

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

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

GEF Focal Area

International Waters

Taxonomy

Focal Areas, International Waters, Freshwater, River Basin, Transboundary Diagnostic Analysis, Influencing models, Strengthen institutional capacity and decision-making, Demonstrate innovative approaches, Convene multi-stakeholder alliances, Transform policy and regulatory environments, Stakeholders, Beneficiaries, Type of Engagement, Partnership, Information Dissemination, Consultation, Gender Equality, Gender Mainstreaming, Women groups, Capacity, Knowledge and Research, Learning, Adaptive management, Capacity Development, Innovation, Climate Finance (Rio Markers), Climate Change Mitigation 0, Climate Change Adaptation 1

Duration

4

In Months

Agency Fee(\$)

588,306

Submission Date

11/19/2018

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
IW-3_P5	GET	3,981,018	7,000,000

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
IW-3_P6	GET	2,211,676	5,900,000
	Total Project Cost (\$)	6,192,694	12,900,000

B. Indicative Project description summary

Project Objective

To strengthen the adaptation capacity of Central Asian countries to climate change impacts on glacio-nival systems through assessment, promotion of regional cooperation, and stakeholder engagement.¹

Footnote: Kyrgyzstan may join the project during the PPG and Uzbekistan is finalizing internal approval process of the PIF and is expected to join the project during the PPG

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 1: Consolidating common knowledge in an integrated glacio-nival systems and permafrost information database in CA countries	Technical Assistance	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	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 facing the glaciers	GET	780,546	1,550,000

¹ Kyrgyzstan may join the project during the PPG and Uzbekistan is finalizing internal approval process of the PIF and is expected to join the project during the PPG

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
		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	2.1 A consolidated national and regional catalogue on the status and changes of glacio-nival systems of CA 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			

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
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2.3 Scenarios of glacio-nival and permafrost changes in response to climate change in glacier systems of each country in Central Asia

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.

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 2: Building the foundation for regional cooperation on glacio-nival systems and permafrost of Central Asian Counties	Technical Assistance	Outcome 3: : Based on enriched knowledge countries agree on national plans and regional strategic action programme - SAP	3.1 Preparation and adoption of National Action Plans for each of the participating countries 3.2 Strategic Action Program agreed between countries and signed on ministerial level. 4.1 Partnership Conference conducted in alignment with SAP investment priorities.	GET	780,546	2,700,000
		Outcome 4: Multi-country agreement on implementation mechanism for the SAP	4.2 Functional national inter-ministerial committees established in each of the			

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
			participating countries, or existing national mechanisms strengthened			
			4.3 Facilitate the establishment of and reinforce the National and Regional Glacial Centers			
			4.4 Establishment and support of the national and regional stakeholder's forums.			
			4.5 Tailored training programmes at the national level			
Component 3 Strengthening the capacity of Central Asian	Technical Assistance	Outcome 5: Consensus on the monitoring programme of	5.1 Regional agreement on glacier monitoring	GET	1,352,946	3,250,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
countries to monitor the glacio-nival systems and permafrost		the glacio-nival systems and permafrost in Central Asia countries	programme and adoption of common harmonized monitoring protocols. 5.2 National monitoring programme of glacio-nival systems and permafrost in Central Asia 6.1 Regional network of national institutions competent in the assessment of climate change impacts on the cryosphere			
		Outcome 6 Countries capacities built for improved monitoring				
Component 4: Demonstration projects to introduce technologies and best	Technical Assistance	Outcome 7: Demonstration and testing of innovative technologies and best	7.1 Replicable demonstration projects in each of the CA countries	GET	2,450,914	4,500,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
practices for integrated management in glacio-nival systems, and for climate change adaptation		practices for integrated management in the glacio-nival systems with an objective to preserve mountain ecosystems				
Component 5: Awareness raising of stakeholders, development of a knowledge platform	Technical Assistance	<p>Outcome 8: Project experiences and lessons disseminated regionally and globally</p> <p>Outcome 9: Increased local and international awareness of the economic and social costs of high altitude glaciers retreat</p>	<p>8.1 Information, Communication, and Outreach Strategy</p> <p>9.1 Stakeholder involvement and Public Participation Strategy</p>	GET	532,852	900,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
		Outcome 10: South-south knowledge exchanges and scientific cooperation among high altitude glacier basins	10.1 Knowledge sharing through twining programmes			
		Outcome 11: Adaptive management measure developed	11.1 Project monitoring to inform adaptive management for successfully delivery of project results. 11.2 Project knowledge captured and disseminated through Internet-based platform and website, including sharing experiences through IW			

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
		Outcome 12: Selection of national institutions for conducting capacity-building activities in partnership with stakeholders at the local level	LEARN, IWC's and COPs 12.1 Stakeholders engaged in training programmes at local level			
Sub Total (\$)					5,897,804	12,900,000
Project Management Cost (PMC)				GET	294,890	0
Total Project Cost (\$)					6,192,694	12,900,000

