trained people were less readily available. Thus, the number of functioning stations decreased constantly until the mid 1990s, before some of the activities was re-activated through international efforts. Although actions are being taken to improve the state of the knowledge base in Central Asia, large amounts of data are currently disputed, controversial, or absent.

? *Lack of an effective mechanism for regional cooperation:* While mechanisms exist for regional dialogue on a variety of issues, including water resources, there is not a specific mechanism for addressing water issues in the runoff formation zone of the region.

? *Lack of coordination in monitoring:* The existing ?network? of regular monitoring in Central Asia is incomplete and not adequate for assessing changes in glaciation and other components of the cryosphere and their possible influence on regional water resources. Two key issues factor into this lack of coordination. First, researchers lack the funding and institutional mandate to cooperate at a regional level. Second, there is a lack of standardized monitoring protocols and practices, which makes aggregated estimates of deglaciation extremely challenging. As a result, there is no regional network in Central Asia that could apply standardized monitoring methods and compile a more accurate picture of water resources and potential climate impacts.

? *Lack of ability to adapt to the impacts of climate change on the cryosphere:* Climate-change adaptation measures are not applied consistently across the region, and there is low awareness in many

communities about available options. Both high-mountain communities and downstream urban areas will face increasing exposure to both flooding and droughts. Communities and policy-makers lack the and capacity to identify and address these threats, and they lack the tools and information to understand how these threats may affect women and men differently. Furthermore, this low level of resiliency at the community level leaves people more vulnerable not only to environmental threats, but also to external threats such as pandemics, and it reduces their ability to take measures to address these threats.

? *Lack of awareness:* Without external support to sustainably ensure domestic and regional capacity to address glacier melting, there is a high probability that realization of intersectoral management of water originating from high-mountain areas in Central Asia will not be harmonized between countries, and degradation of vulnerable resources will continue creating tensions over the quantity, quality and availability of water resources within the region. It is particularly important that decision-makers and the public understand the seriousness of threats to the cryosphere and how communities will have to adapt to the resulting impacts. This understanding will help to prioritize water resource management across the region.

1. 2. Baseline scenario or any associated baseline projects

The project baseline consists of a limited number of water-related projects and research activities carried out in the region with the support of multilateral and bilateral assistance, none the least by the work developed by both the Implementing and Executing Agencies. After the breakup of Soviet Union in 1991, countries of the region continued limited form of cooperation in managing water resources. On February 18, 1992 all five of the newly independent Central Asian states entered into an agreement to maintain and adhere to the existing pattern and principles of water resources allocation. It also created the Interstate Commission for Water Coordination (ICWC) to define seasonal allocations in line with annual agreements. The Syr Darya River Basin Organisation, created during the Soviet rule, would become a part of ICWC and be responsible for monitoring and control of water allocations. However, adherence to the allocations made in the Soviet era proved infeasible under the changed conditions. The countries also concluded another agreement on June 17, 1999 for enabling the continued synchronous operation of the power systems of these countries to facilitate imports and exports of power through 500 kV, 220 kV, and other lower-voltage networks. Agreements for cooperation in the areas of environment and natural resource management were also concluded at about the same time. These agreements were expected to complement each other and open up opportunities for closer cooperation. USAID identified several institutions in countries of the region that were involved in projects related to various aspects of the high-altitude glaciers water management, including the Executive Committee of the International Fund for saving the Aral Sea, the Central Asian Institute for Applied Geosciences - CAIAG, the environmental NGO ?BIOM,? the Institute of Geography and Ministry of Education and Science in Kazakhstan, and others.

The meeting of the Interstate Commission for Sustainable Development of Central Asia, which was held in Dushanbe on November 28, 2014, adopted Decision No. 5, supported by all of the countries participating in this project, in which countries agreed to request that donors and international organizations provide financial assistance to hold a regional seminar on to review climate change and adaptation in the mountainous areas of Central Asia in 2015 in partnership with UNESCO, the Central Asia Mountain Partnership, and other key organizations addressing mountain-related issues.

The United Nations Regional Center for Preventive Diplomacy in Central Asia (UNRCCA) was established in Ashgabat in 2007 to identify and address existing and potential threats and to strengthen cooperative security partnerships between the five governments of Central Asia, regional and international organizations. Environmental degradation and management of common resources, such as water and energy, are among its priority areas of operation. With the break-up of the Soviet Union, the utilization of trans-boundary water resources has become a source of diplomatic tension between countries due to differences in approach and, in some cases, opposing views on priorities for hydro-electric power and irrigation. As a result, the region has relied on short-term *ad hoc* arrangements, which have not prevented tensions from rising over time. The development of a mutually acceptable mechanism on the comprehensive use of water resources in Central Asia, which would duly reflect the interests of all the states of the region, remains a serious challenge. The Centre assists the Governments of the region in the development of a comprehensive mechanism for the management of trans-boundary water resources that takes into consideration the interests of all Central Asian states, supports the International Fund for Saving the Aral Sea (IFAS) and its subsidiary organs, analyzes the impact of the food-water-energy nexus on regional stability and propose appropriate actions, and raises awareness of possible impacts of global climate change on the Central Asian region, including the melting of the glaciers upon which the region depends for its water supply, and explore possible mitigating measures.

The UNDP Central Asian Multi-Country Programme on Climate Risk Management has worked to mitigate the potential impacts of natural disasters related to climate change. It also worked to ensure the integration of climate risk management in the development of key strategies and plans in the Central Asian countries. The programme is designed to reduce climate risks, enhance adaptive capacity and encourage the development of early warning measures, while it also creates a basis for attracting long-term investments aimed at increasing resilience to climate impacts in the region. The project was implemented at a national level, and at a regional level. The multi-country/regional component worked to strengthen human resource capacities in managing the risks of climate change, while disseminating at the global, multi-country and national levels the knowledge and lessons learned as a result of changes introduced into national development processes, in order to address the risks and opportunities associated with climate variability and climate change. It also worked to increase knowledge and awareness about the degradation of glaciers in Central Asia. At a national level, the programme worked to reduce climate-related disasters, initiate adaptation to climate change, and integrate climate risk management into the development policies and strategies of each country. While the need for climate change adaptation is receiving significant attention in the region, national and regional strategies and plans are to be consolidated. The project worked also towards an analysis on the status and needs of national and regional policies and strategies for sustainable management of glacier systems under climate change to support and inform the SAP development process under the proposed GEF project. The analysis also covered the necessity and potential for synergies between national and regional institutions working on glaciers in the region.

During the project preparation period, linkages were established with other international projects conducted in the region on glacier and climate change monitoring, including Capacity Building and Twinning for Climate Observing Systems (CATCOS), Central Asian Water (CAWA), Cryospheric Climate Services for improved ADaptation (CICADA) and Contribution to High Asia Runoff from Ice and Snow (CHARIS). The CICADA project will provide important information resources for this project. The University of Fribourg (UniFri), which manages the CICADA project, is also implementing a multi-year research project focusing on the Abramov Glacier (Pamir-Alay) that will establish a century-long accumulation time series of the glacier, design a model to understand the evolution of glacial snow and ice, and apply the model to reconcile geodetic and in-situ glacier mass balances. UniFri also manages the project "Adventure of science: Women and glaciers in Central Asia." This project organizes field trainings in cryospheric sciences, climate change and alpine

ecology. The target group is young women at the beginning of their scientific studies, because they are at a critical decision-making process in their education and career path. Cooperation between the project and UniFri is detailed in Annex 7 of the accompanying project document.

The project will also coordinate very closely with the Adaptation Fund (AF) project *Reducing Vulnerabilities of Populations in Central Asian Region from Glacier Lake Outburst Floods (GLOFs) in a Changing Climate*, which is also being implemented by the UNESCO Almaty Cluster Office. This five-year project, which is scheduled to start in early 2021, will involve high-mountain communities in Kazakhstan, Kyrgyzstan, Uzbekistan, and Tajikistan. The UNDP-GEF and UNESCO-AF projects are highly complementary. The UNESCO-AF project will be able to contribute specific knowledge and capacity-strengthening related to glacial lakes and GLOFs to this GEF project, while this GEF project will generate research findings, policies and measures, and high-level institutional capacity that will benefit the UNESCO-AF project. The AF project will provide in-kind co-financing for this project to support the following activities: 1) Provision of GLOF maps and mapping approaches to the mapping and DA activities, including the identification of hot spots; 2) Provision of inputs for monitoring protocols and activities for cryosphere monitoring related to the formation of GLOFs; 3) Support to training in demonstration project communities in the four high-mountain countries regarding DRR measures; 4) Support for south-south collaboration and capacity development for universities and research institutes in the areas of climate mapping and DRR in high-mountain regions; and 5) Dissemination of lessons learned and exchange of training and outreach materials developed under the projects.

In addition to these partnerships, synergies will be established with other projects that are presented in Section 6 of this document and with initiatives documented in Annex 4 of the accompanying UNDP project document.

1.3 The proposed alternative scenario with a brief description of expected outcomes and components of the project

The project **objective** is ?Strengthening the adaptation capacity of Central Asian countries to climate change impacts on the cryosphere through assessment, promotion of regional cooperation, and stakeholder engagement.? The project strategy consists of two main elements: 1) Understanding potential impacts related to the cryosphere; and 2) Addressing these impacts by providing stakeholders with the necessary information, policy tools, skills, and proven approaches to adaptation. The project fills a gap in present approach to assessment monitoring and management of resources in the region's cryospheric systems by launching a full-fledged initiative to strengthen management capacities and enhance multi-country cooperation to increase opportunities for sustainable development in a region that is highly susceptible to impacts of climate variability and change. The project also represents a globally relevant demonstration of the important role of high-altitude glaciers in coping with increased climate variability and change, balancing water uses, and improving overall sustainability and cooperation in complex transboundary contexts.

The project is considered ?freshwater foundational,? and it will contribute directly to Objective 3 of the new GEF-7 Strategy ?Enhance regional and national cooperation on shared freshwater surface and groundwater basins.?[5]⁵ Specifically, the project will support two areas: IW-3-5 Enhance water security in freshwater ecosystems through advance information exchange and early warning; and IW-3-6 Enhance water security in freshwater ecosystems through enhanced regional and national cooperation on shared freshwater surface and groundwater basins. It is also aligned with the UNDP Strategic Plan 2018-2021 Outcome 2: Accelerate structural transformations for sustainable development.

The project is comprised of the following nine outcomes:

- ? Science-based consensus among the countries on major problems of the cryosphere of the key CA glaciers
- ? Stakeholders have enhanced knowledge and understanding of changes in the cryosphere and expected implications of climate change for the region
- ? Countries have national action plans and a regional strategic action programme (SAP)
- ? National and regional institutions are in place to implement national action plans and the SAP
- ? Countries use a standard approach to monitor the cryosphere in Central Asia
- ? Countries have increased capacity to undertake monitoring
- ? Countries utilize innovative technologies and best practices for integrated resource management in the cryosphere with the objective of preserving mountain ecosystems
- ? Decision-makers and the public at the national, regional, and global level are increasingly aware of the economic and social costs of retreating high-altitude glaciers
- ? Project management and learning is informed by M&E

A Theory of Change for the project is provided in Annex 11 of the accompanying UNDP project document. It makes the following assumptions:

- ? At the output level, in-country partners will devote sufficient staff and in-kind resources, including data, to analytical efforts and capacity strengthening.
- ? In the approaches used, assessed interest in training and participation will remain the same or increase on the part of government partners and NGOs, resulting legislation and policy measures will be implemented/enforced, and support for adaptation efforts at the country level will continue to increase or remain constant.
- ? At the level of the project objective, governments will maintain a commitment to IWRM at the national and regional level
- ? At the level of UNDP and GEF results, project materials and champions will maintain strengthened capacity in the post-project period, improved management and adaptive capacity lead to broad environmental benefits, and strengthened cooperation leads to practical change and does not remain on paper.
- ? At the impact level, global, regional, and country-level environmental benefits will be closely inter-related, and benefits in natural resources management will have a strong, positive effect on economic and social aspects of human development.

The overall strategy of the project has been selected because it is highly consistent with current scientific consensus. The 2019 IPCC special report covering climate change in high-mountain areas states that "Integrated management approaches for water, in particular for energy, agriculture, ecosystems and drinking water supply, can be effective at dealing with impacts from changes in the

cryosphere.^[6] The project approach and activities have been informed by proven approaches for international waters projects in the GEF portfolio that have been developed over a number of years, such as diagnostic analysis, national action plans and regional strategic action programs (SAPs), and information exchange through designated portals such as IW:LEARN. It has also drawn on work done under UNESCO IHP on awareness-raising regarding glaciers as a source of freshwater, climate change impacts on the cryosphere, and structuring support for institutional capacity strengthening to monitor the cryosphere in developing countries. The project approach and activities have also been informed by the input of international experts on high-mountain cryospheric monitoring. These experts have provided inputs on international best practice on data collection, data analysis, the combined use of in situ and satellite measurement to establish changes in the cryosphere, and systematic approaches to monitoring. Finally, the project has been informed by Central Asian cryosphere experts, who have provided an analysis of current capacities, needs and gaps, and potential areas for cooperation. Annex 4 of the accompanying UNDP project document provides an overview of stakeholder inputs to the project.

The project strategy and activities are also consistent with the UNDP Integrated Response to COVID-19. Information gathered by the project as a part of the diagnostic analysis in Component 1 will contribute to the understanding of the social and economic impacts of the current crisis, and the action plans and demonstration projects supported by the project will use a Build Back Better (BBB) approach. The action plans to be developed under the project emphasize sustainable livelihoods and inclusion, and thus are highly aligned with green recovery efforts in the region.

The proposed project consists of six components: 1) Consolidating common knowledge in an integrated cryosphere information database in Central Asian countries; 2) Building the foundation for regional cooperation on the cryosphere in Central Asian Countries; 3) Strengthening the capacity in Central Asian countries to monitor the cryosphere; 4) Demonstrating technologies and best practices for integrated water resources management and adaptation to climate change in glacier snow-fed river basins; 5) Increasing awareness and involvement of key stakeholders; and 6) Monitoring and evaluation (M&E) and project learning.

Component 1: Consolidating common knowledge in an integrated cryosphere information database in CA countries

Joint fact finding and exchange of information between the participating countries (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan) in the project will facilitate the achievement of science-based consensus among the countries on key problems pertaining to high-altitude glaciers, snow, water and permafrost (Outcome 1.1). This component will focus on improving the knowledge base regarding the dynamics of the cryosphere in the region. It will also ascertain the current state of knowledge, including needs and gaps, on the expected impacts of climate change on cryosphere and the resulting impacts on water resource availability in both upstream and downstream countries, disaster risk, and high-mountain eco-systems, including how sectoral impacts may affect women and men differently (Outcome 1.2).

Outcome 1.1: Science-based consensus among the countries on major challenges from melting glacier snow and permafrost and consequent water availability in the upstream-downstream in CA region

Output 1.1.1: Diagnostic analysis (DA) of the current state of the cryosphere system and its impact on water availability in five countries in Central Asia identifying root and immediate causes of the challenges facing the changes in the cryosphere system

Under this output, the project will undertake a fully-fledged DA identifying root and immediate causes of the challenges facing the changes of the high mountain cryosphere in Central Asia and the associated upstream and downstream areas in Aral Sea and Balkhash basins. The DA will be based on a Situation Analysis and will integrate findings from projects previously implemented in the region. The main technical role of the DA is to identify, quantify, and set priorities for environmental and water resource problems that are common in nature for all the countries. The DA is a highly collaborative process. It will be prepared by national experts, scientists and practitioners with the support of international experts. All steps of the DA will be undertaken in consultation with the participating countries. The DA will also focus on climate change and variability, and if feasible, incorporate projections from modeling and the new insights generated by the enriched knowledge base developed under Outputs 2.2 and 2.3. The resulting DA will provide the technical basis for the development of the Strategic Action Programme (SAP) in Component 3.

