GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

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September 21, 2011

Dear SCCF Council Member:

UNDP as the Implementing Agency for the project entitled: ***Azerbaijan: Integrating climate change risks into water and flood management by vulnerable mountainous communities in the Greater Caucasus region of Azerbaijan***, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with UNDP procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by the SCCF Council in November 2010 and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by UNDP satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at www.TheGEF.org. If you do not have access to the Web, you may request the local field office of UNDP or the World Bank to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

Attachment: Project document

Copy to: Country Operational Focal Point
GEF Agencies, STAP, Trustee

REQUEST FOR CEO ENDORSEMENT[1]

PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND:SCCF

PART I: PROJECT INFORMATION

Project Title: Integrating Climate Change Risks into Water and Flood Management by Vulnerable Mountainous Communities in the Greater Caucasus Region.			
Country(ies):	Azerbaijan	GEF Project ID:[2]	
GEF Agency(ies):	UNDP (select) (select)	GEF Agency Project ID:	3929
Other Executing Partner(s):		Submission Date:	2011-09-06
GEF Focal Area (s):	(Select)	Project Duration(Months)	60
Name of Parent Program (if applicable): For SFM/REDD+ ☐	NA	Agency Fee ($):	270,000

A. FOCAL AREA STRATEGY FRAMEWORK[3]

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount ($)	Cofinancing ($)
CCA-1 (select)	Outcome 1.1. Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas	Output 1.1.1. Adaptation measures and necessary budget allocations included in relevant frameworks	SCCF	515,083	960,000
CCA-2 (select)	Outcome 2.1. Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas	Output 2.1.1 Risk and vulnerability assessments conducted and updated Output 2.1.2 Systems in place to disseminate timely risk information	SCCF	875,083	2,100,000
CCA-2 (select)	Outcome 2.2 Strengthened adaptive capacity to reduce risks to climate-induced economic losses	Output 2.2.1 Adaptive capacity of national and regional centers and networks strengthened to rapidly respond to extreme weather events	SCCF	1,155,084	3,700,000
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)	Others		(select)		

[1] It is important to consult the GEF Preparation Guidelines when completing this template
[2] Project ID number will be assigned by GEFSEC.
[3] Refer to the Focal Area/LDCF/SCCF Results Framework when filling up the table in item A.

Subtotal		2,545,250	6,760,000
Project management cost[4]	SCCF	154,750	500,000
Total project costs		2,700,000	7,260,000

B. PROJECT FRAMEWORK

Project Objective: To reduce vulnerability of the communities of the Greater Caucasus region of Azerbaijan to water stress and hazards by improved water and flood management						
Project Component	**Grant Type**	**Expected Outcomes**	**Expected Outputs**	**Trust Fund**	**Grant Amount ($)**	**Confirmed Cofinancing ($)**
1. Water and flood management policy and regulatory frameworks to respond to climate change risks	TA	1. Water and Flood management framework is modified to respond to adaptation needs and improve climate risk management on over 22,067 sq. km of land in highly vulnerable region of Greater Caucasus.	1.1. A package of five normative legal acts developed on climate resilient water management at the sub-basin level (climate resilient IWRM, flood zoning regulations, participatory risk management and seasonal / inter-seasonal conjunctive use and management of surface and ground waters); 1.2. The water code land code and other related legislation revised to account for climate change risks; 1.3. Conjunctive water management (CWM) model and guidelines for surface and groundwater use introduced to respond to climate change conditions.	SCCF	515,083	960,000
2. Technical capacities to improve climate risk management in the Greater Caucasus	TA	2. Key institutions have capacities, technical skills, tools and methods to apply advanced climate risk management practices for water stress and flood mitigation [i]	2.1. Targeted training program for water and flood management, planning and risk assessment designed and delivered for MoENR and other stakeholders. 2.2. Soil and water assessment tool	SCCF	875,083	2,100,000

[4] This is the cost associated with the unit executing the project on the ground and could be financed out of trust fund or cofinancing sources.

			(SWAT) introduced and applied in each of the three pilot rayon sub-basins to improve land use management and watershed level climate risk assessment and planning. 2.3. Based upon project generated data, model flood risk maps and participatory mapping processes created in three pilot rayon sub-basins to improve flood management as part of land use planning and management. 2.4. Hydro-meteorological observation capacity strengthened by extending the coverage of automated hydromet stations into upper mountain watersheds that are increasingly prone to flood hazards due to climate change. 2.5. Community-based early warning systems for water stress and flood management improved to enable the timely dissemination of water stress and flood information to the local communities through innovative community-based methods, benefiting over 1,000,000 people of the Greater Caucasus region (e.g. local radio for rainfed farmers, mobile sms for pastoralists, regular			

			(seasonal) community meetings. 2.6. Capacity of water user associations increased to adapt to climate change by improving soils and managing land and water by applying new tools such as SWAT and CWM.			
3. Water and Flood management practices demonstrated to lead to community resilience	TA	3. Community resilience to floods and water stress improved by introducing locally tailored climate risk management practices benefiting over 1,000,000 people on total land area of 22,067 km2 of the Southern slopes of the Greater Caucasus	3.1. Fifteen local water user associations strengthened within the three pilot sub-basins to improve flood and water stress forecasting and response planning mechanisms and adaptation-oriented watershed planning and management skills to cope with water stress and floods. 3.2. Rayon-level local local stakeholder committees established and strengthened in three pilot rayons to test and introduce participatory and consensus-based watershed management planning that integrates climate risks. 3.3. Pilot climate-risk oriented watershed management plans (3) (CR-WMP) initiated to implement sustainable water and flood management measures in the three pilot rayon sub-basins and fully account for climate change risks from floods and associated mudflows.	SCCF	1,155,084	3,700,000

			3.4. Pilot CR-WMP processes replicated across the nine rayons of the Greater Caucasus region. 3.5 Locally tailored public information campaign implemented to increase awareness, understanding and acceptance by flood-prone communities of flood risks and effective risk management to reduce vulnerability.			
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
			Subtotal		2,545,250	6,760,000
			Project management Cost	SCCF	154,750	500,000
			Total project costs		2700000	7260000

C. SOURCES OF CONFIRMED COFINANCING FOR THE PROJECT BY SOURCE AND BY NAME ($)

Sources of Co-financing	**Name of Co-financier (source)**	**Type of Cofinancing**	**Cofinancing Amount** ($)
National Government	Ministry of Emergency Situations	Grant	7,000,000
GEF Agency	UNDP-Azerbaijan	Grant	260,000
(select)		(select)	
(select)		(select)	
(select)		(select)	
(select)		(select)	
(select)		(select)	
(select)		(select)	
(select)		(select)	
(select)		(select)	
Total Co-financing			7,260,000

D. GEF/LDCF/SCCF RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY[1]

GEF Agency	**Type of Trust Fund**	**Focal Area**	**Country Name/ Global**	**(in $)**		
				Grant Amount (a)	**Agency Fee** (b)[2]	**Total** c=a+b
UNDP	SCCF	Climate Change	Azerbaijan	2,700,000	270,000	2,970,000
(select)	(select)	(select)				0
(select)	(select)	(select)				0

(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
Total Grant Resources				2,700,000	270,000	2,970,000

E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	Estimated Person Weeks	Grant Amount ($)	Cofinancing ($)	Project Total ($)
Local consultants*	1,768.00	560,400		560,400
International consultants*	161.00	225,000	258,000	483,000
Total		785,400	258,000	1,043,400

* Details to be provided in Annex C.

F. PROJECT MANAGEMENT COST

Cost Items	Total Estimated Person Weeks/Months	Grant Amount ($)	Co-financing ($)	Project Total ($)
Local consultants*	395.00	154,750	60,000	214,750
International consultants*				0
Office facilities, equipment, vehicles and communications*			100,000	100,000
Travel*			80,000	80,000
Others**	Time series and data points collected & provided by MoES, MoENR & AJSC regularly over 5 years.		170,000	170,000
	In-kind staff time of Project Director, Dep PD, and support staff for Project Board meeting organization and participation; reporting; workplan approvals, signing CDR reports, RDPs, reviewing APRs ($18,000/ year of staff time/year or $90,000).		90,000	90,000
Total		154,750	500,000	654,750

* Details to be provided in Annex C. ** For others, to be clearly specified by overwriting fields *(1) and *(2).

G. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? No

(If non-grant instruments are used, provide in Annex E an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF Trust Fund).

H. DESCRIBE THE BUDGETED M &E PLAN:

Note: See Annex E for M&E Plan as formatting difficulties prevented putting a table in this section.

PART II: PROJECT JUSTIFICATION

A. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

A.1.1. The GEF focal area/LDCF/SCCF strategies:

1. The project proposal has been developed with guidance from the *Adaptation Policy Frameworks for Climate Change*[5] and the Special Climate Change Fund (SCCF) of the GEF[6]. The GEF project will position itself strategically by building on current baseline activities and introducing improvements to the legislative framework, including the strengthening of adaptation measures in the current Water Code, the development and adoption of new normative legal acts therein, and modernized adaptation-oriented management tools and practices for water management systems, based on the principles of Integrated Water Resources Management (IWRM). As a result, national and local community-based water resources management practice will become more resilient to climate change impacts. Following the SCCF guidance, the project's adaptation measures will involve changes to the existing system of water and flood management at the framework, policy and legislative level, at the regional level where most of the management work is undertaken and on the ground, introducing a level of community involvement in water and flood management.

2. The adaptation measures also include extensive capacity building and training in innovative approaches to water and flood management to build capacity of the various organizations at all working levels. Specific to flood management, the proposed project introduces methods of damage mitigation not previously considered, as the current approach is based entirely on structural protection measures. The response measures to increasing water stress and flood risks will target improved water policies, laws and regulations, including innovative conjunctive ground and surface water management solutions and mediation of water availability to the communities. The project will sensitize watershed management planning in the target region to climate risks in order to steer inappropriate development away from areas at high risk of flooding, improve water retention to reduce flooding and increase natural storage capacity for drier seasons and reestablish natural floodplain areas for improved water and flood management. The project will also develop the coping capacity of the local population by introducing short and long-term forecasting, early flood warning and water use planning at the local level and by improving communal water and flood management practices overall.

3. The project is aligned with CCA Objectives 1 and 2 and with the Results-based management focus under Climate Change Adaptation, as evidenced by the completion of the Adaptation Monitoring Assessment Tool (AMAT) at this CEO endorsement stage. Outcome and output indicators relevant to this project are:

Outcome Indicator 1.1.1: Adaptation actions implemented in national development frameworks;

Output Indicator 1.1.1.1: Development frameworks include specific budgets for adaptation actions;

Outcome Indicator 2.1.1: Relevant risk information disseminated to stakeholders;

Output Indicator 2.1.1.2: Updated risk and vulnerability assessment conducted;

Output Indicator 2.1.2.1: Type and number of monitoring systems in place;

Outcome Indicator 2.2.1: Number and type of targeted institutions with increased adaptive capacity to reduce risks of and response to climate variability;

Outcome Indicator 2.2.2: Capacity perception index.

4. These indicators in turn are reflected in the project's results framework.

A.1.2. For projects funded from LDCF/SCCF: the LDCF/SCCF eligibility criteria and priorities:

5. Azerbaijan is a developing country that is party to the United Nations Framework Convention on Climate Change (UNFCCC) and is eligible to receive financial support for adaptation to be integrated into development activities.

6. This project is designed to meet the programming priorities of the SCCF in that it will implement adaptation activities under priority areas of intervention as identified by the Climate Convention. The project's areas of focus

[5] Adaptation Policy Frameworks for Climate Change: Developing Strategies, Policies and Measures. UNDP, GEF. September 2004.
[6] GEF Assistance to Address Adaptation. GEF/C.23/Inf.8/Rev.1, prepared for GEF Council. May 19-21 2004.

directly address key SCCF programming priorities, including:

- water resources management
- land management
- fragile ecosystems, including mountainous ecosystems
- related forecasting and early warning systems
- supporting capacity building, including institutional capacity, for preventive measures, planning, preparedness and management of disasters relating to CC, including contingency planning.

A.2. National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NIPs, PRSPs, NPFE, etc.:

7. The project is fully in line with the latest findings and adaptation priorities underlined by the Second National Communication to the United Nations Framework Convention on Climate Change (SNC). With water resources forecast to decline by as much as 23%, and flood frequencies and damages increasing dramatically, water issues are featured as top adaptation priorities. This is the primary document referencing climate change adaptation in Azerbaijan. The SNC prioritizes awareness raising for climate change, calling for an increased role for the formal education system, as well as for the media and public institutions in awareness raising.

8. The SNC also specifically refers to the State Programme on Development of Hydrometeorology, which seeks to improve the monitoring of the climate and water environment for the period 2004–2015. The programme aims to strengthen capacities for monitoring, hydrological forecasting and warning systems, and water resources assessment for improved water resources management. Relevant priorities include the development of early warning systems for flooding, expansion and modernization of the hydrometeorological network, with special attention to climate change and development of a database on global climate change and related issues for decision makers and the public.

9. The State Programme on the Socio-Economic Development of Regions of the Republic of Azerbaijan (2009 – 2013) is a development framework of all economic zones of Azerbaijan calls for flood prevention and mitigation measures such as reforestation in regions subject to flood threats. It also includes specific programs for flood warning systems in some rayons. Importantly, the Programme calls for an integrated management plan of water resources to be prepared and implemented in Azerbaijan. The program supports the streamlining of the structure of scientific research and design institutions in amelioration and the water industry and to establish a united institute and strengthen its materials and its technical capacity. It also calls for improved and strengthened zoning through the creation of protection buffers around water facilities. In the project region of the Greater Caucasus key actions include: improvement of drinking water supply and creation of new flood protection measures.

10. The National Program for Sustainable Socioeconomic Development of the Country (NPSSD) was enacted in 2003 and calls for universal access to good quality water. The program is aimed at coordinating national and regional efforts for protection of the environment. NPSSD sets out priority directions for protection and use of water resources, including: development and implementation of state programs for efficient use of water resources; promotion of efficient use of water resources; improvement of water quality to European standards. Significantly, the Program calls for improving legislation in the area of water ecosystems and their management, the application of integrated approaches to water management, and the improvement of existing water supply and wastewater sites.

11. The State Programme on Poverty Reduction and Sustainable Development (SPPRSD) (2008-2015) has several components related to water and to the participatory process, which are both important to the proposed project. Participatory processes between government and civil society and international organizations are stated as being an important part of the program. Creation of reliable water supply systems by using springs and groundwater sources is a part of the social infrastructure component of this, with the directive that all places in Azerbaijan will have centralized water systems by 2015, as well as complete sewage treatment coverage by 2015. Looking toward sustainable management of the environment, the Program calls for forest area to be increased to 12.5% of total land area by 2015 from the current 11.3%. SPPRSD also has specific provisions to address protection of lands from wind and water erosion, reconstruction and rehabilitation of irrigation and drainage infrastructure and rehabilitation and improvement of water reservoirs.

12. The existing development framework does not consider the long term implications of, or adaptation to, climate change, but does provide favourable baseline conditions for the SCCF funded project to advance additional policies

and practices to address adaptation needs in water and flood management.

B. PROJECT OVERVIEW:

B.1. Describe the baseline project and the problem that it seeks to address:

13. The problem the project seeks to address is the impact of climate change on risks from water stress and flooding to the vulnerable mountain communities of the Greater Caucasus Region.

14. Azerbaijan as a whole is already considered to be a water stressed country, with current surface water resources estimated at less than 10 BCM generated within the country (though there are also resources from transboundary rivers). Azerbaijan's recently completed Second National Communication (SNC) to the United Nations Framework Convention on Climate Change (UNFCCC) forecasts that climate change effects will reduce overall water resources by 23% during the 2021 to 2050 period, compounding the current water deficits. Currently, water use is lower than it had been 20 years ago because of the economic downturn following independence. The continuing recovery of the rural agricultural sector will drive water demands. Highly effective water resources management will be necessary to minimize water stress in these rural communities.

15. Azerbaijan also experiences significant and damaging flooding. Floods in 2003 caused over $US 50 million in losses and damaged over 7,150 private and public buildings. A 100-year flood event would inundate 15,000 km^2, affect 300,000 people, and result in damages on the order of $400 million, according to a recent ADB study on flooding. The frequency of flood events is increasing due to climate change effects. Figure 1 below (based on data from the Azerbaijan SNC) shows a clear trend in increased flooding over the last several decades.

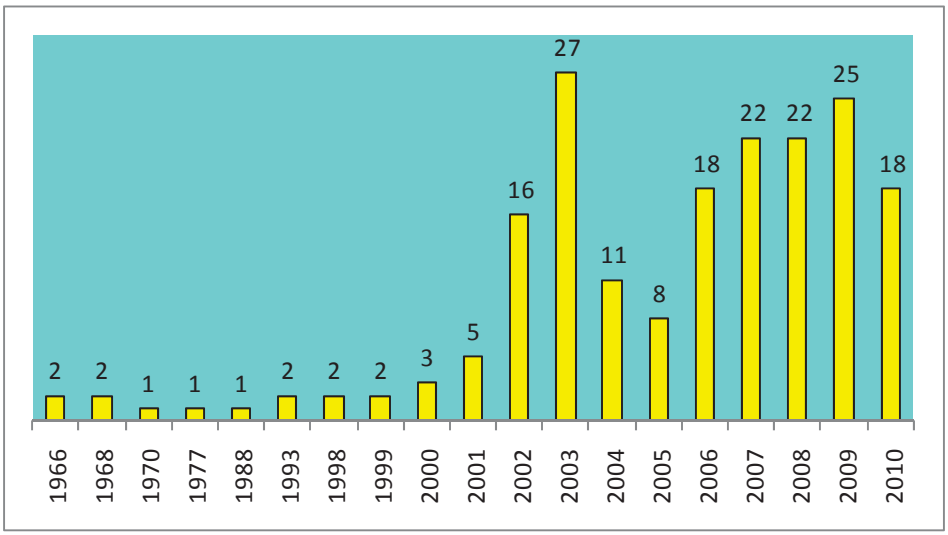


Figure 1: Number of Observed Floods in Azerbaijan by Year

16. The poor tend to be the most vulnerable to floods and the damages they cause. In addition to loss of life and physical damage to people and property, exposure to flood damage reduces income earning opportunities. Impacts are exacerbated by the inability of rural populations to access personal, crop, and livestock insurance because it is either not affordable or simply not available (as is the case in Azerbaijan). The poor have a much lower ability to rebound after suffering losses of assets. Floods worsen living standards of the poor, negate progress made in reducing poverty, and can cause low income earners to fall into poverty. The cumulative effect of droughts, floods and mudflows make the livelihoods of farmers especially difficult as two or more unproductive years in a row make it hard for the farmers to survive, let alone develop and improve their livelihoods.

17. Climate change is already making these problems worse and forecasts indicate that it will continue. Reducing the vulnerability of these communities requires improved management of water resources and flood risks, as well as adaptation to the impacts of climate change.

18. Project area: The proposed project area encompasses the southern side of the Greater Caucasus Mountains, extending from the northwest of this region, in the area of the towns of Belakan and Zagatala, toward the southeast near the towns of Ismayilli and Gabala. This covers an area of just over 22,000 km^2. The whole area is part of the larger Kura River Basin, which is one of the two main rivers of Azerbaijan. Figure 2 shows a map of the proposed project region.

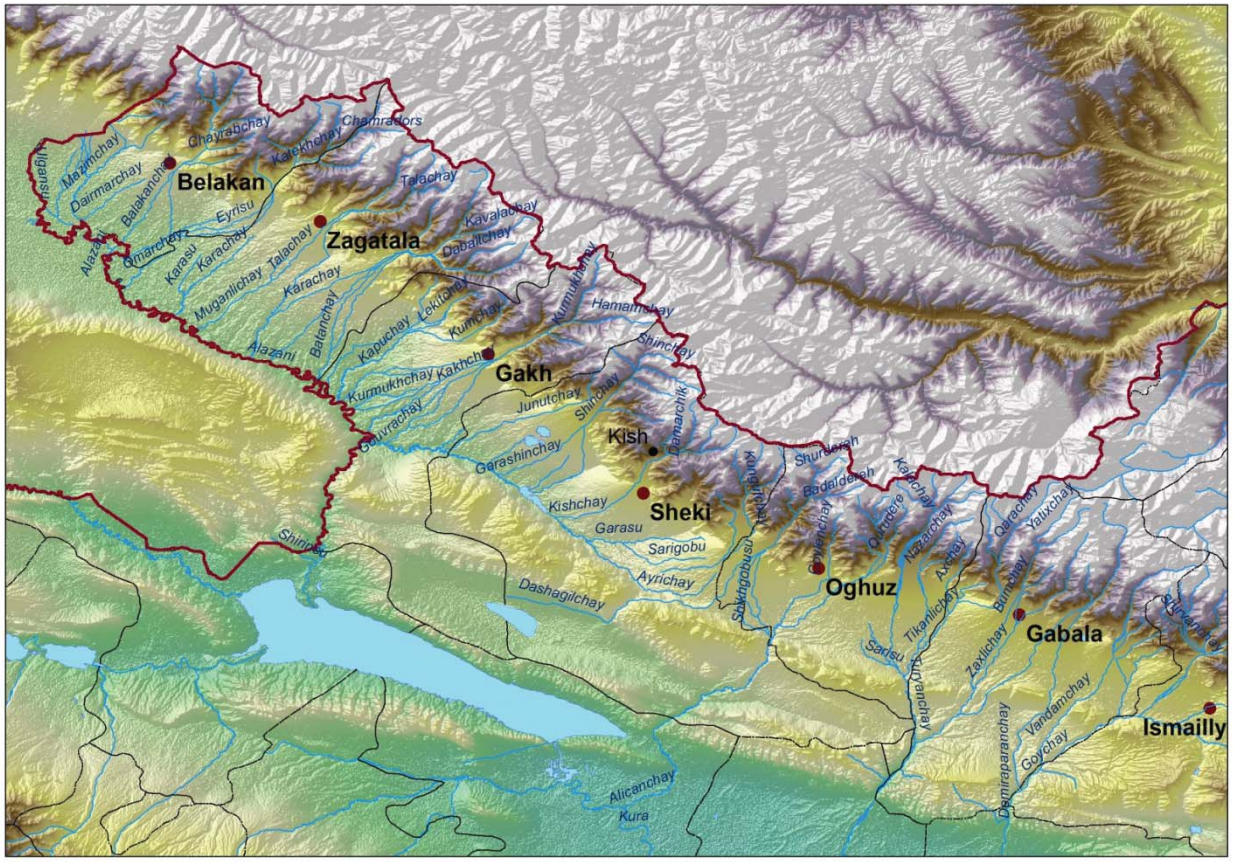


Figure 2: Map of the Proposed Project Region

19. The proposed project region of the Greater Caucasus of Azerbaijan has been identified as particularly vulnerable to both water stress and flooding. Floods and flood damages occur frequently across the region, with more than 150 damaging floods in the region in last 50 years. The floods of 1999 were the largest and most damaging of the last 100 years. Though the only two major floods that year, they were both severe and damaging on a large scale. Hardest hit were the Demiraparanchay and Turyanchay rivers (one of the three proposed pilot sub-basins), which caused flooding of over 70 settlements, seriously damaging the local economy and killing livestock. Several major floods also occurred between 2002 and 2010 with significant damage in the Greater Caucasus area affecting 82 communities with a total population of 246,000, damaging some 138,000 ha of cultivated area, and destroying public infrastructure. It is estimated that average annual flood damages in the Greater Caucasus Region amounts to $US 18-25 million for infrastructure alone. The focus of the project is on the mountain communities because of their particular vulnerability to water shortages and flooding risks, which are both exacerbated by climate change.

20. Across the project region, total surface water resources are estimated at just over 1 BCM annually. Annual per capita water availability is just over 1000 m^3 per person, the benchmark of severe water scarcity. It is estimated that current water use is 340 MCM, or a third of the total, which is very near the safe limit as a proportion of the total resource. Agriculture accounts for about 70% of the total water use in the basin, with industry at 20-25% and domestic use at 5-10%. Agricultural production of the project area is of national importance, meaning that the water is not just a locally used resource. Current levels of water use are lower than they have been in the recent past,

because of the economic downturn of the 1990s. Demands on water resources will increase as the agricultural sector recovers and develops further.

21. Groundwater resources are estimated at about 0.5 BCM annually, but actual use of groundwater use is less than one percent of this. As greater pressure is placed on the overall resource through climate change, there will need to be a significant increase in sustainable groundwater exploitation, through conjunctive water management.

22. Climate change impacts in Azerbaijan are greatest in the higher mountain sub-basins of the Greater Caucasus region according to the SNC. Three high mountain sub-basins have therefore been selected as pilot areas for demonstrating approaches to reducing vulnerability to water stress and flood events through climate change adaptation. These are the Talachay, Kishchay, and the Turyanchay rivers. Their characteristics include: 1) they are well distributed across the Greater Caucasus region and are representative of it, which will facilitate replication; 2) they are prone to large, damaging floods with steep upper catchments and upper river beds and have a history of floods carrying large amounts of rock and associated debris; 3) there are several communities within the pilot sub-catchments, including both small, rural, agricultural villages and larger, more populated towns, which are vulnerable to water stress and at great risk from flooding; 4) the economy of the sub-basins and the human activities associated with them are typical of the region.

23. The Talachay is in the northwest of the project area, in the Zagatala rayon. It has a catchment area of 410 km^2, with two main upper tributaries. From that confluence, it flows 40 km to the Ganikh River. There are several mountain communities, namely Mesles, Car, Oxoxdara and Siliban, which are in high flood risk areas and are now exposed to greater vulnerability through climate change impacts, making this river a good choice as a pilot. The Talachay flows through the town of Zagatala and it is also at increasing risk of flood damages.

24. The Kishchay is in the central part of the project area, flowing through the Sheki rayon, including immediately beside the historic town of Sheki. There are several communities in vulnerable areas of the river, namely Kish, Oxut and Goxmuq. The Kishchay is also a tributary of the Ganikh River, with a length is 49 km and a catchment area of 265 km^2. Flooding is frequent and damaging, with associated mud, rock and other debris flows. The problem is increasing in magnitude and severity with climate change. The town of Sheki is also highly vulnerable to flooding, especially as the river bed has risen to the extent it is now above base level of the town. Water stress is also growing, as overall resources are declining, especially during July and August, the period of most intensive water demands for domestic and irrigation use. Water supply for the mountain communities and for the town of Sheki comes from the Kishchay.

25. The Turyanchay is in the southeastern part of the project area, in Gabala Rayon. It is large in comparison to the other two pilot rivers, having a catchment area of 4,840 km^2. It has several upper tributaries, each with flooding problems, with as much as 60% of the annual runoff occurring during the spring flood season. The communities of Qumarvan, Abrix, Bum and Xirxatala are particularly vulnerable for floods and debris flows. Similar to the other pilot sub-basins, water stress is growing as climate change both reduces the resource and increases demand.

26. Climate Change and its Impacts on Flood Events and Water Stress. The project region, being mainly a steep mountain environment, is one that has always been exposed to floods. Water for their domestic and irrigation use has always been difficult to access because of the volatility of the rivers and the under-developed capacity to access and manage ground water. In the business as usual baseline situation, the communities have evolved to deal with these two issues by establishing themselves close to the rivers, but at a safe distance from all but the worst floods, negating the need for such things as early warning systems and improved flood zoning practices. Climate change has imposed new costs and new risks for local communities by making water more difficult to access through declining resources, growing demands and damages to water supply infrastructure from floods. Floods themselves are increasing in frequency and severity due to climate change. Climate change has also created a new, and much larger, problem across the project region associated with floods that has dramatically increased the vulnerability of the mountain communities.

27. The increase in rock material washed down the mountain rivers in large floods is the new flood related problem associated specifically with climate change. These are often referred to locally as “mudflows,” but along with the mud are larger debris flows of small stones to boulders ranging in size up to several meters in diameter. Floods can carry as much as 1.0 million cubic meters of material in a single event. The floods and mudflows bury fertile lands as well as wash away good soil, permanently damaging land productivity, agricultural systems and resulting in

human casualties and loss of property, as well as retarding the people's struggle to improve their livelihoods. The 'mudflows' have always been a feature of flooding in this mountain region, but total rock volumes and rock sizes have significantly worsened this aspect of flooding and make the floods more damaging to people, their property and their lands.

28. The climate change related phenomenon behind this is straightforward. Part of climate change is the increase in temperatures. Mountain regions are generally cold through much of the year but temperatures fluctuate frequently between freezing and thawing. With climate change increasing temperatures result in a greater number of cycles of freezing and thawing, which is the engine of rock erosion. This leads to more rock material falling off the mountains and becoming available for transport down the rivers during floods. The rock material settles as the flood slows, which is typically at the point where the steep upper catchment meets the more gradually sloping plain. This is also where mountain communities tend to be built, finding a good balance between the relative security of the hills and the flatter land needed for agriculture. As the rock is deposited by the rivers, the river bed rises, in turn elevating the flood plain and making vulnerable areas of communities which were previously safe. While 'mudflows' are not new to the project area, the rising river beds are a new and very dangerous phenomenon that is strongly associated with climate warming and related accelerated erosion processes. Temperatures are forecast to continue to rise with climate change, so the rising river beds problem will worsen at least for the foreseeable future. This is a phenomenon that is irreversible and will continue to worsen as long as climate change processes result in rising temperatures in the region. New approaches are required for flood risk management to address this new flood problem -- approaches that will accommodate inter-seasonal and long term risks of flood and water stress.

29. Water stress in the region is the result of the combination of a declining water resource base and increasing demands placed on those resources. Rising temperatures in the region are creating a greater demand for water resources from the natural environment and from human populations. While rainfall itself may increase under climate change, increased evaporation will result in net water availability being reduced. At the same time, population growth, increasing agricultural and industrial activity and economic growth all put ever-growing demands on the declining water resources. The SNC concludes that temperatures in the project region will continue to rise and at an accelerating rate. Water resources are predicted to decline by as much as 26% in the region by the latter half of this century. This is a direct consequence of climate change but climate change and its implications are not addressed in water related planning in Azerbaijan.

30. With greater pressures placed on a finite and declining water resource, good water resources management is the only way to ensure sufficient access to water in the future. Water management needs to address both supply and demand. Demand management is achieved through a variety of water conservation measures, including: minimizing losses in water delivery systems, managing irrigation to get maximum economic return from agricultural production with the least water. Supply management is achieved through such interventions as: conjunctive water management to ensure that all possible sources are known and quantified for use, watershed management to ensure that water which falls as rainfall is captured as a water source, and the protection of sources from pollution. These approaches are not well known in Azerbaijan, in part because many water management functions have fallen through the gaps created by the fragmentation of water management institutions. The proposed project will introduce these approaches to the project region and to the country as a whole.

31. The real solution to both of these climate change induced problems is one of adaptation to the new situation. Local communities are aware of the situation because the effects of increasing water stress and increasing flood risks have been noticeable for some time already. However, they do not know how to address the problems themselves or even what options are available to them. While there are local solutions, they also require the support of regional and national organizations that are responsible for water and flood management. The current water and flood management system is not fully capable of responding to these new threats and challenges and can actually exacerbate the problems associated with climate change, rather than mitigating them. The proposed project aims to introduce new approaches to these new problems, ensure there is legal and policy backing to support them, and train the organizations involved to be able to manage and implement them.

The Baseline Project and the Problem the Project Seeks to Address:

32. This project aims at reducing climate change induced vulnerability to both flood risk and water stress to

vulnerable mountain communities in the Greater Caucasus region of Azerbaijan. The programs of the Ministry of Emergency Situations (MoES), together with its partner organizations the Amelioration Joint Stock Company (AJSC) and the Ministry of Ecology and Natural Resources (MoENR) underlie the main flood risk and water stress elements of the project and which together, form the "baseline project" described below.

33. The Amelioration Joint Stock Company's (AJSC) flood defense efforts focus on building structural flood protection walls in the project region. This work, together with its annual budget allocation (indicated in Table 1 below) is taken as the baseline 'project' for flooding issues for the proposed project. The AJSC was initially established to develop and manage irrigation infrastructure, and now also has been tasked with flood protection with a rolling, medium term budget for building flood protection walls. Table 1 details the budget of AJSC's baseline flood protection work in the nine rayons of the project region, indicating that the project's rayons are a priority. Previous expenditures (2006 - 2010) are just over $US 46 million. The projected budget will more than double to almost $US 100 million for the 2011 to 2014 period, which indicates the growing concern over flooding in the project region. In addition, Table 1 highlights a strong geographic correlation that will enable the project to demonstrate a better, climate resilient flood management practice and to influence the investment flows and to shape these investments to support improved adaptation options in the flood risk areas going forward.

Table 1: AJSC Expenditures on Flood Protection 2006 to 2014 in the 9 Rayons of the Project Region

	AJSC Expenditures on Flood Protection ($US * 1000)					
Rayon	**2006-2010**	**2011**	**2012**	**2013**	**2014**	**Total 2011-2014**
Balakan	4,540	1,270	1,900	1,900	6,800	11,870
Zagatala	6,630	1,900	1,900	1,900	2,600	8,300
Gakh	11,030	7,600	10,700	7,300	6,300	31,900
Sheki	7,740	3,800	3,800	3,800	3,150	14,500
Oghuz	2,170	1,000	1,100	1,300	1,300	4,700
Aghsu	2,230	1,000	1,200	1,000	1,000	4,200
Goychay	1,440	760	1,700	650	650	3,760
Gabala	8,800	2,500	3,800	4,000	3,800	14,100
Ismayilli	2,220	760	1,140	1,900	1,930	5,730
Total	**46,880**	**20,590**	**27,240**	**23,750**	**27,530**	**99,110**

34. As is the case with many former Soviet countries, Azerbaijan faces a huge back-log of new and restored infrastructure needs in almost every sector of the economy. Azerbaijan's flood defense and water management efforts focus on building structural flood protection walls and structural water stress reduction measures in the project region. The Amelioration JSC traditionally has been responsbile for most of the structural construction work for flood protection/mitigation and water supply capture and MoENR/Hydromet is responsible for hydrometerological monitoring. However, the creation of the new State Agency on Water Reserves under the MoES means that these AJSC and MoENR activities will be absorbed by this new State Agency. As of this writing, they are still separate entitites and thus are presented separately here. The AJSC and MoENR are no confirmed co-financers but rather key partners of the project and for these reasons, their programs are relevant to the baseline project description in addition to the core-co-funder MoES.

35. The MoES's "General Construction Works Plan" for 2010-2014 envisages the necessary construction of structural measures for flood protection, with a total annual budget for the project region of approximately $9,500,000. MoES plan also calls for the installation and equipping of automatic solar powered hydrometeorology observation stations on each major river. There are 3-5 major rivers in each of the project's pilot rayons, and at least 1-2 such automatic stations have to be established in the catchments of each river. Thus, approximately 20 such

stations will be established in the Project Area alone. The budget for these automatic hydrometeorology stations is estimated at approximately US$250,000/year over the four-year life-span of the project. The annual budget allocations (indicated in Table 1 above) provide the value for the baseline 'project' for flooding and water stress issues for the proposed project.

Table 1 a: Annual and total budget allocations on flood protection and water management in the project area over the 4-year lifespan of the project.

Baseline project stakeholders	**Annual Budget Allocations**	**Total Budget Allocation**
MoES	**10,500,000**	**42,000,000**
AJSC	24,777,500	99,110,000
MoENR	1,000,000	4,000,000

36. MoES partner organization AJSC was initially established to develop and manage irrigation infrastructure, and now also has been tasked with flood protection with a rolling, medium term budget for building flood protection walls. Previous expenditures (2006 - 2010) are just over $US 46 million. The projected annual budget during the project period will more than double to almost $US 99 million, which indicates the growing concern over flooding in the project region. In addition, Table 1 highlights a strong geographic correlation that will enable the project to demonstrate improved climate resilient flood management practices and to influence the investment flows and to shape these investments to support improved adaptation options in the flood risk areas going forward. Annex - provides details of the budget of AJSC's baseline flood protection work in the nine rayons of the project region, indicating that the project's rayons are a priority.