For multi-trust fund projects, provide the total amount of PMC in Table B and indicate the list of PMC among the different trust funds here:

C. Indicative 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(\$)
Government	Government of Kazakhstan	In-kind	Investment mobilized	1,500,000
Government	Government of Tajikistan	In-kind	Investment mobilized	1,250,000
Government	Government of Turkmenistan	In-kind	Investment mobilized	500,000
Others	UNESCO	In-kind	Investment mobilized	700,000
GEF Agency	UNDP	In-kind	Investment mobilized	300,000
Donor Agency	TBD	In-kind	Investment mobilized	5,400,000
Government	Government of Kazakhstan	In-kind	Recurrent expenditures	1,500,000
Government	Government of Tajikistan	In-kind	Recurrent expenditures	1,250,000
Government	Government of Turkmenistan	In-kind	Recurrent expenditures	500,000
			Total Project Cost(\$)	12,900,000

Describe how any "Investment Mobilized" was identified

TO BE CLARIFIED DURING THE PPG

D. Indicative 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		6,192,694	588,306
Total Project Cost(\$)					6,192,694	588,306

E. Project Preparation Grant (PPG)

PPG Amount (\$)
200,000

PPG Agency Fee (\$)
19,000

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

Core Indicators

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

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

	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) [e](#)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Amu Darya	1			
Illi River	1			
Syr Darya	1			

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) [e](#)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Amu Darya	1			
Illi River	1			
Syr Darya	1			

Indicator 7.3 Level of National/Local reforms and active participation of Inter-Ministerial Committees (IMC, scale 1 to 4; See Guidance) [e](#)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Illi River	1			
Amu Darya	1			
Syr Darya	1			

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

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Amu Darya	1			
Illi River	1			
Syr Darya	1			

Part II. Project Justification

1a. Project Description

- a. The global environmental and/or adaptation problems, root causes and barriers that need to be addressed;
- b. The baseline scenario or any associated baseline Programs;
- c. The proposed alternative scenario with a brief description of expected outcomes and components of the Program;
- d. Alignment with GEF Focal Area and/or Impact Program Strategies
- e. Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, CBIT and co-financing;
- f. Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and
- g. Innovation, sustainability and potential for scaling up.

1.1 Global environmental problems, root causes and barriers that need to be addressed

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. The competing demands for water resources, between sectors are expected to grow, including from glaciers, while resources are becoming scarcer.

Melting glaciers will have widespread consequences for priority 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 hydrologic systems, of which glaciers are a component. There may be too much water in the form of floods, 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. Glaciers of Central Asia also followed worldwide pattern with 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 between 20 to 30% in volume . 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 the basin. Thus, for example, as a consequence of this process, continued glacier shrinkage will eventually transform glacio–nival runoff regimes in the Tien Shan into nival–pluvial regimes, with a much larger year-to-year variability in water yields. Such an alteration in runoff may not only intensify ecological problems such as the drying of the Aral Sea, but may also add to political instability in Central Asia. It is important to note that the water yield from glacierized basins has increased due to the reduction of ice storage. Under present-day condition, flood hazard is at a high level, and will stay high, as storm events are likely to increase intensity in the future. With continued global warming, the glaciers will eventually disappear. Water yield will be reduced drastically in dry summers.

The project will focus on the Tien Shan and Pamir mountain range in Kazakhstan, Tajikistan, Turkmenistan. The mountain range covers 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 of glacial –nival and permafrost systems of participating countries to formulate national and regional adaptation strategies. Therefore, strengthening regional cooperation, collaborating with local scientists and institutions, and enhancing knowledge sharing and dialogue are envisaged within the proposed project. Glacier monitoring enhances the resilience of the populations that depend on natural resources from glacierized regions or that are affected by hazards related to glacier 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 drainages of the Aral Sea are heavily dependent on the melting of snow and ice from their headwaters. The total glaciers area, comprising of two glacier systems (Pamir, Tien Shan), together with river basins that these glacier systems provide water to (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). The biggest glaciers are located in the Pamir Mountains in Tajikistan . In the Amu Darya River, glacial melt is an important contributor to the entire flow, especially in the 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 the total flow is generated by glacial melt, while for the upstream Syr Darya this figure is just over 10%.