This output will include the following activities:

- 1.1.1.1 Appoint national coordinators for the DA
- 1.1.1.2 Adopt GEF IW transboundary diagnostic analysis (TDA) methodology for the preparation of the DA for glaciers
- 1.1.1.3 Undertake a stocktaking exercise to assess data collection, historic data availability and quality, and monitoring protocols and methodologies
- 1.1.1.4 Identify needs and gaps in measurements and monitoring
- 1.1.1.5 Prepare regional vulnerability mapping based on cryosphere degradation scenario
- 1.1.1.6 Convene a technical expert group to review findings and identify priority problems that are common to all countries.
- 1.1.1.7 Conduct a consultation or consultations with national experts, scientists, and practitioners to validate the conclusions on priority problems
- 1.1.1.8 Produce a report summarizing the findings of the DA, including a summary for policy-makers and a roadmap with recommendations for addressing data gaps and methodological discrepancies

Outcome 1.2: Stakeholders have enhanced knowledge and understanding of changes in the cryosphere and expected implications of climate change for the region

Output 1.2.1 Standardized national databases on the status and changes of the cryosphere in CA established and updated regularly

It is essential at the beginning of the project to address the lack of information for decision-making. Prior to undertaking the activities under this output, the project will seek consensus on the structure of the database and information to be shared with relevant international databases on glacier and permafrost monitoring. In addition to climate databases, databases are needed on the state of the components of the mountain cryosphere (glaciers, snow, and permafrost). While glacier inventories have been produced by individual countries, such as the state-of-the-art glacier inventory for Kazakhstan produced by the Institute of Geography, and for the region as a whole during the Soviet era, there is a need for current, standardized information that can be updated on an ongoing basis to inform research and policy-making at the regional level. Existing glacier inventories should be

complemented with other essential cryospheric baseline data such as glacier mass balance, snow monitoring and runoff monitoring. Over the longer term, the database will benefit from data collected under the national and regional monitoring programs that will be established under Component 3.

Specifically, there is a need for “living” databases that can document the current status and changes in the cryosphere originating from the glaciers of Central Asia. These databases will integrate a detailed GIS-based inventory database of glaciers on the basis of current field and remote sensing data (using aerial photography and high-resolution satellite imagery)^[7] with data on previously-documented change and with *in situ* measurements going forward. Considering the importance of glaciers in runoff formation, the inventory should be systematized using a catchment approach; i.e., the approach previously used for the creation of Soviet Glacier Inventory. In addition to the inventory of glaciers, the database will include areas to exchange information generated from Outputs 2.2 and 2.3 (vulnerability and adaptive capacity and scenarios of climate change and the associated impacts on the cryosphere in the region).

National institutions in each country will be responsible for inventories on their territory. However, the same methodological approaches will apply in all countries. Particular attention will be given to mobilizing expertise from within the region for countries with more significant data gaps and to developing appropriate QA/QC procedures for data, particularly data from semi-automatic monitoring. Joint training will be organized under Output 4.5 to build capacity and develop uniform methods.

This output will include the following activities:

- 1.2.1.1 Building on the recommendations from the DA, determine a common inventory (database) architecture and format for cryospheric data to which the participating countries will contribute
- 1.2.1.2 Select national partners for the databases and identify the location(s) of the database servers
- 1.2.1.3 Compile existing glacier mass balance and snow mapping of the region
- 1.2.1.4 Determine and document institutional responsibilities for data transmission, QA/QC, storage, and archiving
- 1.2.1.5 Based on the DA completed under output 1.1., develop a strategy for data collection in areas where there are acute shortages of data
- 1.2.1.5 Populate the databases with inputs from participating countries supplemented by project-supported experts as needed

Output 1.2.2 Research synthesized on national monitoring of environmental and non-environmental vulnerability factors of the cryosphere to climate change, key determinants of vulnerability, and adaptive capacity

This output will collect information necessary to understand the relationships between the cryosphere, high-mountain ecosystems, and societies in a changing climate. This knowledge will be extremely important to determining subsequent national and regional steps to adapt to these changes.

The synthesis should be preceded by a thorough analysis of the content of scientific publications (international practice) on assessment methods, distribution patterns, and current dynamics of the aforementioned components of the cryosphere due to all causes. It will be necessary to take into account all the possible consequences of climatically and anthropogenically determined changes in the main components of the cryosphere of the runoff formation zone (glaciers, snow cover of the territory, underground ice, including permafrost, glacial lakes) and related natural hazards (snow avalanches, mudflows, snow flows, etc.) Findings from the DA from Output 1.1.1 will be taken into consideration.

Findings on ecosystems are also significant because they affect the conservation of biodiversity, and historical, cultural and natural heritage in high-altitude headwaters and downstream areas. Climate impacts on the cryosphere will have subsequent impacts on wildlife, such as a potential decrease in habitats and populations of animals, including endangered species. Changes in vegetation cover in high-mountain ecosystems, which is occurring with deglaciation, is another phenomenon with potential consequences.

? Research regarding community-related impacts and adaptation will also be important to consider, because life in high-mountain areas has always been correlated with risks, depending on the dynamics of the climate and natural phenomena, which are hard to predict (extreme temperatures, intense downpours in the summer with the risk of the formation of destructive floods and landslides, and heavy snowfall during cold periods, which brings the threat of catastrophic avalanches across the region, such as those that have occurred in recent years across Central Asia. Another important area for study will be to assess the potential change of the cryosphere-related hazards. Research will integrate international best practice from Alpine countries in assessing current trends in the dynamics of anthropogenic loads on mountain ecosystems, including recreational use, and their likely future consequences. In certain areas of the region, one of these consequences is the progressive pollution of the high-mountain areas due to the influx (from mountain valley circulation) of an increasingly toxic smog that has formed over foothill plains in population centers.

It will also be necessary to determine linkages between water availability and vulnerability in important sectors such as agriculture. Several factors influencing the productivity of food and industrial crops are climate sensitive: the state and degree of land degradation, effective temperatures, and the reliability of water supply systems. Data and research for individual countries will be particularly important here given country-specific factors influencing agricultural production.

In all areas where non-environmental vulnerability factors are assessed, the experts compiling the diagnostic analysis will consider the current and potential future impacts of the COVID-19 global pandemic on communities in the participating countries and differentiated effects by gender, age, and other characteristics.

This output will include the following activities:

1.2.2.1 Compile a background report on existing international literature regarding key drivers of vulnerability to climate change in the high mountain cryosphere and the current state of adaptive capacity

1.2.2.2 Map water vulnerability in the region

1.2.2.3 Commission country-level reports to compile research and project findings on vulnerability and adaptation to climate change in the water sector and related water-sensitive sectors, such as agriculture and infrastructure

1.2.2.4 Produce a synthesis report for the region, including a summary for policy-makers

Output 1.2.3 Scenarios of changes in the cryosphere in response to climate change in Central Asia developed

Scenarios are meant to integrate the DA and support the development of national plans and strategic action programme (SAP). Scenarios will be crucial to the development of a regional approach to integrated water resources management, because they will project the contribution of the cryosphere for future streamflow. They will therefore provide decision-makers with information needed to prioritize water resource management activities.

The scenarios will be developed by national and international experts, and they will consider the drivers of change identified in the synthesis report completed under Output 1.2.2. The identified scenario will help develop adaptation strategies, which will be discussed with policy makers and planners.

This output will include the following activities:

- 1.2.3.1 Convene a technical expert group to develop a range of scenarios.
- 1.2.3.2 Determine science-based assumptions and climate change scenarios to be used in the set of scenarios.
- 1.2.3.3 Develop a range of scenarios
- 1.2.3.4 Provide the scenarios to the regional database developed under Output 1.2.1

Output 1.2.4 Governance analysis conducted on the status and needs of national and regional strategies for addressing the impacts of changes in the cryosphere under climate change

A comprehensive governance analysis will inform the Strategic Action Programme (SAP) and corresponding national action plans that will be developed under Component 2. This analysis will identify and analyze existing policies, strategies, laws, and regulations (including orders and decrees) in several areas: 1) Cryosphere monitoring; 2) Integrated water resource management (IWRM) and efficient use of water resources; and 3) Governance in sectors that are water-sensitive or vulnerable to impacts on the cryosphere, such as agriculture, water supply and treatment, hydropower, urban infrastructure, DRR, and ecosystems. The analysis will incorporate initial findings from the PPG phase of the project, and it will include climate change-related legislation that is endorsed prior to its submission.

This output will include the following activities:

- 1.2.4.1 Conduct an analysis of existing national and regional governance in the monitoring of the cryosphere, IWRM, and water-sensitive/vulnerable sectors.
- 1.2.4.2 Conduct a gap analysis and develop specific recommendations to address gaps in the policy and regulatory framework.
- 1.2.4.3 Conduct a governance analysis workshop to review findings and finalize the analysis
- 1.2.4.4 Provide the results in a report for policy-makers and present the findings at a targeted briefing during a regional forum.

Output 1.2.5: Gender considerations in vulnerability, adaptive capacity and governance arrangements for addressing the impacts of changes in the cryosphere identified

Women are essential to water management projects, and in Central Asia they play an important role in water-sensitive economic sectors such as agriculture. However, there is a lack of research on gender differences in vulnerability and adaptive capacity to climate change in the region. This output will ensure that gender is mainstreamed into the analysis that is conducted throughout Component 1. It will also ensure that policy-makers and experts are aware of gender-differentiated impacts of climate change on the cryosphere and the ways that policies and measures in the water sector may affect women and men differently.

This output will include the following activities:

- 1.2.5.1 Establish a technical working group on gender and water
- 1.2.5.2 Hold consultations with national gender machineries^[8] during the preparation of the diagnostic analysis to obtain inputs
- 1.2.5.3 Provide analysis and specific recommendations related to gender in project reports and recommendations compiled under outputs 2.2 and 2.3.

- 1.2.5.4 Review NAPs and the SAP developed under Component 2 identify any gender-differentiated policy impacts
- 1.2.5.5 Develop a stand-alone report on gender issues related to climate change and the cryosphere.

Component 2: Building the foundation for regional cooperation on the cryosphere in Central Asian Countries

A visioning process and an agreement on priorities for action opens the way for systematic cooperation in relation to the cryosphere in Central Asian countries that will result in the preparation of national action plans and endorsement of a regional SAP (Outcome 2.1). This effort will strengthen regional collaborative mechanisms that will then contribute to the development of mechanisms for the implementation of the national action plans and SAP (Outcome 2.2).

Outcome 2.1: Countries have national action plans and a regional strategic action programme (SAP)

Output 2.1.1 National Action Plans (NAPs) for each of the participating countries prepared and adopted

National Action Plans are particularly important given the variation in the participating countries, which include countries with glacial headwaters and downstream countries. Action plans will be designed to complement the SAP under Output 2.1.2. NAPs for each country will present a vision statement and describe current challenges to cryosphere as applicable. They will then set short-term, mid-term and long-term targets for addressing these challenges and will prioritize targets and actions. Finally, the NAPs will propose a legal and institutional basis for implementation. The development of the NAPs will take into account other key policies under development and implementation, such as National Adaptation Plans and sectoral strategies, and they will consider and consult the private sector as one of several stakeholders.

This output will include the following activities:

- 2.1.1.1 Establish national teams for the development of the NAPs
- 2.1.1.2 Formulate a program of work and methodological approach using application of the Strategic Environmental and Social Assessment (SESA) approach
- 2.1.1.3 Identify priority areas for the NAP based on the DA and other synthesis reports and scenarios compiled under Component 1
- 2.1.1.4 Establish a list of target measures, and conduct a cost-benefit analysis of proposed measures
- 2.1.1.5 Prioritize target measures on the basis of stakeholder consultation, including climate change adaptation measures to address impacts on ecosystems and communities
- 2.1.1.6 Circulate the draft NAP for technical and public consultation
- 2.1.1.7 Finalize the draft NAP and submit to the appropriate national authorities in each country

Output 2.1.2. Strategic Action Program agreed between countries and signed on ministerial level or equivalent.

The purpose of output component is to develop and endorse a Strategic Action Programme (SAP) for cryosphere in Central Asia. The preparation of a SAP is a highly cooperative and collaborative process among all countries in a given region. It is a negotiated policy document that should be endorsed at the highest political level. It establishes clear priorities for action (for example, policy, legal, institutional reforms, or investments) to resolve the priority problems identified in the DA. The development of the implementation mechanisms for the SAP is a joint effort on the part of all participating countries. The strategic component of the SAP process has two key phases: strategic thinking (defining vision, goals,

opportunities and options); and strategic planning (defining strategy for implementation, action planning, and implementation). The SAP will be developed following the GEF IW:LEARN guidance on TDA/SAP that will benefit from more than 30 previous TDAs/SAPs undertaken globally, building on the experiences of UNDP-GEF projects in Eastern Europe and Central Asia. However, it will also adapt standard environmental quality objectives to the context of the cryosphere.

A key element of the SAP is a well-defined baseline; in this case, the project will draw upon the DA conducted under Output 1.1. The development of the SAP will follow the standard steps for GEF-supported SAPs: developing environmental quality objectives, determining the means of achieving these them, conducting cost/benefit assessments of alternatives, establishing management arrangements, M&E of SAP implementation, national action plans, etc. **The SAP will also consider and consult the private sector as one of several stakeholders.** The SAP will be approved at the highest level; e.g. Ministerial **or the equivalent.** The SAP will make a clear distinction between actions with purely national benefits and those addressing common concerns with global benefits. The SAP will also be screened for gender considerations as described in Output 2.5.

This output will include the following activities:

- 2.1.2.1 Convene a regional working group for SAP development, including relevant international organizations
- 2.1.2.2 Formulate a program of work and methodological approach using application of the Strategic Environmental and Social Assessment (SESA) approach
- 2.1.2.3 Develop and endorse an action plan for SAP development
- 2.1.2.4 Undertake consultations in support of SAP development, including the determination of relevant targets, a cost-benefit assessment of these targets, institutional arrangements, and an M&E plan
- 2.1.2.5 Draft the SAP and circulate for comments
- 2.1.2.6 Conduct a technical and public consultation of the SAP report
- 2.1.2.7 Finalize the SAP and present it at a regional ministerial meeting

Outcome 2.2: National and regional institutions are in place to implement national action plans and the SAP

Output 2.2.1 Partnership Conference conducted in alignment with SAP investment priorities.

The successful implementation of the SAP will be dependent on investments to enable its realization. The project will conduct a stocktaking of existing and planned investments by governments, donors, and non-governmental organizations in the regions. It will assess how these investments are currently funded and will propose possible ways of financing various elements of the SAP implementation. The project will also seek to identify areas where the SAP may reduce social and economic vulnerabilities that have been exacerbated by the COVID-19 global pandemic, and to ensure that programs to support economic relief and recovery leverage opportunities to support sustainable resource use and align with green recovery initiatives.

In order to promote financial sustainability of the project, the project team will continue analysis and outreach to donors on a regular basis following the partnership conference and will develop specific recommendations for post-project financing to be presented to governments and donors during the final year of the project.

This output will include the following activities:

- 2.2.1.1 Assess the incremental costs of regional environmental benefits under the SAP
- 2.2.1.2 Conduct outreach to donors in the region
- 2.2.1.3 Organize a partnership conference
- 2.2.1.4 Formalize financial commitments
- 2.2.1.5 Re-visit the funding strategy on an annual basis and provide recommendations on further action
- 2.2.1.6 Prepare recommendations for post-project financing of key SAP measures

Output 2.2.2 Functional national inter-ministerial committees established in each of the participating countries, or existing national mechanisms strengthened

Another key element of SAP implementation involves the development of institutional mechanisms at the regional and national levels to oversee activities and M&E procedures to measure effectiveness of the outcomes of the process. National Inter-Ministerial Committees comprised of representatives from relevant sectors (water, environment, energy, agriculture, spatial planning, treasury) will be tasked with coordinating action across key sectors with a stake in glacier basins.