37. The National Hydrometeorology Department (NHD) of the MoES partner MoENR operates a national network comprised of 70 meteorological stations, with approximately 30 located in the project area. The NHD employs on average approximately 5 staff to maintain, record and distribute data gathered by every two stations. However, the network is somewhat outdated, with most of the stations dating back to the Soviet period and very located in the upper catchments of mountain river systems. In addition, very few have modern hydrological monitoring capacity. NHD is tasked with improving the network together with MoES and the State Programme on Development of Hydrometeorology (2011 to 2015) provides funding for doing so.

38. Directing attention to upgrading and modernizing stations for early flood warning requires specialist knowledge not currently found in Azerbaijan. This will be supported by GEF's incremental investments. The hydro-meteorological observation capacity in the project region is insufficient to monitor flooding or to monitor extreme rainfall, both of which are necessary for early warning systems. There are currently very few (two) high elevation automated meteorological stations in the project area and none in the actual pilot sub-basin. The hydrometeorological observation capacity is insufficient for monitoring floods or extreme rainfall, both of which are necessary for early warning systems.

39. The project will add to the information base for analysis and to support an early warning system by assisting the MoES and NHD to extend the coverage of automated hydro-meteorological stations in the region. A telemetric data system to send information to regional authorities will also be included as part of an early warning system.

Table 1a: Relevant co-funded activities by component both ongoing and to be re-oriented by GEF incremental investments.

MoES Co-funding	**Relevant Ongoing Activities providing co-funding**	**GEF influenced changes to baseline project activities providing co-funding**
Component 1 Co-financing: $960,000	- Engendering calculations and design of flood protection structures; - Elaboration of State Programmes on	- Support and engagement in the strengthening of the law and policy framework for strengthened and adaptive

	flood and water management.	water and flood management; - Participation in legal working group.
Component 2 Co-financing: $2,100,000	- Training in the construction and maintenance of flood protection and mitigation infrastructure. - Planning for flood mitigation infrastructure; - Planning for creating and expanding automatic hydrometeorology observation station network.	- Support and participation in the development of non-structural tools for water and flood risk management; - Establishment, installation, and operation of automatic hydro-meteorological stations across the Greater Caucasus region, together with a telemetric data system to send information to decision makers. - Support for communications links between community-based early warning systems and hydro stations.
Component 3 Co-financing: $3,700,000	- Construction of flood mitigation and protection infrastructure.	- Participation in and support of elaboration of pilot climate risk oriented watershed management plans; - Participation in/leadership of project-inspired local stakeholder committees. - Support for replication of the project's work.

40. Flood management in Azerbaijan is focused on flood protection, rather than flood prevention and mitigation of damages, with all work directed entirely at building flood protection walls which attempt to stop the floods from reaching vulnerable areas. These investments in flood protection walls may protect vulnerable communities in the short term from one, or possibly a few individual flood events, but do not function well with the new conditions imposed by climate change, especially with the dramatically changing conditions found in the Greater Caucasus Region. They are not long term solutions as the walls tend to become buried quickly by the rock material (described in previous section) that has become the worst component of the floods. These are outdated methods of protection, which do not address the impacts of climate change. Other complementary practices and methods are needed.

41. Table 1a summarizes the relevant ongoing co-funded activities as well as those co-funded activities that will be "re-oriented" or given a new "spin" as a result of this GEF project's incremental investments. As Table 1a reflects, this project will complement and influence the MoES and Government of Azerbaijan's flood protection efforts by emphasizing flood prevention and the mitigation of flood damages through introducing cutting-edge non-structural measures that specifically address climate change, including: flood zoning and the appropriate legal backing for it, improved watershed management in upper catchments and micro-watersheds, and local climate risk management actions the communities can take to reduce their exposure and vulnerability such as developing observation and early warning systems. By working closely with the MoES and its partner organization, the project will introduce and demonstrate the cost-effectiveness of these climate resilient flood management practices and in so doing, overcome the lack of awareness of such measures in Azerbaijan and help to direct the budget allocations of the MoES and other entities to more cost-effective adaptation investments in the future. Importantly, the project will take a participatory approach to flood damage mitigation, which brings the communities into the practice of flood management and gives the communities a greater say in their own flood damage mitigation. These approaches will be developed and tested in the project sub-basins and rayons before replication across the project region.

42. With respect to the project's water stress elements, the baseline project is also comprised of the State Programme on Poverty Reduction and Sustainable Development (SPPRSD) (2008-2015). Although the SPPRSD is not a co-funder of this project, it is relevant here because the GEF project will be working closely with the same stakeholders (namely the Rayon Executive Authorities) as SPPRSD and there will be ample opportunity for cross-fertilization between the two initiatives. For example, this GEF project will seek to enable activities under SPPRSD to utilize SWAT and CWM tools.

43. As stated in Section A.2, the SPPRSD prioritizes the protection of water resources and the improvement of domestic water supply in Azerbaijan in part by improving water delivery infrastructure and services and thus

improving access to water. However, it does not address climate change and the impacts it will have on future water resources and future demands. It also does not address actual water resources management, which is crucial to maintaining sustainable water supplies under conditions of climate change. The SPPRSD is the only programme in Azerbaijan that references water management and land management together, which is key to an integrated water resources management (IWRM) approach to climate change adaptation. With four more years of operation, the SPPRSD will be concurrent with the proposed project, presenting an opportunity to influence the programme by addressing climate change issues in water resources.

44. The Government of Azerbaijan is dedicating significant resources to achieving SPPRSD's priority of improved access to water. The Second National Water Supply and Sanitation Project (SNWSSP) is the primary example of this budgetary and programmatic support for the water management goals of SPPRSD. This $230 million joint initiative with the World Bank will improve the availability, quality, reliability and sustainability of water supply and sanitation services in 21 rayon centers across Azerbaijan, including the rayons of the project region. The provision of water supply and sanitation services are a sound baseline element to the proposed project and the water users and service providers targeted by the SNWSSP are important stakeholders in the project. In addition, this project will complement the SNWSSP's work by elaborating the critical cross sectoral IWRM context of structural initiatives like SNWSSP. This project will also work closely with SNWSSP as part of the conjunctive water management modeling work under Outcome 1, with the goal of influencing the way SNWSSP and future investments assess and exploit groundwater resources.

45. The existing baseline project falls short in addressing long term adaptation to climate change. However, it provides favourable conditions for the SCCF funded project to advance policies and implement many of the on-the-ground measures for addressing adaptation needs in water and flood management. The project will build on this baseline through three strategically designed outcomes. First, the project will modify the water and flood management framework of law and policy to respond to adaptation needs and improve climate risk management through the elaboration of strategic normative legal acts (by-laws) to empower stakeholders to implement new and innovative water and flood management tools under the existing Water Code, including conjunctive water management. Second, the project will strengthen institutional capacities, technical skills, tools, and methods to enable them to apply tools such as "SWAT" (soil and water assessment tool) and advanced climate risk management practices such as participatory flood risk mapping in order to reduce vulnerabilities to floods and water stress. Third, the project will empower the vulnerable communities themselves to take charge of their own adaptation to climate change through comprehensive participation in water and flood management, working with regional practitioners through a Local Multi-stakeholder Committee established under the project.

Barriers:

Barrier #1: Water legislation and policy do not reflect the growing challenges of managing risk associated with climate change

46. Effective management requires a framework of both water policy and water law, or, in the case of Azerbaijan, a Water Code. The existing framework is insufficiently robust to support the type of water management needed in light of climate change and its impacts on water resources, water use and flooding. Partly, this is due to there being no National Water Policy in place which defines what specific issues the government will address in water and flood management, and how they will be addressed. What does exist within the Water Code does not allow for more integrated approaches to water and flood management, which are so necessary to address effectively the seasonal and interannual water stress and flood risk response measures.

47. There are ongoing efforts in Azerbaijan to create a National Water Policy, which is a good start, but with a weak framework and a limited understanding of what is needed for effective water and flood management, it is unlikely that the resulting Policy will support the modern, integrated approaches that are essential to the level water and flood management required to respond to climate change.

48. Azerbaijan's National Water Code was enacted in 1999. The Code provides, with its various by-laws and regulations, the basis for water regulation in Azerbaijan. However, the Water Code was enacted prior to systematic consideration of climate change, its impacts, and adaptations to it. Therefore, while the Code contains many of the requirements to support basic water management, it is not sufficiently adaptable to the increased management demands that climate change imposes.

49. Increasing pressure on declining water resource requires more effective water resources management. Integrated Water Resources Management (IWRM) was developed internationally over the past two decades to respond to the mounting need for improved water management and has become the accepted international approach. IWRM was relatively new at the time of the development of the Water Code and therefore its principles are not referenced in the new Code. IWRM and its principles remain relatively unknown and not well understood in Azerbaijan. Although there is an emerging recognition of the need for IWRM, current knowledge and understanding of it are weak at all levels.

50. An important principle of IWRM is that the correct management unit for water resources is the river basin. River basin level management planning is not yet the case in Azerbaijan and, while some wording is in place to support it, the Water Code does not create the environment necessary to start managing water by basin. As a result, local zoning and planning practices do not consider water and flood management in an integrated framework that can steer inappropriate developments away from the areas of high risk.

51. To use another example, potential groundwater reserves are significant but underused. Conjunctive water management is largely unknown in Azerbaijan and not supported in law or policy. As a result, stakeholders do not manage ground and surface water conjunctively, which aggravates the vulnerability of GC communities to water stress. This is mainly an institutional issue as groundwater has traditionally been overseen by a different government organization than those responsible for surface water and for providing water supply or irrigation services. This is a good example of the fragmentation of water management efforts creating inefficiencies in the water resources – water use balance. Under the conditions of growing water stress due to climate change, groundwater is a resource that cannot continue be ignored.

52. There is no organization in Azerbaijan responsible for the overall management of water resources. As greater demands are placed on both, land and water need to be planned and managed together. There is no such integration stated or promoted in either the Water Code or the Land Code, which would underline the means and provide the legal basis for connecting water and land management organizations. Water management remains highly fragmented, with various organizations acting independently, without consideration of the mounting pressures from climate change that demand more integrated approaches. The current, sector-oriented system of water management cannot accommodate competing demands of water users and is insensitive to the new risks and difficulties posed by climate change. While the way land is used is directly linked to both the quality and availability of water, as well as to the severity and frequency of flooding, land use policies and planning do not consider water and flood management in an integrated framework. The impact of land use changes on water resources and flooding are not well understood and therefore not properly considered in land management decisions.

53. The Water Code and its regulations make no allowance for participation of the community or other public stakeholders in water and flood management processes or for the enhanced participation of women and women's groups in water and flood management. Water User Associations have been established, but they are strictly irrigation oriented and not considered in the larger water and flood management context. Integrating stakeholders into the planning and management process will require reference in the Water Code and guidance in a National Water Policy.

54. Flood zoning requires the force of law. The delineation of flood zones can be incorporated in descriptive regulations, but the Water Code itself must clearly state the meaning of each zone in a way that is enforceable. There are no such articles in the current Water Code. Further, flood risk zoning can be unpopular if done without involvement of the affected communities. Communities are faced with difficult choices when a zoning exercise results in areas currently in use being classified as high risk, for example. Participatory flood zone assessment is not practiced in Azerbaijan and the concept is new. Without it, attempts to impose flood zones will be controversial and difficult to enforce.

55. There is little to no community involvement in flood management planning and there is minimal basis for it in existing legislation and policy. Community participation in the flood zoning process helps to alleviate negative responses to the need for changing land use practices as the communities themselves assist in determining the flood risk zones and in determining land use regulations for their river basin. Community involvement in developing flood warning systems greatly increases their efficacy. At present there is no support in law or in practice for community involvement in flood management.

56. The project will address the weaknesses in the water and flood management framework through 1) contributing to the National Water Policy Dialogue, 2) making recommendations for modifications to the Water Code and related legislation, such as the Land Code and working with the Parliamentary Committees to have those changes adopted into law, 3) modifications to associated regulations, or Normative Legal Acts (NLAs) which detail responsibilities and day-to-day competencies of the relevant organizations and 4) developing practices, such as conjunctive water management which will illustrate improved water management approaches and highlight where changes need to be made in the law and policy framework.

Barrier #2: Institutional capacity is insufficient to meet the challenges of climate risk management.

57. Climate change and its impacts impose the need for new skills, technical knowledge and integrated management approaches in the water and flood management sectors. Water and flood management in Azerbaijan are highly fragmented and there is no cooperative cross-sectoral institutional framework to reduce threats of flooding or address barriers to improved water management from an integrated perspective. The current, sector-oriented institutional structure is inflexible to accommodate competing demands of water users and insensitive to the forthcoming risks posed by the climate change.

58. There is no single agency responsible for water management as a whole, and the institutions involved do not work collaboratively toward the common goal of effective water management. Several agencies are involved: MoES and its new State Agency for Water Reserves are new actors in this field but have become a key part of both water and flood management and being new to the work, they have very limited technical capacity; MoENR's Department of Hydrometeorology is the primary entity that monitors and analyzes data on surface water; its Geological Research and Engineering Geology Department monitors and researches groundwater, and its Land Department is responsible for monitoring aspects of land and land-related pollution; AJSC manages large scale irrigation and has been the main agency for flood protection; AzerSu is the main service provider for water supply and sanitation. These agencies work independently of each other with little communication among them, though their responsibilities are highly related to each other.

59. These key institutions do not have the necessary capacities, technical skills, tools and methods to apply advanced climate risk management practices for water stress and flood risk mitigation. There is limited knowledge of available adaptation technologies, in particular water and land use regulation and management modalities that will make the highly exposed assets and populations resilient to climatic stressors.

60. Several issues have been identified regarding the capacity for water management within these organizations, which include the following. First, there is limited knowledge of climate change adaptation planning, methods and technologies such as aspects as determining groundwater potential, operationalizing conjunctive water management, scenario-based planning, risk assessment and forecasting water demands. Gaps were also identified regarding practical knowledge in the field of flood hydraulics, including specialized structural flood mitigation options such as flow accelerators to cope with the very large floods and mudflows that climate change is making more and more common to the project area.

61. Secondly, existing narrowly focused water and flood management practices do not encourage collaboration among the MoES, MoENR and Amelioration JSC on the issues of protection and use of water resources. Third, there is a lack of a Government entity specific to water resources management. Instead "management" is seen as a byproduct of other activities such as flood protection wall construction or canal building. Fourth, the responsibility for groundwater exploration and use is not related to water resources. Fifth, responsible agencies lack enforcement tools, such as well elaborated flood zoning regulations or normative legal acts. Sixth, flood management is directed entirely at structural measures, mainly because there is little knowledge of non-structural alternatives (elaborated below and in Annex G); Seventh, the limited availability of and/or ineffective education and training in adaptive water management aspects hampers the ability to respond effectively to climate change. Eighth, the implementation of a basin or watershed-based approach to water resources management has yet to be adopted by key agencies. And finally, efforts to improve public awareness and public participation in the decision-making process are inadequate at best, with no public outreach or participation programs under implementation.

62. At the institutional level, most organizations involved in water and flood management are not well versed in modern tools and approaches to reduce vulnerability to water stress and flooding events, such as: a) the use of soil

and water assessment tools to quantify the impact of land management on water resources; b) modern flood risk mapping customized for each particular river system; c) the strategic use of automatic hydrometeorological stations to maximize climate risk mitigation potential; d) the design and use of community-based early warning systems.

63. These shortcomings in capacity have an immediate impact on the vulnerability of communities to water stress and flood damage, especially under the changing conditions that climate change imposes. As an example, the idea of conjunctive use – managing surface water and groundwater together in situations where the two are linked – is an unfamiliar concept, with the result that the project region is in a state of water stress despite apparently rich groundwater reserves. This is an issue closely related to the fragmentation of agencies noted above – the surface water and groundwater are under different organizations – leading to gaps in information and in knowledge of good and climate resilient water management methods.

64. Another example is that the approach to flood management is entirely oriented to structural measures, specifically the building of 'flood protection walls', despite the fact that these are costly and inappropriate to the changing hydraulic conditions in the mountain rivers due to climate change, and consequently risk increasing communities' vulnerability to flood damage. This is an issue of the responsible agencies not keeping up with changes in modern practice. Europe and other areas of the world have moved to more non-structural measures such as flood zoning, flood insurance, flood forecasting and early warning systems and watershed management as more effective means of mitigating flood damages. As a result, there are real gaps in knowledge of flood zoning and how it works to protect communities, and of the impact of land use on floods and on water resources.

65. Azerbaijan has no flood forecasting system, and the flood warning system that is in place is ineffective because of the absence of meteorological stations at high elevations in the 2,000 - 2,500 m range. Additionally, many stations and many components of the telemetric network are non-functional because of insufficient budgets for maintenance and replacement of equipment. Flood forecasting and early warning sytems are very important non-structural measures for reducing vulnerability by mitigating flood risk and mitigating flood damage.

66. In short the capacity is extremely limited within and among the relevant institutions to implement successful climate change adaptation measures that reduce vulnerability to water stress and flooding. This has led to the neglect of many water management functions, such as managing river basins to ensure the sustainable use of water resources. Water management is a rapidly changing science because of growing pressures on the resources through population increases, economic development and climate change. Azerbaijan has not kept up with the changing, modernizing practices that will help to reduce vulnerability to climate change.

67. The project will address the currently limited institutional capacity through 1) a series of targeted training for water and flood management practitioners and other stakeholders at regional and national levels, 2) introducing modern practices such as the Soil and Water Assessment Tool (SWAT) and participatory flood risk mapping, 3) expansion of the hydrometeorological network to support early warning systems, and 4) developing early warning systems.

Barrier #3: Communities are unable to participate in assessing and making decisions related to adapting themselves to climate change risks.

68. Participatory planning and community engagement are necessary to ensure local support and enforcement for the most appropriate land use in the high risk areas in order to avoid potential conflicts between the flood risk reduction and economic returns from the land and to ensure that economic returns are not jeopardized by flood risk management solutions, but rather maximize those returns.

69. Current water and flood management practices in Azerbaijan are focused upon "concrete results" such as more flood protection walls and new canals rather than participatory processes that engage local stakeholders and incorporate their knowledge and concerns into long-term climate change adaptation solutions. At the local and community level, there is no participation in planning and management and no established link between the community and the regional level practitioners in water and flood management, both of which are necessary to reduce vulnerability through adapting to climate change. Community participation and collaboration with government practitioners in the analysis of conditions and adaptation options are necessary because: 1) adaptation, and the decisions on how to adapt, occur at the community level, 2) some of the adaptation measures will be controversial and the community will need to decide for itself, 3) the community alone does not have the technical skills to properly assess the situation on its own, and 4) the regional practitioners do not necessarily have sufficient understanding of the needs of the community in developing adaptation measures and approaches.

70. Communities are unable to participate at this time because: 1) local community engagement mechanisms (associations, clubs, etc) are under-developed in Azerbaijan. Community organizations such as WUAs are new to Azerbaijan; 2) WUAs were set up for purposes other than climate change adaptation, and water and flood management, 3) they do not have sufficient training and technical skills to collaborate with regional agencies as equals.

71. There are no watershed management plans in place that incorporate flood issues or climate change and none that have been elaborated in a participatory manner. Public awareness of floods, especially as it regards early warning is very limited and campaigns to improve awareness do not exist.

72. The proposed project will address these barriers at the management framework level, the institutional capacity building level and the local community involvement level through the three proposed Outcomes. The aim is to develop the capacity for integrating climate change risks into the water and flood management policy and regulatory framework. The focus is on mitigating the impacts of climate change with regard to water resources and flood management for the vulnerable mountain communities of the Greater Caucasus Region. The project will work at national, regional and local levels because of the need for interaction and support among these levels. The project will develop capacities of local communities and communal organizations to more effectively withstand to current and anticipated climate change risks through improved water and flood management.

73. At the local and community level, there is no participation in planning and management, which would help to decrease flood risks and water stress to which the communities are vulnerable.

74. The project will address the problem of limited community involvement by 1) strengthening WUAs through training and hands-on exercises to develop a thorough understanding of water and flood management and climate change adaptation and working collaboratively with regional practitioners, 2) creating a Local Multi-stakeholder Committee with regional practitioners to jointly address climate change adaptation issues, 3) introduce and initiate participatory land use/watershed management planning and management, and 4) prepare and execute a public awareness programme across the region to inform others about the impacts of climate change and options for adapting to it and mitigating its impacts on their communities.

B. 2. incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

75. The proposed project is designed to enable stakeholders to overcome the critical barriers described above preventing them from reducing the vulnerability to climate change induced water stress and flood hazards through improved water and flood management. The project will do this through the targeted design of the following three inter-related outcomes and their respective outputs and activities.

76. This project is additional in as much as it introduces new practices in water and flood management in order to adapt to climate change risks and builds on current baseline of water and flood management practice in Azerbaijan. At the national level, the current baseline of law and policy, institutional programs and capacity and local community engagement lacks the necessary legal basis, modern tools and methods, and participatory approaches that are critical to successful adaptation in water and flood management going forward. In the baseline project, attention will continue to be focused upon narrow sectoral measures and solutions to water resource management and flood risk reduction.

77. At the local level, in the business as usual baseline, mountain communities do not have to put additional effort into protecting themselves from floods because their communities had been developed with good knowledge of the historical flood regime. But with the onset of climate change, these same communities are now faced with more frequent, more severe floods carrying much more debris and water flow, which pose much higher risk of greater danger and damage to their communities. Regional authorities and communities have little knowledge in how to cope with this increased risk due to climate change.

78. In the business as usual baseline, the current low level of water management is evolving slowly using narrow, sectoral, structurally oriented solutions. But water stress caused by CC has imposed new challenges on this slowly evolving baseline, and placed new demands on outdated water management practices. As a result, regional organizations and local communities do not have the expertise to address climate-induced water stress going forward.

This project is designed to provide additional, new and innovative, non-structural tools to enable Azeri stakeholders to reduce vulnerability to water stress and flood risk. This additionality reasoning is reflected in the project's three primary outcomes and their associated outputs described in detail below.

79. The three outcomes of the project are: 1) Water and flood management framework is modified to respond to adaptation needs and improve climate risk management 2) Key institutions have capacities, technical skills, tools and methods to apply advanced climate risk management practices for water stress and flood mitigation and 3) Community resilience to floods and water stress improved by introducing locally tailored climate risk management practices. The three Outcomes, their respective baselines and proposed alternatives are summarized below.

80. **Outcome 1: Water and flood management framework is modified to respond to adaptation needs and improve climate risk management.**

81. Outcome 1 is directed at the water and flood management framework, which is law and policy, with outputs that address modifications directly, or work to inform the recommendations toward those modifications.

82. Baseline: The management framework refers to the policies and laws that govern water and flood management. Azerbaijan enacted the National Water Code in 1999 to provide the legal foundation for regulating water. There have been occasional amendments to the Code and new regulations added in response to changing conditions and priorities, but the pace of change has not met the needs imposed by climate change (CC). The Water Code does not explicitly consider CC, its impacts on water resources and what adaptations may have to be made to mitigate them. Therefore, while the Code contains many of the requirements to support basic water management, there are no articles in the Water Code or any other legislation that address climate change, its impacts, and adaptations to it. The Code is not sufficiently adaptable to the increased management demands that climate change imposes. The impact of land use changes on water resources and flooding are not well understood and therefore not properly considered in land management. As greater demands are placed on both as a result of climate change, land and water need to be planned and managed together.

83. There are some specific and critical gaps in the Water Code that the project, working with MoES, will seek first to bridge, using Normative Legal Acts in the near term and in the longer term to fill these gaps through specific modifications to the Code itself. Gap #1: The first critical gap is the lack of formal recognition and support within the Code to enable an Integrated Water Resources Management (IWRM) planning and implementation approach, which is a necessary and missing basis for effective CC adaptation.

84. For example, the Water Code as written does not promote and underline the means and provide the legal basis for integrating water and land management organizations. Water management remains highly fragmented, with various organizations acting independently, without consideration to the overall process. An effective water law defines which organizations have responsibility for each of the various activities. Instituting new approaches and new organizations or making changes to how those organizations work and how they interconnect with other government or non-government entities requires the backing of law.

85. As another example, an important principle of IWRM is that the correct management unit for water resources is the river basin or watershed. Micro-watershed management is not yet the case in Azerbaijan and, while some wording is in place to support it, the Water Code does not provide the necessary backing to catalyze such an approach. Adopting IWRM is a "no regrets" situation with regard to climate change adaptation, as introducing IWRM will result in much needed improved water management even if the forecasts for climate change are less severe than expected. The proposed project will introduce the IWRM process at the legislative and policy level, within the responsible organizations as a form of institutional capacity building, and at the community level through introducing participatory approaches to land, water, and flood management.

86. The Water Code and its regulations and by-laws provide little understanding of the range of non-structural options available for flood risk reduction. This is because the growing emphasis on non-structural measures in Europe and other areas is relatively new and has not yet been adopted in Azerbaijan (See Annex G for a summary of non-structural measures). Gaps 2-5 relate to this issue.

87. Gap #2: the specific CC adaptation duties or competencies of each organization are not delineated in the Water Code or under any existing NLA. This includes the lack of specific enabling language to encourage innovation in responding to CC adaptation challenges by providing funding for CC adaptation innovation. The current, sector-oriented system of water management does not allow or enable organizations to adapt their activities to address new

challenges imposed by climate change, hampering their ability to respond effectively to the demands of water users and make them more insensitive to the new risks posed by climate change.

88. Until recently, there were several organizations involved but none with responsibility for overall water management. The organization of water management is fragmented, with limited coordination between the various organizations. As a result, many water management functions have been neglected, such as managing watersheds to ensure sustainability of water resources. This is beginning to change and in fact will be a key element of this project's baseline. The MoES's new State Agency for Water Reserves (SAWR) was only established in the spring of 2011 and is still being staffed. It will be the closest that Azerbaijan has ever come to having one agency dedicated to water resources management. The SAWR will be a key actor in the project's work.

89. Gap #3: Flood zoning is a key non-structural means of reducing vulnerability of communities to flood damages. Flood zoning requires the force of law and this must be clearly defined in articles of the Water Code. There are no such articles in the current Water Code. There has been a step toward flood risk zoning legislation, initially put forward under the Asian Development Bank (ADB) Supporting River Basin and Flood Management Planning Project (2003 to 2008) which has recently been adopted into regulations. However, these regulations were poorly defined because they are generic – delineating a certain distance from a river bank as a flood zone based on the length of the river, rather than studying a specific river and delineating flood zones based on its very individual flooding regime, including the long term changes in flooding regimes, due to climate change. Application of these regulations to specific rivers is practically impossible. This differs from the European approach in which flood risk zones for individual rivers are studied, delineated and entrenched in by-laws. Such an approach will need to be adopted in Azerbaijan for flood risk zoning to work.

90. The delineation of flood zones can be incorporated in descriptive regulations or normative legal acts (NLA), but the Water Code itself must ultimately clearly state the meaning of each zone in a way that is enforceable. There are no such articles or NLA in the current Water Code. Further, flood risk zoning must be carefully implemented in full collaboration with the affected communities. Communities are faced with difficult choices when a zoning exercise results in areas currently in use being classified as high risk. Participatory flood zone assessment is not practiced in Azerbaijan and the concept is new. Without it, attempts to impose flood zones will be controversial and difficult to enforce. Modifying the Water Code to include articles on flood zoning will be one of the areas in which the project adds to existing legislation, in the near term using NLA and in the longer-term with actual modifications to the Water Code.

91. Pilot integrated zoning plans will also be prepared by the project under Outcome 2 based on flood risk mapping generated through participatory risk assessments. These are new concepts in Azerbaijan that the project will introduce. Their preparation will also inform the recommendations for modifications to the Water Code as many aspects will need a legal foundation.

92. Gap #4: The Water Code and its regulations make no allowance for participation of the community or other public stakeholders in water and flood management processes. Community participation in the flood zoning process helps to alleviate negative responses to the need for changing land use practices as the communities themselves assist in determining the flood risk zones and in determining land use regulations for their river basin. Community involvement in developing flood warning systems greatly increases their efficacy. A step forward has been made in establishing Water User Associations (WUA). However, WUA are strictly irrigation oriented and not considered in the larger water and flood management context. This project will show how stakeholders can be integrated into the planning and management process through a series of activities, including participatory land use planning, participatory flood zone delineation and various types of training for community members and government organizations. Integrating stakeholders into the planning and management process will require reference in the Water Code and guidance in a National Water Policy.

93. Azerbaijan does not yet have a National Water Policy (NWP), which is crucial to the water management framework because it provides an official statement on how the government intends to manage water. It directs the law, especially the Water Code, which in turn supplies the legal basis for implementation. Azerbaijan is in the process of holding a National Policy Dialogue (NPD), supported by the EU and the UNECE. One of its aims is to institute a NWP. This dialogue is in part considering whether Azerbaijan can adopt the EU Water Framework Directive (EUWFD) as a basis for its NWP. However, the dialogue is occurring at a high level and is not being informed by community and regional level actors. The project will provide a direct link between law and policy and,

through the various participatory activities noted above, will inform the NPD on community and local aspects of water management which should become entrenched in the policy. The project will work with the NPD to ensure its final form fully integrates climate change and the needs of community participation.

94. Gap #5: Conjunctive water management (CWM) is unknown and not supported by the existing legal and regulatory framework. One significant cause of water stress for communities in the Greater Caucasus is that potential groundwater reserves are significant but underused. This is mainly an institutional issue as groundwater has traditionally been overseen by a different government organization than those responsible for surface water and for providing water supply or irrigation services. This is a good example of the fragmentation of water management efforts creating inefficiencies in the water resources – water use balance. Under the conditions of growing water stress due to climate change, groundwater is a resource that cannot continue be ignored.

95. Conjunctive use of surface and groundwater requires the water management system to have knowledge of both resources and the ability to determine how best to use them for the various water demands. This does not happen in Azerbaijan because the organizations responsible for surface water and groundwater are separate and because water is not managed holistically at the watershed level. Groundwater reserves are estimated to be abundant in the project region, but groundwater remains an underused resource, despite growing water stress. The project will add to the understanding of conjunctive use through activities such as developing a conjunctive use model and guidelines for its use in the pilot sub-basin and the project region. These will serve to build capacity in the regional organizations and also serve to inform the package of modifications to the Water Code.

96. The project adds to the existing law and policy framework by first enhancing the ability of the existing Water Code to support climate change adaptation work and strengthens the water management framework to support the actions which need to be taken to reduce the risk of water stress and flood damage from the impacts of climate change.

97. Alternative: Outcome 1 is designed to improve the water and flood management framework, specifically law and policy, through a three step process. The first step is to recommend modifications to the 'Normative Legal Acts', which are regulations which detail actions under the various articles of the Water Code or other laws, then working with the Cabinet of Ministers to enact them. Work on the Normative Legal Acts is approached first, because the process of amendment is easier and faster. The second step is to recommend modifications to the existing Water Code itself, and to other legislation, then working with Parliamentary Committees to adopt the modifications. The third step is taking part in and influencing the National Policy Dialogue toward establishing a new National Water Policy to ensure that the National Water Policy addresses climate change and its impacts and promotes community participation in the water management process. Outcome 1 works to achieve a comprehensive legal and policy base for water resources so that it can fully address climate change and adaptations to it, and support the establishment of effective water management organizations to facilitate reducing vulnerability to water stress and flooding.

98. <u>Output 1.1: A package of five Normative Legal Acts (regulations) developed on climate resilient water management at the sub-basin level.</u>

99. Work under this output focuses on practical near-term amendments, improvements and additions to the existing "Normative Legal Acts" (NLA) which are associated with the Water Code to support effective climate change adaptation in the water and flood management fields. Under this output, project resources will enable the formation of a national Legal Working Group (LWG) of national experts to elaborate specific NLAs in the critical areas needed to enable adaptation. Normative Legal Acts are like regulations which support a particular implementation of a law. They detail the responsible organizations, their competencies and other considerations needed to implement the article or articles under the Water Code. They are simpler to elaborate and enact, as they require only a review and approval by the Cabinet of Ministers, rather than a full parliamentary process as amendments to law require.

100. The LWG will be 5 to 7 members, which will be made up of representatives of the line agencies (Ministry of Emergency Situations, AJSC, AzerSu, Ministry of Justice, and MoENR). Other ministries and organizations will be consulted as needed. The LWG will be supported by an international water law expert and an international IWRM expert with best international practice on water law and policy to provide a starting point for the review, as well as a national legal and legislative expert. The LWG will also be informed by the Local Stakeholder Committee (LSC, formed under Output 3.2). Several activities in the three Outcomes will inform the specifics for elaborating NLA, which will be developed by the LWG.

101. The formation of the LWG will happen as a priority in the early stages of the project so that amendments to the NLAs can be made quickly and be in place when other Outputs of the project come on line. The majority of the recommendations for modifications to the NLAs will be completed by the middle of Year 2. Working through the Cabinet of Ministers, the enactment of the modifications should be complete by the middle of Year 3.

102. Under this output, the LWG will elaborate at least five NLAs to strengthen and sharpen the Water Code's focus on adaptation in the water and flood management sectors:

103. NLA #1: will enable IWRM. This NLA will create a working environment for IWRM prior to its principles being entrenched in the Water Code. First, this NLA will specify which planning and management activities will be undertaken at the river basin or sub-basin level. It will specify clear and simple steps to be taken by MoES, MoENR, and others to begin practicing IWRM. NLA #1 will specify the organizations that will work collaboratively at national, rayon and local levels and in what capacities. It will regulate the integration of land and water management, of surface water and ground water management and of water quantity and water quality issues.

104. NLA #2: will enable relevant organizations at all levels to adapt their activities to address climate change prior to it being entrenched in the Water Code. This NLA will support organizations to take on new approaches necessary for climate change adaptation by re-defining the competencies of each organization to emphasize climate change. At the same time, the NLA will enable the integration of CC adaptation innovation budget lines into each organization's respective budgetary programme. The uncertainties of climate change require new approaches to planning and other management actions and organizations need the flexibility to proceed under the circumstances of risk and uncertainty. Currently, the water and flood management activities of organizations are highly restrictive, causing them to recycle old ideas in order to obtain working finances.

105. NLA #3: will elaborate specific flood zones and clearly state the meaning of each zone in a way that is understandable, equitable and enforceable. Flood zoning is one of the most effective means of reducing flood risks to communities, industry, and agriculture. Flood zoning requires the force of law to implement because it restricts land use, possible where economic activities are already in place. There is one regulation on flood zoning in place, but it is improperly defined and is unenforceable in its present form. Flood zoning is a key area of focus for this project and requires the regulatory backing to see some of the activities through.

106. NLA #4: supports the introduction of conjunctive water management as a new tool for reducing water stress. This NLA will enable the practice of conjunctive water management through specifying the competencies of each of the relevant organizations which will be involved. It will define the mechanisms through which the organizations will cooperate and collaborate. It will also define how budget lines will be shared to enable disparate organizations to work together.

107. NLA #5: will enhance public participation and gender representation in water and flood management policy and practice. Public or community participation in the water and flood management process is a priority area for modifications to the Water Code. This NLA will highlight specific steps and measures to be taken to improve public participation in water and flood management policy and practice even as the Water Code is updated. Especially where it concerns contentious issues such as flood zoning, the more communities are involved in its development and the more women are represented in these discussions, the more likely the communities are to be accepting of the changes. This is an aspect often overlooked in water related legislation. Instilling participation as an article in law ensures their inclusion in the process and gives them the confidence to participate actively.