In order to address those issues, it is necessary to develop a platform where the national level glacial and permafrost systems in each of the participating countries, could share their knowledge and experience and provide scientific feedback mechanisms to formulate national and regional adaptation strategies for glaciers degradation

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

- Various governance issues are contributing to current vulnerabilities which glacier melt impacts may exacerbate. There is a strong need to build capacities in the areas of scientific cooperation, national and regional institutions, and environmental laws and their implementation.
- The urbanization of much of Central Asia has led to construction of buildings and roads on the unstable slopes of foothills around the alluvial fans. The potential riskiness of this situation has magnified over the past century due to increased population, and the increasing number of glacial lakes that have developed due to glacier retreat. 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 ice storage. Under present- day conditions, flood hazard is at a high level, and will stay high, as storm events are likely to increase intensity in the future. With continued global warming, the glaciers will eventually disappear. Water yield will be reduced drastically in dry summers.
- An arid climate, combined with a history of weak environmental management and limited climate change - adaptation policies, have created a region that is increasingly vulnerable to the effects of rising temperatures, changing rainfall patterns, and increased aridity and frequency of extreme events.

Barriers to be removed include the following:

- The lack of modern data, and the presence of incorrect and old data, makes accurate estimates on deglaciation extremely challenging. In effect, although many data were acquired in Central Asia during the Soviet Union period, the World Glacier Monitoring Service reports that unfortunately, 90 percent of the observation series were discontinued before 1991 and only about a dozen series have reported information in the 21st century. The distribution of mass balance series in space and time shows a similar pattern: just 6 out of 35 series consist of more than 15 years of observation. After the collapse of the Soviet Union and the related economic decline of the region, the national hydrometeorological services were unable to ensure continued monitoring activity at many high mountain stations 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. It is therefore essential to remember that many data are disputed, controversial, or indeed unknown at the present time, although actions are being taken to improve the state of the knowledge base in Central Asia.

- The lack of effective regional cooperation mechanisms makes water disputes a standard feature of Central Asian politics. The upstream and glaciated countries have no hydrocarbon resources but ample water resources and hydropower potential—the opposite is true of downstream countries. Although these resources could be exchanged, withholding on both sides has taken place. This situation has been in place since the break-up of the Soviet Union and is vulnerable to changes in water availability. Glacier melt is of concern to all and each country, with its implications for short- and long-term water supply.
- The existing network or its lack in some countries of regular glacier monitoring in Central Asia is not adequate to assess changes in glaciation and their possible influence on regional water resources. It is desirable to create a national and region wide network amongst the countries of the Central Asia to apply and standardize monitoring methods and to create regional catalogue and information systems.
- Without external support to sustainably ensure domestic and regional capacity to address glaciers melting there is a high probability that realization of intersectoral water resource management in the glacio-nival systems Central Asia region 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.
- Insufficient expertise and investment in capacity building to meet many specific needs and conditions across the Central Asia region and within the participating countries at the local, national and regional levels results in the lack of ability to prioritize glacio-nival water resource management across the region.

1. 2. Baseline scenario or any associated baseline projects

The project will build on a "baseline" represented by 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. 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 the 500 kV, 220 kV and other lower voltage networks. Agreements for cooperation in the areas of environment, rational use of natural resources 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 (The Executive Committee of the International Fund for saving the Aral Sea, Central Asian Institute for Applied Geosciences - CAIAG, BIOM, and Institute of Geography, Ministry of Education and Science in Kazakhstan, etc.).

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

The United Nations Regional Center for Preventive Diplomacy in Central Asia (UNRCCA) has been 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 is one of its priority areas of operation. It is considered that with the break-up of the Soviet Union the utilization of trans-boundary water resources has become a source of tensions between countries due to differences in approach and, in some cases, opposite 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, among other, 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 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 current GEF project. The analysis also covered the necessity and potential for synergies between national and regional institutions working on glaciers in the region.

Linkage will be 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), Cryosphere Climate Services for improved ADaptation (CICADA) and Contribution to High Asia Runoff from Ice and Snow (CHARIS). In addition, synergies will be established with other projects from UNESCO, UNDP and UNECE which are presented in detail in section “5. Coordination” of this document.

1.3. Proposed alternative scenario, with a brief description of expected outcomes and components of the project

There is a need for long-term improvements in understanding of the glacio-nival, permafrost systems in the countries of Central Asia as problems associated with both quality and quantity of water become more acute, and the potential negative impacts of accelerated glacier melt become a reality. Melting glaciers will also have widespread consequences for priority mountain and lowland ecosystems of global relevance for biodiversity and ecosystem services. To manage this issue, there is a need to address the issue of regional cooperation in building the capacity for the analysis of glaciers’ dynamics, including forecasting responses to climate change.

In order to assess the situation, a network amongst the countries of Central Asia to monitor glacier mass balance and dynamics is crucial for the accurate estimation of glacier response to climate change and other drivers and its associated impact on the environment and water resources.

The principal objective of the project:

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.