This output will include the following activities:

2.2.2.1 Assist with the identification of the most appropriate inter-ministerial format for each country

2.2.2.2 Assist with convening the inter-ministerial body to agree upon a format and scope of work

2.2.2.3 Submit annual updates on country-level results that contribute to the SAP targets

2.2.2.4 Support the preparation and dissemination of a publicly-accessible report on country-level activities under the SAP

Output 2.2.3 National and Regional Glacier Centers established or strengthened

This output is designed to promote and facilitate the establishment and strengthening of National and Regional Glacier Centers. A regional glacier center was endorsed by the 36th UNESCO General Conference in 2011, and an agreement was signed between UNESCO and Kazakhstan in 2012. The main objective of the center is to foster cooperation and improve scientific understanding of present and forecasted changes in glacier, snow and water resources in the region. The center is promoting regional research, education and capacity development to assess climate change impact on glaciers and permafrost in the runoff formation zone. UNESCO, working with scientists across the world, can help lay the foundation for the sustainable management of water resources threatened by climate change. Within the framework of the project, UNESCO will facilitate strengthening national capacity of glacier monitoring systems in participating countries. The Water Sciences Division within the framework of Intergovernmental Hydrological Programme (IHP) plays a key role as a platform for scientific networking and cooperation in the areas of assessing and monitoring changes in snow, glaciers and water resources. The Centre should be fully operational and sustained by the time the project is completed.

This output will include the following activities:

2.2.3.1 Identify and develop national training programs for strengthening the national monitoring programs for the cryosphere

2.2.3.2 Ensure regular coordination of the monitoring efforts between the countries by developing a regional training program

Output 2.2.4 National and regional stakeholder forums established and supported

The aim of the stakeholder forums is to provide a space for major interest groups, civil society and other stakeholders to receive briefings on issues related to the cryosphere and to secure broader stakeholder participation in and buy-in to the NAPs and the SAP. The role of the national forums

would be to inform decision-makers on a wide range of positions taken on the NAPs and the SAP. The regional forum will be known as the Central Asia Working Group on the Cryosphere, and it will serve as a community of practice for glacier specialists. The practical operation of the Forum will take a number of forms, ranging from conferences, workshops, internet-based tools, etc. The project website will support communication among members of the stakeholder forum, and it will build on experience with on-line stakeholder consultations developed during the preparatory phase of the project in order to ensure maximum participation of a broad range of stakeholders, providing technical and telecommunications support where necessary.

The stakeholder mechanism will involve representatives from governmental institutions, NGOs/CSOs, the private sector, academia, and relevant water sector organizations. The project will draw on best practice from the experiences of other GEF International Waters projects in the region.

This output will include the following activities:

- 2.2.4.1 Establish national stakeholder forums and a regional working group, the Central Asia Working Group on the Cryosphere, based on regional best practice
- 2.2.4.2 Hold an initial meeting for each of the forums and endorse terms of reference for their work
- 2.2.4.3 Convene the forums as needed to review and comment on key documents, such as the draft NAPs and the SAP

Component 3: Strengthening the capacity in Central Asian countries to monitor the cryosphere

This component will result in a coherent and coordinated monitoring program positioned in all countries in the region. Activities under this component will result in building consensus on a monitoring program for cryosphere (Outcome 3.1) and improving the capacity of the applicable countries to conduct advanced monitoring (Outcome 3.2). Pilot monitoring activities will be developed based on state-of-the-art cryosphere monitoring approaches and techniques that have been developed successfully in Alpine regions. Methodologies will be developed in cooperation with Swiss monitoring initiatives, such as Glacier Monitoring of Switzerland (GLAMOS) and Permafrost Monitoring of Switzerland (PERMOS), which are linked to international monitoring within the framework of the Global Terrestrial Network for Glaciers (GTN-G), which is coordinated by the World Glacier Monitoring Service (WGMS) and the Global Terrestrial Network for Permafrost (GTN-P). GLAMOS is one of the world's oldest glacier measurement networks, and it is an important contributor to the Global Climate Observing System (GCOS) of the World Meteorological Organization (WMO).

Outcome 3.1: Countries use a standard approach to monitor the cryosphere in Central Asia

Output 3.1.1 Regional agreement on a monitoring program for the cryosphere with common, harmonized protocols adopted by relevant countries

Key elements of the monitoring program are organized into long-term measurements with different temporal and spatial resolutions and individual single measurement campaigns to collect important information about glaciers and permafrost. These include the following variables to be measured:

Long-term monitoring: Glaciers:

- ? Mass balance change (seasonal to annual)
- ? Snowline (seasonal)

- ? Length change (annual)
- ? Volume and area change (annual to decadal)
- ? Glacier inventories (quinquennial to decadal)
- ? Ice flow velocities (annual to pluriannual)
- ? Englacial temperatures (annual to pluriannual)
- ? Meteorological data (hourly to daily)
- ? Runoff (daily)

Individual measurements: Glaciers:

- ? Ground penetrating radar measurements to determine the thickness of the glacier and the corresponding total volume
- ? Ground penetrating radar measurements to determine spatial accumulation rates and distribution

Long-term monitoring: Permafrost:

- ? Near surface ground temperature measurement below different surface types (hourly to daily)
- ? Temperature monitoring in boreholes including active layer depth (hourly to daily to annually, depending on measured depth)
- ? Near surface geophysical measurements to determine the change of ground ice content (annual)
- ? Velocities of rock glaciers (annual to pluriannual)
- ? Meteorological data (hourly to daily)
- ? Runoff (daily)

Individual measurements: Permafrost:

- ? Different geophysical measurements (e.g. GPR, ERT, RST) to characterize the different surface and subsurface characteristics

Methods to be used will always be a combination of in situ measurements, remote sensing data and numerical models to achieve highest accuracy and with largest reduction in uncertainties. In addition, climate model output is necessary to drive the cryospheric model to establish sound scenarios for future glacier and permafrost developments.

This output will include the following activities:

- 3.1.1.1 Convene a working group with members from Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan, as well as international experts, to determine standardized monitoring protocols and methodologies
- 3.1.1.2 Draft a program for monitoring at the national and regional level, including the determination of roles and responsibilities
- 3.1.1.3 Present the finalized regional agreement on a standardized monitoring protocol to the appropriate officials for endorsement by all participating countries.

Output 3.1.2 National cryosphere monitoring programs in participating countries established and supported

The activities under this output will operationalize the agreement that is adopted under Output 3.1.1. Data that is generated under the monitoring agreement will be transmitted to relevant international databases such as GTN-G and GTN-P so that it can be analyzed and used both for planning at the regional level and improved understanding of the cryosphere at the international level.

This output will include the following activities:

3.1.2.1 Coordinate annual workplans for national monitoring in countries

3.1.2.2 Undertake monitoring activities as specified

3.1.2.3 Transmit monitoring results to relevant international databases

Outcome 3.2: Countries have increased capacity to undertake monitoring and apply skills in integrated water resources management (IWRM) and resilience to cope with cryosphere hazards

Output 3.2.1 Regional network of national institutions competent in the assessment of climate change impacts on the cryosphere established

Partner institutions under this output will focus on monitoring, assessment and forecasting of climate change impacts on the cryosphere. In-country staff will be trained to monitor, model, and forecast changes and to mitigate related hazards. The project will upgrade the current infrastructure in the participating countries and build on infrastructure financed by bilateral and multilateral donors active in the region.

Glacier Monitoring: A new glacier network was (re-)established on the following glaciers in Central Asia: Golubin, Batysh Sook, and Glacier No. 354 in 2010, Abramov in 2011 of Kyrgyzstan, Barkrak Middle in Uzbekistan in 2016, Zulamart in 2018 and 2019 on Yakarcha of Tajikistan. In addition, Tuyuksu glacier in Kazakhstan and Urumqi glacier in China were continuously measured without any data gaps.

Permafrost monitoring: In last century several permafrost boreholes existed in the Inner Tien Shan and in the Northern Tien Shan. After the break-up of the Soviet Union only a limited number of permafrost boreholes were observed in the Northern Kazakh part of the Tien Shan, whereas the measurements in Kyrgyzstan were stopped and the boreholes are not accessible anymore. Marchenko et al. (2007) reported that since the second part of the nineteenth century, permafrost in the Tien Shan mountains has experienced a continuous warming until the present.

This output will include the following activities:

3.2.1.1 Develop criteria for suitable institutions for the network and criteria for allocating support

3.2.1.2 Select new (where necessary) or deepen existing relations with institutions and establish and/or improve the network

3.2.1.3 Connect the network via the project website

3.2.1.4 Provide project-related information to the network

3.2.1.5 Develop synergies and training program in coordination with partners implementing monitoring systems in the selected network

Output 3.2.2: South-South knowledge exchanges and scientific cooperation among high-altitude glacier basins introduced

This output will leverage the existing relationships that UNESCO has with glacier regions in other parts of the world. UNESCO is the scientific arm of the United Nations and the Water Sciences Division within the framework of the Intergovernmental Hydrological Programme (IHP) is the main

vehicle for work in water sciences at an intergovernmental level. IHP VIII, IHP's medium term strategy, aims to assist UNESCO's Member States in achieving water security by mobilizing international cooperation to improve knowledge and innovation, strengthening the science-policy interface, and facilitating education and capacity development in order to enhance water resource management and governance. The project will utilize a knowledge-sharing platform incorporate feedback best practices, including those in the Andean, Alps and Himalayan regions. UNESCO will facilitate South-South cooperation, North-South cooperation, and triangular cooperation on the exchange of knowledge and resources between governments, organizations and scientists in the context of project activities. There are a number of areas where Central Asian scientists can cooperate with other research programs on the cryosphere, particularly in the area of modeling techniques and regional scale modeling. Collaboration with similar programs and projects will be sought in neighboring countries and other Asian regions as well as in Latin America and Europe. The project will seek to establish twinning programs, and the venues and the scope of the twinning will be decided during the project inception phase. Twinning activities will adhere to UNDP guidance on travel and precautions related to the COVID-19 global pandemic, and the project will develop virtual or on-line activities to support these exchanges where possible.

This output will include the following activities:

- 3.2.2.1 Identify target institutions for scientific cooperation
- 3.2.2.2 Participate in exchange programs
- 3.2.2.3 Disseminate and exchange best practices

Output 3.2.3: Experts in participating countries trained to monitor the cryosphere and climate impacts

The implementation of NAPs in each country will require capacity strengthening in the form of training. The project will develop customized national training programs that will enhance regional monitoring. Training topics will be designed to support targets in the NAPs and other agreements on harmonized monitoring of the cryosphere. Topics could include runoff forecasting and management, cryosphere monitoring, including approaches to *in situ* measurement and the use of remote sensing data, and environmental monitoring system design and management.

The project will take several steps to reduce the risk of capacity loss due to staff turnover. It will repeat training at periodic intervals for key topics, and it will designate training participants who will be able to assume the eventual role of trainers.

- 3.2.3.1 Conduct training needs assessments in each country
- 3.2.3.2 Develop national training plans as part of a regional plan
- 3.2.3.3 Develop training modules in relevant languages
- 3.2.3.4 Conduct training at the appropriate level (local, national, regional)
- 3.2.3.5 Revisit the training plan on an annual basis and revise work plans based on feedback and needs
- 3.2.3.6 Document trainings and make modules available on the project website and IW:Learn as relevant

Component 4: Demonstrating technologies and best practices for IWRM and adaptation to climate change in glacier snow-fed river basins

Cooperation on the assessment of the cryosphere in Central Asian countries will be strengthened by piloting new technologies and sound approaches fitting local ecosystems for the region. All of the countries will benefit from any experience gained with adaptation measures that address the impacts of climate change on the cryosphere.

Outcome 4.1: Countries utilize innovative technologies and best practices for integrated resource management in the cryosphere

Output 4.1.1 Replicable adaptation projects in each of the CA countries implemented

During the PPG phase, the project team developed a potential long list of demonstration projects that could demonstrate effective community responses to changes in the cryosphere, including risk reduction projects and actions to improve water security. A literature review, stakeholder consultations, and expert review resulted in a long list of approximately 20 projects each in the participating countries with glaciers and 15 projects in Turkmenistan addressing downstream communities. Projects identified covered a variety of sectors: agriculture, land management, livelihoods, forest management, energy, water, biodiversity, finance, health, and transport. A short list of projects was then developed based on strong linkages to changes in the cryosphere. These in turn were screened for the availability of co-financing. Information summaries for the shortlisted projects, including provisional financing arrangements, are provided in Annex 12 of the accompanying UNDP project document.

Five of these projects will be selected for piloting. Final selection criteria will be developed by UNESCO in coordination with UNDP as the GEF Implementing Agency and will take into account country circumstances, innovation, scientific evidence, scalability, GEF-7 strategy, co-financing, and contribution to the project objective. In addition, proposed projects must address and/or accommodate risks and impacts of the COVID-19 global pandemic, particularly in areas related to livelihoods. Finally, project selection and project siting will take district-level and basin-level initiatives into account to avoid duplication and provide synergies where possible. The Project Board will select the five finalists.

The 'Social and Environmental Risks' sub-section of the UNDP project document provides additional information on risk mitigation related to the demonstration projects, including 1) Relevant legislation that may apply to demonstration project activities; 2) A list of exclusionary criteria for items activities that shall not be undertaken as part of any demonstration project; and 3) A description of the approach to environmental and social risk management, including specific steps to manage project risk, the responsible parties, and the corresponding timeframe (see Table 4 of the accompanying project document).

This output will include the following activities:

- 4.1.1.1 Re-affirm the selection criteria
- 4.1.1.2 Carry out selection process, including the preparation of the UNDP social and environmental screening procedure (SESP) of each proposed demonstration sites, and prepare any required SES assessments and management plans prior to the initiation of any on-site activities
- 4.1.1.3 Select contractors and community liaisons for the pilot communities
- 4.1.1.4 Implement the demonstration projects as proposed
- 4.1.1.5 Monitor demonstrations and identify practices that can be scaled up
- 4.1.1.6 Capture lessons learned from the demonstrations for dissemination by the project to other participating countries and other high-mountain and downstream communities affected by the changing cryosphere

Output 4.1.2 Stakeholders engaged in training programs at the local level

This output will support scaling up the demonstration projects that are successful through capacity-building activities in partnership with stakeholders at the local level. One of the training programs will be developed based on the 2019 updated edition of the UNESCO Toolkit on Sex-disaggregated Water Data[9]⁹ to develop gender-responsive indicators.

This output will include the following activities:

- 4.1.2.1 Identify national training partners
- 4.1.2.2 Conduct training needs assessments in each country
- 4.1.2.3 Develop national training plans as part of a regional plan
- 4.1.2.4 Develop training modules in relevant languages
- 4.1.2.5 Conduct training at the appropriate level (local, national)
- 4.1.2.6 Document trainings and make modules available on the project website and regional and global climate change adaptation web portals

Component 5: Increasing awareness and involvement of key stakeholders

This component aims at building support for project implementation with a view of increasing its chances for success and sustainability. It will raise awareness among decision-makers and the public at the national, regional, and global level (Outcome 5.1) and ensure that stakeholders are actively involved in project implementation (Outcome 5.2).

Outcome 5.1: Decision-makers and the public at the national, regional, and global level are increasingly aware of the economic and social costs of retreating high-altitude glaciers and the changing cryosphere more generally

Output 5.1.1 Project experiences and lessons disseminated regionally and globally

The entire project will be communication-oriented. Based on an Information, Communication and Outreach Strategy, a range of related activities will be implemented to foster (a) understanding of the issues involved by the general public and the stakeholders, including water users and the private sector, thus enabling their contribution in the development and implementation of solutions; and (b) enhancement of awareness at the political level and among decision-makers, thus creating an enabling environment for action to be taken. The project will also facilitate selective media events to involve and inform key legislative national stakeholders on project deliverables and envisioned benefits.