108. Output 1.2: The Water Code, Land Code and other related legislation revised to account for climate change risks.

109. Work under this Output will support the MoES's State Agency for Water Reserves (SAWR) in establishing a National Water Policy, as well as promulgating modifications to the Water Code itself, and other relevant legislation such as the Land Code, to support effective climate change adaptation in the water and flood management fields. The same national Legal Working Group (LWG) noted in Output 1.1 above will lead this work, and will be chaired by the MoES's SAWR.

110. The elaboration of and passing of a National Water Policy is critical to effective water and flood management in Azerbaijan. A water policy defines the priorities and the approaches to managing water resources from both supply and demands sides. It is an important component of the overall framework because it is the official statement of how the government will address water management. The proposed project will align itself with the ongoing NPD

described in the baseline section above to inform the process to ensure that IWRM and climate change aspects are specified in the National Water Policy. While finalizing a National Water Policy is likely beyond the scope of this project in both resources and time required to achieve, the project will, under this output, contribute strategic input to an ongoing process to elaborate a National Water Policy for consideration and passage by the National Assembly.

111. Modifications to the Water Code itself are necessary to support the changes needed to address climate change and the impact it has on increasing water stress and flood risks, and to address much needed improvements in water and flood management to protect the resource and vulnerable communities. Project resources will provide expertise and guidance to enable the Environmental Committee of the National Assembly to formulate modifications to the Water Code and work with them to support their enactment. The purpose of modifying the Water Code is to support the introduction of new approaches to water stress management for the country, especially for the organizations that carry out day-to-day water and flood management work and for the communities that will participate in it. It is common that such changes need to support of law because of changing competencies, responsibilities and rights. The project will make recommendations for modifications and then work through the process of having them adopted into articles of law.

112. The Land Code will also require modification to allow such aspects as the integration of water and land management. The current mandates of several institutions contribute to overall water and watershed management which are crucial to reducing vulnerability to water stress and flooding risks. However, these institutions are not working collaboratively with each other, leaving gaps in the practice of water management which worsen rather than improve the vulnerability of communities in the face of climate change.

113. The LWG, with support from the international and national legal and IWRM experts, will review progress to date on the National Policy Dialogue and prepare a report on areas which need attention within the Policy Dialogue, and for modifications to legislation. This will be completed by the end of Year 1 and presented to the Dialogue at its next meeting. The LWG and the international and national legal and IWRM experts will attend and contribute to the remainder of the Dialogue meetings by invitation from MoENR, which leads the Policy process and is the main co-financier of the proposed project. This process is expected to be complete by the end of Year 4 of the proposed project, culminating in the finalizing of a National Water Policy.

114. As part of this assessment and review process, the LWG will work closely with the Parliamentary Committee to organize a series of round table discussions, culminating in a set of recommendations for modifications in the Water Code and other legislation. The discussions will be informed by several other project activities, the process of which will underline what legal requirements may be needed. Using these other project activities, most of which are regional and local in scope, elicits input from regional, municipal and community stakeholders on legislative needs, thereby drawing from a more encompassing set of stakeholders, and ensures that recommended modifications are based on needs. The recommended modifications will be drafted as a document by end of Year 2 for submission to the Environmental Committee of the National Assembly and the Parliamentary Commission on the Environment and others for review.

115. The project will provide continued support to adopting the recommended modifications through Year 3 and Year 4. This support will be in the form of a series of meetings with parliamentarians, including the Parliamentary Commission on the Environment, which will be brought on board to assist as they have the ability to bring issues before the Parliament for modifying law. The target is to have modifications to the Water Code and other legislation by the end of Year 4.

116. <u>Output 1.3: Conjunctive Water Management (CWM) model and guidelines for surface and groundwater use under climate change conditions.</u>

117. Conjunctive water management is simply the combined use of surface water and ground water, in situations where the two resources are physically connected, but managed jointly as if they were one resource. Such physical connectivity is evident in the project region through the highly permeable limestone mountains, which surfaces through the river beds at various points even through the dry season. Within and near the river courses, the two are hydraulically connected. This means that the use of one of the sources impacts on the supply of the other. From a management perspective, surface water or ground water can be used in ratios which differ depending on specific circumstances, such as at different times of the year, or when floods threaten surface water infrastructure, etc. While simple in concept, conjunctive use is rare, mostly because surface water and groundwater tend to be managed by

different government organization. This is the case in Azerbaijan, though neither resource is currently managed in a systematic way.

118. In Azerbaijan, including over much of the project area, groundwater is an underutilized resource, mainly because the organization responsible for urban and rural water supply (AzerSu) is under a different umbrella than for groundwater (MoENR). Making matters worse, in the steep mountain catchments of the project area, maintaining surface water infrastructure is very difficult because of the severe floods with heavy rock and sediment loads that damage infrastructure designed to collect surface water. In addition, even during non-flood periods, sediment loads in the rivers are high and treating such water for domestic use is costly and difficult, resulting in deteriorating water delivery infrastructure, such as pipes and valves, frequent system collapses, and delivered water with sediment loads too high for the population to use.

119. With climate change making water more scarce while simultaneously increasing water demand, a new approach is required with more balanced reliance on surface and groundwater as equal sources, where possible. Because conjunctive water management is new, the approach will require "proof of concept" to show its value and training in its practice. Output 1.2 is designed to prove the concept through the development of a CWM model, with practical application through the establishment of test wells in selected sub-basins.

120. A new project for water supply is underway for the town is Ismayilli, within the project area. It aims to rehabilitate the existing surface water sources and infrastructure, damaged mainly due to the hostile environment of the river source. In addition to the rehabilitation, two 150m deep wells are being drilled to obtain groundwater. These wells will supply about 15% of the total water requirement, and are seen as a secondary source. This is not quite a model of conjunctive use, but it does represent an acceptance of the need for groundwater use as a part of urban water supply. This opens the door for the project to use it as part of the illustration or training in conjunctive use and will be used as an example for a CWM model.

121. Work under this output will develop a model for CWM which will enable the communities to improve availability and reliability of their water supplies in the face of climate change. It incorporates important components of both groundwater management and surface water management such as monitoring, evaluation of monitoring data to develop local management objectives, and use of monitoring data to establish and enforce local management policies. The objective is to illustrate the value of CWM and to develop and instruct on a method and approach which is appropriate to local conditions and capacities, with the intention that it become the norm for water management in the project region and across Azerbaijan.

122. The CWM model is aimed at the organizations involved in managing the water resource and supplying water to communities: AzerSu, (water supply and sanitation services), and AJSC (irrigation water supply), and MoENR's Departments of Groundwater and of Hydrometeorology. For the project, the CWM work will be aimed at the rayon level in the three pilot rayons, but national level representatives of these organizations will participate to support replication in other areas of the country. Community stakeholders will also be involved, represented by the existing WUAs.

123. To be practical, the model will need to be based on real groundwater resources. MoES co-financing will support the drilling of test wells in two of the three pilot sub-basins, the Kishchay and the Talachay. Ismayilli Rayon is already drilling wells under an AzerSu programme to improve water supply for that rayon and this can be used as the basis of the model in that area.

124. During Year 1 of the project the international and national IWRM specialists, supported by hydrology and hydrogeology experts from MoENR, will work with AzerSu and AJSC regional staff to identify appropriate well locations and plan for drilling. Drilling, well development and well testing will be completed by the end of Year 2.

125. While the drilling is being done consultation will take place to design the actual CWM model. A CWM model is really a series of steps within a framework of adaptive management where policies and practices are continually improved by learning from the ongoing work. The idea is to make the process interactive and aspects of the management process are revisited, reviewed and improved.

126. A set of guiding principles is in place concerning conjunctive use, which will act as a framework for the CWM model:

- Physically connected surface water (including overland flow) and groundwater should be managed as one

resource.

- All surface water and groundwater stores rely (either directly or indirectly) on rainfall for recharge. Identification of new storages within a connected system does not automatically increase the net sustainable yield of that system.
- Water management regimes should assume connectivity between surface water (including overland flows) and groundwater unless proven otherwise.
- The Precautionary Principle should apply to protect against potential impacts of surface water-groundwater interactions. For example, a single combined sustainable yield should be used as the basis for the net allocation of surface water and surrounding groundwater resources.
- Water users (groundwater and surface water) should be treated equally. It is not appropriate to assume one source is more important than the other.
- Jurisdictional boundaries should not prevent management actions.
- Management arrangements between the various institutions involved should not be an excuse for failing to identify and address issues associated with connected systems, or for not progressing opportunities associated with conjunctive water management.

127. The steps of the CWM model process are described below, and the process illustrated in Figure 3 below:

- Identify the management setting (the key features that define the management of land and water resources in the catchment)
- Acquire the baseline information to describe the characteristics of surface water and groundwater systems of the catchment, and their interactions, both spatially and temporally.
- Summarize the current understanding of the processes, dependencies and impacts on the water resource in a conceptual model. This will be used to form a mathematical model that can be used as a predictive tool.
- Identify the goals and objectives to be achieved for water management in the catchment.
- Develop and implement management options and evaluate and implement an appropriate mix of policy and on-ground investment options for conjunctive water management
- Monitor and review performance of key indicators and use this as the basis to review catchment conditions and the performance of conjunctive water management.

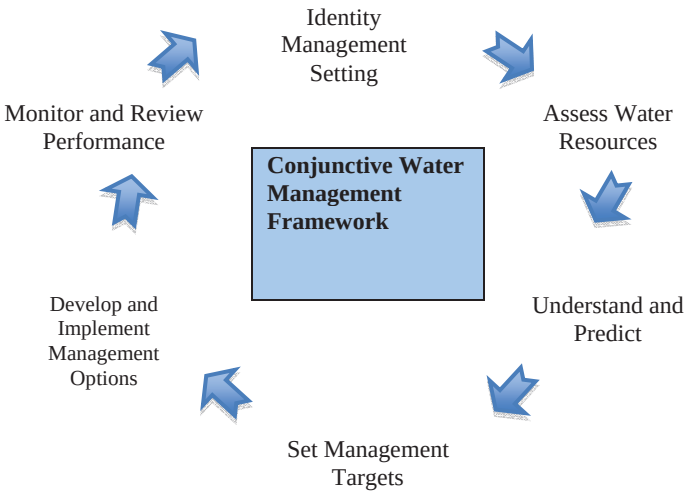


Figure 3: Components of the CWM Model

128. The activities of Output 1.2 will follow the steps outlined above, starting with a set of consultative workshops

to determine the appropriate management setting. The consultation step will be completed by the end of Year 1. This will result in the definition of the form of the model, what it will include, what information is required for it, how it may be used by the various organizations once it is complete.

129. The CWM model development will be led by the international and national IWRM specialists, supported by hydrology and hydrogeology experts from MoES, and in collaboration with the other stakeholders. Data for the model will be obtained from the wells themselves, through bore hole logging and pumping tests, which will define its volumetric output. Similar information will be obtained on surface flow from Hydromet and MoES. The CWM model will be developed in two stages: the first stage model will allow the introduction of the model and training in its use before the full range of data is available from well drilling and river flow monitoring. The stage 1 generic model and training will be completed by the end of Year 2.

130. The development of the CWM model is one of practical training. The training will be a continuous process through the project period as the models are being developed. The three Rayon Executives will contribute to the process by providing space for the training.

131. In Year 3, once the wells are completed and data are available, second stage CWM model will be finalized and will be specific to the pilot sub-basins. This step will involve the same nmexperts and stakeholders, with the difference being the introduction of basin specific data. The model itself is really the process of bringing the various organizations and other stakeholders together to facilitate conjunctive management. By the time this activity is completed at the end of Year 3, the framework for conjunctive water management will be in place in the three pilot rayons.

132. Once the three CWM models for the three pilot rayons / sub-basins are complete, the next step is replication across the project region to the other six rayons. This will be more formal training done as part of a larger training sub-contract supported by project funds. Training will take place at the national level but with selected regional (rayon) participants. MoES will contribute to the training by providing their Training Centre facilities and supporting travel for the participants.

133. **Outcome 2: Key institutions have capacities, technical skills, tools and methods to apply advanced climate risk management practices for water stress and flood mitigation.**

134. Baseline: Adaptation to climate change (CC) in the water and flood management sectors is a new concept in Azerbaijan. Institutions are not prepared to adopt it into their planning and practice. More importantly, until very recently the institutional context for water and flood management in Azerbaijan was fragmented and incomplete in terms of mandate scope, and capacity. Until literally the end of this PPG period, Azerbaijan lacked a ministry or agency that actually deals with overall water management. The fragmented institutional context for water and flood management means each relevant institution has water-related responsibilities that represent only a piece of the overall water management "picture." This reality, together with poor cross-sectoral coordination and leveraging, means that institutional capacity to respond effectively to climate change is piecemeal and ineffective.

135. Fortunately, there are signs that this situation is beginning to improve. Signs of change are evident with the increasing roles and responsibilities of the Ministry of Emergency Situations (MoES). The MoES is a relatively new ministry and is in the process of expanding its mandate to cover most aspects of water and flood management. As yet, they do not have the technical capacity to carry out this wide array of tasks. The State Agency for Water Reserves (SAWR) is the key unit being established within MoES, and has acquired several mandates to undertake water related work related to emergencies, including:

a) participating in the development and implementation of measures to mitigate damages from floods and other negative impacts from surface and ground waters;

b) identifying integrated use and protection of water resources and projected demand on national water resources;

participating in: the development of scenarios for the integrated use of surface water; monitoring of quantity and quality of water; and preparing proposals for water appropriation and for efficient use of water facilities;

c) participating in the development of state programs on the management of water reserves; the development of forecasts and standards for water use together with other MoES divisions and other state agencies;

d) participating in improvement of the management of flood warning and flood prevention measures, providing recommendations on settlement zoning, on the construction of infrastructure, participating in defining flood risk

zones and on the construction of flood protection walls;

e) developing a GIS for the management of emergency situations; participating in the development of normative-legal acts and provisions in the field of water reserves management, and others.

136. The SAWR works at national level, but also has representation in each rayon through each rayon-based Commission on Emergency Situations (CoES) based in the office of the Rayon Executive Authority (REA). The CoES also draws upon representatives of other line agencies, including MoENR, AJSC, AzerSu, Ministry of Health, and others important to water and flood management response. Several other institutions and organizations have responsibility for specific aspects of water management, although there is little understanding of the need for a more collaborative approach to adaptive water and flood management among the ministries and other government organizations and with local communities as well.

137. The Amelioration Joint Stock Company (AJSC) bears responsibility for management of irrigation water resources and hydrological facilities. It is the engineering arm of water management and is very much structurally oriented. AJSC's structurally oriented programme for flood management forms part of the baseline project for this project.

138. The Ministry of Ecology and Natural Resources (MoENR) Hydromet Department is the main water monitoring agency for the country, but it has no remit for managing the resource. MoENR has a Groundwater Department, but it does not have a mandate for developing or managing groundwater resources and focuses on monitoring. MoENR also has a land department that is concerned with land pollution, but is not responsible for land use planning or land management. MoENR is involved in some other aspects of water management, such as leading the development of a National Water Policy and working to protect water sources from pollution, but its mandate is very pollution oriented and not sufficiently broad in scope for the challenges of climate change. AzerSu is responsible for domestic water supply and sanitation. As such, it does not have a mandate for water resources management but, as a major water user, is a key stakeholder in the proposed project. Overall, the institutional context for water and flood management is a picture of a non-coordinate approach to water and flood management that hampers not only effective water and flood management, but additionally, the development and adoption of effective CC adaptation measures in the water and flood management sector.

139. There are large gaps in institutional capacity to develop and apply adaptive water and flood management practice. These gaps are summarized in the following paragraphs:

140. Gap #1: limited knowledge of integrated approaches and tools for adaptive water management among the agencies responsible for water management and even less awareness of how it may be put into practice. There is no "one right way" to implement IWRM. Rather, it must be customized to fit the particular socio-political-economic and environmental contexts of each place. The lack of a coordinated approach to water management has led to the neglect of many water management tools and approaches that are so important to effective adaptation to climate change. This includes the management of water resources by watersheds and sub-catchments. Knowledge of modern approaches to adaptive water and flood management that incorporates CC and its impacts and risks are limited in Azerbaijan. Institutions involved in water and flood management in Azerbaijan are not prepared for the additional challenges imposed by climate change. Significant capacity gaps hamper the ability of the primary institutions in Azerbaijan to plan and implement effective CC adaptation measures for water and flood management.

141. The project will add to the base of knowledge and to an overall understanding of best practice in water and flood management through the introduction of modern tools and demonstrations of how properly linked institutions are critical to adaptive water and flood management.

142. Gap #2: lack of knowledge in key disciplines critical to effective adaptation in water and flood management. PPG consultations revealed a lack of basic knowledge in critical adaptation-related water management skills and approaches, such aspects as determining groundwater potential, operationalizing conjunctive water management, scenario planning, risk assessment, forecasting water demands, and many other areas. Gaps were also identified with respect to practical knowledge of flood hydraulics, including specialized structural flood mitigation options such as flow accelerators to cope with the very large floods and mudflows that climate change is making more and more common to the project area. There are also gaps in knowledge of flood zoning and how it works to protect communities, and of the impact of land use on floods and on water resources, among others.

143. Gap #3: Existing institutional capacity focuses on flood defense rather than flood management. At present, the

approach to flooding problems in Azerbaijan is one of flood protection rather than one of flood management, and it is based entirely on structural measures. Nearly all flood management work currently is directed toward structural measures, specifically flood protection walls that attempt to stop the floods from reaching vulnerable areas. But current practice does not account for the additional risks from climate change such as increased frequency and severity of mud and debris flows. Many of the flood walls that have been put in place only recently in the Greater Caucasus region have been buried by the fluvial material and are now useless.

144. These investments in flood protection walls do not consider the long term implications of climate change, especially with the dramatically changing conditions found in the Greater Caucasus Region. Rising river beds resulting from climate change can bury the walls after only one or two flood events. This is at best an inefficient use of finances and, at worst, may actually increase the vulnerability of local communities to flood risks. The structures themselves cause rock material carried by the floods to pile up, raising river beds higher than they would rise without the structures and increasing the potential depth of flooding and increasing the flooded area. Additionally, as the frequency of flooding is also increasing under climate change, the effective life of the structures in the region is short.

145. It is unlikely that structural measures alone can provide a solution to the growing flood problems caused by climate change. While there may be some scope for structural measures, there must also be non-structural measures – essentially good water and land management – to adapt to this new flood regime that is aggravated by climate change.

146. Capacity deficiencies related to Gap #3 include a lack of knowledge and experience in using important tools to enhance CC adaptation in water and flood management. Planning tools such as the specialized soil and water assessment tool (SWAT) are not currently available in Azerbaijan and the concept itself is new. SWAT helps to identify where good soils are and how they may be used, and determines water requirements for irrigation. The project will bring this tool into use, train practitioners how to use it and work with the organizations to ensure it is disseminated to the greater region. Flood risk mapping is another critical CC adaption tool for which there is no capacity in Azerbaijan.

147. The hydrometeorological observation capacity is insufficient for monitoring floods or extreme rainfall, both of which are necessary for early warning systems. There are no early warning systems in place in the project region. Community-based early warning systems are another example of locally tailored early warning mechanism in particularly remote areas that are not effectively covered by the national system, especially where alert communication is complicated and feedback mechanisms non-existent. There have been some attempts by rayon level administrations in the project region to develop flood early warning systems, but they have not been very effective. Part of the reason for this is that the communities themselves have not been part of system development. However, the fact that attempts have been made on early warning systems shows that the regional administrations are aware of their value and interested in their development. The early warning systems that have been attempted do not meet international safety standards in part because they were based on mobile telephone technology which, in the more remote areas of the Greater Caucasus, has inadequate coverage to support such an important, potentially life-saving system.

148. The project will develop and introduce community based early warning systems for water stress and flood hazards for the pilot sub-basin. The community will fully participate in the development of the system thereby developing a thorough understanding of how it works, what their roles will be and how they will assist in operating and maintaining it. This is one part of an overall, community based, flood management scheme to be demonstrated in pilot communities in order to catalyze the development of such systems across the region.

149. In the baseline situation, farmers in mountain communities across the Greater Caucasus are already faced with new opportunities and new challenges in water and land management due to the impacts of CC. Climate change, particularly increasing temperatures, drives the need to better manage both water and land. However, rural WUA and farming communities lack this capacity to manage soil and water proactively because they have never been trained or done this before. Project support will strengthen the capacity of farmers and rural WUAs to manage soil and water at the farm level in order to manage water demand effectively in addressing water stress.

150. Alternative: The alternative is regional and national water and flood management organizations which are fully capable of responding to the challenges imposed by climate change and to support and assist communities to reduce

their vulnerability to climate risk. The challenges of climate change require effective water and flood management through strong, knowledgeable management institutions. Outcome 2 will provide a firm base through a combination of targeted training, introducing modern, climate risk management (CRM) tools and showing how properly linked institutions are a more effective management system. The project will build capacity within the various organizations by focusing on core principles and practical skill development and the use of strategic non-structural measures and tools to enable effective adaptation in the face of climate change. These include practical flood risk mapping customized for each river's unique morphology, strategic placement and extended coverage of improved hydrometeorological monitoring capacity, and establishing new community-based early warning systems.

151. Output 2.1: Targeted training program for water and flood management, planning and risk assessment designed and delivered for MoENR and other stakeholders.

152. The first step under this output will be an institutional capacity review to clarify and refine the specific training needs for key institutions (particularly the SAWR, which is still recruiting staff as of this writing) to be able to apply a robust adaptive strategy for water and flood management for mountain communities in the Greater Caucasus. It will be led by the Institutional expert, supported by the IWRM, Land and Flood Management experts. The capacity review and needs assessment will be a collaborative and participatory process, linking directly with the MoES/SAWR at the national level, and the CoES and RAE at rayon level, which then involves the other relevant institutions: MoENR, AJSC, AzerSu and others. It will initially involve the offices of the organizations named above from the pilot rayons (Sheki, Zagatala and Gabala) and at the national level. The product will be a report on the review and highlighting the needs for improvement and training. The training needs assessment will be completed by the end of Year 1 and will inform the development of the training program.

153. Working from the results of the institutional review and needs assessment, a comprehensive and targeted training program will be designed. The training will focus upon enabling stakeholders to apply practical steps in their daily work to strengthen the adaptive elements of current water and flood management capacity.

154. Among the areas of focus to be covered by the training program will include specialized instruction on:

a. IWRM practice - will enable stakeholders to develop a working knowledge of IWRM concepts and how to apply and to customize IWRM to the unique context that is Azerbaijan's Greater Caucasus region.
b. information management covering hydrometeorological data, flood depths and land use.
c. watershed management planning practice: will enable practitioners to understand how land use impacts water availability and floods and how land use can be managed in that context with hand-on training in identifying areas of concern, mapping, data management and related.
d. conjunctive water management: this highlights the primary steps of a model CWM process to develop an understanding of how conjunctive water management works, and how it may be applied in the pilot sub-basins, leading into the preparation of a CWM model.
e. water conservation measures: for water supply, irrigation, other commercial uses, etc. to train stakeholders where conservation efforts are most usefully put and how to apply them, and how to analyze the situation at a sub-basin level to balance demand with supply.
f. flood risk assessment: this will enable the communities and the flood management practitioners to carry out community based, participatory flood risk assessments, identifying the steps in flood risk mapping and what the final maps are used for, prior to carrying out a full flood risk mapping exercise.
g. flood zoning methods: identifying the types of flood zones, why they are used and what the communities will do with the knowledge of flood zones and flood risk in their sub-basin.
h. development of early warning systems: enabling the communities and practitioners to jointly develop their own early warning systems, elaborating the components of a system, how they can be set up, options for response to an early warning, etc.
i. flood hydraulics and types of structural flood protection options that are able to cope with the new climate change induced flooding environment, which is significantly more volatile.

155. As has been noted earlier, climate change has led to much greater flows of mud, sediment and large rocks which are the most damaging feature of floods in the project area. The flood protection walls currently being constructed in the area are no longer appropriate to the new conditions created by climate change, but the AJSC and MoES do not have the specialist knowledge needed to improve the structures. While the project focuses on and emphasizes non-structural approaches to flood damage mitigation, of the types noted above, this problem with flood

protection that may actually increase vulnerability needs to be addressed. Including training on modern approaches to structural flood mitigation will make the project more encompassing of the larger flood management process. The preparation of the training package will be completed by the end of Year 2.

156. Implementation of the training program will be done by the training contractor with support from the IWRM and Flood Management specialists. Training will take place at the MoES training facility in Baku. The participants in the training will be drawn from the strategic cross section of institutions and stakeholders that underlie effective adaptation centered water and flood management in the Greater Caucasus, including: MoES/SAWR, Rayon Executive Authorities, MoENR, AJSC, AzerSu, with specific participation from rayon-level staff. Training will encompass all nine of the rayons in the project area: Balakan, Zagatala, Gakh, Sheki, Oghuz, Agsu, Goychay and Ismayilli, to better facilitate the replication process. It is anticipated that about 80 people will participate. The training programme will take place during Years 3 and 4. The impact of the training programme will be assessed on an ongoing basis.

157. This training program will give participants a solid basic grounding in adaptation-critical knowledge and skills. The remaining outputs under Outcome 2 below will enable stakeholders to build on this knowledge by applying specific non-structural tools and approaches for adaptation.

158. Output 2.2: Soil and water assessment tool (SWAT) introduced and applied in each of the three pilot rayon sub-basins to improve land use management and watershed level climate risk assessment and planning.

159. SWAT will be introduced as a new analysis tool for land use management and watershed level climate risk assessment and planning. SWAT is a specialized soil and water assessment tool used to quantify the impact of land management practices on water, sediment, pollution, etc. in watersheds with varying soils, land use and management conditions. It is applicable for carrying out watershed level assessments of climate change risk, planning and determining the potential for land development. SWAT is a public domain model actively supported by the USDA, so there are no issues with licensing and user support will remain available after the project has ended. There are several organizations that offer training in its application.

160. SWAT will be introduced by applying it in each pilot sub-basin. The introduction of and training for SWAT will be for a more focused group, including the MoES/SAWR and Hydromet Department of MoENR, AJSC, and the CoES and REA. Training will be carried out at the national level for staff of these organizations, and staff from the regional offices of MoENR and AJSC from the nine rayons of the project area: Balakan, Zagatala, Gakh, Sheki, Oghuz, Agsu, Goychay and Ismayilli. Including staff from the nine rayons will facilitate the replication of SWAT to their respective areas. MoENR will provide their Training Centre facilities in Baku for this. The training will be completed by the end of Year 3.

161. A SWAT model will be prepared for each pilot sub-basin, working with the regional MoENR and AJSC staff. This will require a fairly extensive programme of soil sampling, land assessment, physical surveys for current land cover and land use, assessing water resources. The MoES/SAWR, MoENR and AJSC staff will participate in this important aspect of model development. The IWRM and Land Management experts will also participate. The model for the three pilot sub-basins (Kishchay Talachay and Turyanchay) will be completed by the end of Year 3. This will be passed on to WUAs in each pilot area so that members of the WUA and other members of the farming community are better able to manage their own land and water in the face of climate change (See Output 2.7). This will considerably improve the local farming decisions, with particular focus on water demands and distribution requirements that WUA are charged to deal with. Staff from all nine rayons will participate in the SWAT training and will develop the capacity to implement it in other areas.

162. Output 2.3: Based upon project generated data, model flood risk maps and participatory mapping processes created in three pilot rayon sub-basins to improve flood management as part of land use planning and management.

163. Based on project generated data, flood risk maps will be elaborated in the project's three pilot sub-basins utilizing the by-laws and guidelines prepared under Output 1.2. These maps and the mapping process will in turn support the watershed management planning process under Output 3.3 to improve flood management and reduce vulnerability. Experience generated under this output will also be used as feedback to improve and refine by-laws and guidelines produced under Output 1.2.

164. Flood risk mapping will be a participatory process, directly involving members of the pilot communities in a hands-on joint effort with regional staff through the CoES, and including MoES/SAWR, MoENR, AJSC and others,

with project IWRM and Flood Management experts. The final products will be the flood risk and zone maps, prepared for the three pilot sub-basins/rayons. This will be completed by the end of Year 3. Beginning in Year 4, these flood risk mapping process will be adopted in the remaining six rayons as part of the project's replication work under Outcome 3.4. In doing this, the approach and method will become incorporated into regional, and national, flood management strategies. This activity will be completed by the end of Year 5.

165. The preparation of the flood risk assessments, flood risk maps and flood zone delineations are new concepts in Azerbaijan. Participatory flood risk assessments, which involve the affected communities in the process from the outset, will be based on a combination of modern mapping, using high resolution satellite images and GIS technology, and participatory risk assessments, which involve the communities directly in the mapping process. Selected community members will walk the rivers with the flood management experts and identify specific locations where floods have caused damage and important locations will be marked using GPS technology, which will then be translated to maps by the GIS expert. Flood impact scenarios are overlaid on the maps so that the communities can develop an understanding of their own risks and vulnerabilities. This will interest the communities and regional authorities, and provide invaluable historical knowledge of flooding situations, former land use practices, settlement configurations, and so on. One difficult aspect of flood management that will need to be addressed as one of the mitigation options is flood zoning, which implies the possibility of relocating some parts of existing communities. Involving the community in flood mapping allows them to develop an understanding of the real problems and real solutions themselves. This allows them to take ownership of those solutions, which makes it easier to make the hard choices on allowable land use within the flood zone if and when those choices arise. The pilot flood risk assessment, flood risk maps and zoning delineation will be completed by the end of Year 3.

166. Other project components, such as the introduction of SWAT (Output 2.3) and the training programme, will significantly improve the knowledge of flood risk and other aspects of sub-basin level water and flood management. The approach and methodology and the software and tools will be transferred to the MoES and their regional counterparts of CoES, and other relevant flood management authorities, such as AJSC, as part of the replication process. The replication process will also include training of staff from the nine rayons of the project region.

167. Output 2.4: Hydro-meteorological observation capacity strengthened by extending the coverage of automated hydromet stations into upper mountain watersheds that are increasingly prone to flood hazards due to climate change.

168. Work under this output will strengthen the hydrometeorological observation capacity by extending the coverage of automated hydrometeorological (weather and river flow) stations in the hazard prone areas of the project region. The target is for six new, fully automated meteorological stations in the project area and three hydrological (river flow) stations, one on each of the three pilot rivers, Kishchay, Talachay and Turyanchay. Identification and installation of the network should be completed by the end of Year 4. Through their co-financing of the project, MoES and MoENR will support the costs of the hardware, installation, operations and maintenance. While the final cost will be determined by specific need, selected manufacturer and installation difficulty, typical costs per meteorological unit are on the order of US$100,000 for the hardware, with additional costs for installation. The total cost installed for all six units will be approximately US$750,000. For hydrological stations, the hardware cost is lower, approximately US$40,000 plus installation, for a total of US$150,000. Telemetry will require a further US$100,000.

169. GEF support will be used to identify the optimum locations for the new meteorological stations to maximize climate risk mitigation potential and assist MoES and MoENR in making the decision of the specifications for the hardware. The project will support a Hydrometeorology Expert for this specific task. It will be done collaboratively with national and regional staff of the MoES and the Hydromet Department of MoENR. The equipment will include telemetry to send information to directly regional authorities as part of an early warning system. By the end of Year 1, locations for new automated stations will be identified and the equipment types identified and costed in collaboration with MoENR, who will order the equipment and be responsible for its installation.

170. Each meteorological station will consist of several components. The first line of defense from the meteorological station for an early warning system is barometric pressure. As a storm approaches the atmospheric pressure drops and the rate of its decline is the first indicator of a storm. Pressure drops that indicate a storm can be several hours in advance of the storm allowing people to respond to a first warning. The second line for the early warning system is the measure of rainfall that is currently occurring. This requires a Light Emitting Diode Weather Identifier (LEDWI) to determine what type of precipitation is falling. The LEDWI sensor measures the pattern of

precipitation as it falls through the sensor's infrared beam and determines from a pattern analysis of the particle size and fall velocity. This identifies the severity and intensity of the rainfall, which is the key factor in rainfall becoming a damaging flood. Once high intensity rainfall is occurring in the high upper catchment, there is much less warning time, perhaps as much as two hours, but not much more. There are other components of the meteorological station that are valuable for research, such as the measurement of total precipitation, wind speed and gust maxima, various types of temperature readings, etc.

171. Hydrological stations measure flow in the river by measuring the depth of water in the river and relating that to the cross sectional area of the river. Modern equipment consists of simple pressure transducers which detect the water pressure on top of the sensor, which is related to depth through pressure – density functions. Hydrological stations measure the flow at a given time and contribute to the early warning system by monitoring the rate of the rise of the water depth. A rapid rise indicates a likely flood and therefore acts as a warning.

172. Both meteorological and hydrological stations report to an early warning centre or office through telemetry. This is most often done through radio waves using automated VHF airband frequencies. Telephone based systems can also work, but this is unlikely in the project area as the stations will be in remote mountain valleys. The project will develop early warning centres in the three project rayons within the CoES offices. These will be the locations to which rainfall, storm and river flow warnings will be transmitted. From there, the warning will be passed to communities through radio to support the community based early warning system established in Output 2.5.

173. Replication will consist of establishing early warning centres in the remainder of the nine rayons of the project region, also within the CoES offices.

174. MoES is expanding its work in the water related fields. MoENR has a long and significant history of establishing and managing a national network of meteorological stations across Azerbaijan. Combined, there is both the funding and the existing institutional mechanism to support the efficient management of the hydro-meteorological information. The Department of Hydrometeorology of the Ministry of Ecology and Natural Resources is the manager of information from hydrometeorological stations and this will continue under close collaboration with MoES. This mechanism already exists through the long-established network of meteorological stations managed by MoENR/NHD, combined with the disaster early warning capabilities of MoES. This project's work will work with existing mechanisms to enhance sustainability and efficiency of use for the hydromet data.

175. Output 2.5: Community-based early warning systems to disseminate water stress and flood risk information to the local communities.

176. Under this output, new early warning systems will be established to enable the timely dissemination of information (water stress and flood related) to the local communities through innovative community-based methods (e.g. local radio for rainfed farmers, mobile sms for pastoralists, regular (seasonal) community meetings for both farmers and pastoralists etc), benefiting over 1,000,000 people of the Greater Caucasus region

177. Work under this Output will develop and introduce early warning systems for the pilot sub-basins and rayons of: Kishchay /Sheki Rayon, Talachay /Zagatala Rayon and Turyanchay/Gabala Rayon). Their development will also serve to instruct the flood management organizations (MoES and AJSC) for application in other parts of the country.

178. There are two separate early warning systems in this Output. Water stress warning systems work over a relatively longer period. They indicate water availability with regard to the water demands of the season to provide information to water users that conservation may be required. This allows communities to respond before the situation becomes a crisis, thereby reducing the financial impact of water shortages. The time element is very short term for flood early warning. In the steep upper sub-basins targeted by the project, the first stage early warning will be a matter only an hour or so prior to a potential flood. While this is a very short response period, flood early warning systems aim to save lives and property.

179. The indicators for water stress are based on rainfall and soil moisture measurements. Rainfall measurements come from Hydromet meteorological stations, including those newly installed with MoENR co-financing under Output 2.5. Soil moisture measurements will require special equipment which will also be installed under MoENR co-financing. The indicators for the flood early warning are based on rainfall and river flow measurements that will derive from the specialized hydrometeorological equipment installed with MoENR co-financing under this project.