Component 1: Consolidating common knowledge in an integrated glacio-nival systems and permafrost information database in participating CA countries

Joint fact finding and exchange of information between the participating countries (Kazakhstan, Tajikstan and Turkmenistan) in the project will facilitate achievement of science -based consensus among the countries on key problems pertaining to high altitude glacio-nival systems and permafrost (Outcome 1). It will be concentrated on improving the knowledge base of the glaciers' dynamics, impacted, among others, by expected implications of climate change, and ensuring the understanding of the impacts these changes will make on glacio-nival systems and permafrost (Outcome 2). Major outputs of the Component 1 will be the following :

- i. Diagnostic Analysis (DA): A fully-fledged DA identifying root and immediate causes of the challenges facing the glaciers of the extended high altitude glacio-nival systems in the participating Central Asian countries, based on the Situation Analysis, and integrating consideration of the results of projects previously implemented in the region. The main technical role of a 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 support of international experts, in consultation with and approval by the 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. The scenarios will be developed considering the identified drivers of change, by national and international experts and will include extensive stakeholders' consultations. Its results are meant to integrate the TDA and support the development of national plans and strategic action programme (SAP).
- ii. Creating and updating national and regional catalogue of the status and changes of glacio-nival systems originating from the glaciers of Central Asia, vulnerabilities and risks, and socioeconomic conditions with associated land use changes as a result of climate change. It will embed a detailed GIS- based inventory database of glaciers on the basis of current field and remote sensing data (using aero- photography and high-resolution satellite imagery), and data on past glacio-nival systems change.
- iii. Synthesis research results underpinned by national monitoring of environmental and non-environmental vulnerability factors of glacio-nival systems and permafrost impacted by climate change, will help identify key determinants of vulnerability and adaptive capacity.
- iv. Forecasting of glacio-nival and permafrost changes in response to climate change in glacier systems of Central Asia

- v. Preparation of comprehensive glacio-nival governance analysis to inform SAP process.

Component 2: Building the foundation for regional cooperation on glacio-nival systems and permafrost of Central Asian Countries

Visioning process and agreement on priorities for action opens the way for systematic cooperation in relation to high altitude glacio-nival systems and permafrost in Central Asian countries that will result in a preparation of national action plans and endorsement of the regional action programme (SAP) (Outcome 3). This effort will strengthen regional collaborative mechanisms that will further contribute to the development of mechanisms for the implementation of national action plans and SAP. (Outcome 4). Major outputs of the Component 2 will be the following:

- i. Preparation and adoption of National Action Plans

- ii. Development of Strategic Action Programme (SAP): The SAP is a negotiated policy document that should be endorsed at the highest level of all countries. It establishes clear priorities for action (for example, policy, legal, institutional reforms, or investments) to resolve the priority problems identified in the DA. Development of the implementation mechanisms of SAP is a shared effort. The preparation of a SAP should be a highly cooperative and collaborative process among all the countries of the region. The strategic component of the SAP process has 2 key phases: Strategic Thinking (defining vision, goals, opportunities and options); and Strategic Planning (defining strategy for implementation, action planning, and implementation). A key element of the SAP is a well-defined baseline. This contributes to and enables a clear distinction between actions with purely national benefits and those addressing common concerns with global benefits. Another key element involves the development of institutional mechanisms at the regional and national levels for implementing the SAP and monitoring and evaluation procedures to measure effectiveness of the outcomes of the process. Which shall include National Inter- Ministerial Committees of relevant sectors (water, environment, energy, agriculture, spatial planning, treasury) tasked with coordinating country action across key sectors with a stake in glacio-nival systems. Furthermore, a partnership Conference will consolidate international support for the implementation of the priority actions identified in the SAP.

- iii. Promote and facilitate the establishment and strengthening of National and Regional Glaciers Center:

The center was endorsed by the 36th 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. The International Hydrological Programme (IHP) plays a key role, as a platform for scientific networking and cooperation, to contribute to assessing and monitoring changes in snow, glaciers and water resources. The Centre should be fully operational by the time the project is terminated.

iv. Stakeholders Forum: The aim of this Forum is to provide a space for major interest groups, civil society and other stakeholders to receive briefings on the issue of high altitude glaciers management context and to secure broader stakeholder participation in and buy-in to the NAPs and SAP. The outcome of the Forum would be to inform the decision makers and wide range of positions taken on NAPs and SAP. The practical operation of the Forum will take a number of forms, ranging from conferences, workshops, internet based tools, etc.

v. Tailored national training programmes: Implementation of training programmes, targeting managers, professionals practitioners, relevant officers and local authorities' staff, civil society, private sector, farmers, etc. that may include: (a) integrated basin planning and management in accordance with WFD, (b) practices of transboundary water cooperation as guided by the UNECE Water Convention, (c) Early Warning systems (d) flood forecasting and management, (e) Monitoring of glacio-nival system using earth observatories such as remote sensing (i) environmental monitoring system design and management, (j) enforcement of water quality, water abstractions, recharge area protection and biodiversity regulations, (k) scenario building, (l) surface water and groundwater management.