The project will also undertake an innovative activity in the form of a visualization of a selected Central Asian glacier, such as Tuyuksu, Golubin or Abramov in a so-called virtual reality (VR) environment. This tool will make climate change tangible and produce an emotional involvement. A VR-Experience will simulate the mountain environment to let the target audience: decision makers, school and university students and general public experience scenarios of a future world at and beyond the 2°C air temperature target defined at the COP21 in Paris. The VR experience and the possibility of interaction will demonstrate that every individual can contribute by changing personal behavior. This is a basic tool which allows stakeholders developing strategies for a future low carbon emission world with the necessary societal transformations. The main objective of the 2°C-VR component is to let the

target audience interactively experience the impacts of climate change in VR. This new medium allows users to view past, current and future alpine environments and to experience expected changes. VR technology will allow the project team to integrate different forms of scientific knowledge and communicate very complex processes in a way that is easily understandable. The impacts of different climate change scenarios will enable an emotional, individual and unique experience. The project will be able to utilize the expertise available in this field, as the Department of Geosciences at University of Fribourg has just recently introduced such a tool in Switzerland.[\[10\]](#)¹⁰

Results will be disseminated to targeted audiences through relevant information-sharing forums and networks, including a project website. The project will contribute to scientific, policy-based and/or any other networks as appropriate (e.g. by providing content, and/or enabling participation of stakeholders/beneficiaries), particularly IW:LEARN.

Participation in IW:LEARN activities will be systematic in terms of sharing lessons learned in the form of GEF IW Experience Notes, organization of webinars, attendance at webinars, and participation in international events. A project website that complies to IW:LEARN standards will be established.

Apart from being used as an information provision hub, the website will be an instrument supporting the implementation of the project activities. It will support and incorporate several functions, including a workspace for the project team, links to the regional information database, and other features as needed. In accordance with all GEF International Waters Projects, 1% of the GEF grant will go towards IW:LEARN activities (including production of project experience notes, participation in IW:LEARN Biannual Global Waters conferences, participation in regional workshops, face-to-face project exchanges, and other IW:LEARN activities).

This output will include the following activities:

5.1.1.1 Develop an Information, Communication, and Outreach Strategy for the project

5.1.1.2 Establish a project website and develop and maintain content for the website that is relevant to its users

5.1.1.3 Develop a VR visualization of at least one glacier in the project region

5.1.1.4 Disseminate project findings through Internet-based platforms and websites, including sharing experiences through IW:LEARN and other relevant regional and global portals

5.1.1.5 Develop GEF IW experience notes, with best practices from the project

5.1.1.6 Ensure representation of the project at selected regional and global events, such as GEF IW conferences

5.1.1.7 Organize events at the country level to present policy-maker summaries directly to decision-makers in targeted briefings

5.1.1.8 Organize events to disseminate project knowledge off-line to beneficiary communities, taking steps to ensure equitable participation by women

Output 5.1.2 Key stakeholders and the public involved in a gender-responsive way

Activities under this output will develop a stakeholder involvement and public participation strategy, including a strategy for women's equitable participation in all project areas. Activities will target project stakeholders and beneficiaries. These may include water sector practitioners, national and regional civil servants, academia, civil society, the private sector, communities, gender machineries, and other groups. The project will also develop and disseminate knowledge products that are engaging and informative for community stakeholders, such as peer-to-peer videos, and it will provide assistance in the form of local consultants in order to assist communities in interpreting and using the project's data and findings. In order to ensure the safety of stakeholders, the project will support remote and on-

line involvement when indicated, and it will take steps to ensure that stakeholder participation in remote activities is fully supported, particularly for groups that face barriers to access.

Specific activities will be implemented to engage a wide range of stakeholders in the project implementation in order to facilitate: (a) building of ownership by the stakeholders; (b) long-term sustainability of project outcomes; and (c) better-informed implementation (with knowledge at the national and local levels) of the project activities.

This output will include the following activities:

5.1.2.1 Develop a stakeholder involvement and public participation strategy

5.1.2.2 Monitor participation in the project, including gender-disaggregated statistics on participation in project forums, working groups, trainings, and other events.

Component 6: Monitoring and evaluation (M&E) and Project Learning

Component 6 is designed to ensure that project results are monitored and evaluated according to GEF, UNDP, and UNESCO requirements and that lessons learned from the project will be communicated to all stakeholders in order to inform the design and implementation of other projects.

Outcome 6.1: Project management and approaches to country reporting are informed by M&E

Output 6.1.1 Project monitored to inform adaptive management for successfully delivery of project results.

The project results, corresponding indicators and mid-term and end-of-project targets in the project results framework will be monitored annually and evaluated periodically during project implementation. Mandatory GEF-specific M&E requirements will be undertaken in accordance with the [GEF Monitoring Policy](#) and the [GEF Evaluation Policy](#) and other [relevant GEF policies](#).^[11]

Deliverables will consist of an inception workshop and report, an annual review of project indicators, annual Project Steering Committee meetings, and annual Project Implementation Reviews (PIRs).

Output 6.1.2. Knowledge and lessons learned generated

The project team will ensure extraction of lessons learned and good practices to enable adaptive management and upscaling or replication at local and global scales. Activities will also provide project knowledge and lessons learned to the project team so that it can be disseminated under Output 5.1.1.

Deliverables will consist of a Mid-Term Review, a Terminal Evaluation, a final report, and lessons learned notes as appropriate throughout project implementation.

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

This project is aligned with key national strategies and plans and also with country commitments to multilateral environmental agreements. The table below provides an overview of the relevant strategies by country. Several countries lack a national strategy on climate change adaptation, although adaptation strategies may be under development or have been developed but not endorsed.

Country	National Strategies	Project Alignment with Strategies
Kazakhstan	<ul style="list-style-type: none"> *Kazakhstan 2050 *The Strategic Development Plan of the Republic of Kazakhstan until 2025 (2017) *The state program for water resources management in Kazakhstan 2014-2020 *Concept of Kazakhstan on Transition to Green Economy 	Kazakhstan 2050 increases funding for science to 3% of GDP. The project will provide information necessary to the state program for water resources management, which should include agricultural development. The green economy concept emphasizes a shift to clean energy and the creation of green jobs.
Kyrgyzstan	<ul style="list-style-type: none"> *National Development Strategy of the Kyrgyz Republic for 2018-2040 *Water Code of the Kyrgyz Republic (2004) *The Law of Kyrgyz Republic on Interstate Use of Water Bodies, Water Resources, and Water Structures of Kyrgyzstan 	The national development strategy supports the rational use of natural resources for socio-economic development and the preservation of the country's unique ecosystems.
Tajikistan	<ul style="list-style-type: none"> *National Development Strategy (NDS) of the Republic of Tajikistan 2030. *Action Plan of the Republic of Tajikistan for Climate *National Strategy of Adaptation to Climate Change of the Republic of Tajikistan for the period till 2030 (No. 482, Oct. 2, 2019) *The National Environmental Action Plan of the Republic of Tajikistan (NEAP, adopted in 2006) *The Water Code of the Republic of Tajikistan *Decree of the Government of the Republic of Tajikistan dated December 30, 2015, No. 791 on the Tajikistan Water Sector Reform Program for the period 2016-2025 and accompanying Action Plan. *National Action Plan of the Republic of Tajikistan on Climate Change (2003) *National Disaster Risk Management Strategy (2018), *State Program for Monitoring and Preservation of Glaciers until 2030 	<p>The NDS supports the expansion of international cooperation and provision of support to strengthen national capacities in the field of water supply and sanitation (including rainwater harvesting, desalination of water, increasing water use efficiency, wastewater treatment and the use of water recycling and reuse technologies). It also supports the creation of a code of nature protection, including mechanisms of adaptation to climate change, with the expansion of international cooperation in this area; and the development of a system of mainstreaming climate change and disaster risk reduction (DRR) issues into regional strategies.</p> <p>The Action Plan uses a basin zone approach and creates a Syr Darya Basin Zone</p> <p>The National Strategy of Adaptation specifically mentions glacier melting and retreat as an area of concern for the country.</p>

Turkmenistan	<p>*The program of the President of Turkmenistan on the socio-economic development of the country for 2019-2025</p> <p>*The National Strategy on Climate Change 2030 of Turkmenistan</p> <p>*Water Code of Turkmenistan (2016)</p> <p>*Law of Turkmenistan "On Hydrometeorological Activities" (1999, 2009)</p>	<p>These documents contain language supporting the development of the rural and water sectors and the rational and efficient use of land and water resources.</p> <p>The national strategy is the basis of policy on climate change and its effects. Primary objectives for water sector adaptation to climate change include improving water management, water storage and advanced irrigation, incentives for rational water consumption, and strengthening international cooperation on conservation and use of transboundary waters.</p>
Uzbekistan	<p>*National Development Strategy 2017-2021</p> <p>*The Concept on Efficient Use of Land and Water Resources in Agriculture for the period 2020-2030</p> <p>*On a Program of Measures for Long-Term Development of Hydropower for 2017-2021</p> <p>*The State Program for the Development of Irrigation and Improvement of the Meliorative State of Arable Lands for the Period 2018-2019</p> <p>Presidential Decrees:</p> <p>*On measures to organize the activities of the Ministry of Water Resources of the Republic of Uzbekistan 04.17.2018, No. PP-3672</p> <p>*On measures to improve the efficiency of water resource use 07/02/2018 No. PP-3823</p> <p>*On measures for the efficient use of land and water resources in agriculture June 17, 2019 No. UP-5742</p>	<p>The National Development Strategy includes a focus on modernization of the agriculture sector.</p> <p>Steps to improve irrigation will support adaptation to climate change and may also improve the efficiency with which water resources are used.</p>

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

The incremental reasoning that informs this project is simple. The proposed project will in fact expand the scope of *ad hoc* baseline activities to assist the countries in advancing to concrete achievements in the form of cooperative frameworks and institutional mechanisms, commitments to and implementation of priority actions, specific targets/indicators and strategic choices, and the adoption of common harmonized monitoring protocols. The project will not only increase understanding of the glacier systems of Central Asia, but will also increase the level of cooperation between the countries of the region. It will also improve the potential benefits of actions aimed at managing the glacier systems as well as strengthen the impact of associated strategic actions. In the absence of this project, the cryosphere in Central Asian countries will continue to be a source of uncertainty, which will be exacerbated by uncoordinated and uneven development in water-dependent sectors at the national and

regional level. The degradation and retreat of the cryosphere will continue to worsen, placing a political and environmental strain on the countries in the region.

1.6 Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF);

The global benefits that the project aims to produce fall into the following categories: 1) Enhanced understanding of hydrology in the high-mountain cryosphere; 2) Development of scientific decision-making processes on cryo-hydrology impacted by climate change in Central Asia; 3) Acquisition of knowledge regarding inherent resiliencies of human-natural systems Central Asian high-mountain regions; 4) Enhanced cooperation in the management of transboundary water resources in regions with a high-mountain cryosphere and their associated basins; 5) More sustainable use of glacier basin ecosystem services, particularly in view of climate variability and change. In this way, the project will enhance water security in freshwater ecosystems through advance information exchange and early warning, and through enhanced regional and national cooperation on shared freshwater surface and groundwater basins.

The project estimates that 1,500 people will benefit directly from project activities. Of that number, at least 50 people per country and of those at least 25 women per country will benefit from capacity strengthening and training activities on research, analysis, and cryosphere monitoring provided by the project. In addition, at least 250 people in each country and of those at least 125 women) will benefit from training, skills development, and awareness-raising activities carried out under the demonstration projects that are implemented in Component 4 of the project. Finally, millions of people will benefit indirectly from the institutional mechanisms, policies, and projects that are put into place to improve water resource management in Central Asia.

1.7: Innovativeness, sustainability and potential for scaling up.

Innovativeness: The project fills a gap in context that coherent and long-term initiatives for collaborative management of glaciers? and adaptation to impacts of climate variability and change are missing in this region of Central Asian glacier system. For the sake of comparison, other similar cryospheric regions in the vicinity have had a much larger share of international and national projects dealing with the issue of glacier melt.

As with other glaciers worldwide, the glaciers of Central Asia are experiencing a rapid decline in mass. Changes in glaciers in Central Asia will have significant effects on large populations. The cryosphere, areas where water is in solid form, such as glaciers, snow cover, and frozen ground, is widely acknowledged to be an important water storage component in Central Asia contributing substantially to river runoff in each of the participating countries.

The two main river systems in Central Asia, which are the Syr darya/Amu darya draining into the Aral Sea, and the Ili river draining into Lake Balkhash, heavily depend on the seasonal melting of snow and glaciers, with little additional precipitation input in the lower reaches of the rivers. These river systems sustain the lives and livelihoods of the people and the economic development in the countries of the region. Currently the lack of (and access to) data is an impediment for research, modelling and adequate management of water resources in Central Asian countries. The differences in design, quality and efficiency between glacier monitoring networks are equally a challenge in the region. Monitoring these glaciers is therefore crucial not only to understand climate change and its impact on flow regimes in these important water life-lines, but to also guard the well-being of those who live downstream of these glaciers and depend for their livelihood on their waters. Monitoring of glacial zones in Central Asian countries will provide feedbacks based on the new methodology and tools for observing influence of changing climate on mass balance of glaciers. This will allow to conduct an informed quantification of properties and extension of glacier system (dry and wet snow, superimposed ice and bare ice), which is also essential for evaluating amount of water resources available from the glacier system.

Snow and glacier monitoring is crucial for anticipating and adapting to changes in glacier fed streamflow system and water availability and allocation in the Central Asia. The main focus of any adaptation strategy must be to reduce the vulnerability and increase the resilience of the affected population. Such strategies can be applied in different sectors to strengthen actors involved in climate change adaptation in Central Asia.

The institutional standing of authorities involved in glacier research will be strengthened and capacity building in the region needs will be enhanced. Similarly, existing research networks will be supported to allow for synergistic activities and interdisciplinary research. Regional and international cooperation will be aligned with the national and regional needs. The project will provide a platform where the national-level glacial and permafrost systems for each of the mountain countries will share their knowledge and experience with the downstream regions to formulate national and regional adaptation strategies in all five participating Central Asian countries. Furthermore, scientific results will be made accessible and translated into language that is understandable by non-scientists, for example through better visualizations and understanding of glacier systems. This is fundamentally important to improve communication between glaciologists, policy- and decision-makers, water managers and affected segments of the local population.

The project will introduce and improve the innovative technologies and state-of-the-art techniques in monitoring glaciers and protecting high-mountain ecosystems in other regions (Switzerland, Austria, and others). The project will showcase glacial management strategy in ground which will be developed based on a state-of-the-art cryosphere monitoring system, successfully developed in other alpine regions. The application of a best-practice approach to cryosphere monitoring will be developed

particularly in cooperation with Swiss Glacier Monitoring project such as GLAMOS and Permafrost Monitoring of Switzerland (PERMOS) which are related to international monitoring within the framework of the Global Terrestrial Network for Glaciers (GTN-G) coordinated by the World Glacier Monitoring Service (WGMS), and Global Terrestrial Network for Permafrost (GTN-P).

Sustainability: The sustainability of the project results will be brought about through strengthening the Regional Glaciers centre and with the agreement between the countries on the long-term strategic actions (SAP and NAPs) that they will be implementing to protect the cryosphere. Accompanying national programs of actions, including long term monitoring programmes will be carried out. Strong capacity building and participation of local stakeholders in project activities will also contribute to sustainability. In addition to strengthen the capacity of relevant National and Regional Glaciological Centres, the project will support developing strategies towards securing funding from relevant national and international budget and donors towards a long term financial and operational sustainability of the centres. To sustain long-term operation of the envisioned environmental monitoring system of Component 3, the project will support establishing links to national funding budgets in order to secure sustainability of the planned regional network of laboratories.

A consolidated national and regional catalogue on the status of and changes in the cryosphere will be developed and embedded within a suitable institute such as the Central Asian Regional Glaciological Centre under the auspices of UNESCO and in the national designed glaciological centres. This will help secure sustainability of long term data series monitoring and collection. Basin-wide cooperation focusing on long-term glacier mass balance measurements and national glacial and permafrost systems for Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan will form the basis of efforts to calibrate and validate models to identify future water resources and adaptation strategies for the five participating countries.