180. The first step will be to determine the specific requirements for the early warning systems: what equipment is

needed, where it will be located, how it will be used, who is responsible for it, and the mechanism for warnings distribution/communication. This will be done collaboratively, involving community members, through the LSC, and staff from the regional offices of MoENR, AJSC and, possibly, MoES. While the two types of warning system have somewhat different purposes, the regional organizations involved will be the same because of overlapping responsibilities. This allows the two systems to be developed and introduced together, saving resources and broadening the knowledge base. The project will supply expertise in the IWRM and Flood Management experts. This will be completed by the end of Year 2.

181. The project will also provide training to the WUAs in the three pilot communities covering the community component of the early warning system. The training will cover initial response and how the WUA disseminates information to the people, options for responses depending on the size of the flood and variations in the flood regime in each of the communities, how to implement those responses according to the different levels of severity of the flood. About 20 people will be provided with the training, which will be completed by the end of Year 2.

182. The next step will be to install and operationalize the system. This is specialized equipment and the supplier of it will be contracted to also provide training in its use and other expertise. The cost of the equipment will be met through the MoES co-financing. The equipment will be obtained and installed and training completed by the end of Year 3. GEF resources will be used to support the detailed design of the early warning systems through a collaborative effort of the users of the systems who will contribute to its function and be fully aware of how it will work and what functions they will have within the system. This will also be completed by the end of Year 3. Activation of the systems will require installing the equipment, testing the equipment and fine tuning the system. By the end of Year 4, the early warning systems will be in place in the three pilot sub-basins.

183. The time frame of the project will not allow full replication to all communities in the project region. The replication will be at the rayon level, with an early warning centre established in each of the remaining six rayons, with training provided to regional staff of CoES and MoENR to enable them to work with WUAs in their rayon to establish community based early warning systems for themselves.

184. Output 2.6: Capacity of water user associations increased to adapt to climate change by improving soils and managing land and water by applying new tools such as SWAT and CWM.

185. Under this output farming community water user associations will increase their capacity to adapt to climate change by improving soils and managing their land. This is related to the introduction of SWAT from Output 2.3 in that SWAT is a modeling analysis of the soil and water situation and this is to instruct farmers in what they can do to improve soil and water management and how to do it. This is especially important in the upper catchments where climate change is raising temperatures, driving new agricultural zones uphill and opening the possibility of expanded agriculture. Farmers will then need to know what to do to improve soil fertility and to manage soil, land and water effectively in the long term. Farmers in the region will not have considered cropping in those higher regions and are unfamiliar with the special needs of high mountain agriculture.

186. A soil survey will be completed under Output 2.3. An assessment of the water resources will be completed under Output 3.3 in the analysis of conjunctive use modeling. The capacity building of farmers follows on from these two exercises to provide them with practical, hands-on experience of water and land management at the farm level.

187. Coincident with the SWAT and CWM assessments, assessments of options for soil and land management improvements will be completed for farm areas and potential farm areas in the three pilot sub-basins by project staff, specifically the Land Management and Soils experts. This will also be a collaborative exercise, involving the community through the LSC, linking the WUA with the regional land and water management practitioners. The assessment will be completed by the end of Year 3.

188. A field based set of exercises will follow, with experts instructing farmers in soil and water improvement and conservations techniques. The instruction will cover a full agricultural season from soil preparation through the growing period to harvest and post harvest. Farmers will learn how to conserve water and how to manage soils to maximize crop yield sustainably. It is expected that about 30 farmers will take part in the training and field exercises.

189. Based upon the assessments and instruction for the pilot sub-basins, guidebooks will be prepared on soil, land and water management under conditions of climate change which will be disseminated initially around the pilot communities and rayons for comment and discussion. Following revisions, the guidebooks will be disseminated throughout the region through the participating REAs in each rayon. Guidebooks will be completed and disseminated

by the end of Year 5.

190. **Outcome 3: Community resilience to floods and water stress improved by introducing locally tailored climate risk management practices**.

191. Baseline: Communities in the mountain areas of the Greater Caucasus are highly vulnerable to flood damage and to water stress, which is being exacerbated by climate change, and they do not have the capacity to cope with these increasing threats or adapt to their changing environment. Over the last decade, the typical number of floods recorded per year has risen ten-fold. Climate change is also increasing the volume of sediment and other rock material carried by individual floods, which has caused the river beds to rise, further increasing the risk of flood damage to the mountain communities. The region is also highly vulnerable to water stress. With an annual per capita water availability of just over 1000 m3 per person, the region is already close to the benchmark of 'severe water scarcity.' Climate change, notably the rise in temperature, will increase water scarcity as higher temperatures cause higher evaporation rates from open surfaces and higher transpiration rates from native and cultivated plants.

192. Communities do not have the capacity to cope with the increasing threats from climate change. They do not have the opportunity to participate in the decision making process which would allow them to adapt to their changing environment because the current framework and institutional structure for water and flood management does not support community participation in the process.

193. For example, the single-solution mentality of most government efforts in water and flood management discounts the importance of the consultative process, emphasizing the importance instead of "concrete solutions" such as a flood protection wall instead. This narrow, pre-determined solution type of approach leaves little room for the exploration of other options and for reflective practice in collaboratively defining "the problem." Additionally, local people throughout the GC region do not have sufficient knowledge to fully understand the changes in their situation, the options for mitigation or to contribute meaningfully to the solutions to the problems. They are not aware of what changes are occurring from a climate perspective and how these may affect them. For the communities to be able to adapt adequately to decrease their vulnerability they must build their knowledge and in order to have the ability to participate meaningfully in the decision making process.

194. However, there are promising trends in Azerbaijan and in the project region. The Government of Azerbaijan and local communities are realizing that in order to manage certain natural resources on the local level more effectively, community institutions and associations must be created or strengthened for this purpose. The recent development of Water User Associations (WUAs) is one excellent example. At present five WUAs have been developed in Sheki Rayon, eight in Gabala Rayon and six in Zagatala Rayon, the three pilot rayons. The specific purpose of these WUAs is to assist in management of large irrigation schemes, largely through collecting water user fees. This is separate from the aims of the proposed project, the WUA are extremely relevant to this project's baseline for two important reasons: a) their establishment paves the way for participation from community based organizations and; b) their functions can be expanded to encompass the larger areas of water resources management and flood management. Through the project communities will become fully engaged in the process of water and flood management and will take an active role in mitigating the impacts of climate change on water stress and flood risks.

195. Good water and flood management is most effectively achieved with an informed and active community which can collaborate with regional organizations responsible for water, flood and land management. The project will ensure that the communities are fully engaged with regional organizations and with the management process. This will be accomplished through introducing and developing community based planning for land, water and flood management and flood early warning systems.

196. The project will introduce participatory forecasting and response planning. This will be done through several community based initiatives, linking the communities with the water and flood management organizations through a Local Multi-stakeholder Committee (LSC) which the project will establish. The project adds to the current stakeholder participation situation, which is limited to the irrigation-focused WUAs. By the end of the project there will be community-oriented, stakeholder-based organizations which will significantly improve water and flood management and reduce the vulnerability of the mountain communities to climate change induced risks.

197. Alternative: The alternative is active and fully engaged communities which are able to take charge of their own adaptation to climate change risks, in collaboration with the professional staff of the regional organizations

responsible for water and flood management. Outcome 3 will develop an informed and active community which can collaborate with regional organizations responsible for water, flood and land management and is intended to fully engage the communities with these organizations, as well as introducing and developing community based planning for land, water and flood management and flood early warning systems. Communities will become aware of the risks and potential impacts of climate change, how these impacts will affect their communities and their livelihoods and the options for mitigating these impacts. Outcome 3 is aimed at preparing the communities and the responsible government organizations to be able to prepare for and respond to climate change threats.

198. Output 3.1: Fifteen local water user associations strengthened within the three pilot sub-basins to improve flood and water stress forecasting and response planning mechanisms and adaptation-oriented watershed planning and management skills to cope with water stress and floods.

199. Water User Associations are relatively new in Azerbaijan. Their role is currently limited to assisting in the management of large scale irrigation. However, as the only existing communal management system associated with water, work under this output will pilot the expansion of WUA roles to include broader water and flood management. This project will also ensure that the WUA will have an appropriate gender representation. There are 4 WUAs established in the pilot sub-basins of Talachay, Kishchay and Turyanchay, with 19 WUAs established within the three pilot rayons of Zagatala, Sheki and Gabala. While the pilot work in Outputs 3.2 and 3.3 will focus on the 4 in the pilot sub-basins, the other 15 WUAs will be included in the strengthening programme.

200. Work under this output will strengthen the capacity of the WUAs to improve local forecasting and response planning mechanisms as well as watershed planning and management skills, to cope with water stress and floods. The objective is to make the WUAs ready to work with the regional professionals as part of the Local Multi-stakeholder Committees established in Output 3.2 on the activities to be undertaken in Outputs 2.3, 2.5, 3.2 and 3.3. Output 2.3 is preparing participatory flood risk zone maps, Output 2.5 is to develop an early warning system for floods and water stress, Output 3.2 is to develop participatory watershed management plans, and Output 3.3 is the initiation of those plans. Output 2.1 is a comprehensive training package aimed at the regional professional staff. This Output 3.1 prepares the WUAs to take their part in the participatory process.

201. Several types of training will be delivered to the WUAs. Under Output 2.5 an early warning system will be set up in the three pilot sub-basins. Flood forecasting and the community link with the early warning system is the first training subject. This will entail developing an understanding of flood forecasting – how and why it is done, how it reduces damages and losses when a flood occurs, how the community maintains vigilance in watching for a flood. Much of the flood forecasting work is done by the regional professionals, but the community is also involved in the process and this training provides them the knowledge needed to participate. Specifics of the training will be detailed through the needs assessment but the following paragraphs provide an idea of what training will entail.

202. The WUA members will be trained in how to respond when a flood occurs and a warning is given and to develop flood response mechanisms specific to their situation and what their role will be in the response process and how the other members of the community will be involved. There are several levels of response depending on how soon a flood is expected. The lowest level of response is the ability to act well in advance in response to the knowledge that a flood will occur at some point in the future, which is related to effective flood zoning. The training will detail the process of how flood risk zones are determined, what they mean, and how the community responds to and respects those zones. The responses will range from acceptance of the losses, to insurance against those losses, to reducing buildings and activities in specific zones to restricting their use altogether. Responses in each flood zone also vary with the severity of the flood. The WUAs will learn how to lead in the event a flood warning is given, and how to activate the community in those circumstances. These are more short term responses, ranging from moving livestock, to moving personal possessions, to moving people for safety.

203. Watershed planning and management is another form of response mechanism to both flooding and water stress, but is preventive rather than reactive. A healthy watershed will be able to absorb the impacts of climate change more and minimize floods and maximize its water retention properties. In Output 3.2 participatory watershed plans will be developed through a series of hands-on activities and the training is aimed at preparing the WUAs to do them. The watershed plans will be detailed and delineated in a geographical sense take place over the entirety of the watershed of the community, both in and out of the flood plain, emphasizing areas where all of the normal land use based activities of the community occur. Parts of the area will require actions to reduce flood and water stress impact and these will be identified and located on the watershed management plan. The WUAs will learn about the types of

actions that will have an impact, and where they may be best placed. These will include protected areas to allow natural regeneration of damaged land, actual reforestation of some areas, soil conservation in areas which will help reduce erosion and water retention capacity of the soils, land rehabilitation where land has been damaged and where restoration will contribute to soil conservation, erosion reduction, which maintains soils but also reduces sediment in flood flows, water retention, and others. They will also learn the techniques for watershed planning to contribute to the process in Outputs 3.2 and 3.3.

204. The training will be mainly classroom based, as the important hand-on aspects will be done as part of the work itself. The training for Output 3.1 will be for about 200 people, covering the 4 WUAs of the pilot sub-basin communities, plus those of the 15 other WUAs of the three pilot rayons. The community oriented training will take place in the regional offices of the REA in Sheki, which are most centrally located rayon offices. MoES will provide resources to support the training as part of their co-financing of the project. Strengthening of the WUAs will be completed by the end of Year 1, resulting in WUA members ready to link with LSCs on climate oriented watershed management planning and other activities.

205. Output 3.2: Rayon-level local local stakeholder committees established and strengthened in three pilot rayons to test and introduce participatory and consensus-based watershed management planning that integrates climate risks.

206. The project will prepare communities to become fully engaged with the process of water and flood management to mitigate the impacts of CC on water stress and flood risks. Output 3.2 will achieve this through linking the WUAs (with expanded responsibilities and strengthened in Output 3.1) with the government rayon level organizations responsible for the various aspects of water and flood management, through the Local Multi-Stakeholder Committee. Each of the rayons has a Rayon Executive Authority (REA) in addition to regional offices from key national agencies, including MoES, MoENR/Hydromet/Land Department, AJSC, AzerSu, MoA, Ministry of Social Development, Ministry of Planning, State Land and Cartography Committee, State Committee for Family, Women, and Children's Affairs and others important to water and flood management. Each rayon hosts a Commission on Emergency Situations (CoES) that is chaired by the Deputy Rayon Executive. With MoES responsible for most aspects of water and flood management and emergency situations, and other key line agencies represented, the RAE is the main counterpart for project work. The RAE will be linked with the WUA to form the Local Multi-Stakeholder Committee (LSC) in each of the three pilot rayons of Zagatala, Sheki and Gabala. Other elements of civil society will be included through social development and environmentally focused NGOs. Women's empowerment NGOs will be asked to provide inputs and guidance to ensure a gender balance is achieved.

207. Through the project, the LSC will undertake several community based initiatives to test and introduce participatory and consensus-based inputs into integrated water and land use planning to: 1) link community and rayon-level authorities and water and flood management practitioners and other relevant stakeholders to develop a collaborative approach to decision making in water and flood management; and 2) serve as the cross-sectoral entity that will provide the mechanism for conducting the pilot climate risk oriented watershed management planning developed under this Output, and initiated under Output 3.3. Activities under this output will coordinate with those under Output 1.1 to determine if there are elements in law which will require modification in order to make LSCs permanent bodies for water and flood management activities.

208. The project will introduce participatory approaches to several water and flood management actions under several project Outputs, linking the communities with the water and flood management. By the end of the project there will be stakeholder based, LSCs which are active in water and flood management and empowered to reduce the vulnerability of the mountain communities across the region to climate change induced risks.

209. Output 3.2 will also develop watershed management plans for the three pilot sub-basins of Talachay (410 km2), Kishchay (265 km2) and Turyanchay of 4,840 km2, for initiation under Output 3.3. In each case the WUAs from those sub-basins will work together with their respective LSCs from Zagatala, Sheki and Gabala rayons.

210. The watershed management planning process will be a participatory, hands-on learning exercise, and the deliverable will be a full watershed management plan. The LSC will take the lead on this, but many members of the communities involved will participate, including people who are not members of the WUA. The participation is expanded to include as many community members as possible. Many decisions in the watershed management planning process are contentious, for example, some land currently in use may be need to be put out of use. Full understanding by a larger part of the community is helpful in such cases. The watershed management plan will be

partly geographical in scope, with problem areas identified, areas where interventions would take place and flood risk zones delineated and highlighted. It will also be oriented to climate change adaptation, identifying areas where specific actions will be carried out to mitigate climate change impacts, such as afforestation to reduce sediment loads in the rivers during floods, areas for watershed rehabilitation, such as rejuvenation of vegetation to maintain healthy soil for water retention to ensure a sustainable supply of water, and areas of locally controlled and managed flood zones.

211. The watershed management plans will be based on a combination of modern mapping, using high resolution satellite images and GIS technology and community participation in the mapping process. The mapping will require considerable field work to identify and understand the impacts of poor land use choices, and to develop an understanding of the impact of actions to mitigate climate change.

212. The watershed management plan will be supported and guided by the international and national WMP experts and IWRM experts, with the LSC fully participating. The project GIS expert will also be a key part of the process as this is a mapping exercise, using GPS and GIS technology. Three satellite image based maps of the three sub-basins with current land types use marked on it will be the first deliverable. A digital data base will developed from the information gathered through the survey, forming the base information for the watershed planning initiation. This will be completed by the middle of Year 2.

213. The second stage will be connecting land use within the watershed with impacts on water resources and flood risk. Special attention will be given to flood risk zones, indicating where land use influences flooding and where floods impact land use. This will take the form of instruction or training, with the project WMP and GIS experts leading. The group will be instructed on how different land uses impact the environment, especially water and flooding. It is expected that 50-75 people will participate in this training in each of the three rayons.

214. The third step will be to produce a map-based watershed management plan that takes climate change into account and addresses mitigating water stress and flood risk. The map-based plan will indicate areas of particular concern, determining what may be done for risk mitigation in those areas, and other aspects which will be clarified through the process. This will also be led by WMP and GIS experts. The result will be three full, community driven watershed management plans for the pilot sub-basins which will initially form the template for initiating the watershed plans in Output 3.3, and become the reference for land use decision making for the future and define the a method for replication. This will be completed by the end of Year 3.

215. Work under Output 3.2 will also inform the recommendations for modifications to the law, regulations and policy in Outputs 1.1 and 1.2.

216. Output 3.3: Pilot climate-risk oriented watershed management plans (3) (CR-WMP) initiated to implement sustainable water and flood management measures in the three pilot rayon sub-basins and fully account for climate change risks from floods and associated mudflows.

217. Inclusive watershed management planning, as it relates to reducing vulnerability from water stress and from flooding and the rock and mudflows, is a new concept in Azerbaijan. Watershed management planning (WMP) for CC adaptation is also a new concept. Work under Output 3.3 follows on from Output 3.2 by enabling the LSC to initiate climate risk oriented watershed management plans (CR-WMP) in each of the three pilot sub-basins of: Talachay (410 km2), Kishchay (265 km2) and Turyanchay of 4,840 km2. GEF resources will support the activity with the international and national WMP experts and IWRM experts providing guidance and expertise, as with Output 3.2. In each case the WUAs from the pilot sub-basins will work as part of their respective LSCs from Zagatala, Sheki and Gabala rayons. The initiation of each CR-WMP will be based on the plan developed under Output 3.2. It will act as the base for a set of ground-based activities for initiation. It will focus on developing the several critical vulnerability reducing actions, which are presented in the following paragraphs.

218. Monitoring and data collection points will be established to facilitate community based data collection and monitoring in the watershed and on the flood plains. This will enable both the communities and the regional professionals through the LSC to update the watershed management plans as they progress and as changes take place. The continuing monitoring and data collection programme also facilitates continued collaboration between the community members and the regional professionals and ensures that the communities are fully engaged in the overall process of watershed management and planning so that they are part of the decision making process as climate induced changes continue. Typical data to be collected will include vegetation types, accumulations of rocks and

other transportable materials, areas of degraded land and eroded soils, areas of good forest which may be expandable, activities in the flood plain which may be at risk from floods, and the level of that risk. The project will initiate the community based data collection activities for the communities themselves to continue indefinitely.

219. The initiation of the CR-WMP will include establishing locally controlled and managed flood zones. Flood zoning is a key component of the project because it is a primary flood damage mitigation intervention. The zones will be identified along with the types of land use that will not be permitted or to be permitted with restrictions, or specific actions to be taken when a flood occurs. Zoning decisions are generally community decisions, though there may be regional or national by-laws which will need to be followed, but the project experts and regional professionals which are part of the LSC will support the making of these decisions.

220. Flood zones themselves will have been identified through the activities under Output 3.2 and Output 2.3, both of which are community based, participatory exercises. For much of the sub-basin the flood plain is not very wide, but the combined river reaches are long. The Talachay has a sub-basin river length of some 80 km, including the two upper tributaries. The Kish itself is only 49 km in length, but totals more than 100 km when the upper tributaries are included. The Turyanchay is much larger, with 300 km of river including upper tributaries. The whole of the river length is considered a 'flood zone' but over much of the length there are no human activities and no specific problems currently associated with them. In zoning, emphasis is placed on reaches of river with human activity, though there may be areas which are not now those with human activities, but which may want to be restricted in the future as climate change alters land use across the watershed.

221. Finalizing flood zoning restrictions will take many years and cannot be completed within the time of the project. The project will therefore initiate the flood zone component of the CR-WMP by working with the LSC to detail options for each flood zone. This is an exercise done on the ground, but with the backing of the GIS and satellite maps of the watershed developed in Output 3.2. The project will also support the process of determining the land use to be allowed in each of the flood zones according to their classifications. This will require debate within the community decision makers, informed by the CR-WMP itself, and the ground based investigation of options.

222. The plan initiation will identify watershed rehabilitation measures for each of the 'hotspots' which have been shown to be of importance in the development of the CR-WMPs. These will range from reforestation of areas that have been over cut, afforestation of areas that are not now forested, identification of vegetated areas which need to be protected to be allowed to expand, areas of land degradation which need rehabilitation, areas of land which need to be revitalized to prevent degradation, etc. Climate change will induce rising temperatures. In the upper areas of the watersheds this will mean the potential for tree lines to expand to higher elevations – in other words areas where forests do not grow now. This will help significantly in reducing rock material from entering the stream beds and contributing to river bed rising in the lower part of the sub-basin. However, human intervention will speed the process, which is important as climate change is already occurring and impacting the communities.

223. In the upper catchments, areas of potential afforestation are large. In both the Talachay and the Kish sub-basins, the areas are on the order of 5,000 or 6,000 ha. In the Turyanchay this is as much as 20,000 ha. To do all of this during the project period will be impossible, and drain project funds. Therefore the project will initiate these actions at levels of 200 or 300 ha to instruct the stakeholders in how to do it, as well as building the collaboration of the LSC – between the communities and the regional practitioners.

224. Forecasting climate change impacts at the watershed level is also an important component. By developing the current base line, which is done in Output 3.2, and following that with initiated plans for rehabilitation, land use restrictions, etc. the LSC develops a good understanding of impacts already occurring due to climate change and can forecast what is likely to occur over the next several years. They can then plan in advance to adapt to the changes to mitigate damage from them. As time progresses, they can update the plans, including their responses to changes. The response mechanisms must therefore be both strong and flexible to work effectively.

225. Work under Output 3.3 will also inform the recommendations for modifications to the law, regulations and policy in Outputs 1.1 and 1.2.

226. Output 3.4: Pilot CR-WMP processes replicated across the nine rayons of the Greater Caucasus region.

227. Work under this output will focus on replicating the project's vulnerability reducing measures across the remaining six rayons within the project region. Each pilot sub-basin and rayon will replicate its work in neighboring rayons and respective sub-basins (Zagatala → Balakan, Qax; Sheki → Oguz; Gabala → Ismayilli, Goychay and

Agsu). A key element of the pilot work in each of the three pilot rayons will be the participation of "leaders" from each of six replication rayons for the purpose of bringing them in on the CR-WMP work in the pilot regions as it goes on to jump start interest in the other 6 rayons/sub-basins targeted for replication.

228. The project will utilize existing regional institutional mechanisms of key stakeholder institutions to facilitate replication, working through the REA, especially the CoES regional offices in Gabala rayon, which is responsible for project's nine rayons. Also key will be including the MoENR's two regional offices: regional center #9 in Zagatala city covers the five GC rayons: Balakan, Zagatala, Gakh, Sheki and Oguz and regional center #11 in Ismayilli city covers the remaining four of the project's nine GC rayons: Agsu, Goychay, Gabala and Ismayilli. MoENR's Hydromet Department has a separate Center in Sheki, which covers the entire project area.

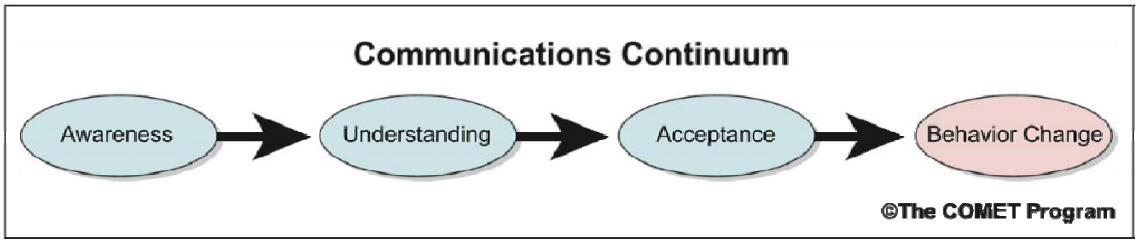
229. Output 3.5: Locally tailored public information campaign implemented to increase awareness, understanding and acceptance by flood-prone communities of flood risks and effective risk management to reduce vulnerability.

230. Work under this output will design and implement tailored public information campaigns to make water stressed and flood prone communities aware of the risks and the means to manage those risks to minimize impacts. Particular focus will be placed on local enforcement of flood zoning and land use regulations and watershed protection, risk mitigation and flood response strategies for communities.

231. Measures for flood mitigation will include watershed management and planning flood zoning to be taken at community level to address flood risks and risk management will be agreed with the LSC in a series of discussion meetings during Year 2. Approaches to the public awareness campaign will also be agreed and finalized. This will be led by the international and national stakeholder experts.

232. Effective education under this output will be based on a thorough understanding of the process that individuals go through when they make decisions about modifying their personal behavior in order to reduce vulnerability. Figure 4 shows the key stages in the continuum of persuasive communication that leads to behavior change. The success of a warning rests in the public's/ individual's awareness, understanding, and acceptance of their risk.

Figure 4: Stages of persuasive communication (http://www.meted.ucar.edu/hazwarnsys/ffewsrg/FF_EWS.pdf)



233. For example, in order to motivate residents to heed flood warnings, the residents must first be aware of their risk. Second, they must understand the impacts an event may have on their family and community. Third, they must accept the idea that not following a warning message can result in property loss, injury or death. Finally, they must take action and heed the warning. If the intent is behavior change or action then public outreach must focus on moving the public through the initial stages of awareness, understanding, and acceptance.

234. Public campaign materials will be prepared and finalized between the project and the LSC and rolled out to the three pilot sub-basins by the end of Year 3. Feedback will be sought in order to revise campaign materials and revisions will be completed by the middle of Year 4, with replication of PA campaign in 6 other GC rayon's in Year 5.

B.3. Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF). As background information, read Mainstreaming Gender at the GEF.":

235. Socio-economic benefits: The project goal is to reduce vulnerability to water stress and flood risks and damages. The primary socioeconomic benefits to be delivered by this project derive from enabling stakeholders to reduce these vulnerabilities.

236. The project region as a whole covers 22,000 km^2 in nine rayons (administrative regions) of the Greater Caucasus Region. About 70% of the total population of approximately 1 million lives in rural, agrarian villages, but there are also several larger towns with populations in the range of 50,000 people. Annual flood damages in the project region are estimated at $US 18-25 million. This estimate covers only damage to physical assets and does not relate the full costs of flooding to the people of the region, a point which is revisited later. The damage to assets would be reduced significantly as a result of this project, though it is not possible to quantify the reduction in financial terms at this stage.

237. The project region is an area populated mainly by poor and lower income people with a high incidence of poverty, with over 20% having a per capita income of less than 1 dollar per day, twice as high as than the national average. The poor tend to be the most vulnerable to floods and the damages they cause because they have a much lower ability to rebound after suffering losses of assets. Total losses include physical damage to people and property, loss of or damage to agricultural land and other income generating lands such as managed forests and the loss of income earning opportunities. Such socioeconomic impacts are not accounted for in the financial flood damage estimate given above.

238. Floods worsen living standards of the poor, negate progress made in reducing poverty, and can cause low income earners to fall into poverty. They are sufficiently frequent and severe in the region that they have been a major barrier to the ability of the communities to recover socioeconomically from the depression suffered following independence. The project will improve socioeconomic conditions of the region by reducing flood damages by introducing new climate resilient flood adaptation measures.

239. The most immediate socioeconomic benefits will be felt in the pilot river basins selected for the project, such as the Kish River basin. Its steep upper sub-catchment has a river length of 49 km and a catchment area of 265 km2. The main village in this upper sub-basin is called Kish and has a population of 6,500. In close proximity is the Town of Sheki, which is an important historic town with a population of 65,000. It will also be an immediate beneficiary, as the Kish River is the flooding source that threatens Sheki and causes significant annual damage.

240. The two other pilot regions are the Talachay sub-basin, in the northwest extreme of the project area, in the Zagatala Rayon, and the Turyanchay, in the southeastern part of the project area, in Oghuz Rayon. The Talachay is similar in size and population to the Kish, but the Turyanchay is much larger, with a catchment area of 4,840 km2. It has several upper tributaries, each with flooding problems, and several vulnerable villages. These will also be early beneficiaries as the roll out will take place as part of the project.

241. There are additional, indirect socioeconomic benefits. The project will develop community based climate-risk oriented watershed management methods which are new to Azerbaijan, which are collaborations between community members and practitioners from regional administrations. In addition to improving water and flood management, effective watershed management has the further benefit of improving the environment of their communities and the sub-basin in which they are situated. The new approach will lead to an increase in forest area, which has far reaching socioeconomic benefits and opportunities for improving livelihoods. There may be increased agricultural productivity through better land and water management.

242. The project is working at several levels simultaneously – community, regional and national. The project draws lessons from its activities at the community and regional administration levels and uses them to modify the governing legislative and policy base at the national level. Changes to policy and law in turn will result in improved adaptation practices in water and flood management not just in the project area, but across the country, and with them, the socioeconomic benefits of reduced vulnerability to water stress and flooding.

243. Achievement adaptation benefits: Many of the same project activities that will generate socio-economic benefits for local communities in the Greater Caucasus will also contribute to generating adaptation benefits. The adaptation benefits of the project relate to all the systems and practices that the project will put into place in response to future climate risks and impacts that are also meaningful to the current climate variability. For example, non-structural measures for flood and water management, including: strengthened law and regulatory framework to enable immediate adaptation measures to be undertaken, improved and forward-looking flood risk mapping and zoning,

climate risk oriented micro-watershed management plans, community-based early warning systems, innovative water stress management through conjunctive water use, and the use of soil and water assessment tools. These are adaptation benefits that the project will deliver and which can be replicated to increase adaptation community resilience in the country and beyond.

244. The replication potential of the project's adaptation practices amplify the adaptation benefit. The project's work of modifying the Water Code and the National Water Policy specifically for climate change adaptation will provide guidance for replication and serve as a model for developing or improving Water Codes and other relevant legislation in other countries. Conjunctive water management is new concept worldwide. With water becoming more scarce and water demands rising due to climate change across the larger region, greater reliance on groundwater is and will be necessary. The CWM model developed in this project can serve as model in many parts of the broader region with the comparable conditions. The project introduces participatory preparation of flood hazard maps by directly involving community members in the process. This is a rare feature of flood mitigation measures. The participatory flood risk mapping can be replicated to any area which is affected by increasing flood risk and damage due to climate change. Community-based early warning systems are also rare worldwide and they are very much additional to the business as usual baseline: this project's work to establish them will be valuable experience that can be used for replication in many parts of the world, but especially in mountain environments, increasing the adaptive capacity of communities globally.

245. Cost-effectiveness: The project will make available non-structural, lower-cost methods and tools to aid in flood risk and water stress reduction, freeing up public resources to be spent on other priorities. Currently, flood management is entirely directed at structural defense-oriented measures. These are expensive and have short effective lives and so are not very economically efficient, especially in the context of climate change. For example, between 2006 and 2010 the Government of Azerbaijan spent $US 46.9 million in the project region building 17 km of flood protection walls, for an average cost of $US 2,758/meter. During that period flood protection walls were constructed in all three of the pilot sub-basins proposed for the project. In Kishchay sub-basin just over $US 1 million were spent to construct 363 m of flood protection wall. It was buried by a flood the following year. Similar expenditures were made in Talachay ($US 600,000 for 237 m of wall or $2,531/m) and in Turyanchay ($US 466,000 for 400 m of wall or $1,165/m). For the period 2011 to 2014 $US 99.1 million is budgeted for the same flood protection walls within the nine rayons of the project region. This project's modest investment of US$2.7 million in non-structural adaptation measures such as strengthening the legal framework, building capacity and demonstrating on-the-ground adaptation practices, will contribute significantly to reducing the risk that mountain communities face across hundreds of kilometers of high-risk flood areas. The combined river length of the project's three pilot sub-base rivers is 480 km (480,000 m), for a reduced risk cost of $US 5.63/meter for the project's non-structural measures. Compare this cost per meter to that of the structural measures above ($US 1,165/m - $2,758/m) and one begins to see the cost-effectiveness of non-structural approaches.

246. In addition, the impact of this work will grow over time, not diminish, as is the case with any physical infrastructure. The types of non-structural measures to be introduced include participatory land use planning and flood risk zoning. The participatory approach brings the communities into the practice of flood management, giving the communities a greater say in their own flood damage mitigation and increasing local ownership in the solution, also a cost-effective approach. These approaches will be developed and tested in the project sub-basin before disseminating to other participating sub-basins of the project area and should be adopted nation-wide.

247. As another example of the long-term/cost-effective impact of this project's work, the $515,083 GEF investment under Component 1 creates the enabling environment that is essentially permanent and is national in scope. As it will address the real problem of climate change driven flooding and water stress, it will have a greater impact than continuing the status quo of reacting to disasters. For example, this can be compared to the $99.1 million spent on one region, for flood protection alone, with an impact lifespan of only 5 years or so.

248. The environmental benefits of the project's proposed alternative also contribute to the cost-effectiveness, sustainability and feasibility of the non-structural, lower cost project alternative. These benefits include a maintenance and enhancement of natural flood plain functioning through better zoning and a reduced water risk through conjunctive water management as compared to what can be destructive structural measures such as flood protection walls, dredging of river bottoms, and construction of new reservoirs.

249. Another method of flood damage mitigation is developing early warning systems. These rely on modern

hydrometeorological instrumentation and monitoring which can provide instantaneous information when severe storms are detected. Early warning systems save lives and reduce damage to households. The warning systems will also be developed using a participatory approach so that the communities are involved in the process from the outset. The project will reduce flood damages through developing early warning systems. The socio-economic benefits will be achieved very quickly as floods are frequent and the systems will be fully operational within the project period. Early warning systems will be developed and tested in the pilot sub-basins, then disseminated to rest of the project area and serve as a model for anywhere flash floods occur, thus conveying socioeconomic benefits to larger areas of the country. Actual monetary figures for economic and financial benefits vary greatly with the value of the properties and the magnitude of the floods, among other variables. With poorer beneficiaries, the impact on their livelihoods and abilities to continue to develop their own household economies far outweigh the monetary value of their assets. With large flood it is highly probable that they may lose all, or a large part of their property, forcing them into extreme poverty.

250. The mountain communities are also vulnerable to water stress, and the degree of water stress is growing as climate change continues. The cumulative effect of water shortages make livelihoods of farmers especially difficult, as two or more unproductive years in a row make it hard for the farmers to survive, let alone develop and improve their livelihoods. Water shortages are already a problem, and climate change is causing water resources to decline and water demands to increase, driving the need for much better management of the water resource. The project provides better management through introducing the practice of Integrated Water Resources Management (IWRM) which ensures that the various organizations which are involved in water management operate collaboratively with each other and with the communities, that land is managed properly to ensure a sustainable water resource as well as land resource and that all water resources are considered holistically. The socioeconomic benefit is a more reliable water supply, allowing farmers and other members of the community to plan their own economic growth without being so frequently affected by growing water shortages.

251. Gender dimensions: The project is designed to recognize important gender dimensions of its work both at the national policy level and at the local community level. At the national level, project resources will mainstream a gender perspective into the policy development process under Outcome 1. For example, regulatory improvements will offer clear guidance on how to recognize gender-specific roles in water and flood management and integrate such understanding into non-structural risk reduction measures such as micro watershed management.