Component 3: Strengthening the capacity in Central Asian countries to monitor the glacio-nival systems and permafrost

This component will result in a coherent and coordinated monitoring programmes positioned in all countries of the region. The activities of the component will result in building consensus on the monitoring programme of the glacio-nival systems and permafrost (Outcome 5) and the improvement of the countries' capacity in advanced monitoring (Outcome 6). Main outputs of this component will be the following:

i. Preparation of a coordinated agreement on national and regional glaciers monitoring programme: The programme will develop better monitoring rate of glacier degradation and their current status, which are essential steps to minimizing the negative effects of the degradation through better planning and management. The countries will also adopt common harmonized monitoring protocols. During PPG implementation, based on the needs analysis conducted in each country, UNESCO will identify project partners to finance the procurement of special monitoring equipment for the participating CA countries, including automated glacier monitoring stations, boreholes, etc.

ii. Regional network of laboratories: These institutions will be competent in the monitoring, assessment and forecasting of climate change impacts on the glacio-nival systems. Local staff will be trained to monitor, model and forecast high altitude glacier changes and to mitigate related hazards. The project will upgrade the current infrastructure in the countries and build on infrastructure financed by bilateral and multilateral donors active in the region.

Component 4: Demonstration projects to introduce technologies and best practices for integrated management in glacio-nival systems, and for climate change adaptation

Cooperation on the assessment of glacio-nival systems and permafrost in Central Asian countries will be strengthened by piloting new technologies and sound approaches fitting local ecosystems for the region. A number of pilot projects will be selected depending on co-financing that will be sought through external partners during the project implementation. Testing of innovative technologies to assess the status and changes in the glacial-nival systems with an objective to preserve mountain ecosystems (Outcome 7). The assessment will provide basis to develop strategy and interventions for glacial management in situ. The pilots will showcase glacial management strategy in ground which will be developed based on state of art of glacio-nival and permafrost monitoring system, successfully developed in other alpine regions. Application methodology of such glacial management strategy 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). GLAMOS is one of the world's oldest glacier measurement networks and makes an important contribution to the Global Climate Observing System (GCOS). Knowledge sharing platform will be established and feedbacks obtained from best practices including from Andean and Himalayan regions will be incorporated to formulate strategies for demonstration and testing of innovative technologies for the Central Asian region.

Major outputs of this Component are:

Pilot demonstration projects on risk reduction and adaptation to climate change for glacio-nival systems: The pilot demonstrations will be fully designed during the PPG with associated work plan and budget and final agreement among the countries will be reached during the project inception. Selection criteria will be developed and approved by the project Steering Committee and will take into account country baseline and co-financing commitments, innovation, scientific evidence, GEF7 strategy, as well as co-funding and contribution to demonstrating integrated management of the CA glaciers.

Component 5: Awareness rising of stakeholders, development of a knowledge platform

This component aims at building the support to the project's implementation with a view of increasing its chances for success. The outcomes 8 to 12 will target dissemination of lessons learned (8), local and international awareness on the cost of glaciers retreat (9), South - South cooperation (10) and increasing the capacity of local stakeholders (11). Major outputs of this component are:

- i. Information, Communication, and Outreach Strategy. The entire project will be participatory and 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 the 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.
- ii. Stakeholder Involvement, training and Public Participation Strategy and Stakeholders Training Programmes: 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.
- iii. Twinning programmes: Collaboration with similar programmes and projects will be sought in other Asian regions as well as in Latin America and Europe
- iv. Project monitoring to inform adaptive management for successfully delivery of project results.
- v. Project knowledge captured and disseminated through Internet-based platform and website, including sharing experiences through IW LEARN, IWC's and COPs - Participation in IW LEARN activities will be systematic in terms of contributing to the freshwater COPs, sharing lessons learnt (at least 2 Experience Notes), attendance to, and organization of webinars, participation to the IWCs. A project website, according 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 a range of tools such as project's management team working space, information database, interactive maps, forum discussions etc. It is foreseen that a 1% of the project budget (GEF requirement) will be destined to IW LEARN related activities.
- vi. Stakeholders engaged in training programmes at local level

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

The project will be considered as “freshwater foundational”, directly contributing to the Objective 3 of the new GEF7 Strategy “Enhance regional and national cooperation on shared freshwater surface and groundwater basins”.

1.5. Incremental cost reasoning and expected contributions from the baseline, the GEFTF and co-financing

In order to accrue the above global benefits, the proposed project, thanks to the incremental GEF funding and to the expected large co-financing from countries and donors, will expand the ongoing baseline work (see section 1.2.) of UNDP and UNESCO in promoting international cooperation on water issues in Central Asia, to allow countries to move to the next and higher level of actual implementation and testing on the ground of integrated water management options. These benefits, as established in the “International Waters” Focal Area Strategy, will be accrued by facilitating a broader and more effective collective multi-country management scheme that will embrace the river basins of the region in their entirety and foster the integrity of the basins' ecosystems and of the services, they provide. The most distinctive feature of the nexus in Central Asia is the high degree of dependency of downstream communities on upstream ecosystem services for dry-season water from glacier melt for irrigation, hydropower and drinking water. The increased cooperation and glacier management in upstream will help countries to face economic and livelihood challenges such as food, water, and energy sectors both upstream and downstream countries of Central Asia which are interwoven in many complex ways.