Scaling Up: The focus on capacity building will generate a pool of technical expertise that can be utilised for scaling up and replication in other parts of the high-mountain cryosphere in participating countries, and regionally and internationally. Methodologies and practical approaches that are implemented under the project will be particularly useful, as will the training materials that are developed and updated for use with project stakeholders. Two project elements have particular potential for scaling up: 1) The cryosphere monitoring supported under Component 3; and 2) The projects to support adaptation to changes in water quantity and quality under Component 4. It is also important to note that research findings related to the Amu Darya river basin would also be beneficial to Afghanistan, which also has territory in the basin.

[1] The cryosphere in Central Asia refers to systems of snow cover and ice in the Tien Shan and Pamir mountain ranges, and it includes glaciers, snowpack, underground ice, rock glaciers, moraines, coarse talus, and permafrost.

[2] ?High Mountain Areas.? Chapter 2 of *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*. H.- O. Pörtner, et. al., eds. In press (approved September 24, 2019): 2-3.

[3] Severskiy, I (2009) ?Current and projected changes of glaciation in Central Asia and their probable impact on water resources? in: *Assessment of Snow, Glacier and Water Resources in Asia*. IHP/HWRP ? Berichte, Heft 8.

[4] ADB (2012) *Climate Change and Sustainable Water Management in Central Asia*.

[5] Please refer to paragraph 202 of the GEF Strategic Directions. <http://www.thegef.org/events/gef-7-replenishment>

[6] IPCC (2019). *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*. H.-O. Pörtner et. al., eds. In press: p. 2-5.

[7] Preference will be given to open-access Sentinel-2 MSI images.

[8] Institutional, governmental structures established to promote women?s advancement and ensure women?s human rights. These vary by country (see Annex 9).

[9] See <http://www.unesco.org/new/en/natural-sciences/environment/water/wwap/water-and-gender/methodology-indicators-and-toolkit/> Accessed December 20, 2019.

[10] See <http://www.expedition2grad.ch/> (in German). Accessed December 20, 2019.

[11] See https://www.thegef.org/gef/policies_guidelines

1b. Project Map and Coordinates

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

The project is a regional project, and the cryosphere in the Tien Shan and Pamir systems is depicted below.



1c. Child Project?

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

2. Stakeholders

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

Civil Society Organizations

Indigenous Peoples and Local Communities

Private Sector Entities

If none of the above, please explain why:

Please provide the Stakeholder Engagement Plan or equivalent assessment.

During the project formulation phase, several stakeholders were involved through several meetings organized in the region by UNDP, UNESCO and UNCPD, the PIF was also presented at different

regional and global forums and received support from number of regional and national stakeholders. Local stakeholders were involved during the implementation of the UNDP Central Asian Multi-Country Programme on Climate Risk Management.

Two technical workshops were conducted by the project to seek input from stakeholders and to discuss project strategy and activities. In July 2019, a workshop was organized in Almaty involving stakeholders from each participating country, including a variety of national and regional CSOs. In November 2019, a technical meeting was held in Tashkent to present research conducted under the project preparation phase.

In addition to these workshops, the project preparation team organized a stakeholder validation workshop on June 18, 2020. The workshop included government representatives of all participating countries and representatives from UNDP and UNESCO. Due to travel restrictions, it was organized as an on-line meeting. A list of the 25 participants and the agenda is included in Annex 4 of the accompanying UNDP project document. The participants provided an update on developments in the participating countries over the course of project preparation, and they supported the project activities as presented in this project document. No significant criticisms of the project or its potential impacts that would raise any concerns about project implementation were raised during the consultation. Finally, stakeholder feedback during the consultation provided additional information on parallel initiatives, new government and donor programs, and ideas (e.g. the possibility of a transboundary demonstration project under Component 4).

On September 30, 2020, the project preparation team organized a stakeholder validation workshop specifically for CSOs. Due to travel restrictions, this workshop was also organized as an on-line meeting. A list of the 11 CSO participants and the 7 organizations that they represented is provided in Annex 4. The project preparation team provided a briefing on the proposed structure of the project, and participating CSOs provided comments during a session for comments both orally and in writing. Several comments have been incorporated into the project. First, there was a suggestion to take sub-regional and basin-level planning efforts into account when selecting and siting demonstration projects. This consideration has been noted under Component 4. Second, there was a suggestion to synchronize coordination of the National Action Plans with the development of National Adaptation Plans for relevant countries; this is noted in the description of project activities under Component 2. CSO representatives also noted the importance of understanding differences in vulnerability to climate risks between women and men; this point will be addressed under Output 1.2.5. Finally, two comments were about ensuring that project communications and learning materials were able to be useful to their intended audience in communities. One representative noted that rural communities could benefit from in-person assistance in interpreting and applying data and information produced by the project, while another suggested that outreach materials be designed in formats like peer-to-peer videos that would be engaging for community groups such as farmers or women's organizations; these comments have been incorporated into Output 5.1.2. No significant criticisms of the project or its potential impacts that would raise any concerns about project implementation were raised during the consultation.

Research undertaken during the project preparation phase suggests that the level of public participation in decision-making and access to environmental information in the environmental sector varies from country to country, and that there is room for improvement in all countries. Feedback from stakeholders has resulted in the general approach to strengthening institutional capacity in all of the participating countries and monitoring in all participating countries with glaciers.

Summaries of all meetings during the project preparation period and participant lists are provided in Annex 4 of the accompanying UNDP project document. Feedback has also informed the list of

stakeholders, initiatives and activities that could inform this project, and the opportunities for stakeholder involvement in the project. A comprehensive overview of project stakeholders and a description of how they will be involved in the project is included in Annex 4 as referenced above, and a detailed public participation strategy will be developed under Output 5.1.2. of the project.

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

Select what role civil society will play in the project:

Consulted only;

Member of Advisory Body; Contractor;

Co-financier;

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

Executor or co-executor;

Other (Please explain) Yes

Partner for demonstration projects.

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

The project recognizes the linkages between poverty and gender issues and places great importance on women's empowerment as a means to reduce poverty and climate change risks. Women's secure access to water is central to achieving the Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development, in particular SDG 1 (End poverty in all its form everywhere) and SDG 5 (Achieve gender equality and empower all women and girls). The project strategy will therefore contribute to improving women's access to and control over resources and will reinforce their participation and leadership in decision-making processes.

The project has been designed to conform to 2018 guidance from the GEF on gender equality^[1] in the following ways:

? A **gender analysis** has been prepared as recommended under GEF procedures and is included in Annex 9 of the accompanying UNDP project document.

? A **gender action plan** is also included in Annex 9 in order to ensure that the issues identified in the analysis will be addressed.

? **Project outputs** also support this work. **Output 2.5** specifically addresses the need to better understand the women's roles and participation in regions with a high-mountain cryosphere and in water resources management more generally. Other outputs with training components target women and women's organizations, and **Output 8.2** ensures that awareness-raising and involvement strategies will take gender into account.

? The **project results framework** includes targets for the number of women as beneficiaries and for women's equitable participation in project events and management.

? Project **M&E activities** will monitor the share of women and men who are direct project beneficiaries, and it will also monitor the nature of these benefits. The project monitoring and evaluation budget supports the collection of gender-disaggregated data.

? Gender elements of targets and activities will be monitored in **project reporting**, both in annual reports and in the terminal evaluation and project outreach materials.

? The project **knowledge management** strategy will support the dissemination of lessons learned from the gender output of this project and will promote the use of guidance and good practice in gender mainstreaming as it develops from the GEF, relevant global and regional conventions, and other countries with GEF International Waters projects.

The project commits to being in line with the GEF Gender Equality Action Plan, the United Nations System-wide Action Plan on Gender Equality and the Empowerment of Women, and the 2018-2021 UNDP Gender Equality Strategy. The project team will utilize UNESCO gender focal points where relevant and will align project communications and outreach with approaches to gender mainstreaming in its communications policy, including the use of guidelines on gender-neutral language.[2]

The UNDP Atlas gender marker for the project is 1.

[1] GEF (2018). *GEF Policy on Gender Equality*.

[2] UNESCO (1999) Guidelines on Gender-Neutral Language.

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

Yes

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

Improving women's participation and decision making Yes

Generating socio-economic benefits or services or women

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

4. Private sector engagement

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

Consultations during the project preparation have identified several areas where private sector involvement could be beneficial to the project objectives. In general, there is an acknowledged role for the private sector in the sustainable mountain development agenda in terms of the skills and resources that privately-owned entities command. However, the relatively high involvement of the public sector in Central Asian economies results in a profile and market for private sector entities that differs from other regions. That said, private companies and entrepreneurs will all face economic consequences from changes in water availability. For resource extraction, processing, and manufacturing businesses, water shortages can affect operations and profitability. For small-holder farmers and pastoralists, water shortages can affect both livelihoods and food security.

The project has identified several key points for the involvement of the private sector. First private sector representatives will be involved in the stakeholder mechanism developed under Output 2.2.4. Second, they will participate in outreach activities developed under Output 5.1.1. Third, they will be included in the project public participation strategy developed under Output 5.1.2. Finally, several of the proposed demonstration projects will support livelihoods in high-mountain areas, while others will work to encourage the efficient use of water resources, which will benefit private-sector entities in downstream areas. Throughout the project's implementation, the project management team will keep in mind the diversity of the private sector and to be inclusive in their outreach and support.

5. Risks to Achieving Project Objectives

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

In Central Asia, the more important and relevant issue in regional cooperation related to environmental sustainability and human security, is the impact of climate change and variability. Given the geographical configurations of Central Asia, disasters, such as GLOFs, earthquakes and floods can take on a trans-boundary perspective. Regional environmental issues stem from the national context, but the most difficult question for the national governments is how to justify a regional decision in the national context.

At the national level, different ministries are expected to integrate the decisions of the regional bodies into national policies, strategies and programs. However, the real capacities of these ministries in fulfilling this task are often overestimated. There is a degree of institutional overlap and inconsistencies in adopting the coordinated actions. At local level, the participation of governments, the private sector, civil society organizations and institutions is ineffective. Capacity strengthening is needed to translate these policies and programs into action and provide feedback. This aspect of ineffective participation is de facto almost totally ignored by the national governments of the region despite the formal attempts of the regional bodies.

The proposed project is, then, based on presumption of a strong government support and can draw on important pilot experiences that have been derived from existing projects in the region. This reduces strategic and organisational risks to the project.

The main risks for the project can be summarized as follows:

	Risk	Level of risk	Mitigating Action
1	Too many different/divergent stakeholder interests in target sites may prevent efficient consensual decision-making (lack of the agreed procedures for effective functioning of the regional environmental institutions, different understanding and definition of the importance of the national and the regional environmental problems and priorities)	Moderate	Identification of the appropriate government agencies, implementing partners and project implementation arrangements prior to project inception
2	Political instability and discontinuity at national level and in project sites (Inadequacy of the existing legal framework for intergovernmental decision making, insufficient mandate of regional institutions, e.g. ICSD, ICWC, IFAS, and lack of cooperation among them)	Moderate	Defining project implementation arrangements which enable efficient project implementation in unstable political conditions
3	Lack of community involvement in some project sites	Low	Assessment of available community workforce and cash-for work-modalities in target sites prior to demonstration project inception
4	Lack of agreement on the terms and procedures for environmental glacier monitoring and data exchange	Moderate	To create a network among the countries of the Central Asia to apply and standardize monitoring methods and to create regional databases and information systems
5	Project delays, constraints, or capacity-related risks related to the COVID-19 global pandemic	Moderate	<p>Short-term constraints on travel and group gatherings will be taken into account in project planning, and on-line or remote learning and communication options will be used where necessary. Longer-term economic impacts will be analyzed in the diagnostic analysis where relevant and factored into efforts to finance the continued implementation of the NAPs, the SAP, and monitoring activities following the conclusion of the project.</p> <p>A special annex detailing the integration of pandemic-related issues into project design and implementation is now included as Annex 16 in the accompanying UNDP project document.</p>

A copy of the UNDP Risk Log for the project is provided in Annex 5 of the accompanying UNDP project document. Annex 8 of accompanying project document also contains the results of the Social and

Environmental Screening Procedure (SESP). Because demonstration projects will not be finalized until after the project has started, the risk rating is 'moderate.' Annex 8 and the 'Risks' sub-section of Section IV. (Results and Partnerships) in the project document provide a comprehensive overview of potential environmental and social risk and describe the risk mitigation procedures that the project will follow throughout its implementation including a tabular overview of social and environmental risk management for the project (Section IV., Table 4).

6. Institutional Arrangement and Coordination

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

Institutional Arrangement

The project will be implemented by UNDP, which will oversee compliance with GEF and UNDP policies and provide linkages with other GEF initiatives on groundwater management. UNDP is accountable to the GEF for the implementation of this project. This includes oversight of project execution to ensure that the project is being carried out in accordance with agreed standards and provisions. UNDP is responsible for delivering GEF project cycle management services comprising project approval and start-up, project supervision and oversight, and project completion and evaluation. UNDP is also responsible for the Project Assurance role of the Project Board.

The UNESCO cluster office in Almaty will take the lead role in the execution of the project and in regional coordination with stakeholders. Country support will be provided by UNESCO office in Almaty in close coordination with offices in Tashkent and Teheran. The Water Sciences Division, secretariat of the UNESCO's Intergovernmental Hydrological Programme (IHP), will provide oversight on technical matters through backstopping and the provision of expertise, and will disseminate information about the project at the global level. IHP has been involved in execution of GEF IW projects for more than a decade. A detailed description of institutional arrangements and project governance is provided in Section VII. of the accompanying project document.

Coordination

The need for a worldwide inventory of existing perennial ice and snow masses was first considered during the International Hydrological Decade, declared by UNESCO for the period 1965-1974. More than half a century later, there remain deep gaps in monitoring and understanding of glacier systems in all mountainous regions. Recognizing this gap, UNESCO has initiated several effort including capacity building programme focusing on glacier mass balance measurements in coordination with scientists, centre of excellences, governments and stakeholders from all over the world.

The Intergovernmental Hydrological Programme (IHP) of UNESCO will play a key role, as a platform for scientific networking and cooperation, in contributing to the assessment and monitoring of changes in snow, glaciers and water resources and in proposing options for adaptation. UNESCO works with a wide range of partners in all of its fields of competence. Partnerships are a key enabler for meeting global challenges and generating sustainable change and long-lasting impact. Partnerships are firmly embedded in UNESCO's way of working at global, regional and national levels. The proposed project can effectively

benefit from UNESCO's ongoing work in the region within the framework of IHP by leveraging technical and scientific feedback, capacity building and by supporting project coordination and implementation. By joining forces with its partners UNESCO can leverage resources, expertise and competencies to promote all UNESCO's ideals and values, to achieve common development goals, and to strengthen visibility and impact of its action. UNESCO offers a range of different entry points for partnerships. These are all areas where the Organization has leadership, recognized expertise and comparative advantage.