252. At the local level, the project will use participatory approaches to involve all members of the community in planning. The project's stakeholder engagement work will further clarify gender roles, including the different types of gender specific vulnerabilities. For example, in at-risk natural resource-dependent communities, men and women have distinct roles and responsibilities, which give rise to differences in vulnerability and ability to cope with change. In mountain communities of the Greater Caucasus, women and girls are hardest hit when water shortages occur. In most of the mountain communities there are technical water supply systems with stand pipes at various locations around the village. Most villages do not have household water services. Women and girls have the task of collecting water for the household. These systems are of limited reliability and during the frequent system failures, women and girls are forced to spend much more time fetching water, reducing their time on other important tasks, such as education and income generation. The project improves water management and therefore the impact on women and girls of supply failures will become less frequent. Women will also become part of the decision making process through the establishment of the Local Stakeholder Committees (LSCs). Gender mainstreaming will ensure that women are properly and effectively represented in these new community organizations.

253. This project recognizes the following ways that gender roles are linked to climate change adaptation:

254. Due to a gender-based division of labour, men and women perform different jobs/tasks. Climate change will alter what they can do, exposing men and women to different risks and opportunities. Men may migrate for work while women have to spend more time collecting fuel and water, for example.

255. Men and women have different access to resources, including physical resources like land, social resources like networks, and financial resources like income-generating work and credit. In times of change, they will have different options and 'safety nets' for coping with change.

256. Based on their distinct roles, women and men have different sets of knowledge and skills, such as knowing which seeds to plant during a dry spell or knowing how to dig a well. Recognizing their contributions will result in a

wider range of options for preparing for and coping with change.

257. Participation in decision making and politics, and access to decision makers is not always equal for men and women and this may affect their participation and the representation of their ideas in short and long-term decision making on climate change.

258. Gender analysis will seek to understand further women's and men's different activities and responsibilities, and their access to resources and decision-making. This approach will be taken in the project's work to demonstrate new tools and approaches under Outcomes 2 and 3. In addition, the project's M&E includes gender disaggregated indicators for improved water and flood management. The project recognizes that the failure to consider these differences between men and women reduces the relevance and efficiency of project activities.

B.4 Indicate risks, including climate change 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:

Description	Date Id'd	Type	Impact & Probability	Countermeasures / Management response
Entrenched sectoral barriers among environment, water and land management, and emergency situations may hamper improved water and flood management for CC adaptation.	05/ 2011	Organizational	Med	The project is designed to both counter and minimize this risk. The organization of the entire project is cross-sectoral in and of itself. Under Outcome 1, the project's work to strengthen the legal and policy framework will address the importance of cross-sectoral approaches to effective CC adaptation. Under Outcome 2, the project's capacity building work will be cross-sectoral in its design and execution; and under Outcome 3, the project creates a new rayon level cross-sectoral mechanism called the Local Stakeholder Committee that will be the vehicle for the project's demonstration of improved cross-sectoral watershed management (land-use) planning to reduce vulnerability to climate change.
The legal process involved in modifying the Water Code and other legislation to address climate change adaptation and support the use of new tools and approaches may require more time than the project period itself.	03/ 2011	Regulatory	Low	The government, in endorsing this project, has committed to modifying and improving the Water Code and other legislation to better support climate change adaptation in the water and flood management sectors. The project's primary partner is the Ministry of Emergency Situations, which is an influential Ministry. In addition, the project design does not put all of its "legal eggs" in one basket: first the project will create and pass "normative legal acts" (NLA) to strengthen the legal framework's ability to support CC adaptation. NLA are easier and faster to write and pass. Secondly, the project resources will support MoES's effort to improve and update the Water Code itself.
People may incorrectly perceive that there will be additional financial costs in	03/ 2011	Financial	Med	The project will highlight the costs that local people, municipalities, rayon and national government agencies already

adopting new approaches to flood damage which may hamper the project's efforts to reduce vulnerability.				incur due to flood damage. Plus, new financial mechanisms to provide incentives for improved flood risk planning (i.e. flood insurance only being available in areas outside the area zoned "high risk.") will be explored under Outputs 1.1, 1.2 and 2.3.
Climate change impacts may increase to the extent that even if the project reduces vulnerability, it may not be enough to make a difference.	03/ 2011	Environ-mental	Uncertain - Low	The project's approach to building capacity for adaptation focuses on practical tools and fundamental principles vis-a-vis water and flood management that will enable communities to modify adaptation approaches to the proper scale and scope needed. Under Outcome 1, the core elements of an adaptive approach will be incorporated into the legal framework; Under Outcome 2, the foundational capacity will be strengthened along with specific capacity to use specific critical tools for adaptation work and under Outcome 3, the project strengthens local communities ability to become more proactive stewards of their own watersheds, which will maximize community level resilience and ability to adapt.
Sometimes flood zoning can be initially unpopular because it requires a change in the land use habits of local communities. There may also be land ownership conflicts that hamper the project's ability to introduce this concept.		Organizat-ional	Med	The project emphasizes the importance of local engagement and initiative. Most of Outcome 3 is designed to catalyze this and involve the people in the activities of the project from the outset, thereby developing an understanding and an acceptance of the various adaptation measures for flood and water stress mitigation. Awareness raising is also a priority of the project.

B.5. Identify key stakeholders involved in the project including the private sector, civil society organizations, local and indigenous communities, and their respective roles, as applicable:

Primary Relevant Institutions	**Envisioned roles and responsibilities in the project.**
National level	
Ministry of Emergency Situations (MoES)	Project Director will come from MoES Will be member of Project Board Key participants in Outputs 1.1 -1.3, Outputs 2.1 – 2.6, and Outputs 3.2 – 3.5. Regional office in Gabala will play an important role in replication (Output 3.4) Staff at rayon level will be key participants in project inspired local stakeholder committees (LSC) to be formed.
State Agency for Water Reserves (SAWR)	Agency still being created. Preliminary list of possible roles and responsibilities: - Management of mountain rivers - Protection of territories and people from floods - Informing them about approaching flood-related disasters (in collaboration with Hydromet and others)

	· Construction of protective structures · Responsible for safety of canals, water collectors
Greater Caucasus Northwest Regional Center - MoES	Located in Gabala, this will be a key counterpart of project's work in the GC region for MoES. All MoES work in the Greater Caucasus goes through this center.
Ministry of Ecology and Natural Resources (MoENR)	Will be member of Project Board Key participants in Outputs 1.1 -1.3, Outputs 2.1 – 2.6, and Outputs 3.2 – 3.5. Regional centers #9 and 11 will play an important role in replication (Output 3.4) Staff at rayon level will be key participants in project inspired local stakeholder committees (LSC) to be formed.
Department of Ecology and Environmental Protection Policy	Key actors under Outcome 1, with all outputs related to law and policy.
Regional Office on Hydrometeorology (MoENR)	The key actor under Output 2.5 and important participant under Output 2.6. In addition to the regional center in Sheki, there is a Hydromet representative in each rayon who will be an important member of the LSC at the rayon level. Separate Center in Sheki will play important role in replication.
Regional Office on Environment and Natural Resources.	Key offices to facilitate replication of improved vulnerability reduction practices across the GC region (Output 3.4)
Department of Geological Research and Engineering	Provides approval for usage of ground waters ("clears" applications). Important actor under Outputs 1.3 and 2.3.
Amelioration and Water Facility Joint Stock Company (AJSC)	Will be member of Project Board Key participants in Outputs 1.1 -1.3, Outputs 2.1 – 2.6, and Outputs 3.2 – 3.5. Regional offices in Sheki and Gabala will play an important role in replication (Output 3.4) Staff at rayon level will be key participants in project inspired local multi-stakeholder committees (LSC) to be formed. Drills groundwater wells for amelioration.
Parliamentary Commission on Energy and the Environment.	Will play a central role in all outputs under Outcome 1 as the key consultative body and venue for many round table expert working group discussions.
AzerSu Joint Stock Company	Will be member of Project Board Key participants in Outputs 2.1 – 2.6, and Outputs 3.2 – 3.5. Staff at rayon level will be key participants in project inspired local stakeholder committees (LSC) to be formed. Drills groundwater wells for drinking water purposes.
The State Land and Cartography Committee	Will be a key player in the LSCs and their work on CR-WMP development (Outcome 3.3) as they are responsible for land mapping and other related tasks.
Ministry of Agriculture	Staff at rayon level will be key participants in project inspired local stakeholder committees (LSC) to be formed.
Regional office of National Academy of Science (Sheki)	Members will play an important role in expert working groups which are formed to produce key outputs.
NGOs	
Alazani River Basin Council (Ganikh River)	This was established under an EU-TACIS project for a transboundary water management body. As such it is concerned with more macro-scale issues, but will be a stakeholder as activities in the project region will impact the larger Alazani (Ganikh) River basin.
Association on International Hydrological Program	This is a programme established between Armenia, Georgia and Azerbaijan to share hydrological information across borders to counter flooding. It is part of a planned large scale warning system. While on a much larger scale, there may be shared lessons important to both initiatives.
Local NGOs	Will play an important role in LSCs under Outcome 3.3 and in public awareness raising under Outcome 3.5.

Local level/regional level	
Rayon Executive Authority	Key stakeholder under Outcomes 2 and 3, particularly the demonstrating and adoption of new tools and planning approaches. Primary host/chair of each respective LSC; Deputy Executive of Rayon chairs the Commission of Emergency Services.
Commission on Emergency Situations (CoES)	Rayon level entity that is chaired by the Deputy Rayon Executive. Comprised of members representing the major ministries and agencies working in each respective rayon, the CoES is called together for emergency response or in cases of preparation for emergency response. One of the key entities through which this project will work at the rayon level.
Municipalities	Key stakeholder under Outcome 3.
Water User Associations	Key local –level stakeholder institution with which the project will interact on a number of levels. Will play key roles in the demonstrating and piloting of new tools, zoning and planning approaches. Will be an important target for training and capacity building under Output 2.1.

B.6. Outline the coordination with other related initiatives:

259. Part of the Transboundary River Management Phase II for the Kura River (EU TACIS) aims to develop a River Basin Management Plan (RBMP) for the Alazani River. This is also known as the Ganikh River in Azerbaijan, which is the main river into which all the rivers of the proposed project area flow. The project is mainly focused on improving water quality in the Kura River basin through transboundary cooperation and adoption of the river basin management approach. The project is transboundary in nature and covers Georgia and Armenia as well as Azerbaijan and therefore the emphasis is on the transboundary issues. As such, the RBMP components are fairly coarse, covering large areas. However, a RBMP is closely related to the work of the proposed project as they are both components of IWRM. The proposed project, targeting primarily the upper catchments, works at a much more detailed level in establishing a method to manage river sub-basins in a hands-on, community oriented way. The emphasis of the proposed project is on water management rather than water quality. However, these are all complimentary aspects of the same approach to good, environmentally sound management of river basins.

260. There is also an element of capacity building in the EU/TACIS project, but it is concerned with the higher, transboundary level, whereas the proposed project targets the regional and local levels, with some aspects of the national level. The proposed project will maintain close liaison with the EU/TACIS project to ensure complementarity throughout.

261. A UNDP/GEF-IWP project called “Reducing Transboundary Degradation in the Kura-Aras Basin” has recently started and will run essentially concurrently with the proposed project. The long-term development and environmental goal of the project is sustainable development of the Kura-Aras River Basin enhanced through ecosystem-based Integrated Water Resource Management approaches. The project objective is to improve the management of the Kura-Aras River Transboundary Basin through the implementation of a sustainable programme of policy, legal and institutional reforms and investment options. The project will assist the Kura-Aras riparian states to identify the principal threats and root causes of the transboundary water resources of the basin and develop and implement a sustainable programme of policy, legal and institutional reforms and investments to address these threats. The Project will create synergies with and build upon a range of initiatives being undertaken by the countries themselves.

262. The proposed project is complimentary to the Kura-Aras project. First, the project region is part of the larger Kura-Aras. The Kura–Aras project also aims at capacity building and improving the legal and policy framework and the capacity of the main organizations. That project emphasizes the transboundary component of water management, but to be successful, it requires improvement of national and sub-national water management, which this project aims to achieve. It strengthens the success of the proposed project as we will work toward similar goals of frameworks and institutional capacity building within Azerbaijan. The proposed project is mainly local (rayon) and community oriented, which provides another level of understanding of the processes for IWRM at that scale.

263. The proposed project will liaise directly with the Kura–Aras project from the outset and ensure that there is no

duplication of tasks and that the two projects work in a complimentary way.

C. GEF AGENCY INFORMATION:

C.1 Confirm the co-financing amount the GEF agency brings to the project:

264. UNDP will contribute $US 260,000 in co-financing. These funds will support the costs of an international Chief Technical Advisor (CTA) to support project implementation and provide technical guidance to the project team.

C.2 How does the project fit into the GEF agency's program (reflected in documents such as UNDAF, CAS, etc.) and staff capacity in the country to follow up project implementation:

265. Disaster risk management is prominent in the present framework documents for UNDP's involvement in the country. The Common Country Assessment and Country Analysis for Azerbaijan highlight the significant negative impacts of natural disasters upon the economy and society. They emphasize the need to assist the Government in shifting its approach from disaster response to disaster risk management. The UNDP has a particular advantage in the area of disaster preparedness and response because it was leading the country's disaster management team and has extensive experience and expertise in implementing and coordinating multi-sector emergency response and disaster reduction programmes within the region and worldwide. The UNDAF for 2011-2015 highlights the need to strengthen the enabling environment and build capacities. Disaster risk reduction is emphasized as a cross-cutting issue to be addressed in strengthening economic development, social development, and governance. An important "Expected CP Outcome" is: Outcome 1.3: Relevant national strategies, policies, and capacities strengthened to address environmental degradation, promote the green economy, and reduce vulnerability to climate change.

PART III: INSTITUTIONAL COORDINATION AND SUPPORT

A. INSTITUTIONAL ARRANGEMENT:

N/A

B. PROJECT IMPLEMENTATION ARRANGEMENT:

A. National Execution (NEX).

266. The project will be nationally executed by the Ministry of Emergency Situations (MoES) that will act both as the Implementing Partner and the Beneficiary of the project. Implementation support will be provided by the UNDP Country Office (see Project Governance Arrangements below). In its capacity of Executing Entity the MoES will be responsible for overall project management. Besides, the MoES will be responsible for the facilitation of all project activities such as international consultant missions, trainings for respective staff, ensuring appropriate access to project sites, relevant data, records, agencies and authorities. UNDP will provide support services including procurement and contracting, human resources management, and financial services in accordance with the relevant UNDP Rules and Procedures and Results-Based Management guidelines.

B. Project Governance Arrangements.

267. The project will have a governance structure, aligned with UNDP's new rules for Results Based Management.

268. Project Executive Group. The Project Board will be the executive decision making body for the project, providing guidance to the Project Manager and approving project revisions, annual workplans and budgets. It will be responsible for reviewing project progress reports, the risk log, issue log and the monitoring and communication plan. The Project Board will consist of the Deputy head of MoES, the Director of the MoES/SAWR, the UNDP Deputy Resident Representative (DRR), and the Representative of UNDP's Energy and Environment Unit Azerbaijan.

269. The Project Board (PB) is responsible for making management decisions for a project in particular when guidance is required by the Project Manager. The Project Board plays a critical role in project monitoring and evaluations by quality assuring these processes and products, and using evaluations for performance improvement,

accountability and learning. It ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems with external bodies. In addition, it approves the appointment and responsibilities of the Project Manager and any delegation of its Project Assurance responsibilities. Based on the approved Annual Work Plan, the Project Board can also consider and approve the quarterly plans (if applicable) and also approve any essential deviations from the original plans.

270. In order to ensure UNDP's ultimate accountability for the project results, Project Board decisions will be made in accordance to standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. In case consensus cannot be reached within the Board, the final decision shall rest with the UNDP DRR. The functions of the PB will be distributed as follows:

1) **An Executive**: individual representing the project ownership to chair the group. The Ministry of Emergency Situations will fulfill the Executive role, and will convene the Project Board's meetings. The Deputy Head of MoES will hold this position.
2) **Senior Supplier**: Represents the interests of the parties that provide funding for specific cost sharing projects and/or technical expertise to the project. The Senior Supplier's primary function within the Board is to provide guidance regarding the technical feasibility of the project. This position will be held by the UNDP DRR, or a designated UNDP Development Advisor.
3) **Senior Beneficiary** is the individual representing the interests of those who will ultimately benefit from the project. This function will be performed by the Director of the MoES State Agency for Water Reserves (SAWR). The Senior Beneficiary's primary function within the Board is to ensure the realization of project results from the perspective of project beneficiaries.
4) The **Project Assurance** role supports the Project Board Executive by carrying out objective and independent project oversight and monitoring functions. The UNDP-Azerbaijan Representative of the Energy and Environment Unit will provide independent project oversight and monitoring functions to ensure that project activities are managed and milestones accomplished. The UNDP HEP will be responsible for reviewing Risk, Issues and Lessons Learned logs, and ensuring compliance with the Monitoring and Communications Plan. The UNDP-GEF Regional Technical Advisor located in Bratislava will also play an important project assurance role by supporting the annual APR/PIR process.

271. The PB will provide guidance based upon project progress assessments and related recommendations from the PM. The PB will review and approve annual project reviews and workplans, technical documents, budgets and financial reports. The PB will provide general strategic and implementation guidance to the PM. It will meet annually, and make decisions by consensus. The specific rules and procedures of the PB will be decided upon at the project inception meeting.

272. The success of the project implementation is dependent upon strong project guidance, coordination and advocacy from the PB. The PM, which will be responsible for arranging PB meetings, providing materials to members prior to the meeting, and delineating a clear set of meeting objectives and sub-objectives to be met.

273. Project Management. The national Project Manager (PM) will be tasked with the day-to-day management of project activities, as well as with financial and administrative reporting. The Project Manager's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The PM will be responsible for project implementation and will be guided by Annual Work Plans and follow the RBM standards. The PM will prepare Annual Work plans in advance of each successive year and submit them to the Project Board for approval. The PM will be supported by the Administrative /Finance Assistant. The PM will have the authority to run the project on **a daily basis** on behalf of the PB within the constraints laid down by the PB. The PM's prime responsibility is to ensure that the project produces the planned outputs and achieves the planned indicators by undertaking necessary activities specified in the project document to the required standard of quality and within the specified constraints of time and cost. This will require linking the indicators to the workplan to ensure RBM.

274. Project Support. UNDP will provide financial and administrative support to the project including procurement, contracting, travel and payments.

275. Visibility of GEF financial support will be ensured by using the global GEF branding in all electronic and printed materials.. UNDP will also apply the following UNDP-GEF policy: "*The GEF logo should appear on all*

relevant project publications, including amongst others, project hardware and other purchases with GEF funds. Any citation in publications regarding projects funded by GEF should also acknowledge the GEF. Logos of the Implementing Agencies and the Executing Agency will also appear on all publications. Where other agencies and project partners have provided support (through co-financing) their logos may also appear on project publications." Full compliance will be made with the GEF's Communication and Visibility Guidelines ("GEF Guidelines"): http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf.

PART IV: EXPLAIN THE ALIGNMENT OF PROJECT DESIGN WITH THE ORIGINAL PIF

276. The project design aligns very closely with the original PIF. The components and outcomes are exactly the same. The level of co-funding is the same; as is the apportionment of GEF grant funds among the three primary outcomes. The outputs have been adjusted based upon the improved understanding of the relationship among and between the outcomes, but overall, the level of change is relatively minor.

277. Under Outcome 1, the number of outputs has been consolidated from four to three, with two outputs focusing on strengthening the governance framework of law, policy and by-laws (normative legal acts) for improved water and flood management. Conjunctive water management remains under Outcome 1 as Output 3; Output 1.4 under the PIF "pilot land use plans" was moved to Outcome 3, where the on-the-ground land-use planning work under the project is now consolidated.

278. Under Outcome 2, the number of outputs has increased by one, from five to six. The order of the outputs has been modified to begin with the development and implementation of the training program (Output 2.1) and continue with the tools and models being elaborated and demonstrated and implemented and ending with strengthened capacity of local institutions to use these tools and models. The new output, Output 2.6 focuses on strengthening the capacity of local Water User Associations to implement CC adaptation tools and methods.

279. Under Outcome 3, the number of outputs has increased from four to five. Recognizing the importance of effective replication, the preparatory period created the new output (Output 3.4), which focuses on the replication of the project's vulnerability reduction tools and practices from the 3 pilot regions (rayons) to the remaining six rayons across the whole GC region.

280. Finally, by presidental decree the State Agency for Water Reserves (SAWR) was created within the MoES in the Spring of 2011. Therefore the project's executing partner within Government has changed from the Ministry of Ecology and Natural Resources (MoENR) to the Ministry of Emergency Situations (MoES). MoENR will remain an important partner in certain project activities and outputs, but MoES takes over the primary co-funding and executing role on behalf of the Government of Azerbaijan for the project. This change is reflected throughout the design of the project, from implementation arrangements to the specifics of activity descriptions under each output.

PART V: 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(s) with this template. For SGP, use this OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
Mr. Husseyn Baghirov	Minister	MINISTRY OF ECOLOGY AND NATURAL RESOURCES	04/28/2010

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF policies and procedures and meets the GEF/LDCF/SCCF criteria for CEO endorsement/approval of project.

Agency Coordinator, Agency Name	Signature	Date *(Month, day, year)*	Project Contact Person	Telephone	Email Address
Yannick Glemarec UNDP/GEF Executive Coordinator		September 6, 2011	Keti Chachibaia (LECRDS)	+4212 59337 422	keti. chachibaia@ undp.org

ANNEX A: PROJECT RESULTS FRAMEWORK

Project Strategy	Indicator	Baseline value	Target by end of Project	Sources of verification	Risks and Assumptions
Goal	**To sensitize the water management policies to the long term risks of climate change.**				
Objective: to reduce the vulnerability of the communities of the Greater Caucasus (GC) region of Azerbaijan to water stress and hazards by improved water and flood management.	# of hectares in the GC affected by improved CRM practices.	Zero. There are no programs in place currently focused on improving climate risk management in the areas of flood and water management.	Improved climate risk management affecting over 22,067 sq. km (2,206,700 ha) of land in highly vulnerable region of Greater Caucasus.	Climate-risk oriented watershed management plans.	
	# of people who benefit from locally tailored CRM practices for flood and water risk management.	Zero. There are no locally tailored climate change adaptation practices in place.	1,000,0000 people benefit from improved CRM practices across the GC region.	- Calculation of # of people benefitting from improved CRM across the nine catchments in GC. - Location and impact of community-based early warning systems.	Water code and policy changes will affect people nationwide.
	Number and Type of adaptation actions implemented in national development frameworks; (AMAT Outcome Indicator 1.1.1.)	0 Normative Legal Acts (NLA) referencing CC or IWRM; Water Code is not IWRM oriented 0 NLA; water code does not have relevant normative legal acts 0 NLA; water code does not have relevant normative legal acts 0 NLA; water code does not have relevant normative legal acts	1 NLA; IWRM principles integrated in water policy 1 NLA; Flood zoning regulations introduced in water code 1 NLA; Conjunctive water management part of the water policy 1 NLA; Public participation and gender representation rules as part of the water and flood management policy	AMAT; APRs; Legal reports	
Outcome 1: Water and Flood management framework is modified to respond to adaptation needs and improve climate risk	# of articles included into the Water Code supporting non-structural climate change adaptation practices and their implementation.	Zero. The Water Code is not sensitized to climate risks in water and flood management.	At least 3 new CC-A focused articles included into the water code by end of project.	Parliamentary notice of modification. Official revised Water Code enactment notice.	There is willingness in national, regional and local administrations to integrate CC risks into water management

Project Strategy	Indicator	Baseline value	Target by end of Project	Sources of verification	Risks and Assumptions
management.					plans, policies and strategies.
	Development frameworks include specific budgets for adaptation actions;	Type: no flood zoning policies and regulations; Level of Action: national, local and community Type: no conjunctive water management practice; Level of Action: national, local and community	Type: flood zoning regulations included in flood and river management; Level of Action: national, local and community level covering 400km of the target river body Type: conjunctive water management model developed; Level of Action: national, local and community level river	Actual state budgets	
	Water Code does/does not mandate unified management or collaborative approaches to reduce climate-induced risk of increased flood damage and water stress.	Water Code is not sensitized to the importance of collaborative approaches to climate risk reduction.	Amended water code mandates unified management and/or collaborative approaches to reducing CC risk of increased flooding and water stress.	Official Gazette.	MoES will have the clout to win approval of modifications to the Water Code.
Outcome 2: Key institutions have capacities, technical skills, tools and methods to apply advanced climate risk management practices for water stress and flood mitigation.	Capacity Perception Index Score (1 - 5) to be disaggregated by gender 1. No capacity built 2. Initial Awareness raised (e.g. workshops, seminars) 3. Substantial training in practical application (e.g. vocational training) 4. Knowledge effectively transferred (e.g. passing examination, certification) 5. Ability to apply or disseminate knowledge demonstrated. (AMAT Outcome Indicator 2.2.2)	Baseline Score for Male and Female = 1. No capacity built for climate change adaptation and risk reduction.	Target Score for Male and Female = 3. Substantial training in practical application (e.g. vocational training).	Before and after simple tests to document improved understanding. Documentation on tools and training provided. Minutes of workshops and other forms of training. Evaluations of improvement in capacity, knowledge, etc.	Key organizations open to new ideas and able to devote time to capacity building.
	AMAT Output Indicator 2.1.1.1:	No, there is no updated risk and vulnerability assessment	Yes. There will be an updated risk and vulnerability assessment by end of project.	Risk and vulnerability	

<table>
<tr><th>Project Strategy</th><th>Indicator</th><th>Baseline value</th><th>Target by end of Project</th><th>Sources of verification</th><th>Risks and Assumptions</th></tr>
<tr><td></td><td>Updated risk and vulnerability assessment. Yes/No</td><td></td><td></td><td>assessment document ; SWAT Tool results.</td><td></td></tr>
<tr><td></td><td>AMAT Output Indicator 2.1.1.2: Updated risk and vulnerability assessment conducted. Yes/No</td><td>No, there is no updated risk and vulnerability assessment conducted.</td><td>Yes. An updated risk and vulnerability conducted by end of project as part of project’s work to produce model flood risk maps and participatory mapping processes.</td><td>Risk and vulnerability assessment document from</td><td></td></tr>
<tr><td></td><td>AMAT Output Indicator 2.1.2.1: Number and Type of monitoring systems in place.</td><td><table><tr><th>Number</th><th>Type</th></tr><tr><td>0</td><td>High elevation meteorological stations</td></tr><tr><td>0</td><td>River Monitoring meteorological stations</td></tr><tr><td>0</td><td>Community-based early warning for floods</td></tr><tr><td>0</td><td>Community-based water stress early warning</td></tr></table></td><td><table><tr><th>Number</th><th>Type</th></tr><tr><td>6</td><td>High elevation meteorological stations</td></tr><tr><td>3</td><td>High-altitude river monitoring meteorological stations</td></tr><tr><td>3</td><td>Community -based early warning for floods</td></tr><tr><td>3</td><td>Community-based water stress early warning</td></tr></table></td><td></td><td></td></tr>
<tr><td>Outcome 3: Community resilience to floods and water stress improved by introducing locally tailored climate risk management practices.</td><td>Number of WUA created / and or strengthened for CRM with respect to water stress and floods in project area.

Percentage increase in representation of women in pilot WUAs.</td><td>Zero Water User Associations (WUA) strengthened for CRM in project area.

Women are underrepresented in WUAs.</td><td>At least 5 by end of year 2; 10 by end of year 4; and 15 by end of project.

At least 20% women in all pilot WUAs by end of project.</td><td>Documentation of formation of WUAs, minutes of meetings, documentation of training, evaluation of the various activities at specific stages in the project to monitor progress.</td><td>Regional and local authorities able and willing to participate in taking on new, community based approaches and join activities.

Communities are interested in participating in the process.</td></tr>
<tr><td></td><td>Number of Local Stakeholder Committees with at least 20%</td><td>Zero. There are no such LSCs in place.</td><td>By end of Year 2, at least 3 Local Multi-Stakeholder Committees (LSCs) actively involved with regional administration in addressing climate change responses and water stress and flood damage mitigation.</td><td>Documentation of formation of LSCs, minutes of meetings,</td><td></td></tr>
</table>

Project Strategy	Indicator	Baseline value	Target by end of Project	Sources of verification	Risks and Assumptions
	women representation.		6 by end of year 4 and 9 by end of project, all with at least 20% women membership.	documentation of training, evaluation of the various activities at specific stages in the project to monitor progress.	
	Relevant risk information disseminated to stakeholders. (AMAT Outcome Indicator 2.1.1).	No, relevant risk information is not disseminated to stakeholders.	Yes, relevant risk information will be disseminated to stakeholders.	Risk information; dissemination results.	
	Number of rayon's to which climate-risk watershed management planning is replicated.	Climate-risk watershed management planning has not yet been piloted, much less replicated.	6 climate-risk watershed management plans in addition to the 3 pilot rayons for a total of 9.	Actual watershed management plans.	

Annex A-1: Total Budget and Workplan.

Award ID:	*00062260*	Project ID(s):	*00079670*
Award Title:	PIMS 3929 SCCF FSP Azerbaijan "Integrating Climate Change Risks into Water and Flood Management by Vulnerable Mountainous Communities in the Greater Caucasus Region."		
Business Unit:	AZE10		
Project Title:	PIMS 3929 SCCF FSP Azerbaijan "Integrating Climate Change Risks into Water and Flood Management by Vulnerable Mountainous Communities in the Greater Caucasus Region."		
PIMS no	3929		
Implementing Partner (Executing Agency)	MoENR		

GEF Outcome / Atlas Activity	Responsible Party / Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Notes
Outcome 1: Water and Flood management framework is modified to respond to adaptation needs and improve climate risk management	MoENR	62000	GEF	71200	Int'l Consultants	33,000	18,000	9,000	6,000	3,000	69,000	1.
				71300	Local Consultants	30,900	32,100	28,200	18,000	10,800	120,000	2.
				71600	Travel	26,750	15,000	8,250	6,500	1,750	58,250	3.
				72100	Contractual Services	0	0	0	0	0	0	4.
				72200	Equipment	0	0	0	0	0	0	5.
				74200	Publications	0	8,000	0	2,000	0	10,000	6.
				75700	Misc-Training	18,000	40,000	20,000	40,000	80,000	198,000	7.
				74500	Misc - Services	4,750	5,000	5,000	5,000	5,000	24,750	8.
				Total Outcome 1:		**113,400**	**118,100**	**70,450**	**77,500**	**100,550**	**480,000**	
Outcome 2: Key institutions have capacities, technical skills, tools and methods to apply advanced climate risk management practices for water stress and flood mitigation.		62000	GEF	71200	Int'l Consultants	18,000	18,000	15,000	6,000	3,000	60,000	9.
				71300	Local Consultants	34,800	46,500	38,700	39,300	34,200	193,500	10.
				71600	Travel	10,500	12,000	11,750	3,500	1,750	39,500	11.
				72100	Contractual Services	30,000	40,000	90,000	80,000	30,000	270,000	12.
				72200	Equipment	4,000	0	0	0	0	4,000	13.
				74200	Publications	6,000	0	12,000	12,000	0	30,000	14.
				75700	Misc- Training	28,000	60,000	70,000	50,000	30,000	238,000	15.
				74500	Misc - Services	1,000	1,000	1,000	1,000	1,000	5,000	16.
				Total Outcome 2:		**132,300**	**177,500**	**238,450**	**191,800**	**99,950**	**840,000**	
Outcome 3: Community resilience to floods and water stress improved		62000	GEF	71200	Int'l Consultants	27,000	30,000	18,000	12,000	9,000	96,000	17.
				71300	Local Consultants	52,200	56,100	57,000	42,600	39,000	246,900	18.
				71600	Travel	18,750	19,000	10,500	10,000	8,250	66,500	19.
				72100	Contractual Services	40,000	30,000	40,000	38,000	70,000	218,000	20.
				72200	Equipment	0	0	0	0	0	0	21.

by introducing locally tailored climate risk management practices.				74100	Professional Services	6,000	24,000	6,000	6,000	44,000	86,000	22.
				74200	Publications	7,000	8,000	8,000	8,000	10,000	41,000	23.
				75700	Misc- Training	60,000	70,000	50,000	60,000	100,000	340,000	24.
				74500	Misc - Services	5,600	4,000	4,000	4,000	8,000	25,600	25.
				Total Outcome 3:		**216,550**	**241,100**	**193,500**	**180,600**	**288,250**	**1,120,000**	
Project Management Costs		62000	GEF	71400	Project Personnel	30,950	30,950	30,950	30,950	30,950	154,750	26.
				Total Management		**30,950**	**30,950**	**30,950**	**30,950**	**30,950**	**154,750**	
GRAND TOTALS		62000	GEF	71200	Int'l Consultants	78,000	66,000	42,000	24,000	15,000	225,000	
				71300	Local Consultants	117,900	134,700	123,900	99,900	84,000	560,400	
				71400	Project Personnel (Management)	30,950	30,950	30,950	30,950	30,950	154,750	
				71600	Travel	77,045	67,048	51,548	41,051	32,808	269,500	
				72100	Contractual Services	70,000	70,000	130,000	118,000	100,000	488,000	
				72200	Equipment	4,000	0	0	0	0	4,000	
				74100	Professional Services	6,000	24,000	6,000	6,000	44,000	86,000	
				74200	Publications	13,000	16,000	20,000	22,000	10,000	81,000	
				75700	Misc -Training	106,000	170,000	140,000	150,000	210,000	776,000	
				74500	Misc - Services	11,350	10,000	10,000	10,000	14,000	85,350	
				Total Project		**514,245**	**588,698**	**554,398**	**501,901**	**540,758**	**2,700,000**	

#	Budget Notes
1.	Int'l IWRM expert (11 wks, 33k); Int'l Water and Env. Law Expert (7 wks, 21k); Int'l Climate Change Expert (2 wks, 6k); Int'l Flood Mgmt Expert (2 wks, 6k);Int'l Watershed Management Planning Expert (1 wk, k);
2.	PM technical input to law and policy, conjunctive management modelling (32 wks @ 600wk = 19200). Nat'l Stakeholder/Gender Participation expert to develop participation plan; (16 wks @ 300/wk = 4,800); Nat'l GIS expert (72 wks @300/wk = 21600); Nat'l Water Law expert (68 wks @300/wk = 20400); Nat'l Climate change expert (12 wks @300/wk = 3600); Nat'l training specialists (32 wks @300/wk = 9600); Nat'l Flood Mgmt Expert (68 wks @300/wk = 20,400); Watershed Mgmt & Planning Expert (68 wks @300/wk = 20,400)
3.	Travel costs for five int'l experts, total 12 air fares, plus DSA. Project site specific, 6 field missions to the target regions.
4.	N/A
5.	N/A
6.	Translation, publication, etc. of recommended modifications to law in year 2 and final documentation in year 4.
7.	Training of national Working Group on Law and Policy on international best practice in Water Law. Initial training of community members and regional staff on IWRM and conjunctive water management toward a collaborative conjunctive water management plan and to inform modifications to law.
8.	Workshop and associated costs for participatory activities on law and policy.
9.	Int'l IWRM expert (7 wks, 21k); Int'l Climate Change Expert (1 wk, 3k); Int'l Flood Mgmt Expert (7wks, 21k); Int'l Watershed Management Planning Expert (2wks, 6k); Int'l Agriculture Expert (3wks, 9k)

10.	PM technical input to institutional assessment, IWRM training, flood risk assessment, etc. (44 wks, $26400). Nat'l Stakeholder/Gender Participation expert to support participatory activities, (16 wks, $4,800); Nat'l GIS expert to support various mapping activities, (76 wks, $22800); Nat'l Climate change expert (17 wks, $5100); 6 Nat'l training specialists for all aspects of training for capacity building (160 wks, $48000); Nat'l Flood Mgmt Expert (72 wks, $21600); Watershed Mgmt & Planning Expert (72 wks, $21600); Nat'l Soils expert (42 wks, $12600); Nat'l MET expert (32 wks, $9600); Nat'l Telemetry expert (14 wks, $4200); Nat'l Agriculture expert (32 wks, $9600), (all Nat'l consultants @ $300/wk, except for technical PM time @ $600/wk).
11.	Travel costs for 4 int'l experts, total 3 air fares, plus DSA. Project site specific, 6 field missions to the target regions.
12.	Contracts for: 1) GIS development and satellite imagery, with training of regional staff for Output 2.4; 2) SWAT model preparation, assessment, publication and dissemination for Output 2.3; 3) Participatory Watershed Management and Planning for Output 2.4 and 2.7.
13.	Hand held GPS devices for participatory watershed management planning and flood risk mapping.
14.	Translation and publication of findings of institutional capacity assessment (Output 2.1) , guidelines on land and soil improvement (Output 2.7), documentation of early warning systems for dissemination to stakeholders (Output 2.6).
15.	Training for community stakeholders, regional and national staff of government organizations for training package in Output 2.2.
16.	Meeting logistics costs associated with pilot activities, community working groups, etc.
17.	Int'l IWRM expert (11 wks, 33k); Int'l Stakeholder/Gender Participation expert, (11 wks, $33,000); Int'l Flood Mgmt Expert (6wks, 18k); Int'l Watershed Management Planning Expert (4wks, 12k).
18.	PM technical input to participatory planning, flood risk assessment, etc. (24 wks, $14400). Nat'l Stakeholder/Gender Participation expert to support participatory activities, (92 wks, $27600); Nat'l GIS expert to support various mapping activities, (76 wks, $22800); Nat'l Climate change expert (17 wks, $5100); 6 Nat'l training specialists for all aspects of training for capacity building (132 wks, $39600); Nat'l Flood Mgmt Expert (72 wks, $21600); Watershed Mgmt & Planning Expert (68 wks, $20400); Nat'l Soils expert (96 wks, $28800); Nat'l MET expert (96 wks, $28800); Nat'l Telemetry expert (96 wks, $28800); Nat'l Agriculture expert (30 wks, $9000), (all Nat'l consultants @ $300/wk, except for technical PM time @ $600/wk).
19.	Travel costs for 4 int'l experts, total 7 air fares, plus DSA. Project site specific, 6 field missions to the target regions.
20.	Contracts for: 1) GIS development and satellite imagery, with training of community and regional staff for Outputs 3.3, plus replication in 3.5; 2) SWAT model dissemination for replication in Output 3.5; 3) Participatory Watershed Management and Planning for Output 3.3 and replication in Output 3.5.
21.	
22.	Audit (30k); Mid-Term Evaluation (18k) and Terminal Evaluation (38k)
23.	Guidelines on participatory Watershed Management and Planning in Output 3.3, materials for the public awareness campaign in Output 3.4.
24.	Training for strengthening WUAs (Output 3.1) and for pilot watershed management and planning (Output 3.3), several aspects of training for government and other stakeholder staff under the replication process in Output 3.5.
25.	Costs for workshops, meetings, etc. for establishment of LSC in Output 3.2 and for WUA meetings for strengthening in Output 3.1. Plus associated costs with travel, workshops, etc. for the replication process.
26.	PM at 60% time for whole project period @ $600/wk, PA at 90% for project period @ $250/wk.