Due to the lack of capacity in dealing with glaciers' system management in a comprehensive manner, the countries of the region, in absence of the proposed GEF funded initiative, will continue with the present fragmented approach to glaciers' systems management, and will be unable to fully capture the opportunities that integrated management will present to improve overall sustainability in the region, and cope with growing negative impacts of climatic variability and change.

The incremental reasoning at the basis of this foundational project is simple. The proposed project will in fact expand the scope of the baseline project and assist the countries to advance to concrete achievements in terms of cooperative frameworks and institutional set up, commitments to and implementation of priority actions, specific targets/indicators and strategic choices, and adoption of common harmonized monitoring protocols. The project will bring not only the understanding of the glacier systems of Central Asia to the higher level 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 the GEF Project high altitude glacio-nival and permafrost systems of Central Asian countries will continue to be impacted by uncoordinated and uneven development of water-dependent sectors at the national and regional levels, due to lack of

effective resource governance, shifting political and economic development priorities. The degradation and glacier retreat will continue: their resistance to climate change will be weakening, posing challenges due to a non-continuous nature of cooperation between the countries.

1.6. Global environmental benefits

The global benefits that the project aims to produce fall into the following categories:

- i. Enhanced understanding of the high mountain glacio-nival hydrology particularly in the context of the glacier –related floods
- ii. Development of scientific decision-making processes on cryo-hydrology impacted by climate change in Central Asia
- iii. Showcase inherent resiliencies of human-natural systems of the Central Asian high mountain regions, based on generated evidence-based knowledge for adaptation strategies which could be compared with another alpine environment.
- iv. Enhanced cooperation in the management of the transboundary water resources of the basins of high altitude glaciers region in the participating countries;
- v. Improved sustainable use of the services provided by the glaciers' basins ecosystems, also in view of climate variability and change.

The project fills a gap in present approach to management in all the region's glacier systems by launching a full-fledged initiative to strengthen management capacities and enhancing the multi-country cooperation to increase opportunities for sustainable development in the region that is highly susceptible to impacts of climate variability and change. The project will also represent 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.

In order to maximize the ability of the project to produce global benefits, its design includes specific elements that will emphasize the national benefits that integration of water management and climate change adaptation issues into national policies and practices and increased regional cooperation in water management will bring about. In particular, Component 4 that will enable countries to incorporate consideration of integrated water management and climate variability and change and gender issues into glacier systems management. Building the foundation for multi-country coordination and institutional strengthening for water management will result

in enhanced synergy and cooperation thus contributing to regional stability in an area that has been impacted by political tensions in the near past.

1.7. Innovation, sustainability and potential for scaling up

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 ecosystem regions in the vicinity have had a much fairer share of international and national projects dealing with the issue for glaciers 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 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/Amudarya 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 countries, including Turkmenistan, Tajikistan and Kazakhstan, will share their knowledge and experience to formulate national and regional adaptation strategies. The platform will also invite Kyrgyzstan to participate in the scientific meetings and training programme to benefit from national and regional exchanges. 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 managing the glaciers from other regions (Switzerland, Austria and others). The project will showcase glacial management strategy in ground which will be developed based on state of art of glacio-nival and permafrost monitoring system, successfully developed in other alpine regions. Application methodology of such glacial management strategy 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 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 glacial-nival systems. 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 and changes of glacio-nival systems 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 each of the participating countries of central Asia: Tajikistan, Turkmenistan and Kazakhstan are the basis to calibrate and validate models to identify future water resources and adaptation strategies in the region.

The focus on capacity building will generate a pool of technical expertise that can be utilized for scaling up and replication in other parts of the country, region and internationally, in particular by providing information on tested methodologies and practical approaches.

1b. Project Map and Coordinates

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

Pamir Mountain range, Tajikistan Highest peak coordinate - N 38°00'00" E 73°00'00" , ID 1131187 (geonames.org)The Pamir Mountains are a mountain range in Central Asia, at the junction of the Himalayas with the Tian Shan. They are among the world's highest mountains in the region.

2. Stakeholders

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

Indigenous Peoples and Local Communities

Civil Society Organizations

Private Sector Entities

If none of the above, please explain why:

During the development of the present PIF, 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.