Linkages will be established with other ongoing UNESCO efforts that include the following:

- ? UNESCO Project: The impact of glacier retreat in the Andes: International Multidisciplinary Network for Adaptation Strategies?: Exchange of information from Andean project including links with the Snow Glacier Networks
- ? UNESCO Project Addressing Water Security: Climate Impacts and Adaptation responses in Africa, Asia and Americas (2014-2018)
- ? UNESCO associated global project: The International Network for Alpine Research Catchment Hydrology (INARCH PROJECT (2015-2019)

The project will take advantage of the UNESCO global activities on Snow Glacier and Water Resources within the framework of International Hydrological Programme (IHP VIII, 2014-2021) ?Water Security: Responses to Local, Regional and Global Challenges.? This and other initiative listed above provide global multidisciplinary scientific expertise, and platform of world authority on Glacier Sciences, which paired with an ability to translate science into recommendations, policy and application - a unique combination and competence. Furthermore, the project will coordinate and leverage the work of UNESCO's Citizen Sciences activities, which help improve monitoring of Climate related goals and Water related SDGs. New technologies are key driver of the recent success of citizen science activities, and applications such as use of mobile device application one engage non-scientists in the collection of local data, that can later be used by national and local authorities to prepare adaptation measures under climate change. One such example, which is very relevant to the project is Glacier App for mobile devices, which was launched during the Paris Climate Conference COP21 in December 2015, by the World Glacier Monitoring Services (WGMS) and UNESCO. This new information system aims at bringing scientifically sound facts and figures on worldwide glacier changes to decision makers at governmental and intergovernmental levels as well as reaching out to the interested public. Recently updated version includes new data on glacier special events such as floods, avalanches, surge or calving dynamics. It allows the user to submit own glacier photographs, and it gives improved visibility of principal investigators and latest publications related to glacier observations. The project should be able to verify and update such devices based on the available glacier data and observation obtained from the region.

During COP-22, UNESCO IHP together with Center for Hydrometeorology and Remote Sensing (CHRS) of University of California launched a new App (iRain) for mobile devices with remotely sensed Precipitation Data, which is essential for water resource planning and preparing for floods and droughts. The tool seems very relevant to the project as the data will feed into existing tools that use remote sensing technologies and artificial intelligence to estimate rainfall globally from satellite imagery in near real-time including for the region. These tools are used to inform emergency planning and management of hydrological risks, such as floods, droughts, and extreme weather events.

Coordination will also be secured with UNESCO IHP activities in Central Asia, which provide support to the Member States on capacity development of monitoring of glaciers. Specifically, UNESCO contributes to strengthening the capacity of young scientists in permafrost studies, support summer schools on the analysis and measurement of glacier mass balance, those events were organized in close cooperation with the Central Asian Institute for Applied Geosciences (CAIAG) and Kyrgyz National University. Since 2013 UNESCO, in cooperation with several partner institutions, in particular with UNRCCA, has organized and conducted a series of seminars on "the Impact of glaciers melting on national and transboundary water resources in Central Asia". The seminars provided key important platform for scientists and politicians to discuss the impact of climate change on melting glaciers and water resources and contributed to strengthening stakeholder dialogue regional cooperation.

The project will implement awareness-raising programme for policy-makers at the national and regional level on the predictions and risks related to melting glaciers in Central Asia. Furthermore, regional networks and inter-regional transfer of knowledge development activities will be encouraged focusing on water resources and hydrologic hazards in mountains and arid and semi-arid regions. Water security can only be attained via the development of suitable policies, based on the sound knowledge of water and of its interactions. UNESCO IHP is uniquely positioned to assist Member States in addressing water security.

The project will also coordinate with other projects and donors, including the following:

UNDP/GEF project "Conservation and sustainable use of Pamir Alay and Tian Shan ecosystems for Snow Leopard protection and sustainable community livelihoods" has the objective to demonstrate viability of landscape approach to conservation of internationally important biodiversity, land and forest resources in Tian Shan and Pamir Alay Mountain Ecosystems in harmony with sustainable development of local communities. It covers part of the area covered by this project is a welcome complement to its objectives.

The **Finnish Meteorological Institute** is implementing a project in Kyrgyzstan and Tajikistan (2018-2022) aiming at capacity building of national hydromet agencies by conducting joint field expeditions to the glaciers and installation of Automatic Weather Stations next to the glaciers, as well as conducting pilot measurements of atmospheric absorbing aerosols in the air and on the surface layer of the glacier snow.

The **CAWA** project focuses on support informed decision making in land and water management through transparent data sets, promotion of regional and trans-sectoral water cooperation and strengthening professional and methodological capacities of specialists and researchers. It works on modeling of snow resources of Central Asia for water runoff predictions.

The **World Bank** project (2015-2021) on "Climate Adaptation and Mitigation Program for the Aral Sea Basin" focuses on enhancing regionally coordinated access to improved climate change knowledge services for key stakeholders (e.g., policy makers, communities, and civil society) in CA countries, by establishing a regional climate knowledge services. It aims to provide technical assistance, as well as minor civil works, goods (including software and equipment), and training, at both the regional and national levels, to develop a unified, integrated regional analytical platform for climate-resilient and low emission development, with improved data, information, knowledge, and decision-support tools. The activities under Component 5 of the project will be coordinated closely.

UNECE is also implementing several projects in Central Asia, which this project will build on:

? *Regional Dialogue and Cooperation on Water Resources Management in Central Asia.* The goal of the project is to empower the countries of Central Asia to develop and implement mutually acceptable, long-term solutions to improve cooperation on transboundary water resources. This will be done by enhancing the regional dialogue and strengthening the capacity of regional institutions for water resources management. The project is implemented under the Berlin Water Process.

? *Capacity building for cooperation on dam safety in Central Asia.* The first phase of the project resulted in: (a) a model national law on safety of large hydraulic facilities, including dams, intended as a basis for national harmonized legal frameworks, and (b) a draft regional agreement on cooperation on dam safety, which stipulates, inter alia, the exchange of information and notification of other countries in case of dam's accidents. In the second phase, all Central Asian countries were engaged in the improvement or revision of existing legal provisions and institutional modalities for dam safety. The development of a formalized sub regional cooperation on dam safety continued and efforts were made on capacity building of experts and institutions. A third phase of the project started in 2012. The project is being undertaken in cooperation with the Executive Committee of the International Fund for Saving the Aral Sea (EC-IFAS).

? *Water Quality in Central Asia.* The United Nations Development Account has made funding available to UNECE for a project to improve cooperation and policy related to water quality in Central Asia. The project was implemented in 2009-2012 in cooperation with the Regional Environmental Centre for Central Asia (CAREC). Project objectives included the establishment of establish common principles for measurement, exchange of information and joint assessment on shared water resources. As the water quality monitoring has seriously deteriorated since the early 1990s, it is a challenge to establish a basic monitoring network. The development of more efficient national policies, including the standards and principles applied in the permitting of environmentally harmful activities, were other key aspects of the project. A [project report](#) and an [external evaluation](#) are available. More detailed information can be found [here](#)

? *Strengthening cooperation on hydrology and environment between Afghanistan and Tajikistan in the upper Amu Darya River basin.* UNECE is supporting Afghanistan and Tajikistan in the development of hydrology and environment cooperation in the upper Amu Darya basin. From Afghanistan the Ministry for Water and Energy and the National Environmental Protection Agency, and from the Tajik side the Committee for Environmental Protection and Tajik Hydromet are project partners. On the basis of existing bilateral agreements, the two countries will strengthen their cooperation and information exchange. The Russian Federation is providing funding for the project. The project will facilitate the establishment of long-term cooperation between the two countries on hydrology and environment. The aim is also to improve the understanding and access to information about the water resources and environmental conditions in the upper Amu Darya basin to relevant stakeholder in the whole basin.

7. Consistency with National Priorities

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

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

The project is aligned with the following international agreements and reporting documents:

International Agreements / Reports	Relevant Countries	Description of Project Alignment
2030 Agenda for Sustainable Development	All	SDG 6, Targets 6.2, 6.4, 6.5 (and 6.5.2) SDG 13, Targets 13.1 13.3 SDG 11, Target 11.5 SDG 15. Target 15.1 Target 15.4
UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992)	Kazakhstan (2001) ; Turkmenistan (2002; Uzbekistan (2007)	The project supports the use of transboundary waters ?with the aim of ecologically sound and rational water management.?
Aral Sea Basin Program (ASBP)	All	Integrated Use of Water Resources Improving Institutional and Legal Instruments

<p>UN Framework Convention on Climate Change (FCCC) and associated reporting</p> <p>Paris Agreement</p>	All	<p>The National Communications of all Central Asian countries under the UNFCCC conclude that their territories will become more arid due to rising temperatures and changes in precipitation.</p> <p>The Nationally Determined Contribution of (NDC) of Kyrgyzstan identifies the water resources sector as the sector with the greatest expected economic losses. The NDC of Tajikistan specifically mentions glacier monitoring as a means of supporting the reduction of vulnerability to the impacts of climate change. The NDC of Uzbekistan lists the adaptation the agriculture and water resources sector as a priority adaptation activity, which includes the wide use of integrated water resources management practices.</p>
<p>UN Convention on Biological Diversity (UNCBD) and Aichi Biodiversity Targets</p>	All	<p>The project aligns with two key aspects of the CBD as expressed in Aichi Target 11: promoting the protection of ecosystems and promoting sustainable development in areas adjacent to protected areas.</p> <p>Demonstration projects may also support progress under Target 7 (Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity) and Target 14 (Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods, and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable).</p>
<p>The Sendai Framework for Disaster Risk Reduction</p>	All	<p>The Sendai Framework (2015-2030) was the first major agreement of the post-2015 development agenda and provides Member States with concrete actions to protect development gains from the risk of disaster. The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.</p> <p>Dialogue has taken place at the regional level on methodological approaches to systematizing the collection, analysis and reporting of data related to disaster losses and on Sendai Framework targets.</p>

UN Convention to Combat Desertification (UNCCD)	All	According to the recent IPCC report on climate change and land degradation, ?increased land surface air temperature and evapotranspiration and decreased precipitation amount, in interaction with climate variability and human activities, have contributed to desertification? in Central Asia.[1]
UNECE Convention on Access to Information, Public Participation in Decision-Making, and Access to Justice in Environmental Matters (Aarhus Convention)	Kazakhstan (2001); Kyrgyzstan (2001); Tajikistan (2001); Turkmenistan (1999).	Provision of information on environmental issues to stakeholders and the public.

[1] Arneth et. al. (2019). *IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems*. Summary for Policymakers. Approved draft, 07 August 2019: p 6.

8. Knowledge Management

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

Component 5 of the project is devoted to knowledge management, including anticipation of experiences and lessons learned from other similar projects as well as sharing the experiences of this project with other similar initiatives in participating countries, wider region and international community. In this endeavor, IW LEARN will be utilized as a platform for information exchange. In addition, the project's web site will serve as a workspace to be shared by experts and stakeholders involved in the project. The project will benefit from UNESCO world wide scientific and educational networks and global activities on Snow Glacier and Water Resources within the framework of International Hydrological Programme (IHP VIII, 2014-2021) ?Water Security: Responses to Local, Regional and Global Challenges?. UNESCO is finalizing a project ?The Impact of Glacier Retreat in the Andes: International Multidisciplinary Network for Adaptation Strategies? which establishes a multi and transdisciplinary network to enhance resilience to changes, particularly climate change, through improved understanding of vulnerabilities, opportunities and potentials for adaptation.

This project will have the opportunity to interact with the networks, generate knowledge base for adaptation strategies based on undertaken case studies and benefit from the flagship products such as *The Andean Glacier and Water Atlas*. The project will also benefit from global policy processes, which will provide visibility. In 2018, UNESCO member states adopted a resolution during the 23rd Intergovernmental Council of IHP to support the initiative and to designate the year 2020 as the International Year of Snow and Ice, which will have provided visibility for project-related issues and a platform for sharing knowledge about the project preparation among stakeholders.

A knowledge platform will be developed based on interlinkages established with similar activities and initiatives undertaken by Global Cryosphere Watch (GCW) of WMO, International Association of Cryosphere Sciences (IACS), The International Network for Alpine Research Catchment Hydrology (INARCH PROJECT (2015-2019) and others. Furthermore, the activities of the project will be developed in coordination with the UNESCO's project on "Reducing vulnerabilities of populations in the Central Asia region from glacier lake outburst floods in changing climate?". The knowledge management platform will facilitate generation and exchange of knowledge around global high-mountain cryosphere issues, facilitating the capture, synthesis, transfer and uptake of knowledge system within and beyond the project activities.

9. Monitoring and Evaluation

Describe the budgeted M and E plan

The project results, corresponding indicators and mid-term and end-of-project targets in the project results framework will be monitored annually and evaluated periodically during project implementation. If baseline data for some of the results indicators is not yet available, it will be collected during the first year of project implementation. The Monitoring Plan included in Annex 3 details the roles, responsibilities, frequency of monitoring project results.

Project-level monitoring and evaluation will be undertaken in compliance with UNDP requirements as outlined in the [UNDP POPP](#) and [UNDP Evaluation Policy](#). The UNDP Country Office is responsible for ensuring full compliance with all UNDP project monitoring, quality assurance, risk management, and evaluation requirements.

Additional mandatory GEF-specific M&E requirements will be undertaken in accordance with the [GEF Monitoring Policy](#) and the [GEF Evaluation Policy](#) and other [relevant GEF policies](#)[1]. The costed M&E plan included below, and the Monitoring plan in Annex 3, will guide the GEF-specific M&E activities to be undertaken by this project.

In addition to these mandatory UNDP and GEF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management will be agreed during the Project Inception Workshop and will be detailed in the Inception Report.

Inception Workshop and Report: A project inception workshop will be held within 60 days of project CEO endorsement, with the aim to:

- a. Familiarize key stakeholders with the detailed project strategy and discuss any changes that may have taken place in the overall context since the project idea was initially conceptualized that may influence its strategy and implementation.
- b. Discuss the roles and responsibilities of the project team, including reporting lines, stakeholder engagement strategies and conflict resolution mechanisms.

- c. Review the results framework and monitoring plan.
- d. Discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E budget; identify national/regional institutes to be involved in project-level M&E; discuss the role of the GEF OFP and other stakeholders in project-level M&E.
- e. Update and review responsibilities for monitoring project strategies, including the risk log; SESP report, Social and Environmental Management Framework and other safeguard requirements; project grievance mechanisms; gender strategy; knowledge management strategy, and other relevant management strategies.
- f. Review financial reporting procedures and budget monitoring and other mandatory requirements and agree on the arrangements for the annual audit.
- g. Plan and schedule Project Board meetings and finalize the first-year annual work plan.
- h. Formally launch the Project.

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GEF Project Implementation Report (PIR):

The annual GEF PIR covering the reporting period July (previous year) to June (current year) will be completed for each year of project implementation. Any environmental and social risks and related management plans will be monitored regularly, and progress will be reported in the PIR. The PIR submitted to the GEF will be shared with the Project Board. The quality rating of the previous year's PIR will be used to inform the preparation of the subsequent PIR.

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GEF Core Indicators:

The GEF Core indicators included as Annex 14 will be used to monitor global environmental benefits and will be updated for reporting to the GEF prior to MTR and TE. Note that the project team is responsible for updating the indicator status. The updated monitoring data should be shared with MTR/TE consultants prior to required evaluation missions, so these can be used for subsequent ground-truthing. The methodologies to be used in data collection have been defined by the GEF and are available on the [GEF website](#).

Independent Mid-term Review (MTR):

The terms of reference, the review process and the final MTR report will follow the standard templates and guidance prepared by the UNDP IEO for GEF-financed projects available on the [UNDP Evaluation Resource Center](#) (ERC).

The evaluation will be ?independent, impartial and rigorous.? The evaluators that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Equally, the evaluators should not be in a position where there may be the possibility of future contracts regarding the project under review.

The GEF Operational Focal Points and other stakeholders will be actively involved and consulted during the evaluation process. Additional quality assurance support is available from BPPS/GEF Directorate.

The final MTR report and MTR TOR will be publicly available in English and will be posted on the UNDP ERC by January 31, 2023. A management response to MTR recommendations will be posted in the ERC within six weeks of the MTR report's completion.

Terminal Evaluation (TE):

An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance for GEF-financed projects available on the [UNDP Evaluation Resource Center](#).

The evaluation will be "independent, impartial and rigorous". The evaluators that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Equally, the evaluators should not be in a position where there may be the possibility of future contracts regarding the project being evaluated.

The GEF Operational Focal Points and other stakeholders will be actively involved and consulted during the terminal evaluation process. Additional quality assurance support is available from the BPPS/GEF Directorate.