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).

N/A

ANNEX C: CONSULTANTS TO BE HIRED FOR THE PROJECT USING GEF/LDCF/SCCF RESOURCES

Position Titles	*$/ Person Week**	*Estimated Person Weeks***	*Tasks To Be Performed*
For Project Management			
Local			
See Annex F for expanded table			
International			
Justification for travel, if any: Project is working across the Greater Caucasus region, which will require travel within the country; travel to/from training sessions, collaboration with co-funding entitites/partners, etc...			
For Technical Assistance			
Local			
International			
Justification for travel, if any:			

* Provide dollar rate per person week. ** Total person weeks needed to carry out the tasks.

ANNEX D: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS

A. EXPLAIN IF THE PPG OBJECTIVE HAS BEEN ACHIEVED THROUGH THE PPG ACTIVITIES UNDERTAKEN.

The PPG phase of the project "Integrating climate change risks into water and flood management by vulnerable mountainous communities in the Greater Caucasus region of Azerbaijan" achieved its main outcome, meaning the Full-Size Project Proposal was developed for submission to GEF/SCCF. The PPG phase covered the costs of information collection, research, and consultations necessary for the development of the FSP.

To accomplish the work, the team of two international and five local experts have been formed. During the PPG period several field trips were undertaken to the project region and intensive discussions were held with all important stakeholders, including but not limited to the Ministry of Emergency Situations, Ministry of Ecology and Natural Resources, State JSC on Amelioration and Water Resources, Azersu State JSC, Parliamentary Commission on Energy and Environment, Ministry of Agriculture, the branches and service centers of those ministries in the regions, the local authorities, NGOs and local population.

The following activities were undertaken under each component.

1. Baseline Studies:
   - 1.1. Legal and institutional capacity in Azerbaijan for water and flood management has been reviewed and analyzed; the existing legislation, regulatory and institutional framework, water governance at national, sub-national and local levels were assessed.
   - 1.2. Water and flood management system has been analyzed; the current and planned scope of the investments in flood preparedness, flood protection and early warning system has been assessed; capacities of local organizations to address water needs and flood mitigation were assessed; current level of ground water extraction and the respective investments have been analyzed; time-series of investments in structural measures were also summarized; key categories of land and water use in the region have been identified; the current flood protection infrastructure, existing practices and their effectiveness were analyzed.
   - 1.3. Socio-economic condition in the region has been analyzed; the study revealed the areas of economic activities, major crops harvested, farm sizes and yield volumes; land use planning and usage and access of population to water were assessed; overall poverty level in the region has been examined, pour mountain communities and women were identified as the most vulnerable social groups in the region; the respective state programs on socio-economic development and on poverty alleviation were also reviewed.

2. Climate Change Impact and Vulnerability Assessment.

   Based on the SNC the impact of climate change and vulnerability assessment of population has been conducted; data on temperature and precipitation as well as on major floods and on shortage of water were collected and analyzed; main reasons of increased flood risk caused by the climate change have been identified; the importance and effectiveness of non-structural measures of protection from flood in the project region were examined; the surveys were conducted among local populations and water users associations; the level of damages and losses experienced by the local communities were assessed.

3. Conjunctive Water Management Study

   The feasibility of conjunctive water management in the Greater Caucasus region has been conducted; the model and innovative practice of conjunctive usage of surface and ground waters was checked for suitability to address water shortages and adaptation to the climate change in the region; the directions were identified on introduction of conjunctive water use and integrated water resource management that includes regulatory framework requirements, institutional set up, capacity assessment and development.

4. Feasibility study

   - 4.1. The respective past, current and planned activities of other donors and stakeholders in the region were analyzed; such measures as aforestation and reforestation, hazard zoning, settlement, irrigation scheme and crop pattern changes were assessed; the project's scope has been identified and the feasibility of alternative

approaches to be proposed by the project were analyzed;

4.2. A package of measures to: (i) modify the water and flood management framework, (ii) to create capacities, technical skills and to provide tools and methods to apply advanced climate risk management practices for water stress and flood mitigation, and (iii) to enhance communities' resilience to flood and water stress by introducing locally tailored climate risk management practices were prepared; analysis of barriers to conjunctive water usage and to integrated water resource management was conducted and remedial actions offered;

4.3. Set of measures were prepared to ensure the sustainability of the project results; the sites for pilot interventions in the region and for replication in broader geographic area were identified; clear financial plan was developed; monitoring and evaluation plan to ensure the quality control and guidance was developed with the set of indicators to track the project's progress and effectiveness.

B. DESCRIBE FINDINGS THAT MIGHT AFFECT THE PROJECT DESIGN OR ANY CONCERNS ON PROJECT IMPLEMENTATION, IF ANY:

C. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES AND THEIR IMPLEMENTATION STATUS IN THE TABLE BELOW:

Project Preparation Activities Approved	***Implementation Status***	***GEF/LDCF/SCCF Amount ($)***				***Cofinancing ($)***
		Amount Approved	***Amount Spent Todate***	***Amount Committed***	***Uncommitted Amount****	
Activity 1 Baseline studies	Completed	25,881	25,881	25,881	0	44,573
Activity 2 Climate change impact and vulnerability assessment	Completed	10,240	10,240	10,240	0	30,931
Activity 3 Conjunctive water management study	Completed	17,820	17,820	17,820	0	15,118
Activity 4 Feasibility study	Completed	46,059	46,059	46,059	0	9,378
	(Select)					
	(Select)					
	(Select)					
	(Select)					
Total		100,000	100,000	100,000	0	100,000

* Any uncommitted amounts should be returned to the GEF Trust Fund. This is not a physical transfer of money, but achieved through reporting and netting out from disbursement request to Trustee. Please indicate expected date of refund transaction to Trustee.

ANNEX E: PROJECT MONITORING AND EVALUATION PLAN AND BUDGET (For detailed text describing this, see M&E section of the Project Document)

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project staff time*	Time frame
Inception Workshop & associated arrangements	▪ Project Manager ▪ UNDP CO ▪ UNDP GEF	Indicative cost: 10,000	Within first two months of project start up
Inception Report	▪ Project Team ▪ UNDP CO ▪ Consultancy support if needed	Indicative cost 5,000 (stakeholder consultations, consultancy translation)	Immediately following IW
Measurement of Means of Verification for Project Purpose Indicators	▪ Project Manager will oversee the hiring for specific studies and institutions, delegate responsibilities to relevant team members, and ▪ Ensure hiring outside experts if deemed necessary	To be finalized in Inception Phase and Workshop. Indicative cost 5,000	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	▪ Oversight by Project GEF Technical Advisor and Project Manager ▪ Measurements by regional field officers and local IAs	To be determined as part of the Annual Work Plan's preparation. Indicative cost 10,000	Annually prior to APR/PIR and to the definition of annual work plans
APR/PIR	▪ Project Team ▪ UNDP-CO ▪ UNDP-GEF	Indicative cost: 0	Annually
Steering Committee Meetings and relevant meeting proceedings (minutes)	▪ Project Manager ▪ UNDP CO	Indicative cost: 5,000 (travel costs for relevant project stakeholders)	Following Project IW and subsequently at least once a year
Quarterly status reports	▪ Project team	Indicative cost: 0	To be determined by Project team and UNDP CO
Technical reports	▪ Project team ▪ Hired consultants as needed	Indicative cost: 5,000	To be determined by Project Team and UNDP-CO
Project Publications (e.g. technical manuals, field guides)	▪ Project team ▪ Hired consultants as needed	Indicative cost: 20,000	To be determined by Project Team and UNDP-CO
Mid-term External Review	▪ Project team ▪ UNDP- CO ▪ UNDP-GEF RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 18,000	At the mid-point of project implementation.
Final External Evaluation	▪ Project team, ▪ UNDP-CO ▪ UNDP-GEF RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 38,000	At the end of project implementation
Terminal Report	▪ Project team ▪ UNDP-CO	Indicative cost: 0	At least one month before the end of the project
Lessons learned	▪ Project team ▪ UNDP-GEF RCU (suggested formats for documenting best practices, etc)	Indicative cost: 0	Yearly
Audit	▪ UNDP-CO ▪ Project team	Indicative cost: 30,000 (average $6000 per year)	Yearly
Visits to field sites	▪ UNDP Country Office	Indicative cost: 2,000	Yearly

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project staff time*	Time frame
(UNDP staff travel to be charged to IA fees)	▪ UNDP-GEF RCU (as appropriate) ▪ Government representatives	(average one visit per year)	
TOTAL INDICATIVE COST Excluding project team staff time and UNDP staff and travel expenses		US$ 148,000	

ANNEX F: EXPANDED ANNEX C – TABLE OF NATIONAL AND INTERNATIONAL CONSULTANTS.

Position Titles	*$/person wk*	*Estimated Person wks*	*Tasks to be Performed*
For Project Management			
Local			
Project Manager	600	160	Responsible for the overall management of the project, including the mobilization of all project inputs, supervising project staff, consultants and sub-contractors. The PM will report to the UNDP-Azerbaijan Environment Department Director in close consultation with the UNDP RR (or duly designated UN officer) for all substantive and administrative issues. The PM will report on a periodic basis to the Project Board. The PM will be responsible for meeting government obligations under the project, liaise with the Government, UNDP and other UN Agencies, NGOs and project partners, and maintain close collaboration with other donor agencies providing co-financing.
Project Assistant	250	235	The PA will manage the day to day operations of the project, particularly with respect to finances, technical services, procurement and personnel matters, supervise the provision of supplies and services, be responsible for the maintenance of project equipment administer petty cash and manage accounts on behalf of the PM.
		395	
International – N/A			

Justification for travel: The project is working across the Greater Caucasus region, which will require travel within the country; travel to/from training sessions, collaboration with co-funding entities/partners, etc. The cost of renting a car/4wd vehicle & driver for a typical 4-5 day trip is approximately US$1,500. Assuming *at least* one of these per month over the 60 month duration of the project and the total cost is a minimum of $90,000 for travel over 5 years, not including incidental travel on project business within Baku and those months where more than one mission or more than one vehicle is organized. Including these, a total calculation of 104,000 (24 from GEF and 80 from MoES) is a reasonable figure. MoES will co-fund this by providing one of their cars and drivers for project work most of the time.

Justification for local consultant co-financing by MoES of US$60,000: this co-financing comes as in-kind time contributions on a technical level by MoES staff at central office and regional office in Greater Caucasus working with/collaborating with project experts over the 60 month period, or an average of US$1,000 worth of staff time/month.

For Technical Assistance			
National Consultants			
IWRM Expert / PM	600	100	Technical lead on project as all components are related to IWRM. Advise on modifications to Water Code and other legislation, and lead project involvement in National Policy Dialogue. Oversee all IWRM and Flood related activities.

Stakeholder / Gender Participation Expert	300	124	Lead the stakeholder assessments, strengthening of WUAs, establishing the LSC. Working with IWRM Expert, organize and manage all stakeholder activities. Involved in many Outputs but instrumental Output 3.1, 3.2 and 3.4.
GIS Expert	300	224	Develop the GIS data base from satellite imagery and project generated data. Assist in the generation of data from participatory watershed management and flood risk assessments, and other activities throughout the project. Prepare maps as necessary. Instrumental to many Project Outputs.
Water / Env law Expert	300	68	Especially important to Outputs 1.1 and 1.2, advising on modifications to Water Code and other legislation, and the National Policy Dialogue. Lead the preparation of the recommendations for modification of law and follow the process of adopting the modifications through to finalization.
Climate Change Adaptation Expert	300	46	Advise on climate change issues for modifications to Water Code and other legislation, and the National Policy Dialogue, preparation of Participatory Watershed Management Planning activities. Important to Outputs 1.1, 1.2 and 3.3.
Training Experts (6)	300	324	Assist training contractors in developing the training programme, preparing materials and implementing the training. Their main Output is 2.2, but involved in several others.
Flood Management Expert	300	212	Advise the team, especially the PM and IWRM Expert on all aspects of flood management, with important inputs to many Outputs.
Watershed Management Planning Expert	300	208	Advise the team, especially the PM and IWRM Expert on all aspects of watershed management planning. Involved in many Outputs, but particularly 3.3, 2.4 and 2.3.
Institutional Expert	300	24	Lead the institutional assessment and advise on capacity building requirements. Instrumental to Output 2.1.
Soils Expert	300	138	Lead the soils survey as part of the community capacity building exercise, assist in soils aspects of the development of the SWAT model. Instrumental to Output 2.3 and 2.7.
Meteorological Expert	300	128	Advise MoENR and Hydromet on locating new hydrometeorological stations. Key advisor in Output 2.5 and 2.6.
Telemetry Expert	300	110	Advise MoENR and Hydromet on telemetry associated with new hydrometeorological stations for the Early Warning System (Output 2.6). Advise on telemetric aspects of the EWS.
Agriculture Expert	300	62	Advise on agricultural aspects of the community capacity building exercise, and in the development of the SWAT model. Important to Outputs 2.3 and 2.7, especially.
		1768	
International Consultants			

Chief Technical Advisor	3,000	86	Provide advice on all technical aspects of the project, especially regarding international best practice, with reference to water and flood management, climate change adaptation, risk mitigation, institutional requirements, water management needs with respect to law and policy. Support the PM on technical matters. *Note: UNDP Co-financing of 260,000 will support this position. ($3,000/wk * 86 weeks = 258,000). The remaining 2,000 will support local travel of the CTA on project business in pilot rayons.*
IWRM Expert	3,000	29	Lead the IWRM component, with special emphasis on developing IWRM practice at national and local level. Work with National IWRM Expert and others to detail modifications to Water Code and other legislation, support project involvement in the National Policy Dialogue, work with WUAs to broaden their mandate to cover water and flood management.
Stakeholder / Gender Participation Expert	3,000	11	Advise and support the National Stakeholder / Gender Expert in the stakeholder assessments, strengthening of WUAs, establishing the LSC. Assist in organizing and managing all stakeholder activities. Involved in many Outputs but instrumental Output 3.1, 3.2 and 3.4.
Water / Env law Expert	3,000	7	Advise on modifications to Water Code and other legislation, and the National Policy Dialogue. Especially important to Outputs 1.1 and 1.2.
Climate Change Adaptation Expert	3,000	3	Advise on climate change adaptation for modifications to Water Code, other legislation and the National Policy Dialogue and other Outputs such as the Participatory Watershed Management Planning activities. Important to Outputs 1.1, 1.2 and 3.3.
Flood Management Expert	3,000	15	Advise the team, especially the PM and IWRM Experts on all aspects of flood management. Involved in all Outputs related to floods.
Watershed Management Planning Expert	3,000	7	Advise the team, especially the PM and IWRM Experts on all aspects of watershed management planning. Involved in many Outputs, but particularly 3.3, 2.4 and 2.3.
Agriculture Expert	3,000	3	Advise on agricultural aspects of the community capacity building exercise, and in the development of the SWAT model. Important to Outputs 2.3 and 2.7, especially.
161			
Justification for travel, if any: The project is working across the Greater Caucasus region, which will require travel within the country, to and from Baku; travel to/from training sessions, collaboration with co-funding entities/partners, and so on. The cost of renting a car, in most cases a four wheel drive vehicle, adds up over time and indeed, MoES will provide most of this as part of their co-financing. Travel to Azerbaijan is required for international experts.			

Annex G: Important Non-Structural Measures and Tools in Adapting Water and Flood Management to the Impacts of Climate Change:

281. The current national strategy for flood protection in Azerbaijan is based entirely on structural measures. Because of a long involvement in structural flood mitigation measures, national and local administrations have developed extensive experience in design and construction of flood protection walls and other structures. Many, especially those protecting major cities, have been well designed, constructed, and maintained and are still serving their purposes. However, examples of poor construction and neglected maintenance are also numerous, especially in rural areas.

282. The approach to flood management by MoES and AJSC is limited to structural measures mostly because of a lack of knowledge of the benefits of including non-structural measures in an overall flood management program. The inhabitants of flood prone areas still consider structures and channelization as the most reliable flood protection measures, again mostly because of a lack of experience in other methods. Other methods can also be more contentious, such as flood plain zoning that may require relocation of some structures and activities, and changes to land use which tend to take more time to have a measurable impact.

283. International experience shows that the best approach to flood management and protection is a combination of structural and non-structural measures. The most important first step is determining the correct mix of structural and non-structural measures and precisely how they will work.

284. Flood Management: Important Non-Structural Measures and Tools

285. 1) Flood zoning is a nonstructural measure that regulates land use in the flood plain to minimize flood damage. Such zoning is implemented through legislation, mostly at the level of bylaws but supported by a national Water Code, and are usually specific to municipalities and responsive to local conditions.

286. Relocating settlements, agricultural lands, and infrastructure is difficult and socially contentious and may have untenable costs, and therefore should be avoided wherever possible.. If communities are involved in the assessment of flood risks and delineation of flood risk zones, some of these issues can be eased. Zoning bylaws can also be structured to make the changes through attrition such that existing land use, such as buildings, can be allowed to stay for the remainder of their useful lives, and abandoned or removed at that time and no new building will be allowed. Similarly, on agricultural land, certain crop types in certain seasons may be allowed, but not others. How a particular zone is managed will depend on circumstances and is best decided at a community level. Flood insurance can be an important aspect of flood zoning, where insurance may become mandatory in certain high risk flood zones.

287. Flood plain related zoning laws are very limited in Azerbaijan. There is one law that restricts specific development on waterways and water bodies, but the purpose is to protect water quality (and the actual benefits of such protective strips are questionable in any case). A relatively new regulation does relate zoning to flood protection, but the regulation is poorly defined because it is generic with the flood prone zone related to a set distance from the river bank depending on the length of the river. It cannot work unless the delineation is based on the specific hydraulic conditions and individual flooding regime of each river, as is done in Europe and much of the rest of the world. Application of the regulations in its current form is practically impossible.

288. 2) Watershed management is another non-structural method that has proved effective for flood management in many parts of the world. Its aim in flood management is improving the hydrologic characteristics of the catchment, notably the retention capacity of the soil, thereby reducing flood peaks and sediment load, and stabilizing river channels. Watershed management requires a long-term commitment and the coordinated efforts of several government and civil society organization. Once taken on, though, watershed management has many benefits other than flood management.

289. One of the common components of watershed management is reforestation of catchments that have lost forest cover. In Azerbaijan, reforestation or afforestation amounts to only 1,500 to 3,000 ha annually nationwide, and is not done specifically to promote sustainability, reduce erosion, or improve the watershed hydrologic characteristics. Sadly, the efforts put into reforestation in the region have been done on a scale so small as to have little impact, reinforcing the attitude that only structural measures work.3) Flood forecasting and early warning is another non-structural measure that has great merit in saving lives, and reducing loss of livestock, and saving smaller personal items which reduce the impact of the floods on livelihoods. Mountain floods develop rapidly and response times are short. Therefore the time from warning to safety is also short. The main components include: a specialized, high elevation hydrometeorological network which is capable of sensing the possibility of high intensity rainstorms before they occur, then monitoring their progress; a telemetric network to send data to a central flood warning office; an information dissemination system to

spread the word from the central office back to communities, and a well understood and rehearsed community level flood warning and response system which allows the people of the community to act quickly and effectively.

290. Water Stress Management: Important Non-Structural Measures and Tools

291. 1) Watershed management is also a non-structural measure for water management, using much the same process as for flood related management but with different emphasis. The health of the watershed is assessed in terms of land use and a watershed management plan is developed considering vegetation, soils, and other aspects. Vegetation and soil can be managed for water conservation to ensure a sustainable water resource.

292. 2) Conjunctive water management can also be considered a non-structural measure to improve access to water and reduce water stress. Groundwater and surface water are managed and used as one resource in situations where the two resources are hydraulically linked, as is the case in the project area. Conjunctive management can significantly increase access to the resource by using different infrastructure depending on the current hydrological conditions.

293. 3) Integrated Water Resources Management is another non-structural measure to reduce water stress. Essentially IWRM is a practice aimed at managing water as efficiently as possible so that water is not wasted, thereby having a more sustainable resource without large spending on infrastructure. The key word is integration, aiming at integrating fragmented water management organizations, integrating water and the land it flows over and through, integrating surface water and groundwater and integrating stakeholders into the water management process. IWRM has the added bonus of being highly environmentally sound, working to protect the ecological health of the catchment as it impacts water resources.

Annex H: Letters of co-financing

THE MINISTRY OF EMERGENCY SITUATIONS OF THE REPUBLIC OF AZERBAIJAN

501st block, M. Mushfig str.,
AZ1073, Baku

Tel.: (994 12) 512 00 13
Fax: (994 12) 512 00 39
E-mail: info@fhn.gov.az

08 «10» 2011 №15/02-23/06515

UNDP Resident Representative
Mr. Fikrat Akcura

Dear Mr. Akcura,

I am writing on behalf of the Ministry of Emergency Situations of the Republic of Azerbaijan (MoES) to express support for the project proposal submitted by the United Nations Development Programme (UNDP) and the Government of the Republic of Azerbaijan "Integrating climate change risks into water and flood management by vulnerable communities in the Greater Caucasus region of Azerbaijan".

I confirm that the above-mentioned project proposal is in accordance with the priorities of the Government of Azerbaijan. MoES is a willing partner in the project and found it consistent with its own strategic plans and intentions. If the project is approved, the MoES will make contribution from its budget to the project totaling to 7 mln USD, out of which $6,760,000 will be contributed to the implementation of the project components and $240,000 to the project management.

We were also informed that total amount of the GEF/SCCC award equals to $2,700,00 and UNDP Azerbaijan makes cash contribution to the project implementation equal to $260,000.

Sincerely,

First deputy minister **Rafail Mirzoev**

United Nations Development Programme
Birləşmiş Millətlər Təşkilatının İnkişaf Proqramı

Azerbaijan

UNDP/OL/EEU/11/10700 20 July 2011

Dear Mr. Yannick Glemarec,

Subject:: **Co-financing for the Project: "Integrating climate change risks into water and flood management by vulnerable communities in the Greater Caucasus region of Azerbaijan"**

I am writing to express support for the project proposal submitted by the United Nations Development Programme (UNDP) and the Government of the Republic of Azerbaijan "Integrating climate change risks into water and flood management by vulnerable communities in the Greater Caucasus region of Azerbaijan".

I confirm that the above-mentioned project proposal is in accordance with UNDAF for Azerbaijan for 2011-2015 and with the Azerbaijan's Second National Communication to the UNFCCC. If the project is approved, UNDP Azerbaijan will make cash contribution to the project in the amount of $ 260,000.

Thank you for cooperation.

Yours sincerely,

Fikret Akcura
UN Resident Coordinator
UNDP Resident Representative

Mr. Yannick Glemarec
GEF Executive Coordinator
United Nations Development Programme

3, UN 50th Anniversary street, Baku, Az1001, Azerbaijan; Tel: (+ 99412) 498 98 88; Fax: (+ 99412) 492 24 91; E-mail: registry@un-az.org;

United Nations Development Programme

Country: AZERBAIJAN

PROJECT DOCUMENT[1]

Project Title:	Integrating Climate Change Risks into Water and Flood Management by Vulnerable Mountainous Communities in the Greater Caucasus Region.
UNDAF Outcome(s):	**Outcome 1.** By 2015, non-oil development policies result in better economic status, decent work opportunities and a healthier environment in all regions and across all social groups

UNDP Strategic Plan Environment and Sustainable Development Primary Outcome: Goal 4: Managing Energy and the environment for sustainable development**.** Outcome 3: Strengthened capacity of developing countries to mainstream climate change adaptation policies into national development plans

UNDP Strategic Plan Secondary Outcome: Outcome 4: Strengthened capacity of local institutions to manage the environment and expand environment and energy services, especially to the poor

Expected CP Outcome(s): Outcome 1.3. Relevant national strategies, policies, and capacities strengthened to address environment degradation, promote the green economy, and reduce vulnerability to climate change

Expected CPAP Outputs

Output 1.3.3. Priority ecosystems/economic sectors vulnerable to climate change identified, strategies for improving their resilience developed
Output 1.3.6. Improved water resource management and strengthened transboundary cooperation on this issue in the Kura-Araz River Basin

Executing Entity/Implementing Partner:
Ministry of Emergency Situations (MoES)

Implementing Entity/Responsible Partners:
UNDP

Brief Description

Many of the communities of the Greater Caucasus region of Azerbaijan, especially the mountain communities, are at risk from climate induced flooding and water stress. The people have become resilient to the difficult conditions of the region, but now climate change is exacerbating both problems. Reducing the vulnerability of these communities requires proactive adaptation to the impacts of climate change. The current legislative and policy framework for water management is not sufficiently flexible to address climate change or to modernise water and flood management. Institutional capacity is also insufficient to tackle the problems that the impacts of climate change bring, including: increasing flood frequency, damages and hazards, and decreasing availability of and access to water resources. Communities have not been able to actively participate in water and flood management decision making. This project aims to reduce vulnerability of the mountain communities of the Greater Caucasus region of Azerbaijan to climate change induced water stress and flood hazards by improved water and flood management. This will be accomplished through addressing the management framework at the legislative and policy level, strengthening institutional capacity by introducing new non-structural methods and providing training, and empowering communities to actively participate in water and flood management.

[1] For UNDP supported GEF funded projects as this includes GEF-specific requirements

Programme Period:	2011-2016
Atlas Award ID:	00062260
Project ID:	00079670
PIMS #	3929
Start date:	Oct 2011
End Date	Oct 2016
Management Arrangements:	NIM
PAC Meeting Date	TBC

Total resources required	9,960,000
Total allocated resources:	9,960,000
• Regular	260,000
• Other:	
o GEF	2,700,000
o Government	7,000,000
o In-kind	_____
o Other	_____
In-kind contributions	_____

Agreed by (Government):

Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

Date/Month/Year

Agreed by (UNDP):

Date/Month/Year

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ACRONYMS

AAS	Azerbaijan Academy of Sciences
AJSC	Amelioration (Irrigation) Joint Stock Company
AMAT	Adaptation Monitoring and Assessment Tool
APR	Annual Project Review
BAT	Best Available Techniques
BCM	billion cubic meters
BEP	Best Environmental Practices
CCA	Climate Change Adaptation
COES	Commission on Emergency Situations
CP	Country Programme
CWM	Conjunctive Water Management
EB	Ecosystem-based
EBM	Ecosystem-based Management
EIA	Environmental Impact Assessment
EU	European Union
EUWFD	EU Water Framework Directive
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GEF	Global Environment Facility
IW	International Waters
IWRM	Integrated Water Resources Management
LSC	Local Stakeholder Committee
MCM	million cubic meters
M&E	Monitoring and Evaluation
MoENR	Ministry of Ecology and Natural Resources
MoES	Ministry of Emergency Situations
NFP	National Focal Point
NHD	National Hydrometeorology Department
NLA	Normative Legal Acts
NWC	National Water Committee
PB	Project Board
PMU	Project Management Unit
RCU	Regional Coordinating Unit (UNDP-GEF in Bratislava)
REA	Rayon Executive Authority
SAWR	State Agency for Water Reserves
SNC	Second National Communication
SNWSSP	Second National Water Supply and Sanitation Project
SWAT	Soil & Water Assessment Tool
TA	Technical Assistance
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNESCO	United Nations Education, Science and Cultural Organization
UNFCCC	UN Framework Convention on Climate Change
USAID	US Agency for International Development
WB	World Bank
WUA	Water User Associations

1: SITUATION ANALYSIS

Background: Water Stress, Flooding and the Project Area

1. The problem the project seeks to address is the impact of climate change on risks from water stress and flooding to the vulnerable mountain communities of the Greater Caucasus Region.

2. Azerbaijan as a whole is already considered to be a water stressed country, with current surface water resources estimated at less than 10 BCM generated within the country (though there are also resources from transboundary rivers). Azerbaijan's recently completed Second National Communication (SNC) to the United Nations Framework Convention on Climate Change (UNFCCC) forecasts that climate change effects will reduce overall water resources by 23% during the 2021 to 2050 period, compounding the current water deficits. Currently, water use is lower than it had been 20 years ago because of the economic downturn following independence. The continuing recovery of the rural agricultural sector will drive water demands. Highly effective water resources management will be necessary to minimize water stress in these rural communities.

3. Azerbaijan also experiences significant and damaging flooding. Floods in 2003 caused over $US 50 million in losses and damaged over 7,150 private and public buildings. A 100-year flood event would inundate 15,000 km^2, affect 300,000 people, and result in damages on the order of $400 million, according to a recent ADB study on flooding. The frequency of flood events is increasing due to climate change effects. Figure 1 below (based on data from the Azerbaijan SNC) shows a clear trend in increased flooding over the last several decades.

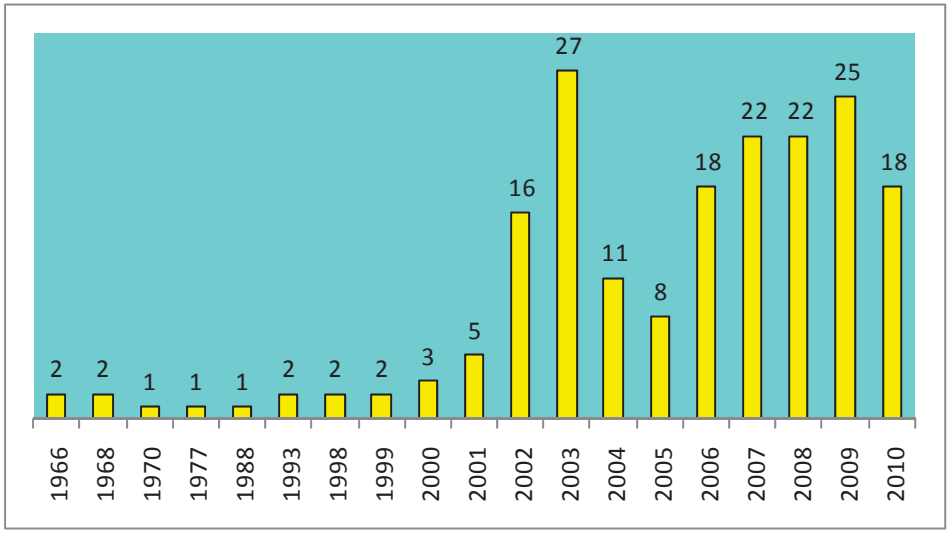


Figure 1: Number of Observed Floods in Azerbaijan by Year

4. The poor tend to be the most vulnerable to floods and the damages they cause. In addition to loss of life and physical damage to people and property, exposure to flood damage reduces income earning opportunities. Impacts are exacerbated by the inability of rural populations to access personal, crop, and livestock insurance because it is either not affordable or simply not available (as is the case in Azerbaijan). The poor have a much lower ability to rebound after suffering losses of assets. Floods worsen living standards of the poor, negate progress made in reducing poverty, and can cause low income earners to fall into poverty. The cumulative effect of droughts, floods and mudflows make the livelihoods

of farmers especially difficult as two or more unproductive years in a row make it hard for the farmers to survive, let alone develop and improve their livelihoods.

5. Climate change is already making these problems worse and forecasts indicate that it will continue. Reducing the vulnerability of these communities requires improved management of water resources and flood risks, as well as adaptation to the impacts of climate change.

6. Project area: The proposed project area encompasses the southern side of the Greater Caucasus Mountains, extending from the northwest of this region, in the area of the towns of Belakan and Zagatala, toward the southeast near the towns of Ismayilli and Gabala. This covers an area of just over 22,000 km^2. The whole area is part of the larger Kura River Basin, which is one of the two main rivers of Azerbaijan. Figure 2 shows a map of the proposed project region.