The level of public participation in the decision making in each country is not yet fully clear. Available information suggests that it is still inadequate. It is also unclear which local stakeholders are involved in the management of glaciers' water systems and at what level, or what in fact is the level of access to information. The proposed project will hence act within a context where the principles of stakeholder involvement, while fully recognized by the national laws, are not yet fully translated into daily practice and at all levels – the water sector being no exception.

The key national stakeholders are the national government agencies responsible for environmental regulations and water management including their subsidiaries in the country regions. The following key stakeholders will try to be involved:

In Kazakhstan, the key stakeholders are most likely to include:

- Oblast (Regional) Agencies for environmental protection
- Committee for Water Resources of the Ministry of Agriculture
- River Basin Organizations
- KazHYDROMET & climate forecasting expertise
- Water User Associations within Irrigation command areas
- Ministry of Energy
- Institute of Geography

In Tajikistan, the key stakeholders are most likely to include:

- Committee on Environmental Protection
- Executive Office of the President of the Republic of Tajikistan
- Ministry of Agriculture and Nature Protection

- State Department of Natural Protected Areas
- TajikHYDROMET
- State Control Service for Nature Use and Conservation
- Institute of Water Problems

In Turkmenistan, the key stakeholders are most likely to include:

- State Committee for Environmental Protection and Land Resources
- Ministry of Agriculture and Water Resources of Turkmenistan
- National Forestry Company
- TurkmenHYDROMET
- National Coordinating Unit

The regional stakeholders include the following:

- Central Asian Regional Glaciological Centre under the auspices of UNESCO
- the International Fund for saving the Aral Sea (IFAS) and its two intergovernmental bodies, Inter State Commission for Sustainable Development (ICSD) and Inter State Commission for Water Coordination (ICWC).

This is an initial list of stakeholders that comprises all those involved directly or indirectly in glaciers water systems. However, during the PPG phase a detailed stakeholders' analysis will be made and the most appropriate stakeholders will be identified and involve in project development and implementation. In addition, during the PPG stage the project will attempt to identify and engage relevant private sector stakeholders.

In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement.

3. Gender Equality and Women's Empowerment

Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).

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. Supporting the notion that 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), project strategy will contribute to improve the women access to and control over resources and will reinforce their participation and leadership in decision making processes. In addition, the project will also directly contribute to SDG 6 (Ensure availability and sustainable management of water and sanitation for all); SDG 11 (Make cities and human settlements inclusive, safe, resilient and sustainable); SDG 13 (Take urgent action to combat climate change and its impacts) and SDG 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss)

Since women and men are affected differently by disaster and climate change, their different vulnerabilities and capacities will be analyzed, and their gender-specific concerns and priorities will be addressed. Women will be recognized for their resilience in the face of disaster, and for the roles, they play as active agents of change in helping communities to recover and adapt. The aim is that during the project cycle, the policy work contributes to gender equality by transforming the balance of power between women and men in the Central Asia region to improve regional resilience to climate change. During the PPG phase, a detailed gender involvement strategy will be developed. The project commits to being in line with the GEF and UNDP Gender Equality Action Plans.

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

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

Improving women's participation and decision-making; and/or

Generating socio-economic benefits or services for women.

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

TBD

4. Private sector engagement

Will there be private sector engagement in the project?

No

Please briefly explain the rationale behind your answer.

To be clarified during the PPG.

5. Risks

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (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 organizational risks to the project.

At this point, 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)	Low	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)	Low to Medium	Defining project implementation arrangements which enable efficient project implementation in unstable political conditions
3	Lack of community involvement in some project sites	Medium	Assessment of available community workforce and cash-for-work-modalities in target sites prior to project inception
4	Lack of agreement on the terms and procedures for environmental glacier monitoring and data exchange	Low to Medium	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

6. Coordination

Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.

The project will be implemented by UNDP overseeing the compliance with GEF and UNDP policies and providing linkages with other GEF initiatives on groundwater management. The project will be executed through UNESCO/IHP (providing project management and technical support on data management, interpretation and reporting). Already for more than a decade, UNESCO-IHP has been involved in execution of GEF IW projects. During the PPG, the M&E plan will be developed in accordance with GEF and UNDP rules and regulations

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 efforts including capacity building programmes focusing on glacier mass balance measurements in coordination with scientists, centres of excellence, governments and stakeholders from all over the world.

The International Hydrological Programme (IHP) of UNESCO plays 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 as well 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:

- 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 UNESCOs 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 tools seems very relevant to the project as the data 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.

Strong linkages will be secured during PPG and project implementation to the following projects - hereunder with the intent of securing interlinkages when planning and implementing e.g. the envisioned Interregional network of laboratories.