The final TE report and TE TOR will be publicly available in English and posted on the UNDP ERC by September 30, 2024. A management response to the TE recommendations will be posted to the ERC within six weeks of the TE report's completion.

Final Report:

The project's terminal GEF PIR along with the terminal evaluation (TE) report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the Project Board during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.

Agreement on intellectual property rights and use of logo on the project's deliverables and disclosure of information: To accord proper acknowledgement to the GEF for providing grant funding, the GEF logo will appear together with the UNDP logo and the UNESCO logo on all promotional materials, other written materials like publications developed by the project, and project hardware. Any citation on publications regarding projects funded by the GEF will also accord proper acknowledgement to the GEF. Information will be disclosed in accordance with relevant policies notably the UNDP Disclosure Policy^[2] and the GEF policy on public involvement.^[3]

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GEF M&E requirements	Indicative costs (US\$)	Time frame
Inception Workshop	29,780	Within 60 days of CEO endorsement of this project.
Inception Report	6,000	Within 90 days of CEO endorsement of this project.
M&E of GEF Core Indicators and Project Results Framework	12,000	Annually prior to GEF PIR. This will include GEF core indicators.
GEF Project Implementation Report (PIR)	None ²¹	Annually typically between June-August

GEF M&E requirements	Indicative costs (US\$)	Time frame
Monitoring of Social and Environmental Standards	12,000	Throughout selection and implementation of demonstration projects.
Monitoring of stakeholder engagement plan	14,000	On-going.
Monitoring of gender mainstreaming and women's participation in the project	12,000	On-going.
Supervision missions	None ^[4]	Annually
<i>Independent Mid-term Review (MTR) and management response</i>	35,000	January 2023
Independent Terminal Evaluation (TE) and management response	55,000	September 2025
TOTAL indicative COST Excluding oversight/project assurance costs.	175,780	

[1] See https://www.thegef.org/gef/policies_guidelines

[2] See http://www.undp.org/content/undp/en/home/operations/transparency/information_disclosurepolicy/

[3] See https://www.thegef.org/gef/policies_guidelines

[4] The costs of UNESCO's and UNDP's participation and time are charged to the GEF Agency Fee.

10. Benefits

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

The types of beneficiaries will vary across project components. At the national level, activities related to glacier monitoring and analysis will work with researchers and policy-makers to develop unified approaches that will avoid overlap and duplication of resources while activities to demonstrate adaptive technologies and practices in water management will include upstream and downstream communities. The diagnostic analysis and information exchange will also provide information that will allow decision-makers to undertake and prioritize sound investments in the water sector and in water-dependent sectors such as energy and agriculture. These activities will allow participating governments to enhance water security in the freshwater ecosystems of the two cryosphere systems involved in the project through information exchange and enhanced regional cooperation.

At the local level, the community demonstration projects under Component 4 will allow the project to pilot promising approaches to addressing climate threats such as drought and water-related hazards that can threaten lives and livelihoods. Output 4.1 will pilot technologies and approaches for both upstream and downstream communities with an emphasis on ensuring sustainable livelihoods in the affected communities. Output 4.2 will allow the project to disseminate these findings beyond the pilot communities to others that might benefit from these approaches. Increased adoption of sustainable water management will enhance water security in the freshwater ecosystems of the two cryosphere systems involved in the project.

Communities that are highly vulnerable to the impacts of retreating glaciers are often in rural and remote areas and have limited options for livelihoods. These high-mountain communities also have particularly vulnerable members within them, such as women-headed households, the elderly, and residents with disabilities. The project team will include a gender expert and a safeguards expert, who will monitor the equitable and meaningful participation of community members in the demonstration projects and, more broadly, representation and transparency in the mechanisms established as the result of the planned regional strategic action plan and national action plans. All project activities and outputs will be monitored for compliance with the UN member state pledge to ensure that "no one will be left behind."^[1] Component 5 is designed specifically to ensure that many different groups will be able to engage in the project activities and share in its benefits.

^[1] 2030 Agenda for Sustainable Development (2015).

11. Environmental and Social Safeguard (ESS) Risks

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

Overall Project/Program Risk Classification *

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate			

Measures to address identified risks and impacts

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

Project Information

<i>Project Information</i>	
1. Project Title	Strengthening the resilience of Central Asian countries by enabling regional cooperation to assess high altitude glacio-nival systems to develop integrated methods for sustainable development and adaptation to climate change
2. Project Number	GEF 10077 / PIMS 5516
3. Location (Global/Region/Country)	Regional (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan)

Part A. Integrating Overarching Principles to Strengthen Social and Environmental Sustainability

Integrate the Overarching Principles in order to Strengthen Social and Environmental Sustainability?
<i>Briefly describe in the space below how the Project mainstreams the human-rights based approach</i>

The project development process will involve the active participation of both rights-holders (water users in upstream and downstream communities) and duty-bearers (government officials at the local, provincial/regional, and country level). The TDA process will analyze threats to realization of rights due to changes in the environment, such as increased glacier melting due to climate change, and socio-cultural issues such as women's access to resources. Project activities and outcomes have been developed to support the implementation of national and international commitments in the area of environment, and they will contribute to participating countries' progress towards achieving several of the sustainable development goals (SDGs).

Training activities and learning-by-doing analytical exercises carried out in the course of project implementation are designed to build the capacities of duty-bearers to fulfill their obligations, including the ability to monitor water resources and undertake steps to manage them in an integrated way. The demonstration projects that will be implemented will build the capacity of rights-holders by increasing their ability to respond to changes in water supply through water conservation and alternative livelihoods that may be less water-sensitive. Throughout its implementation, the project will involve a variety of stakeholders, including international and national NGOs, academia, and other civil society organizations with linkages to affected communities.

Project monitoring and evaluation will examine project processes and outcomes with a view to human rights standards and principles.

Briefly describe in the space below how the Project is likely to improve gender equality and women's empowerment

The project includes specific steps through the project cycle to support gender equality and women's empowerment in all aspects of project management and activities. Participation of project workshops, meetings and other activities will be documented in sex-disaggregated reports, and gender participation targets have been established. Socio-economic benefits and gender mainstreaming will serve to strengthen the impacts of the interventions on the integrated management of water resources in high-mountain Central Asia and its downstream communities.

The proposed project will analyze any gender-based differences in access to water resources or participation in water management and will work to address them. The project team will include in-country gender expert and will maintain open lines of communication with relevant ministries in this area. Project indicators are designed to explicitly measure the representation of women in trainings and other project-related activities. Finally, project monitoring and evaluation will examine project processes and outcomes with a view to gender equality and women's empowerment.

Briefly describe in the space below how the Project mainstreams environmental sustainability

The strategic focus of the project is the promotion of environmental sustainability through the rational use of natural resources in the form of water in high-mountain areas of Central Asia. Through the use of a TDA/SAP process that follows GEF recommended good practice, the project will develop a strategic action programme that will assist the participating countries with implementing priority actions of transboundary importance. The SAP will assist with harmonizing policies, legislation and operational practices within the Tien Shan and Pamir glacio-nival basins and will develop potential financing options to assist the countries sustain the environmental improvements that are expected from implementing the SAP.

In addition, the project will support extensive capacity development activities that will further enable the multiple stakeholders involved in these glacio-nival basins to sustain new and innovative environmental practices to manage demand for water and other natural resources.

The project will monitor the environmental impact of all activities on an ongoing basis, and the project team will include a safeguards expert.

Part B. Identifying and Managing Social and Environmental Risks

<p>QUESTION 2: What are the Potential Social and Environmental Risks?</p> <p><i>Note: Describe briefly potential social and environmental risks identified in Attachment 1 ? Risk Screening Checklist (based on any ?Yes? responses). If no risks have been identified in Attachment 1 then note ?No Risks Identified? and skip to Question 4 and Select ?Low Risk?. Questions 5 and 6 not required for Low Risk Projects.</i></p>	<p>QUESTION 3: What is the level of significance of the potential social and environmental risks?</p> <p><i>Note: Respond to Questions 4 and 5 below before proceeding to Question 6</i></p>			<p>QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?</p>
<p>Risk Description</p>	<p>Impact and Probability (1-5)</p>	<p>Significance (Low, Moderate, High)</p>	<p>Comments</p>	<p>Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.</p>

Risk 1: Under Principle 2, demonstration projects related to livelihoods might inadvertently reinforce traditional gender roles in a way that could limit women's meaningful participation.	I = 3 P = 2	Moderate		The project includes a Gender Action Plan that covers the design and monitoring of the demonstration projects, and specific steps to screen and monitor for gender issues are included in the project document. A Gender Expert will screen and monitor demonstration projects as part of her/his tasks (see Table 4 in the Project Document).
Risk 2: Under Standard 1 and Standard 5, demonstration projects (which have yet to be finalized and selected) could involve afforestation and/or the construction of small reservoirs. If not properly supervised, project activities in this area could affect natural resources and/or livelihoods.	I = 3 P = 2	Moderate		The project will manage this risk through the selection, design, and implementation of the demonstration projects using a suitably-qualified Safeguards expert (see Table 4 in the Project Document). All projects will undergo required screening with the SESP and the exclusionary criteria. All demonstration projects will be conducted in accordance with the SES and local legislation and regulations, and all necessary permits will be obtained for any proposed interventions that affect the natural or built environment of the communities in which they take place.
Risk 3: Under Standard 1 and Standard 4, project activities such as demonstration projects may be conducted on the territory the Western Tien-Shan UNESCO World Natural Heritage site, which is classified as a protected area as per the UNDP SES.	I = 2 P = 3	Moderate		The project will manage this risk by adhering to the applicable UNDP SES requirements under for Standard 1 and Standard 4, and the Safeguards Expert and the Project Manager will ensure that all guidance related to activities in protected areas is followed by acting in a manner consistent with existing area management plans and involving all relevant stakeholders. Demonstration projects that would compromise any aspect of the Western Tien-Shan World Natural Heritage site will not be considered, per the exclusionary criteria described in the ProDoc, and all potential demonstration project will undergo a required screening with the SESP and the exclusionary criteria as specified in this project document.

<p>Risk 4: Under Standard 1, Standard 3 and Standard 4, monitoring activities may be conducted on the territory the Western Tien-Shan UNESCO World Natural Heritage site, which is classified as a protected area as per the UNDP SES.</p>	<p>I = 2 P = 3</p>	<p>Moderate</p>		<p>The project will manage this risk by adhering to the applicable UNDP SES requirements under for Standard 1 and Standard 4, and the Safeguards Expert and the Project Manager will ensure that all guidance related to activities in protected areas is followed by acting in a manner consistent with existing area management plans and involving all relevant stakeholders.</p>
<p>Risk 5: Under Standard 2, demonstration projects related to sustainable agriculture could be affected by climate change (e.g. changes in temperature and precipitation) in a way that could reduce their productivity.</p>	<p>I = 3 P = 3</p>	<p>Moderate</p>		<p>The project will also mitigate this measure by screening all demonstration projects for potential vulnerability to climate change. All of the proposed projects currently take steps to mitigate threats due to reduced water supply from glaciers; in addition, individual projects will take steps to mitigate other effects of climate change such as changes in temperature and the precipitation regime through measures; e.g. drought-resistant seeds. The project's demonstration projects that promote integrated water resource management measures will directly address reduced water availability.</p>

<p>Risk 6: Under Standard 3, demonstration projects that involve community-level construction projects could theoretically be at risk for infrastructure safety threats and other labour/OHS issues.</p>	<p>I = 2 P = 3</p>	<p>Moderate</p>		<p>Structural elements and services (e.g. transportation) are designed, constructed, operated and decommissioned in accordance with national legal requirements, good international practice, and any relevant international obligations and standards by competent professionals and certified or approved by competent authorities or professionals as per UNDP SES.</p> <p>The Safeguards Expert will monitor the permitting and site supervision process to ensure compliance with the SES and local national regulations and the overarching objective of community safety. Large dams will not be allowed as demonstration projects. The risk management plan in Table 4 of the project document specifies the responsible parties and timeframe for these screening activities.</p>
<p>Risk 7: Under Standard 4, the use of traditional knowledge in sustainable livelihoods activities under the potential demonstration projects could theoretically involve the use of cultural heritage as defined by the UNDP SES in the form of community knowledge and practices).</p>	<p>I = 3 P = 2</p>	<p>Moderate</p>		<p>The project Safeguards Expert will screen all demonstration projects and sites for potential use of indigenous knowledge and practice. In the event that a demonstration project involves these elements, the Safeguards Expert and the demonstration project implementation personnel will not proceed without the meaningful and effective participation of the communities and their free, prior, informed consent to any benefits-sharing arrangements.</p>

Risk 8: Under Standard 6, the project could potentially support climate change adaptation demonstration projects in communities where indigenous peoples (IP) are present.	I = 3 P = 2	Moderate		The project will not support demonstration projects that affect the human rights, lands, natural resources, territories, and traditional livelihoods of IPs in an adverse way. The Safeguards Expert will screen all potential demonstration sites for the presence of IPs as defined by UNDP SES guidance and will take appropriate identification, engagement, monitoring and protective measures as necessary. The project will obtain free prior informed consent (FPIC) for demonstration sites where this is indicated by UNDP SES, and (if indicated) an Indigenous Peoples Plan will be developed and implemented, including the active participation of IPs (see Table 4 in the project document).
Risk 9: Under Standard 7, certain demonstration projects could produce construction waste (e.g. in the case of reservoir construction or renewable energy resource technologies).	I = 3 P = 2	Moderate		The project will mitigate this measure by monitoring the selection, design, and implementation of the demonstration projects using a suitably-qualified Safeguards consultant (see Table 4 in the project document). The consultant will identify potential sources of waste and will suggest a waste management/disposal plan for these projects. All construction or earthworks undertaken in the demonstration projects will be compliant with the SES and local legislation and regulations. Large dams are excluded from use under the project.

<p>Risk 10: The project will support the development of national and regional plans (NAPs and SAP) that could directly or indirectly lead to or perpetuate adverse social and/or environmental impacts (including gender-differentiated impacts), if not designed holistically.</p> <p>(All Principles and Standards potentially relevant)</p>	<p>I = 4</p> <p>P = 1</p>	<p>Moderate</p>	<p>The Safeguards Expert and Specialist will screen the diagnostic analysis in addition to ensuring that the resulting DA fully identifies social and environmental issues that are relevant to policy formulation that is consistent with UNDP SES.</p> <p>The NAPs and SAP will be developed via the application of the Strategic Environmental and Social Assessment (SESA) approach as specified in Outputs 2.1.1 and 2.1.2.</p>	
	QUESTION 4: What is the overall Project risk categorization?			
	Select one (see SESP for guidance)		Comments	
	<i>Low Risk</i>		?	

	<i>Moderate Risk</i>	X	<p>The project does not propose any high-risk activities, but the project is categorized as 'moderate risk' because demonstration projects and their siting have not been finalized. Therefore, it will be necessary to ensure that their implementation is in accordance with the SES and all local legislation regarding afforestation, construction, installation of renewable energy equipment, and waste management and disposal. This responsibility will be carried out by the Safeguards Consultant, who will report directly to the Project Manager.</p> <p>COVID-19: The project design has taken steps to minimize the risks related to the COVID-19 global pandemic in the area of community health (SES 3). While the project will not directly generate risks related to construction or hazardous materials as noted in the screening checklist for SES 3, there is a risk that travel to or from areas where COVID-19 is prevalent could pose a risk to project staff, consultants/contractors, and beneficiaries. The project design includes active steps to mitigate this risk, including training on pandemic-related guidance for project staff and stakeholders during the inception phase, and the expansion of the standard tasks of the NC / Safeguards Specialist to monitor project operations and ensure that they are in conformity with UNDP agency policies regarding travel, risk reduction, and other areas regarding the COVID-19 pandemic. The NC / Safeguards Specialist will report to the Project Manager, who will report on compliance to the Project Board and take any necessary steps to protect the health of staff, consultants/contractors, and beneficiaries required by the situation.</p>
	<i>High Risk</i>	?	

QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are relevant?		
Check all that apply		Comments
<i>Principle 1: Human Rights</i>	X	
<i>Principle 2: Gender Equality and Women's Empowerment</i>	X	The project will ensure that its approach and activities do not discriminate against women or girls or reinforce gender-based discrimination and/or inequalities.
<i>1. Biodiversity Conservation and Natural Resource Management</i>	X	<p>In circumstances where some project activities are located within an internationally recognized area, the project will ensure that the following requirements will apply: (i) act in a manner consistent with any existing protected area management plans; (ii) consult protected area sponsors and managers, local communities, and other key stakeholders on the proposed activities; (iii) implement additional programmes, as appropriate, to promote and enhance the conservation aims and effective management of the area.</p> <p>For activities that affect water resources, the project will promote an integrated water resources management approach that seeks the coordinated development and management of water, land and related resources in order to maximize the economic and social welfare in an equitable manner and without compromising the sustainability of ecosystems. The project will avoid significantly altering flow regimes in ways that prevent water resources from fulfilling their functions for upstream and downstream ecosystems and their services to local communities. Environmental flow analysis and management shall be carried out to the extent feasible in the context of river basin planning.</p>

	2. Climate Change Mitigation and Adaptation	X	<p>The project will ensure that proposed activities are screened and assessed for climate change-related risks and impacts of and to Projects.</p> <p>The climate change risk assessments conducted in the course of the diagnostic analysis and the demonstration project finalization will examine the viability or longer-term sustainability of project outcomes due to potential climate change. This will involve the identification of components that are sensitive or vulnerable to emerging or anticipated manifestations of climate change.</p>
	3. Community Health, Safety and Working Conditions	X	Infrastructure safety: Structural elements of demonstration projects and monitoring activities will be designed and constructed by competent professionals and certified or approved by competent authorities or professionals.
	4. Cultural Heritage	X	If demonstration projects related to traditional knowledge and practices are implemented, the project will promote the equitable sharing of benefits from their use. proposes to utilize Cultural Heritage, including the knowledge, innovations, or practices of local communities, affected communities will be informed of their rights under Applicable Law, the scope and nature of the proposed development, and the potential consequences of such development. The project will not proceed without meaningful, effective participation of affected communities and unless (i) good faith negotiations with affected communities result in a documented outcome, and (ii) the project provides for fair and equitable sharing of benefits from any commercialization of such knowledge, innovation, or practice, consistent with the affected community's customs and traditions.
	5. Displacement and Resettlement	X	

	6. Indigenous Peoples	X	<p>Any and all relevant demonstration projects shall recognize and foster full respect for indigenous peoples' human rights as recognized under Applicable Law, including but not limited to their rights to self-determination, their lands, resources and territories, traditional livelihoods and cultures.</p> <p>Any and all relevant demonstration projects will guarantee the meaningful, effective and informed participation of indigenous peoples on all matters. Culturally appropriate consultation will be carried out with the objective of achieving agreement and free, prior, and informed consent will be ensured on any matters that may affect the rights and interests, lands, resources, territories (whether titled or untitled to the people in question) and traditional livelihoods of the indigenous peoples concerned.</p>
	7. Pollution Prevention and Resource Efficiency	X	<p>The project will avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from Project activities. The project approach and activities will promote more sustainable use of resources, including energy, land and water.</p> <p>Where waste generation from activities related to construction, equipment installation, and / or earthworks cannot be avoided, the project will reduce the generation of waste, and recover and reuse waste in a manner that is safe for human health and the environment. Where waste cannot be recovered or reused, it will be treated, destroyed, or disposed of in an environmentally sound manner that includes the appropriate control of emissions and residues resulting from the handling and processing of the waste material.</p>

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
PIMS 5516 Annex 8 - SESP final	CEO Endorsement ESS	

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

The project results framework is provided in Section V. of the accompanying project document.

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

There were no comments from the STAP reviewer (STAP overall assessment: concur). The tables below provide responses to comments from the GEF Secretariat and Council members at work program inclusion.

Table B1: Response to GEF Secretariat Comments at PIF/Work Program Inclusion

Comments	Response
At the time of CEO endorsement submission stage, please further expand the baseline section and elaborate on potential synergies to initiatives such as the UN Special Programme for the Aral Sea.	The baseline (II.1a.) has been expanded to describe potential synergies with the UN Special Programme for the Aral Sea and other initiatives.
It is expected that the project will work towards increasing co-finance from other sources during either PPG. Further, during PPG the project should aim to increase co-finance in connection with the development of pilot activities.	The project has increased its co-financing from other sources during the PPG by 234% compared to what was indicated at the PIF stage. Government in-kind co-financing will support pilot monitoring activities and the finalization and development of the community-level demonstration projects.
As part of the CEO endorsement package, please provide a letter of support from the relevant IFAS donor coordinating bodies, which shows that the regional organization is fully onboard and will be coordinated with as part of project implementation.	This point has been discussed with the GEF Secretariat. The project will work with IFAS and its donors, but a letter of support has not been sought as the Executive Committee does not currently have representation from all participating project countries.
The role of the private sector will be further clarified during PPG.	The role of the private sector is now described in Section II.4 of this document and in Section IV of the accompanying project document.
The consistency with national strategies section should be expanded by the time of CEO endorsement.	This section has been expanded and is provided in Section II.7 of this document and Section II of the accompanying project document.

Table B2: Response to GEF Council Comments at Work Program Inclusion

Source of Council Comments	Comments	Response

Canada	<p>The Project Identification Form (PIF) makes no mention of how this project will contribute to the achievement of the Aichi Biodiversity targets. This is an area where additional consideration or information might be beneficial especially as the PIF does note that the project is consistent with the national biodiversity strategies of the participating countries.</p>	<p>The project aligns with two key aspects of the CBD (and Aichi Target 11): promoting the protection of ecosystems and promoting sustainable development in areas adjacent to protected areas. Demonstration projects may also support progress under Target 7 (Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity) and Target 14 (Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods, and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable).</p> <p>This information above is now included in Section 7 of this document and in Section II (p. 11) of the accompanying UNDP project document.</p> <p>In October 2019, a regional partnership for Eastern Europe and Central Asia for reporting on Target 11 was launched in Bishkek, Krygyzstan by the Russian Federation and the five Central Asian countries participating in this project. This project will maintain communication with the regional partnership through representatives from the national ministries of environment and the UNESCO Man and Biosphere program in the region.</p>
United States of America[1]	<p>We are concerned about a lack of substance in terms of fleshing out this program's activities ? and as such, wonder whether the ?potential results? are realistic?</p>	<p>Project activities are now detailed in Section II.1a. of this document and Section IV. of the accompanying project document.</p> <p>The diagnostic assessments, promotion of regional cooperation through the NAPs and SAP and their respective mechanism, capacity strengthening in cryospheric monitoring and community-level water management, and awareness raising and education with the support of the IW:LEARN global portal. These steps are both tangible and necessary, and they represent proven good practice in the area of international waters.</p> <p>In addition, the project draws upon experiences with regional cooperation on glaciers and water resources. One of these is the UNESCO project ?The Impact of Glacier Retreat in the Andes,? which involved seven countries. That project produced a Andean Glacier and Water Atlas, which provides clear adaptation pathways underpinned by scientific findings obtained from the project's information and analysis.</p> <p>Information on how the project has drawn upon lessons learned is provided in Section III. of the accompanying project document.</p>
	<p>In a project to study the glacial systems of the Tien Shen and Pamir Mountains, why are Uzbekistan and the Kyrgyz Republic not included?</p>	<p>Uzbekistan and Krygyzstan are now included in the project as participating countries.</p>

Can GEF provide more clarity on the two-thirds of the funding that is coming from in-kind contributions from partners? We note that ?Investment Mobilized? will be clarified during the PPG phase ? how confident is GEF that the partner funds will materialize (and are there any updates to this)?	A detailed overview and description of financial contributions from partners is provided in the accompanying UNDP project document Section VIII (Financial Planning and Management). An overview of the distribution of co-financing over the project life cycle is provide in the Summary of Funds table in Section IX (Total Budget and Workplan). Letters confirming co-financing from all partners have been provided to the GEF Secretariat via the submission portal.
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[1] Comments from the United States were provided prior to the Council meeting. An initial agency response was provided and can be found in the list of documents specific to the project in the GEF Portal.

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

PPG Grant Approved at PIF: USD 200,000			
<i>Project Preparation Activities Implemented</i>	<i>GETF/LDCF/SCCF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent To date</i>	<i>Amount Committed</i>
Component A. Preparatory Technical Studies and Reviews	79,000.11	73,914.45	5,085.66
Component B. Formulation of the UNDP-GEF Project Document, CEO Endorsement Request, and Mandatory and Project Specific Annexes	55,583.06	33,397.95	22,185.11
Component C. Validation Workshop and Report	65,416.83	23,511.80	41,905.03
Total	200,000.00	130,824.20	69,175.80

ANNEX D: Project Map(s) and Coordinates

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



ANNEX E: Project Budget Table

Please attach a project budget table.

Expenditure Category	Detailed Description	Component (USDeq.)								Total (USDeq.)	Responsible Entity [Executing Entity receiving funds from the GEF Agency][1]
		Component 1	Component 2	Component 3	Component 4	Component 5	Sub-Total	M&E	PMC		
		Sub-component 1.1	Sub-component 2.1	Sub-component 3.1	Sub-component 4.1	Sub-component 5.1					
Furniture/Equipment	Database Hardware and Software for the regional database and international reporting (1.2.1).	160,000					160,000			160,000	UNESCO
Furniture/Equipment	Hardware and software for project website and contributing NCs					2,352	2,352			2,352	UNESCO
Contractual Services – Individual	Individual Contracts for Production of the DA (1.1.1) and supporting reports (1.2.2, 1.2.4); Service Contracts / Country Coordinators @ 282/week (all outputs)	96,373					96,373			96,373	UNESCO
Contractual Services – Individual	NAP and SAP production and support for review process (2.1.1, 2.1.2); Service contracts / Country Coordinators @ 282/week for NAPs (2.1.1) and SAP.		130,000				130,000			130,000	UNESCO
Contractual Services – Individual	Service Contract / SE&C Specialist for Output 4.2. @ USD 452/week; Service Contracts / Country Coordinators @ 282/week for NAPs for 4.1 and SAP.				143,258		143,258			143,258	UNESCO
Contractual Services – Individual	Service Contract for Communications/Stakeholder Engagement Specialist for 5.1.1 and 5.1.2 @ USD 452/week. Service Contracts / Country Coordinators for 5.1.1 and 5.1.2.					68,000	68,000			68,000	UNESCO
Contractual Services – Individual	Service Contracts for Project/Programme Assistant (@ USD 315/week) and Project Financial Assistant (@USD 307/week).								95,284	95,284	UNESCO
Contractual Services – Company	Contracts for design/administration of regional database and reporting and for scenarios (1.2.1 and 1.2.3); Implementation Partners Agreement with University of Fribourg (UNIFR).	133,000					133,000			133,000	UNESCO
Contractual Services – Company	Institutional contracts with key glacier institutions for organizational development (2.2.3); Implementation Partners Agreement with UNIFR.		298,000				298,000			298,000	UNESCO

Contractual Services – Company	Contracts to institutions for harmonized cryosphere monitoring and inst. Strengthening. Implementation Partners Agreement with UNIFR.			1,079,000			1,079,000			1,079,000	UNESCO
Contractual Services – Company	Contract for management of demonstration projects (Y1-4); contracts for scaling up (Y4); Implementation Partners Agreement with UNIFR.				2,200,000		2,200,000			2,200,000	UNESCO
Contractual Services – Company	Company contract for development and maintenance of project website. Implementation Partners Agreement with UNIFR.					148,500	148,500			148,500	UNESCO
International Consultants	Chief Technical Adviser/Project Manager (CTA/PM) (90 weeks @ USD 3500/week) (Project Appointment P-3).	361,173					361,173			361,173	UNESCO
International Consultants	CTA/PM (Project Appointment P-3) 31 weeks @ 3500/week for NAP, SAP, and inst. capacity oversight (All outputs).		117,000				117,000			117,000	UNESCO
International Consultants	CTA/PM (Project Appointment P-3) 35 weeks @ 3500/week – oversee institutional cap assessment and cap strengthening.			131,100			131,100			131,100	UNESCO
International Consultants	CTA/PM (Project Appointment P-3) 12 weeks @ 3500/week – technical advice for Outputs 4.1 and 4.2).				66,742		66,742			66,742	UNESCO
International Consultants	CTA/PM (Project Appointment P-3) 1 week @ 3500/week – technical advice for Outputs 5.1.1 and 5.1.2.					4,700	4,700			4,700	UNESCO
International Consultants	IC/Gender, IC/Safeguards (Inception Report), IC/Evaluator for Mid-Term Review (lump sum), IC/Evaluator for Terminal Evaluation (lump sum).							71,000		71,000	UNESCO
International Consultants	CTA/PM (Project Appointment P-3) 39 weeks @ USD 3500/week @ 20% time.								145,606	145,606	UNESCO
Local Consultants	NC – oversee capacity strengthening			58,900			58,900			58,900	UNESCO
Local Consultants	NC/Evaluator for Mid-Term Review (lump sum), NC/Evaluator for Terminal Evaluation (lump sum), NC Gender Specialist, NC Stakeholder Engagement and Communications Specialist, NC Safeguards Specialist.						-	59,000		59,000	UNESCO

Trainings, Workshops, Meetings	Expert meetings to prepare synthesis report, topical reports (gender, policy) and validation of DA and database/reporting protocols (All outputs).	30,000					30,000			30,000	UNESCO
Trainings, Workshops, Meetings	Partnership conference (2.2.1) and inter-ministerial committee meetings (2.2.2)		220,000				220,000			220,000	UNESCO
Trainings, Workshops, Meetings	Participation in international conferences (and expeditions) and training in monitoring techniques			10,000			10,000			10,000	UNESCO
Trainings, Workshops, Meetings	Stakeholder involvement workshops and briefings; community conferences; participation at IW:LEARN events, UNFCCC COP side events, regional/intl. water meetings					59,220	59,220			59,220	UNESCO
Trainings, Workshops, Meetings	Project Inception Meeting (Y1).							29,780		29,780	UNESCO
Travel	Travel related to meetings and the partnership conference (2.2.3, 2.2.2, respectively)		15,546				15,546			15,546	UNESCO
Travel	Travel for south-south exchanges, exchanges within the region			71,946			71,946			71,946	UNESCO
Travel	Travel for NCs and PM to project sites				38,000		38,000			38,000	UNESCO
Travel	Travel for PM, IC and NCs to project sites and meetings as needed.					37,300	37,300			37,300	UNESCO
Travel	Travel to support M&E, including data collection for project results framework by Country Coordinators and travel of evaluators and those providing monitoring (gender, safeguards, community involvement).							20,000		20,000	UNESCO
Office Supplies	Miscellaneous			2,000			2,000			2,000	UNESCO
Office Supplies	Miscellaneous expenses				2,914.00		2,914			2,914	UNESCO
Other Operating Costs	Miscellaneous expenses: Project reports and series of short films or film for local and intl. audience					27,000	27,000			27,000	UNESCO
Other Operating Costs	Inception Report, Lessons Learned, MTR and TE Key Findings Publications.						-	6,000		6,000	UNESCO
Other Operating Costs	Office space for PMU.								54,000	54,000	UNESCO
Grand Total		780,546	780,546	1,352,946	2,450,914	347,072	5,712,024	185,780	294,890	6,192,694	
		780,546.00	780,546.00	1,352,946.00	2,450,914.00	347,072.00		185,780.00	294,890.00	6,192,694.00	

ANNEX F: (For NGI only) Termsheet

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

ANNEX G: (For NGI only) Reflows

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agency is required to quantify any expected financial return/gains/interests earned on non-grant

instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

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

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