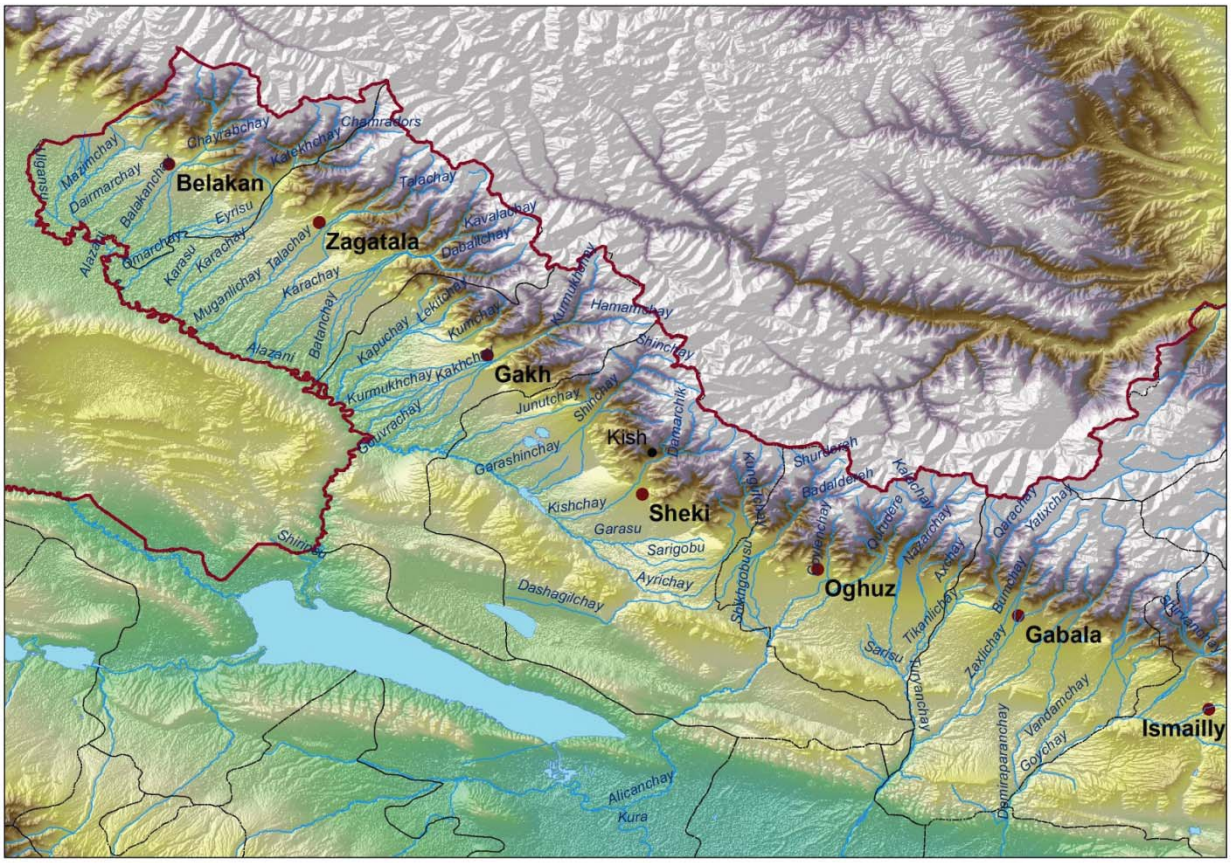


Figure 2: Map of the Proposed Project Region

7. The proposed project region of the Greater Caucasus of Azerbaijan has been identified as particularly vulnerable to both water stress and flooding. Floods and flood damages occur frequently across the region, with more than 150 damaging floods in the region in last 50 years. The floods of 1999 were the largest and most damaging of the last 100 years. Though the only two major floods that year, they were both severe and damaging on a large scale. Hardest hit were the Demiraparanchay and Turyanchay rivers (one of the three proposed pilot sub-basins), which caused flooding of over 70 settlements, seriously damaging the local economy and killing livestock. Several major floods also occurred between 2002 and 2010 with significant damage in the Greater Caucasus area affecting 82 communities with a total population of 246,000, damaging some 138,000 ha of cultivated area, and destroying public infrastructure. It is estimated that average annual flood damages in the Greater Caucasus Region amounts to $US 18-25 million for infrastructure alone. The focus of the project is on the mountain communities

because of their particular vulnerability to water shortages and flooding risks, which are both exacerbated by climate change.

8. Across the project region, total surface water resources are estimated at just over 1 BCM annually. Annual per capita water availability is just over 1000 m^3 per person, the benchmark of severe water scarcity. It is estimated that current water use is 340 MCM, or a third of the total, which is very near the safe limit as a proportion of the total resource. Agriculture accounts for about 70% of the total water use in the basin, with industry at 20-25% and domestic use at 5-10%. Agricultural production of the project area is of national importance, meaning that the water is not just a locally used resource. Current levels of water use are lower than they have been in the recent past, because of the economic downturn of the 1990s. Demands on water resources will increase as the agricultural sector recovers and develops further.

9. Groundwater resources are estimated at about 0.5 BCM annually, but actual use of groundwater use is less than one percent of this. As greater pressure is placed on the overall resource through climate change, there will need to be a significant increase in sustainable groundwater exploitation, through conjunctive water management.

10. Climate change impacts in Azerbaijan are greatest in the higher mountain sub-basins of the Greater Caucasus region according to the SNC. Three high mountain sub-basins have therefore been selected as pilot areas for demonstrating approaches to reducing vulnerability to water stress and flood events through climate change adaptation. These are the Talachay, Kishchay, and the Turyanchay rivers. Their characteristics include: 1) they are well distributed across the Greater Caucasus region and are representative of it, which will facilitate replication; 2) they are prone to large, damaging floods with steep upper catchments and upper river beds and have a history of floods carrying large amounts of rock and associated debris; 3) there are several communities within the pilot sub-catchments, including both small, rural, agricultural villages and larger, more populated towns, which are vulnerable to water stress and at great risk from flooding; 4) the economy of the sub-basins and the human activities associated with them are typical of the region.

11. The Talachay is in the northwest of the project area, in the Zagatala rayon. It has a catchment area of 410 km^2, with two main upper tributaries. From that confluence, it flows 40 km to the Ganikh River. There are several mountain communities, namely Mesles, Car, Oxoxdara and Siliban, which are in high flood risk areas and are now exposed to greater vulnerability through climate change impacts, making this river a good choice as a pilot. The Talachay flows through the town of Zagatala and it is also at increasing risk of flood damages.

12. The Kishchay is in the central part of the project area, flowing through the Sheki rayon, including immediately beside the historic town of Sheki. There are several communities in vulnerable areas of the river, namely Kish, Oxut and Goxmuq. The Kishchay is also a tributary of the Ganikh River, with a length is 49 km and a catchment area of 265 km^2. Flooding is frequent and damaging, with associated mud, rock and other debris flows. The problem is increasing in magnitude and severity with climate change. The town of Sheki is also highly vulnerable to flooding, especially as the riverbed has risen to the extent it is now above base level of the town. Water stress is also growing, as overall resources are declining, especially during July and August, the period of most intensive water demands for domestic and irrigation use. Water supply for the mountain communities and for the town of Sheki comes from the Kishchay.

13. The Turyanchay is in the south eastern part of the project area, in Gabala Rayon. It is large in comparison to the other two pilot rivers, having a catchment area of 4,840 km^2. It has several upper tributaries, each with flooding problems, with as much as 60% of the annual runoff occurring during the spring flood season. The communities of Qumarvan, Abrix, Bum and Xirxatala are particularly vulnerable for floods and debris flows. Similar to the other pilot sub-basins, water stress is growing as climate change both reduces the resource and increases demand.

14. **Climate Change and its Impacts on Flood Events and Water Stress**. The project region, being mainly a steep mountain environment, is one that has always been exposed to floods. Water for their

domestic and irrigation use has always been difficult to access because of the volatility of the rivers and the under-developed capacity to access and manage ground water. In the business as usual baseline situation, the communities have evolved to deal with these two issues by establishing themselves close to the rivers, but at a safe distance from all but the worst floods, negating the need for such things as early warning systems and improved flood zoning practices. Climate change has imposed new costs and new risks for local communities by making water more difficult to access through declining resources, growing demands and damages to water supply infrastructure from floods. Floods themselves are increasing in frequency and severity due to climate change. Climate change has also created a new, and much larger, problem across the project region associated with floods that has dramatically increased the vulnerability of the mountain communities.

15. The increase in rock material washed down the mountain rivers in large floods is the new flood related problem associated specifically with climate change. These are often referred to locally as "mudflows," but along with the mud are larger debris flows of small stones to boulders ranging in size up to several meters in diameter. Floods can carry as much as 1.0 million cubic meters of material in a single event. The floods and mudflows bury fertile lands as well as wash away good soil, permanently damaging land productivity, agricultural systems and resulting in human casualties and loss of property, as well as retarding the people's struggle to improve their livelihoods. The 'mudflows' have always been a feature of flooding in this mountain region, but total rock volumes and rock sizes have significantly worsened this aspect of flooding and make the floods more damaging to people, their property and their lands.

16. The climate change related phenomenon behind this is straightforward. Part of climate change is the increase in temperatures. Mountain regions are generally cold through much of the year but temperatures fluctuate frequently between freezing and thawing. With climate change increasing temperatures result in a greater number of cycles of freezing and thawing, which is the engine of rock erosion. This leads to more rock material falling off the mountains and becoming available for transport down the rivers during floods. The rock material settles as the flood slows, which is typically at the point where the steep upper catchment meets the more gradually sloping plain. This is also where mountain communities tend to be built, finding a good balance between the relative security of the hills and the flatter land needed for agriculture. As the rock is deposited by the rivers, the river bed rises, in turn elevating the flood plain and making vulnerable areas of communities which were previously safe. While 'mudflows' are not new to the project area, the rising riverbeds are a new and very dangerous phenomenon that is strongly associated with climate warming and related accelerated erosion processes. Temperatures are forecast to continue to rise with climate change, so the rising riverbeds problem will worsen at least for the foreseeable future. This is a phenomenon that is irreversible and will continue to worsen as long as climate change processes result in rising temperatures in the region. New approaches are required for flood risk management to address this new flood problem -- approaches that will accommodate inter-seasonal and long term risks of flood and water stress.

17. Water stress in the region is the result of the combination of a declining water resource base and increasing demands placed on those resources. Rising temperatures in the region are creating a greater demand for water resources from the natural environment and from human populations. While rainfall itself may increase under climate change, increased evaporation will result in net water availability being reduced. At the same time, population growth, increasing agricultural and industrial activity and economic growth all put ever-growing demands on the declining water resources. The SNC concludes that temperatures in the project region will continue to rise and at an accelerating rate. Water resources are predicted to decline by as much as 26% in the region by the latter half of this century. This is a direct consequence of climate change but climate change and its implications are not addressed in water related planning in Azerbaijan.

18. With greater pressures placed on a finite and declining water resource, good water resources management is the only way to ensure sufficient access to water in the future. Water management needs to address both supply and demand. Demand management is achieved through a variety of water

conservation measures, including: minimizing losses in water delivery systems, managing irrigation to get maximum economic return from agricultural production with the least water. Supply management is achieved through such interventions as: conjunctive water management to ensure that all possible sources are known and quantified for use, watershed management to ensure that water which falls as rainfall is captured as a water source, and the protection of sources from pollution. These approaches are not well known in Azerbaijan, in part because many water management functions have fallen through the gaps created by the fragmentation of water management institutions. The proposed project will introduce these approaches to the project region and to the country as a whole.

19. The real solution to both of these climate change induced problems is one of adaptation to the new situation. Local communities are aware of the situation because the effects of increasing water stress and increasing flood risks have been noticeable for some time already. However, they do not know how to address the problems themselves or even what options are available to them. While there are local solutions, they also require the support of regional and national organizations that are responsible for water and flood management. The current water and flood management system is not fully capable of responding to these new threats and challenges and can actually exacerbate the problems associated with climate change, rather than mitigating them. The proposed project aims to introduce new approaches to these new problems, ensure there is legal and policy backing to support them, and train the organizations involved to be able to manage and implement them.

The Baseline Project and the Problem the Project Seeks to Address:

20. This project aims at reducing climate change induced vulnerability to both flood risk and water stress to vulnerable mountain communities in the Greater Caucasus region of Azerbaijan. There are two programmes currently running in Azerbaijan that underlie the main flood risk and water stress elements of the project and which together, form the "baseline project" described below.

21. The Amelioration Joint Stock Company's (AJSC) flood defense efforts focus on building structural flood protection walls in the project region. This work, together with its annual budget allocation (indicated in Table 1 below) is taken as the baseline 'project' for flooding issues for the proposed project. The AJSC was initially established to develop and manage irrigation infrastructure, and now also has been tasked with flood protection with a rolling, medium term budget for building flood protection walls. Table 1 details the budget of AJSC's baseline flood protection work in the nine rayons of the project region, indicating that the project's rayons are a priority. Previous expenditures (2006 - 2010) are just over $US 46 million. The projected budget will more than double to almost $US 100 million for the 2011 to 2014 period, which indicates the growing concern over flooding in the project region. In addition, Table 1 highlights a strong geographic correlation that will enable the project to demonstrate a better, climate resilient flood management practice and to influence the investment flows and to shape these investments to support improved adaptation options in the flood risk areas going forward.

Table 1: AJSC Expenditures on Flood Protection 2006 to 2014 in the 9 Rayons of the Project Region

	AJSC Expenditures on Flood Protection ($US * 1000)					
Rayon	**2006-2010**	**2011**	**2012**	**2013**	**2014**	**Total 2011-2014**
Balakan	4,540	1,270	1,900	1,900	6,800	11,870
Zagatala	6,630	1,900	1,900	1,900	2,600	8,300
Gakh	11,030	7,600	10,700	7,300	6,300	31,900

Sheki	7,740	3,800	3,800	3,800	3,150	14,500
Oghuz	2,170	1,000	1,100	1,300	1,300	4,700
Aghsu	2,230	1,000	1,200	1,000	1,000	4,200
Goychay	1,440	760	1,700	650	650	3,760
Gabala	8,800	2,500	3,800	4,000	3,800	14,100
Ismayilli	2,220	760	1,140	1,900	1,930	5,730
Total	**46,880**	**20,590**	**27,240**	**23,750**	**27,530**	**99,110**

22. As is the case with many former Soviet countries, Azerbaijan faces a huge back-log of new and restored infrastructure needs in almost every sector of the economy. Azerbaijan's flood defense and water management efforts focus on building structural flood protection walls and structural water stress reduction measures in the project region. The Amelioration JSC traditionally has been responsbile for most of the structural construction work for flood protection/mitigation and water supply capture and MoENR/Hydromet is responsible for hydrometerological monitoring. However, the creation of the new State Agency on Water Reserves under the MoES means that these AJSC and MoENR activities will be absorbed by this new State Agency. As of this writing, they are still separate entitites and thus are presented separately here. The AJSC and MoENR are no confirmed co-financers but rather key partners of the project and for these reasons, their programs are relevant to the baseline project description in addition to the core-co-funder MoES.

23. The MoES's "General Construction Works Plan" for 2010-2014 envisages the necessary construction of structural measures for flood protection, with a total annual budget for the project region of approximately $9,500,000. MoES plan also calls for the installation and equipping of automatic solar powered hydrometeorology observation stations on each major river. There are 3-5 major rivers in each of the project's pilot rayons, and at least 1-2 such automatic stations have to be established in the catchments of each river. Thus, approximately 20 such stations will be established in the Project Area alone. The budget for these automatic hydrometeorology stations is estimated at approximately US$250,000/year over the four-year life-span of the project. The annual budget allocations (indicated in Table 1 above) provide the value for the baseline 'project' for flooding and water stress issues for the proposed project.

Table 2: Annual and total budget allocations on flood protection and water management in the project area over the 4-year lifespan of the project.

Baseline project stakeholders	**Annual Budget Allocations**	**Total Budget Allocation**
MoES	**10,500,000**	**42,000,000**
AJSC	24,777,500	99,110,000
MoENR	1,000,000	4,000,000

24. MoES partner organization AJSC was initially established to develop and manage irrigation infrastructure, and now also has been tasked with flood protection with a rolling, medium term budget for building flood protection walls. Previous expenditures (2006 - 2010) are just over $US 46 million. The projected annual budget during the project period will more than double to almost $US 99 million, which indicates the growing concern over flooding in the project region. In addition, Table 1 highlights a strong geographic correlation that will enable the project to demonstrate improved climate resilient flood management practices and to influence the investment flows and to shape these investments to support improved adaptation options in the flood risk areas going forward. Annex - provides details of the budget

of AJSC's baseline flood protection work in the nine rayons of the project region, indicating that the project's rayons are a priority.

25. The National Hydrometeorology Department (NHD) of the MoES partner MoENR operates a national network comprised of 70 meteorological stations, with approximately 30 located in the project area. The NHD employs on average approximately 5 staff to maintain, record and distribute data gathered by every two stations. However, the network is somewhat outdated, with most of the stations dating back to the Soviet period and very located in the upper catchments of mountain river systems. In addition, very few have modern hydrological monitoring capacity. NHD is tasked with improving the network together with MoES and the State Programme on Development of Hydrometeorology (2011 to 2015) provides funding for doing so.

26. Directing attention to upgrading and modernizing stations for early flood warning requires specialist knowledge not currently found in Azerbaijan. This will be supported by GEF's incremental investments. The hydro-meteorological observation capacity in the project region is insufficient to monitor flooding or to monitor extreme rainfall, both of which are necessary for early warning systems. There are currently very few (two) high elevation automated meteorological stations in the project area and none in the actual pilot sub-basin. The hydrometeorological observation capacity is insufficient for monitoring floods or extreme rainfall, both of which are necessary for early warning systems.

27. The project will add to the information base for analysis and to support an early warning system by assisting the MoES and NHD to extend the coverage of automated hydro-meteorological stations in the region. A telemetric data system to send information to regional authorities will also be included as part of an early warning system.

Table 2a: Relevant co-funded activities by component both ongoing and to be re-oriented by GEF incremental investments.

MoES Co-funding	Relevant Ongoing Activities providing co-funding	GEF influenced changes to baseline project activities providing co-funding
Component 1 Co-financing: $960,000	- Engendering calculations and design of flood protection structures; - Elaboration of State Programmes on flood and water management.	- Support and engagement in the strengthening of the law and policy framework for strengthened and adaptive water and flood management; - Participation in legal working group.
Component 2 Co-financing: $2,100,000	- Training in the construction and maintenance of flood protection and mitigation infrastructure. - Planning for flood mitigation infrastructure; - Planning for creating and expanding automatic hydrometeorology observation station network.	- Support and participation in the development of non-structural tools for water and flood risk management; - Establishment, installation, and operation of automatic hydro-meteorological stations across the Greater Caucasus region, together with a telemetric data system to send information to decision makers. - Support for communications links between community-based early warning systems and hydro stations.
Component 3 Co-financing: $3,700,000	- Construction of flood mitigation and protection infrastructure.	- Participation in and support of elaboration of pilot climate risk oriented watershed management plans; - Participation in/leadership of project-inspired local stakeholder committees.

		- Support for replication of the project's work.

28. Flood management in Azerbaijan is focused on flood protection, rather than flood prevention and mitigation of damages, with all work directed entirely at building flood protection walls which attempt to stop the floods from reaching vulnerable areas. These investments in flood protection walls may protect vulnerable communities in the short term from one, or possibly a few individual flood events, but do not function well with the new conditions imposed by climate change, especially with the dramatically changing conditions found in the Greater Caucasus Region. They are not long term solutions as the walls tend to become buried quickly by the rock material (described in previous section) that has become the worst component of the floods. These are outdated methods of protection, which do not address the impacts of climate change. Other complementary practices and methods are needed.

29. Table 1a summarizes the relevant ongoing co-funded activities as well as those co-funded activities that will be "re-oriented" or given a new "spin" as a result of this GEF project's incremental investments. As Table 1a reflects, this project will complement and influence the MoES and Government of Azerbaijan's flood protection efforts by emphasizing flood prevention and the mitigation of flood damages through introducing cutting-edge non-structural measures that specifically address climate change, including: flood zoning and the appropriate legal backing for it, improved watershed management in upper catchments and micro-watersheds, and local climate risk management actions the communities can take to reduce their exposure and vulnerability such as developing observation and early warning systems. By working closely with the MoES and its partner organization, the project will introduce and demonstrate the cost-effectiveness of these climate resilient flood management practices and in so doing, overcome the lack of awareness of such measures in Azerbaijan and help to direct the budget allocations of the MoES and other entities to more cost-effective adaptation investments in the future. Importantly, the project will take a participatory approach to flood damage mitigation, which brings the communities into the practice of flood management and gives the communities a greater say in their own flood damage mitigation. These approaches will be developed and tested in the project sub-basins and rayons before replication across the project region.

30. With respect to the project's water stress elements, the baseline project is also comprised of the State Programme on Poverty Reduction and Sustainable Development (SPPRSD) (2008-2015). Although the SPPRSD is not a co-funder of this project, it is relevant here because the GEF project will be working closely with the same stakeholders (namely the Rayon Executive Authorities) as SPPRSD and there will be ample opportunity for cross-fertilization between the two initiatives. For example, this GEF project will seek to enable activities under SPPRSD to utilize SWAT and CWM tools.

31. With respect to the project's water stress elements, the baseline project is comprised of the State Programme on Poverty Reduction and Sustainable Development (SPPRSD) (2008-2015). As stated in Section A.2, the SPPRSD prioritizes the protection of water resources and the improvement of domestic water supply in Azerbaijan in part by improving water delivery infrastructure and services and thus improving access to water. However, it does not address climate change and the impacts it will have on future water resources and future demands. It also does not address actual water resources management, which is crucial to maintaining sustainable water supplies under conditions of climate change. The SPPRSD is the only programme in Azerbaijan that references water management and land management together, which is key to an integrated water resources management (IWRM) approach to climate change adaptation. With four more years of operation, the SPPRSD will be concurrent with the proposed project, presenting an opportunity to influence the programme by addressing climate change issues in water resources.

32. The Government of Azerbaijan is dedicating significant resources to achieving SPPRSD's priority of improved access to water. The Second National Water Supply and Sanitation Project (SNWSSP) is the primary example of this budgetary and programmatic support for the water management goals of SPPRSD. This $230 million joint initiative with the World Bank will improve the availability, quality,

reliability and sustainability of water supply and sanitation services in 21 rayon centers across Azerbaijan, including the rayons of the project region. The provision of water supply and sanitation services are a sound baseline element to the proposed project and the water users and service providers targeted by the SNWSSP are important stakeholders in the project. In addition, this project will complement the SNWSSP's work by elaborating the critical cross-sectoral IWRM context of structural initiatives like SNWSSP. This project will also work closely with SNWSSP as part of the conjunctive water management modeling work under Outcome 1, with the goal of influencing the way SNWSSP and future investments assess and exploit groundwater resources.

33. The existing baseline project falls short in addressing long-term adaptation to climate change. However, it provides favourable conditions for the SCCF funded project to advance policies and implement many of the on-the-ground measures for addressing adaptation needs in water and flood management. The project will build on this baseline through three strategically designed outcomes. First, the project will modify the water and flood management framework to respond to adaptation needs and improve climate risk management through the elaboration of strategic normative legal acts (by-laws) to empower stakeholders to implement new and innovative water and flood management tools under the existing Water Code, including conjunctive water management. Second, the project will strengthen institutional capacities, technical skills, tools, and methods to enable them to apply tools such as "SWAT" (soil and water assessment tool) and advanced climate risk management practices such as participatory flood risk mapping in order to reduce vulnerabilities to floods and water stress. Third, the project will empower the vulnerable communities themselves to take charge of their own adaptation to climate change through comprehensive participation in water and flood management, working with regional practitioners through a Local Multi-stakeholder Committee established under the project.

Barriers:

Barrier #1: Water legislation and policy do not reflect the growing challenges of managing risk associated with climate change

34. Effective management requires a framework of both water policy and water law, or, in the case of Azerbaijan, a Water Code. The existing framework is insufficiently robust to support the type of water management needed in light of climate change and its impacts on water resources, water use and flooding. Partly, this is due to there being no National Water Policy in place which defines what specific issues the government will address in water and flood management, and how they will be addressed. What does exist within the Water Code does not allow for more integrated approaches to water and flood management, which are so necessary to address effectively the seasonal and interannual water stress and flood risk response measures.

35. There are ongoing efforts in Azerbaijan to create a National Water Policy, which is a good start, but with a weak framework and a limited understanding of what is needed for effective water and flood management, it is unlikely that the resulting Policy will support the modern, integrated approaches that are essential to the level water and flood management required to respond to climate change.

36. Azerbaijan's National Water Code was enacted in 1999. The Code provides, with its various by-laws and regulations, the basis for water regulation in Azerbaijan. However, the Water Code was enacted prior to systematic consideration of climate change, its impacts, and adaptations to it. Therefore, while the Code contains many of the requirements to support basic water management, it is not sufficiently adaptable to the increased management demands that climate change imposes.

37. Increasing pressure on declining water resource requires more effective water resources management. Integrated Water Resources Management (IWRM) was developed internationally over the past two decades to respond to the mounting need for improved water management and has become the accepted international approach. IWRM was relatively new at the time of the development of the Water Code and therefore its principles are not referenced in the new Code. IWRM and its principles remain relatively

unknown and not well understood in Azerbaijan. Although there is an emerging recognition of the need for IWRM, current knowledge and understanding of it are weak at all levels.

38. An important principle of IWRM is that the correct management unit for water resources is the river basin. River basin level management planning is not yet the case in Azerbaijan and, while some wording is in place to support it, the Water Code does not create the environment necessary to start managing water by basin. As a result, local zoning and planning practices do not consider water and flood management in an integrated framework that can steer inappropriate developments away from the areas of high risk.

39. To use another example, potential groundwater reserves are significant but underused. Conjunctive water management is largely unknown in Azerbaijan and not supported in law or policy. As a result, stakeholders do not manage ground and surface water conjunctively, which aggravates the vulnerability of GC communities to water stress. This is mainly an institutional issue as groundwater has traditionally been overseen by a different government organization than those responsible for surface water and for providing water supply or irrigation services. This is a good example of the fragmentation of water management efforts creating inefficiencies in the water resources – water use balance. Under the conditions of growing water stress due to climate change, groundwater is a resource that cannot continue be ignored.

40. There is no organization in Azerbaijan responsible for the overall management of water resources. As greater demands are placed on both, land and water need to be planned and managed together. There is no such integration stated or promoted in either the Water Code or the Land Code, which would underline the means and provide the legal basis for connecting water and land management organizations. Water management remains highly fragmented, with various organizations acting independently, without consideration of the mounting pressures from climate change that demand more integrated approaches. The current, sector-oriented system of water management cannot accommodate competing demands of water users and is insensitive to the new risks and difficulties posed by climate change. While the way land is used is directly linked to both the quality and availability of water, as well as to the severity and frequency of flooding, land use policies and planning do not consider water and flood management in an integrated framework. The impact of land use changes on water resources and flooding are not well understood and therefore not properly considered in land management decisions.

41. The Water Code and its regulations make no allowance for participation of the community or other public stakeholders in water and flood management processes or for the enhanced participation of women and women's groups in water and flood management. Water User Associations have been established, but they are strictly irrigation oriented and not considered in the larger water and flood management context. Integrating stakeholders into the planning and management process will require reference in the Water Code and guidance in a National Water Policy.

42. Flood zoning requires the force of law. The delineation of flood zones can be incorporated in descriptive regulations, but the Water Code itself must clearly state the meaning of each zone in a way that is enforceable. There are no such articles in the current Water Code. Further, flood risk zoning can be unpopular if done without involvement of the affected communities. Communities are faced with difficult choices when a zoning exercise results in areas currently in use being classified as high risk, for example. Participatory flood zone assessment is not practiced in Azerbaijan and the concept is new. Without it, attempts to impose flood zones will be controversial and difficult to enforce.

43. There is little to no community involvement in flood management planning and there is minimal basis for it in existing legislation and policy. Community participation in the flood zoning process helps to alleviate negative responses to the need for changing land use practices as the communities themselves assist in determining the flood risk zones and in determining land use regulations for their river basin. Community involvement in developing flood warning systems greatly increases their efficacy. At present there is no support in law or in practice for community involvement in flood management.

44. The project will address the weaknesses in the water and flood management framework through 1) contributing to the National Water Policy Dialogue, 2) making recommendations for modifications to the Water Code and related legislation, such as the Land Code and working with the Parliamentary Committees to have those changes adopted into law, 3) modifications to associated regulations, or Normative Legal Acts (NLAs) which detail responsibilities and day-to-day competencies of the relevant organizations and 4) developing practices, such as conjunctive water management which will illustrate improved water management approaches and highlight where changes need to be made in the law and policy framework.

Barrier #2: Institutional capacity is insufficient to meet the challenges of climate risk management.

45. Climate change and its impacts impose the need for new skills, technical knowledge and integrated management approaches in the water and flood management sectors. Water and flood management in Azerbaijan are highly fragmented and there is no cooperative cross-sectoral institutional framework to reduce threats of flooding or address barriers to improved water management from an integrated perspective. The current, sector-oriented institutional structure is inflexible to accommodate competing demands of water users and insensitive to the forthcoming risks posed by the climate change.

46. There is no single agency responsible for water management as a whole, and the institutions involved do not work collaboratively toward the common goal of effective water management. Several agencies are involved: MoES and its new State Agency for Water Reserves are new actors in this field but have become a key part of both water and flood management and being new to the work, they have very limited technical capacity; MoENR's Department of Hydrometeorology is the primary entity that monitors and analyzes data on surface water; its Geological Research and Engineering Geology Department monitors and researches groundwater, and its Land Department is responsible for monitoring aspects of land and land-related pollution; AJSC manages large scale irrigation and has been the main agency for flood protection; AzerSu is the main service provider for water supply and sanitation. These agencies work independently of each other with little communication among them, though their responsibilities are highly related to each other.

47. These key institutions do not have the necessary capacities, technical skills, tools and methods to apply advanced climate risk management practices for water stress and flood risk mitigation. There is limited knowledge of available adaptation technologies, in particular water and land use regulation and management modalities that will make the highly exposed assets and populations resilient to climatic stressors.

48. Several issues have been identified regarding the capacity for water management within these organizations, which include the following. First, there is limited knowledge of climate change adaptation planning, methods and technologies such as aspects as determining groundwater potential, operationalizing conjunctive water management, scenario-based planning, risk assessment and forecasting water demands. Gaps were also identified regarding practical knowledge in the field of flood hydraulics, including specialized structural flood mitigation options such as flow accelerators to cope with the very large floods and mudflows that climate change is making more and more common to the project area.

49. Secondly, existing narrowly focused water and flood management practices do not encourage collaboration among the MoES, MoENR and Amelioration JSC on the issues of protection and use of water resources. Third, there is a lack of a Government entity specific to water resources management. Instead "management" is seen as a byproduct of other activities such as flood protection wall construction or canal building. Fourth, the responsibility for groundwater exploration and use is not related to water resources. Fifth, responsible agencies lack enforcement tools, such as well elaborated flood zoning regulations or normative legal acts. Sixth, flood management is directed entirely at structural measures, mainly because there is little knowledge of non-structural alternatives (elaborated below and in Annex 6); Seventh, the limited availability of and/or ineffective education and training in adaptive water management aspects hampers the ability to respond effectively to climate change. Eighth, the

implementation of a basin or watershed-based approach to water resources management has yet to be adopted by key agencies. And finally, efforts to improve public awareness and public participation in the decision-making process are inadequate at best, with no public outreach or participation programs under implementation.

50. At the institutional level, most organizations involved in water and flood management are not well versed in modern tools and approaches to reduce vulnerability to water stress and flooding events, such as: a) the use of soil and water assessment tools to quantify the impact of land management on water resources; b) modern flood risk mapping customized for each particular river system; c) the strategic use of automatic hydrometeorological stations to maximize climate risk mitigation potential; d) the design and use of community-based early warning systems.

51. These shortcomings in capacity have an immediate impact on the vulnerability of communities to water stress and flood damage, especially under the changing conditions that climate change imposes. As an example, the idea of conjunctive use – managing surface water and groundwater together in situations where the two are linked – is an unfamiliar concept, with the result that the project region is in a state of water stress despite apparently rich groundwater reserves. This is an issue closely related to the fragmentation of agencies noted above – the surface water and groundwater are under different organizations – leading to gaps in information and in knowledge of good and climate resilient water management methods.

52. Another example is that the approach to flood management is entirely oriented to structural measures, specifically the building of 'flood protection walls', despite the fact that these are costly and inappropriate to the changing hydraulic conditions in the mountain rivers due to climate change, and consequently risk increasing communities' vulnerability to flood damage. This is an issue of the responsible agencies not keeping up with changes in modern practice. Europe and other areas of the world have moved to more non-structural measures such as flood zoning, flood insurance, flood forecasting and early warning systems and watershed management as more effective means of mitigating flood damages. As a result, there are real gaps in knowledge of flood zoning and how it works to protect communities, and of the impact of land use on floods and on water resources.

53. Azerbaijan has no flood forecasting system, and the flood warning system that is in place is ineffective because of the absence of meteorological stations at high elevations in the 2,000 - 2,500 m range. Additionally, many stations and many components of the telemetric network are non-functional because of insufficient budgets for maintenance and replacement of equipment. Flood forecasting and early warning are very important non-structural measures for reducing vulnerability by mitigating flood risk and mitigating flood damage.

54. In short the capacity is extremely limited within and among the relevant institutions to implement successful climate change adaptation measures that reduce vulnerability to water stress and flooding. This has led to the neglect of many water management functions, such as managing river basins to ensure the sustainable use of water resources. Water management is a rapidly changing science because of growing pressures on the resources through population increases, economic development and climate change. Azerbaijan has not kept up with the changing, modernizing practices that will help to reduce vulnerability to climate change.

55. The project will address the currently limited institutional capacity through 1) a series of targeted training for water and flood management practitioners and other stakeholders at regional and national levels, 2) introducing modern practices such as the Soil and Water Assessment Tool (SWAT) and participatory flood risk mapping, 3) expansion of the hydrometeorological network to support early warning systems, and 4) developing early warning systems.

Barrier #3: Communities are unable to participate in assessing and making decisions related to adapting themselves to climate change risks.

56. Participatory planning and community engagement are necessary to ensure local support and enforcement for the most appropriate land use in the high risk areas in order to avoid potential conflicts

between the flood risk reduction and economic returns from the land and to ensure that economic returns are not jeopardized by flood risk management solutions, but rather maximize those returns.

57. Current water and flood management practices in Azerbaijan are focused upon "concrete results" such as more flood protection walls and new canals rather than participatory processes that engage local stakeholders and incorporate their knowledge and concerns into long-term climate change adaptation solutions. At the local and community level, there is no participation in planning and management and no established link between the community and the regional level practitioners in water and flood management, both of which are necessary to reduce vulnerability through adapting to climate change. Community participation and collaboration with government practitioners in the analysis of conditions and adaptation options are necessary because: 1) adaptation, and the decisions on how to adapt, occur at the community level, 2) some of the adaptation measures will be controversial and the community will need to decide for itself, 3) the community alone does not have the technical skills to properly assess the situation on its own, and 4) the regional practitioners do not necessarily have sufficient understanding of the needs of the community in developing adaptation measures and approaches.

58. Communities are unable to participate at this time because: 1) local community engagement mechanisms (associations, clubs, etc) are under-developed in Azerbaijan. Community organizations such as WUAs are new to Azerbaijan; 2) WUAs were set up for purposes other than climate change adaptation, and water and flood management, 3) they do not have sufficient training and technical skills to collaborate with regional agencies as equals.

59. There are no watershed management plans in place that incorporate flood issues or climate change and none that have been elaborated in a participatory manner. Public awareness of floods, especially as it regards early warning is very limited and campaigns to improve awareness do not exist.

60. The proposed project will address these barriers at the management framework level, the institutional capacity building level and the local community involvement level through the three proposed Outcomes. The aim is to develop the capacity for integrating climate change risks into the water and flood management policy and regulatory framework. The focus is on mitigating the impacts of climate change with regard to water resources and flood management for the vulnerable mountain communities of the Greater Caucasus Region. The project will work at national, regional and local levels because of the need for interaction and support among these levels. The project will develop capacities of local communities and communal organizations to more effectively withstand to current and anticipated climate change risks through improved water and flood management.

61. At the local and community level, there is no participation in planning and management, which would help to decrease flood risks and water stress to which the communities are vulnerable.