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 starts to implement 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 was 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. More information on Phase I and Phase II.
- **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). More information about the three project phases can be found on the following web-page
- **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

Is the Project consistent with the National Strategies and plans or reports and assessments under relevant conventions

Yes

If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc

- National Action Plan for Adaptation (NAPA) under LDCF/UNFCCC
- National Action Program (NAP) under UNCCD
- ASGM NAP (Artisanal and Small-scale Gold Mining) under Mercury
- Minamata Initial Assessment (MIA) under Minamata Convention
- National Biodiversity Strategies and Action Plan (NBSAP) under UNCBD
- National Communications (NC) under UNFCCC
- Technology Needs Assessment (TNA) under UNFCCC
- National Capacity Self-Assessment (NCSA) under UNCBD, UNFCCC, UNCCD
- National Implementation Plan (NIP) under POPs

- Poverty Reduction Strategy Paper (PRSP)
- National Portfolio Formulation Exercise (NPFE) under GEFSEC
- Biennial Update Report (BUR) under UNFCCC
- Others

Country	National Strategies
Kazakhstan	<p>Kazakhstan has not yet initiated the development of policies directly focused on climate change adaptation. For future activities, a Government Commission on Climate Change is being established to address impacts and adaptation needs, including impacts on water resources.</p> <p>The state programme for water resources management in Kazakhstan 2014-2020: on the September 9, 2016, the President instructed the Government to develop, a national program of agricultural development, where the state program of water resources management of Kazakhstan should be integrated.</p> <p>Strategic Development Plan of the Republic of Kazakhstan until 2025 has just been adopted.</p>
Tajikistan	<p>National Action Plan of the Republic Tajikistan for Climate Change Mitigation: In 2015 Tajikistan has developed a National strategy climate change adaptation</p> <p>National Development Strategy of the Republic of Tajikistan 2030.</p> <ul style="list-style-type: none"> • 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); • Creating and disseminating the Code of nature protection, mechanisms of adaptation to climate change, with the expansion of international cooperation in this area. • Development of the system of mainstreaming climate change issues, prevention of natural disasters in the regional strategic documents, strengthening local capacity for emergencies and natural disasters risk management.
Turkmenistan	<p>National Strategy on Climate Change 2030.</p> <p>National Climate Change Strategy of Turkmenistan represents the national vision of climate change issues and is a basis for the formulation and implementation of national policy of Turkmenistan on the issues related to climate change and its effects.</p> <p>Primary objectives for water sector adaptation to climate change include:</p> <ul style="list-style-type: none"> • Improving water management • Introducing advanced irrigation methods, construction of water-storage reservoirs and modernization of hydraulic engineering structures • Developing incentive tools for stimulating rational water consumption • Strengthening international cooperation on conservation and use of transboundary waters.

8. Knowledge Management

Outline the Knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

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. The Central Asian project will have 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. Recently Member states adopted a resolution during the 23rd Intergovernmental council of IHP (Paris, 11-15 June 2018) to support the initiative to designate the year 2020 as International Year of Snow and Ice, the process will provide a valuable platform to share knowledge 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 glacio-nival issues, facilitating the capture, synthesis, transfer and uptake of knowledge system within and beyond the project activities.

Part III: Approval/Endorsement By GEF Operational Focal Point(S) And Gef Agency(ies)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

Name	Position	Ministry	Date
Mr. Gani Sadibekov	Vice - Minister	MINISTRY OF ENERGY, KAZAKHSTAN	7/28/2017
Mr. Khayrullo IBODZODA	Chairman of the Committee	COMMITTEE OF ENVIRONMENTAL PROTECTION, TAJIKISTAN	7/26/2017
Mr. Berdi Berdiyev	Head of International Relations and Planning Department	STATE COMMITTEE FOR ENVIRONMENTAL PROTECTION AND LAND RESOURCES, TURKMENISTAN	10/26/2018

ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place

ANNEX B: GEF 7 Core Indicator Worksheet

Use this Worksheet to compute those indicator values as required in Part I, Table F to the extent applicable to your proposed project. Progress in programming against these targets for the program will be aggregated and reported at any time during the replenishment period. There is no need to complete this table for climate adaptation projects financed solely through LDCF and SCCF.

Ili River	3 = National/local reforms and IMCs in place 4 = National/local reforms/policies implemented, supported by IMCs			
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7.4 Level of engagement in IW:LEARN through participation and delivery of key products

Shared Water Ecosystem (name)	Rating (entered at PIF)	Rating (entered at CEO Endorsement)	Rating (entered at MTR)	Rating (entered at TE)
Syr Daria Amu Daria Ili River)	1 = No participation 2 = Website in line with IW:LEARN guidance active 3 = As above, plus strong participation in training/twinning events and production of at least one experience <u>note</u> and one results note 4 = As above, plus active participation of project staff and country representatives at International Waters conferences and the provision of spatial data and other data points via project website			

ANNEX C: Project Taxonomy Worksheet

Use this Worksheet to list down the taxonomic information required under Part1 by ticking the most relevant keywords/topics//themes that best describes the project.