62. The project will address the problem of limited community involvement by 1) strengthening WUAs through training and hands-on exercises to develop a thorough understanding of water and flood management and climate change adaptation and working collaboratively with regional practitioners, 2) creating a Local Multi-stakeholder Committee with regional practitioners to jointly address climate change adaptation issues, 3) introduce and initiate participatory land use/watershed management planning and management, and 4) prepare and execute a public awareness programme across the region to inform others about the impacts of climate change and options for adapting to it and mitigating its impacts on their communities.

2: STRATEGY

63. The proposed project is designed to enable stakeholders to overcome the critical barriers described above preventing them from reducing the vulnerability to climate change induced water stress and flood hazards through improved water and flood management. The project will do this through the targeted design of the following three inter-related outcomes and their respective outputs and activities.

64. This project is additional in as much as it introduces new practices in water and flood management in order to adapt to climate change risks and builds on current baseline of water and flood management practice in Azerbaijan. At the national level, the current baseline of law and policy, institutional programs and capacity and local community engagement lacks the necessary legal basis, modern tools and methods, and participatory approaches that are critical to successful adaptation in water and flood management going forward. In the baseline project, attention will continue to be focused upon narrow sectoral measures and solutions to water resource management and flood risk reduction.

65. At the local level, in the business as usual baseline, mountain communities do not have to put additional effort into protecting themselves from floods because their communities had been developed with good knowledge of the historical flood regime. But with the onset of climate change, these same communities are now faced with more frequent, more severe floods carrying much more debris and water flow, which pose much higher risk of greater danger and damage to their communities. Regional authorities and communities have little knowledge in how to cope with this increased risk due to climate change.

66. In the business as usual baseline, the current low level of water management is evolving slowly using narrow, sectoral, structurally oriented solutions. But water stress caused by CC has imposed new challenges on this slowly evolving baseline, and placed new demands on outdated water management practices. As a result, regional organizations and local communities do not have the expertise to address climate-induced water stress going forward. This project is designed to provide additional, new and innovative, non-structural tools to enable Azeri stakeholders to reduce vulnerability to water stress and flood risk. This additionality reasoning is reflected in the project's three primary outcomes and their associated outputs described in detail below.

67. The three outcomes of the project are: 1) Water and flood management framework is modified to respond to adaptation needs and improve climate risk management 2) Key institutions have capacities, technical skills, tools and methods to apply advanced climate risk management practices for water stress and flood mitigation and 3) Community resilience to floods and water stress improved by introducing locally tailored climate risk management practices. The three Outcomes, their respective baselines and proposed alternatives are summarized below.

Outcome 1: Water and flood management framework is modified to respond to adaptation needs and improve climate risk management.

68. Outcome 1 is directed at the water and flood management framework, which is law and policy, with outputs that address modifications directly, or work to inform the recommendations toward those modifications.

69. Baseline: The management framework refers to the policies and laws that govern water and flood management. Azerbaijan enacted the National Water Code in 1999 to provide the legal foundation for regulating water. There have been occasional amendments to the Code and new regulations added in response to changing conditions and priorities, but the pace of change has not met the needs imposed by climate change (CC). The Water Code does not explicitly consider CC, its impacts on water resources and what adaptations may have to be made to mitigate them. Therefore, while the Code contains many of the requirements to support basic water management, there are no articles in the Water Code or any other legislation that address climate change, its impacts, and adaptations to it. The Code is not sufficiently adaptable to the increased management demands that climate change imposes. The impact of land use

changes on water resources and flooding are not well understood and therefore not properly considered in land management. As greater demands are placed on both as a result of climate change, land and water need to be planned and managed together.

70. There are some specific and critical gaps in the Water Code that the project, working with MoES, will seek first to bridge, using Normative Legal Acts in the near term and in the longer term to fill these gaps through specific modifications to the Code itself. Gap #1: The first critical gap is the lack of formal recognition and support within the Code to enable an Integrated Water Resources Management (IWRM) planning and implementation approach, which is a necessary and missing basis for effective CC adaptation.

71. For example, the Water Code as written does not promote and underline the means and provide the legal basis for integrating water and land management organizations. Water management remains highly fragmented, with various organizations acting independently, without consideration to the overall process. An effective water law defines which organizations have responsibility for each of the various activities. Instituting new approaches and new organizations or making changes to how those organizations work and how they interconnect with other government or non-government entities requires the backing of law.

72. As another example, an important principle of IWRM is that the correct management unit for water resources is the river basin or watershed. Micro-watershed management is not yet the case in Azerbaijan and, while some wording is in place to support it, the Water Code does not provide the necessary backing to catalyze such an approach. Adopting IWRM is a "no regrets" situation with regard to climate change adaptation, as introducing IWRM will result in much needed improved water management even if the forecasts for climate change are less severe than expected. The proposed project will introduce the IWRM process at the legislative and policy level, within the responsible organizations as a form of institutional capacity building, and at the community level through introducing participatory approaches to land, water, and flood management.

73. The Water Code and its regulations and by-laws provide little understanding of the range of non-structural options available for flood risk reduction. This is because the growing emphasis on non-structural measures in Europe and other areas is relatively new and has not yet been adopted in Azerbaijan (See Annex 6 for a summary of non-structural measures). Gaps 2-5 relate to this issue.

74. Gap #2: the specific CC adaptation duties or competencies of each organization are not delineated in the Water Code or under any existing NLA. This includes the lack of specific enabling language to encourage innovation in responding to CC adaptation challenges by providing funding for CC adaptation innovation. The current, sector-oriented system of water management does not allow or enable organizations to adapt their activities to address new challenges imposed by climate change, hampering their ability to respond effectively to the demands of water users and make them more insensitive to the new risks posed by climate change.

75. Until recently, there were several organizations involved but none with responsibility for overall water management. The organization of water management is fragmented, with limited coordination between the various organizations. As a result, many water management functions have been neglected, such as managing watersheds to ensure sustainability of water resources. This is beginning to change and in fact will be a key element of this project's baseline. The MoES's new State Agency for Water Reserves (SAWR) was only established in the spring of 2011 and is still being staffed. It will be the closest that Azerbaijan has ever come to having one agency dedicated to water resources management. The SAWR will be a key actor in the project's work.

76. Gap #3: Flood zoning is a key non-structural means of reducing vulnerability of communities to flood damages. Flood zoning requires the force of law and this must be clearly defined in articles of the Water Code. There are no such articles in the current Water Code. There has been a step toward flood risk zoning legislation, initially put forward under the Asian Development Bank (ADB) Supporting River Basin and Flood Management Planning Project (2003 to 2008) which has recently been adopted into regulations. However, these regulations were poorly defined because they are generic – delineating a

certain distance from a river bank as a flood zone based on the length of the river, rather than studying a specific river and delineating flood zones based on its very individual flooding regime, including the long term changes in flooding regimes, due to climate change. Application of these regulations to specific rivers is practically impossible. This differs from the European approach in which flood risk zones for individual rivers are studied, delineated and entrenched in by-laws. Such an approach will need to be adopted in Azerbaijan for flood risk zoning to work.

77. The delineation of flood zones can be incorporated in descriptive regulations or normative legal acts (NLA), but the Water Code itself must ultimately clearly state the meaning of each zone in a way that is enforceable. There are no such articles or NLA in the current Water Code. Further, flood risk zoning must be carefully implemented in full collaboration with the affected communities. Communities are faced with difficult choices when a zoning exercise results in areas currently in use being classified as high risk. Participatory flood zone assessment is not practiced in Azerbaijan and the concept is new. Without it, attempts to impose flood zones will be controversial and difficult to enforce. Modifying the Water Code to include articles on flood zoning will be one of the areas in which the project adds to existing legislation, in the near term using NLA and in the longer-term with actual modifications to the Water Code.

78. Pilot integrated zoning plans will also be prepared by the project under Outcome 2 based on flood risk mapping generated through participatory risk assessments. These are new concepts in Azerbaijan that the project will introduce. Their preparation will also inform the recommendations for modifications to the Water Code as many aspects will need a legal foundation.

79. Gap #4: The Water Code and its regulations make no allowance for participation of the community or other public stakeholders in water and flood management processes. Community participation in the flood zoning process helps to alleviate negative responses to the need for changing land use practices as the communities themselves assist in determining the flood risk zones and in determining land use regulations for their river basin. Community involvement in developing flood warning systems greatly increases their efficacy. A step forward has been made in establishing Water User Associations (WUA). However, WUA are strictly irrigation oriented and not considered in the larger water and flood management context. This project will show how stakeholders can be integrated into the planning and management process through a series of activities, including participatory land use planning, participatory flood zone delineation and various types of training for community members and government organizations. Integrating stakeholders into the planning and management process will require reference in the Water Code and guidance in a National Water Policy.

80. Azerbaijan does not yet have a National Water Policy (NWP), which is crucial to the water management framework because it provides an official statement on how the government intends to manage water. It directs the law, especially the Water Code, which in turn supplies the legal basis for implementation. Azerbaijan is in the process of holding a National Policy Dialogue (NPD), supported by the EU and the UNECE. One of its aims is to institute a NWP. This dialogue is in part considering whether Azerbaijan can adopt the EU Water Framework Directive (EUWFD) as a basis for its NWP. However, the dialogue is occurring at a high level and is not being informed by community and regional level actors. The project will provide a direct link between law and policy and, through the various participatory activities noted above, will inform the NPD on community and local aspects of water management which should become entrenched in the policy. The project will work with the NPD to ensure its final form fully integrates climate change and the needs of community participation.

81. Gap #5: Conjunctive water management (CWM) is unknown and not supported by the existing legal and regulatory framework. One significant cause of water stress for communities in the Greater Caucasus is that potential groundwater reserves are significant but underused. This is mainly an institutional issue as groundwater has traditionally been overseen by a different government organization than those responsible for surface water and for providing water supply or irrigation services. This is a good example of the fragmentation of water management efforts creating inefficiencies in the water resources – water

use balance. Under the conditions of growing water stress due to climate change, groundwater is a resource that cannot continue be ignored.

82. Conjunctive use of surface and groundwater requires the water management system to have knowledge of both resources and the ability to determine how best to use them for the various water demands. This does not happen in Azerbaijan because the organizations responsible for surface water and groundwater are separate and because water is not managed holistically at the watershed level. Groundwater reserves are estimated to be abundant in the project region, but groundwater remains an underused resource, despite growing water stress. The project will add to the understanding of conjunctive use through activities such as developing a conjunctive use model and guidelines for its use in the pilot sub-basin and the project region. These will serve to build capacity in the regional organizations and also serve to inform the package of modifications to the Water Code.

83. The project adds to the existing law and policy framework by first enhancing the ability of the existing Water Code to support climate change adaptation work and strengthens the water management framework to support the actions which need to be taken to reduce the risk of water stress and flood damage from the impacts of climate change.

84. Alternative: Outcome 1 is designed to improve the water and flood management framework, specifically law and policy, through a three-step process. The first step is to recommend modifications to the 'Normative Legal Acts', which are regulations which detail actions under the various articles of the Water Code or other laws, then working with the Cabinet of Ministers to enact them. Work on the Normative Legal Acts is approached first, because the process of amendment is easier and faster. The second step is to recommend modifications to the existing Water Code itself, and to other legislation, then working with Parliamentary Committees to adopt the modifications. The third step is taking part in and influencing the National Policy Dialogue toward establishing a new National Water Policy to ensure that the National Water Policy addresses climate change and its impacts and promotes community participation in the water management process. Outcome 1 works to achieve a comprehensive legal and policy base for water resources so that it can fully address climate change and adaptations to it, and support the establishment of effective water management organizations to facilitate reducing vulnerability to water stress and flooding.

85. **Output 1.1:** A package of five Normative Legal Acts (regulations) developed on climate resilient water management at the sub-basin level.

86. Work under this output focuses on practical near-term amendments, improvements and additions to the existing "Normative Legal Acts" (NLA) which are associated with the Water Code to support effective climate change adaptation in the water and flood management fields. Under this output, project resources will enable the formation of a national Legal Working Group (LWG) of national experts to elaborate specific NLAs in the critical areas needed to enable adaptation. Normative Legal Acts are like regulations which support a particular implementation of a law. They detail the responsible organizations, their competencies and other considerations needed to implement the article or articles under the Water Code. They are simpler to elaborate and enact, as they require only a review and approval by the Cabinet of Ministers, rather than a full parliamentary process as amendments to law require.

87. The LWG will be 5 to 7 members, which will be made up of representatives of the line agencies (Ministry of Emergency Situations, AJSC, AzerSu, Ministry of Justice, and MoENR). Other ministries and organizations will be consulted as needed. The LWG will be supported by an international water law expert and an international IWRM expert with best international practice on water law and policy to provide a starting point for the review, as well as a national legal and legislative expert. The LWG will also be informed by the Local Stakeholder Committee (LSC, formed under Output 3.2). Several activities in the three Outcomes will inform the specifics for elaborating NLA, which will be developed by the LWG.

88. The formation of the LWG will happen as a priority in the early stages of the project so that amendments to the NLAs can be made quickly and be in place when other Outputs of the project come on

line. The majority of the recommendations for modifications to the NLAs will be completed by the middle of Year 2. Working through the Cabinet of Ministers, the enactment of the modifications should be complete by the middle of Year 3.

89. Under this output, the LWG will elaborate at least five NLAs to strengthen and sharpen the Water Code's focus on adaptation in the water and flood management sectors:

90. NLA #1: will enable IWRM. This NLA will create a working environment for IWRM prior to its principles being entrenched in the Water Code. First, this NLA will specify which planning and management activities will be undertaken at the river basin or sub-basin level. It will specify clear and simple steps to be taken by MoES, MoENR, and others to begin practicing IWRM. NLA #1 will specify the organizations that will work collaboratively at national, rayon and local levels and in what capacities. It will regulate the integration of land and water management, of surface water and ground water management and of water quantity and water quality issues.

91. NLA #2: will enable relevant organizations at all levels to adapt their activities to address climate change prior to it being entrenched in the Water Code. This NLA will support organizations to take on new approaches necessary for climate change adaptation by re-defining the competencies of each organization to emphasize climate change. At the same time, the NLA will enable the integration of CC adaptation innovation budget lines into each organization's respective budgetary programme. The uncertainties of climate change require new approaches to planning and other management actions and organizations need the flexibility to proceed under the circumstances of risk and uncertainty. Currently, the water and flood management activities of organizations are highly restrictive, causing them to recycle old ideas in order to obtain working finances.

92. NLA #3: will elaborate specific flood zones and clearly state the meaning of each zone in a way that is understandable, equitable and enforceable. Flood zoning is one of the most effective means of reducing flood risks to communities, industry, and agriculture. Flood zoning requires the force of law to implement because it restricts land use, possible where economic activities are already in place. There is one regulation on flood zoning in place, but it is improperly defined and is unenforceable in its present form. Flood zoning is a key area of focus for this project and requires the regulatory backing to see some of the activities through.

93. NLA #4: supports the introduction of conjunctive water management as a new tool for reducing water stress. This NLA will enable the practice of conjunctive water management through specifying the competencies of each of the relevant organizations that will be involved. It will define the mechanisms through which the organizations will cooperate and collaborate. It will also define how budget lines will be shared to enable disparate organizations to work together.

94. NLA #5: will enhance public participation and gender representation in water and flood management policy and practice. Public or community participation in the water and flood management process is a priority area for modifications to the Water Code. This NLA will highlight specific steps and measures to be taken to improve public participation in water and flood management policy and practice even as the Water Code is updated. Especially where it concerns contentious issues such as flood zoning, the more communities are involved in its development and the more women are represented in these discussions, the more likely the communities are to be accepting of the changes. This is an aspect often overlooked in water related legislation. Instilling participation as an article in law ensures their inclusion in the process and gives them the confidence to participate actively.

95. **Output 1.2:** The Water Code, Land Code and other related legislation revised to account for climate change risks.

96. Work under this Output will support the MoES's State Agency for Water Reserves (SAWR) in establishing a National Water Policy, as well as promulgating modifications to the Water Code itself, and other relevant legislation such as the Land Code, to support effective climate change adaptation in the

water and flood management fields. The same national Legal Working Group (LWG) noted in Output 1.1 above will lead this work, and will be chaired by the MoES's SAWR.

97. The elaboration of and passing of a National Water Policy is critical to effective water and flood management in Azerbaijan. A water policy defines the priorities and the approaches to managing water resources from both supply and demands sides. It is an important component of the overall framework because it is the official statement of how the government will address water management. The proposed project will align itself with the ongoing NPD described in the baseline section above to inform the process to ensure that IWRM and climate change aspects are specified in the National Water Policy. While finalizing a National Water Policy is likely beyond the scope of this project in both resources and time required to achieve, the project will, under this output, contribute strategic input to an ongoing process to elaborate a National Water Policy for consideration and passage by the National Assembly.

98. Modifications to the Water Code itself are necessary to support the changes needed to address climate change and the impact it has on increasing water stress and flood risks, and to address much needed improvements in water and flood management to protect the resource and vulnerable communities. Project resources will provide expertise and guidance to enable the Environmental Committee of the National Assembly to formulate modifications to the Water Code and work with them to support their enactment. The purpose of modifying the Water Code is to support the introduction of new approaches to water stress management for the country, especially for the organizations that carry out day-to-day water and flood management work and for the communities that will participate in it. It is common that such changes need to support of law because of changing competencies, responsibilities and rights. The project will make recommendations for modifications and then work through the process of having them adopted into articles of law.

99. The Land Code will also require modification to allow such aspects as the integration of water and land management. The current mandates of several institutions contribute to overall water and watershed management, which are crucial to reducing vulnerability to water stress and flooding risks. However, these institutions are not working collaboratively with each other, leaving gaps in the practice of water management, which worsen rather than improve the vulnerability of communities in the face of climate change.

100. The LWG, with support from the international and national legal and IWRM experts, will review progress to date on the National Policy Dialogue and prepare a report on areas which need attention within the Policy Dialogue, and for modifications to legislation. This will be completed by the end of Year 1 and presented to the Dialogue at its next meeting. The LWG and the international and national legal and IWRM experts will attend and contribute to the remainder of the Dialogue meetings by invitation from MoENR, which leads the Policy process and is the main co-financier of the proposed project. This process is expected to be complete by the end of Year 4 of the proposed project, culminating in the finalizing of a National Water Policy.

101. As part of this assessment and review process, the LWG will work closely with the Parliamentary Committee to organize a series of round table discussions, culminating in a set of recommendations for modifications in the Water Code and other legislation. The discussions will be informed by several other project activities, the process of which will underline what legal requirements may be needed. Using these other project activities, most of which are regional and local in scope, elicits input from regional, municipal and community stakeholders on legislative needs, thereby drawing from a more encompassing set of stakeholders, and ensures that recommended modifications are based on needs. The recommended modifications will be drafted as a document by end of Year 2 for submission to the Environmental Committee of the National Assembly and the Parliamentary Commission on the Environment and others for review.

102. The project will provide continued support to adopting the recommended modifications through Year 3 and Year 4. This support will be in the form of a series of meetings with parliamentarians, including the Parliamentary Commission on the Environment, which will be brought on board to assist as

they have the ability to bring issues before the Parliament for modifying law. The target is to have modifications to the Water Code and other legislation by the end of Year 4.

103. **Output 1.3:** Conjunctive Water Management (CWM) model and guidelines for surface and groundwater use under climate change conditions.

104. Conjunctive water management is simply the combined use of surface water and ground water, in situations where the two resources are physically connected, but managed jointly as if they were one resource. Such physical connectivity is evident in the project region through the highly permeable limestone mountains, which surfaces through the riverbeds at various points even through the dry season. Within and near the river courses, the two are hydraulically connected. This means that the use of one of the sources impacts on the supply of the other. From a management perspective, surface water or ground water can be used in ratios which differ depending on specific circumstances, such as at different times of the year, or when floods threaten surface water infrastructure, etc. While simple in concept, conjunctive use is rare, mostly because surface water and groundwater tend to be managed by different government organization. This is the case in Azerbaijan, though neither resource is currently managed in a systematic way.

105. In Azerbaijan, including over much of the project area, groundwater is an underutilized resource, mainly because the organization responsible for urban and rural water supply (AzerSu) is under a different umbrella than for groundwater (MoENR). Making matters worse, in the steep mountain catchments of the project area, maintaining surface water infrastructure is very difficult because of the severe floods with heavy rock and sediment loads that damage infrastructure designed to collect surface water. In addition, even during non-flood periods, sediment loads in the rivers are high and treating such water for domestic use is costly and difficult, resulting in deteriorating water delivery infrastructure, such as pipes and valves, frequent system collapses, and delivered water with sediment loads too high for the population to use.

106. With climate change making water more scarce while simultaneously increasing water demand, a new approach is required with more balanced reliance on surface and groundwater as equal sources, where possible. Because conjunctive water management is new, the approach will require “proof of concept” to show its value and training in its practice. Output 1.2 is designed to prove the concept through the development of a CWM model, with practical application through the establishment of test wells in selected sub-basins.

107. A new project for water supply is underway for the town is Ismayilli, within the project area. It aims to rehabilitate the existing surface water sources and infrastructure, damaged mainly due to the hostile environment of the river source. In addition to the rehabilitation, two 150m deep wells are being drilled to obtain groundwater. These wells will supply about 15% of the total water requirement, and are seen as a secondary source. This is not quite a model of conjunctive use, but it does represent an acceptance of the need for groundwater use as a part of urban water supply. This opens the door for the project to use it as part of the illustration or training in conjunctive use and will be used as an example for a CWM model.

108. Work under this output will develop a model for CWM which will enable the communities to improve availability and reliability of their water supplies in the face of climate change. It incorporates important components of both groundwater management and surface water management such as monitoring, evaluation of monitoring data to develop local management objectives, and use of monitoring data to establish and enforce local management policies. The objective is to illustrate the value of CWM and to develop and instruct on a method and approach which is appropriate to local conditions and capacities, with the intention that it become the norm for water management in the project region and across Azerbaijan.

109. The CWM model is aimed at the organizations involved in managing the water resource and supplying water to communities: AzerSu, (water supply and sanitation services), and AJSC (irrigation water supply), and MoENR’s Departments of Groundwater and of Hydrometeorology. For the project, the

CWM work will be aimed at the rayon level in the three pilot rayons, but national level representatives of these organizations will participate to support replication in other areas of the country. Community stakeholders will also be involved, represented by the existing WUAs.

110. To be practical, the model will need to be based on real groundwater resources. MoES co-financing will support the drilling of test wells in two of the three pilot sub-basins, the Kishchay and the Talachay. Ismayilli Rayon is already drilling wells under an AzerSu programme to improve water supply for that rayon and this can be used as the basis of the model in that area.

111. During Year 1 of the project the international and national IWRM specialists, supported by hydrology and hydrogeology experts from MoENR, will work with AzerSu and AJSC regional staff to identify appropriate well locations and plan for drilling. Drilling, well development and well testing will be completed by the end of Year 2.

112. While the drilling is being done consultation will take place to design the actual CWM model. A CWM model is really a series of steps within a framework of adaptive management where policies and practices are continually improved by learning from the ongoing work. The idea is to make the process interactive and aspects of the management process are revisited, reviewed and improved.

113. A set of guiding principles is in place concerning conjunctive use, which will act as a framework for the CWM model:

- Physically connected surface water (including overland flow) and groundwater should be managed as one resource.
- All surface water and groundwater stores rely (either directly or indirectly) on rainfall for recharge. Identification of new storages within a connected system does not automatically increase the net sustainable yield of that system.
- Water management regimes should assume connectivity between surface water (including overland flows) and groundwater unless proven otherwise.
- The Precautionary Principle should apply to protect against potential impacts of surface water-groundwater interactions. For example, a single combined sustainable yield should be used as the basis for the net allocation of surface water and surrounding groundwater resources.
- Water users (groundwater and surface water) should be treated equally. It is not appropriate to assume one source is more important than the other.
- Jurisdictional boundaries should not prevent management actions.
- Management arrangements between the various institutions involved should not be an excuse for failing to identify and address issues associated with connected systems, or for not progressing opportunities associated with conjunctive water management.

114. The steps of the CWM model process are described below, and the process illustrated in Figure 3 below:

- Identify the management setting (the key features that define the management of land and water resources in the catchment)
- Acquire the baseline information to describe the characteristics of surface water and groundwater systems of the catchment, and their interactions, both spatially and temporally.
- Summarize the current understanding of the processes, dependencies and impacts on the water resource in a conceptual model. This will be used to form a mathematical model that can be used as a predictive tool.
- Identify the goals and objectives to be achieved for water management in the catchment.
- Develop and implement management options and evaluate and implement an appropriate mix of policy and on-ground investment options for conjunctive water management

- Monitor and review performance of key indicators and use this as the basis to review catchment conditions and the performance of conjunctive water management.

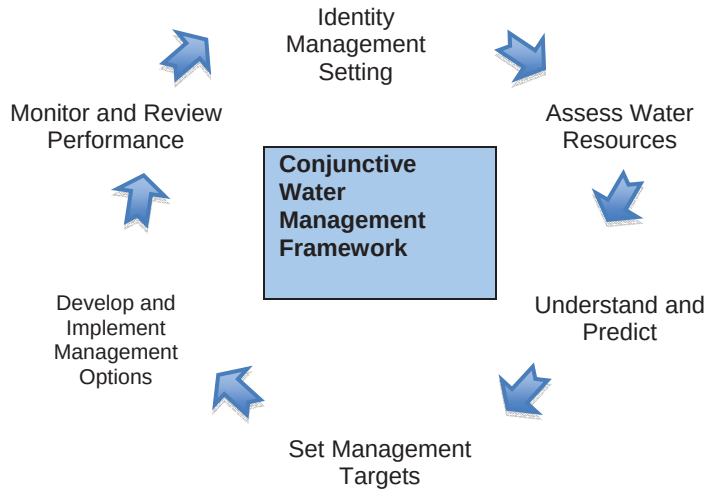


Figure 3: Components of the CWM Model

115. The activities of Output 1.2 will follow the steps outlined above, starting with a set of consultative workshops to determine the appropriate management setting. The consultation step will be completed by the end of Year 1. This will result in the definition of the form of the model, what it will include, what information is required for it, how it may be used by the various organizations once it is complete.

116. The CWM model development will be led by the international and national IWRM specialists, supported by hydrology and hydrogeology experts from MoES, and in collaboration with the other stakeholders. Data for the model will be obtained from the wells themselves, through bore hole logging and pumping tests, which will define its volumetric output. Similar information will be obtained on surface flow from Hydromet and MoES. The CWM model will be developed in two stages: the first stage model will allow the introduction of the model and training in its use before the full range of data is available from well drilling and river flow monitoring. The stage 1 generic model and training will be completed by the end of Year 2.

117. The development of the CWM model is one of practical training. The training will be a continuous process through the project period as the models are being developed. The three Rayon Executives will contribute to the process by providing space for the training.

118. In Year 3, once the wells are completed and data are available, second stage CWM model will be finalized and will be specific to the pilot sub-basins. This step will involve the same experts and stakeholders, with the difference being the introduction of basin specific data. The model itself is really the process of bringing the various organizations and other stakeholders together to facilitate conjunctive management. By the time this activity is completed at the end of Year 3, the framework for conjunctive water management will be in place in the three pilot rayons.

119. Once the three CWM models for the three pilot rayons / sub-basins are complete, the next step is replication across the project region to the other six rayons. This will be more formal training done as part of a larger training sub-contract supported by project funds. Training will take place at the national level but with selected regional (rayon) participants. MoES will contribute to the training by providing their Training Centre facilities and supporting travel for the participants.

Outcome 2: Key institutions have capacities, technical skills, tools and methods to apply advanced

climate risk management practices for water stress and flood mitigation.

120. Baseline: Adaptation to climate change (CC) in the water and flood management sectors is a new concept in Azerbaijan. Institutions are not prepared to adopt it into their planning and practice. More importantly, until very recently the institutional context for water and flood management in Azerbaijan was fragmented and incomplete in terms of mandate scope, and capacity. Until literally the end of this PPG period, Azerbaijan lacked a ministry or agency that actually deals with overall water management. The fragmented institutional context for water and flood management means each relevant institution has water-related responsibilities that represent only a piece of the overall water management "picture." This reality, together with poor cross-sectoral coordination and leveraging, means that institutional capacity to respond effectively to climate change is piecemeal and ineffective.

121. Fortunately, there are signs that this situation is beginning to improve. Signs of change are evident with the increasing roles and responsibilities of the Ministry of Emergency Situations (MoES). The MoES is a relatively new ministry and is in the process of expanding its mandate to cover most aspects of water and flood management. As yet, they do not have the technical capacity to carry out this wide array of tasks. The State Agency for Water Reserves (SAWR) is the key unit being established within MoES, and has acquired several mandates to undertake water related work related to emergencies, including:

a) participating in the development and implementation of measures to mitigate damages from floods and other negative impacts from surface and ground waters;

b) identifying integrated use and protection of water resources and projected demand on national water resources;

participating in: the development of scenarios for the integrated use of surface water; monitoring of quantity and quality of water; and preparing proposals for water appropriation and for efficient use of water facilities;

c) participating in the development of state programs on the management of water reserves; the development of forecasts and standards for water use together with other MoES divisions and other state agencies;

d) participating in improvement of the management of flood warning and flood prevention measures, providing recommendations on settlement zoning, on the construction of infrastructure, participating in defining flood risk zones and on the construction of flood protection walls;

e) developing a GIS for the management of emergency situations; participating in the development of normative-legal acts and provisions in the field of water reserves management, and others.

122. The SAWR works at national level, but also has representation in each rayon through each rayon-based Commission on Emergency Situations (CoES) based in the office of the Rayon Executive Authority (REA). The CoES also draws upon representatives of other line agencies, including MoENR, AJSC, AzerSu, Ministry of Health, and others important to water and flood management response. Several other institutions and organizations have responsibility for specific aspects of water management, although there is little understanding of the need for a more collaborative approach to adaptive water and flood management among the ministries and other government organizations and with local communities as well.

123. The Amelioration Joint Stock Company (AJSC) bears responsibility for management of irrigation water resources and hydrological facilities. It is the engineering arm of water management and is very much structurally oriented. AJSC's structurally oriented programme for flood management forms part of the baseline project for this project.

124. The Ministry of Ecology and Natural Resources (MoENR) Hydromet Department is the main water monitoring agency for the country, but it has no remit for managing the resource. MoENR has a Groundwater Department, but it does not have a mandate for developing or managing groundwater resources and focuses on monitoring. MoENR also has a land department that is concerned with land

pollution, but is not responsible for land use planning or land management. MoENR is involved in some other aspects of water management, such as leading the development of a National Water Policy and working to protect water sources from pollution, but its mandate is very pollution oriented and not sufficiently broad in scope for the challenges of climate change. AzerSu is responsible for domestic water supply and sanitation. As such, it does not have a mandate for water resources management but, as a major water user, is a key stakeholder in the proposed project. Overall, the institutional context for water and flood management is a picture of a non-coordinate approach to water and flood management that hampers not only effective water and flood management, but additionally, the development and adoption of effective CC adaptation measures in the water and flood management sector.

125. There are large gaps in institutional capacity to develop and apply adaptive water and flood management practice. These gaps are summarized in the following paragraphs:

126. Gap #1: limited knowledge of integrated approaches and tools for adaptive water management among the agencies responsible for water management and even less awareness of how it may be put into practice. There is no "one right way" to implement IWRM. Rather, it must be customized to fit the particular socio-political-economic and environmental contexts of each place. The lack of a coordinated approach to water management has led to the neglect of many water management tools and approaches that are so important to effective adaptation to climate change. This includes the management of water resources by watersheds and sub-catchments. Knowledge of modern approaches to adaptive water and flood management that incorporates CC and its impacts and risks are limited in Azerbaijan. Institutions involved in water and flood management in Azerbaijan are not prepared for the additional challenges imposed by climate change. Significant capacity gaps hamper the ability of the primary institutions in Azerbaijan to plan and implement effective CC adaptation measures for water and flood management.

127. The project will add to the base of knowledge and to an overall understanding of best practice in water and flood management through the introduction of modern tools and demonstrations of how properly linked institutions are critical to adaptive water and flood management.

128. Gap #2: lack of knowledge in key disciplines critical to effective adaptation in water and flood management. PPG consultations revealed a lack of basic knowledge in critical adaptation-related water management skills and approaches, such aspects as determining groundwater potential, operationalizing conjunctive water management, scenario planning, risk assessment, forecasting water demands, and many other areas. Gaps were also identified with respect to practical knowledge of flood hydraulics, including specialized structural flood mitigation options such as flow accelerators to cope with the very large floods and mudflows that climate change is making more and more common to the project area. There are also gaps in knowledge of flood zoning and how it works to protect communities, and of the impact of land use on floods and on water resources, among others.

129. Gap #3: Existing institutional capacity focuses on flood defense rather than flood management. At present, the approach to flooding problems in Azerbaijan is one of flood protection rather than one of flood management, and it is based entirely on structural measures. Nearly all flood management work currently is directed toward structural measures, specifically flood protection walls that attempt to stop the floods from reaching vulnerable areas. But current practice does not account for the additional risks from climate change such as increased frequency and severity of mud and debris flows. Many of the flood walls that have been put in place only recently in the Greater Caucasus region have been buried by the fluvial material and are now useless.

130. These investments in flood protection walls do not consider the long-term implications of climate change, especially with the dramatically changing conditions found in the Greater Caucasus Region. Rising riverbeds resulting from climate change can bury the walls after only one or two flood events. This is at best an inefficient use of finances and, at worst, may actually increase the vulnerability of local communities to flood risks. The structures themselves cause rock material carried by the floods to pile up, raising river beds higher than they would rise without the structures and increasing the potential depth of

flooding and increasing the flooded area. Additionally, as the frequency of flooding is also increasing under climate change, the effective life of the structures in the region is short.

131. It is unlikely that structural measures alone can provide a solution to the growing flood problems caused by climate change. While there may be some scope for structural measures, there must also be non-structural measures – essentially good water and land management – to adapt to this new flood regime that is aggravated by climate change.

132. Capacity deficiencies related to Gap #3 include a lack of knowledge and experience in using important tools to enhance CC adaptation in water and flood management. Planning tools such as the specialized soil and water assessment tool (SWAT) are not currently available in Azerbaijan and the concept itself is new. SWAT helps to identify where good soils are and how they may be used, and determines water requirements for irrigation. The project will bring this tool into use, train practitioners how to use it and work with the organizations to ensure it is disseminated to the greater region. Flood risk mapping is another critical CC adaption tool for which there is no capacity in Azerbaijan.

133. The hydrometeorological observation capacity is insufficient for monitoring floods or extreme rainfall, both of which are necessary for early warning systems. The National Hydrometeorology Department (NHD) of the MoENR is tasked with improving the network and the State Programme on Development of Hydrometeorology (2011 to 2015) provides funding for doing so. Directing attention to upgrading and modernizing stations for early flood warning requires specialist knowledge not currently found in Azerbaijan. The hydrometeorological observation capacity, including in the project region, is insufficient to monitor flooding or to monitor extreme rainfall, both of which are necessary for early warning systems. There are currently very few (two) high elevation automated meteorological stations in the project area and none in the actual pilot sub-basin. The project will add to the information base for analysis and to support an early warning system by assisting the NHD to extend the coverage of automated hydrometeorological stations in the region. A telemetric data system to send information to regional authorities will also be included as part of an early warning system.

134. There are no early warning systems in place in the project region. Community-based early warning systems are another example of locally tailored early warning mechanism in particularly remote areas that are not effectively covered by the national system, especially where alert communication is complicated and feedback mechanisms non-existent. There have been some attempts by rayon level administrations in the project region to develop flood early warning systems, but they have not been very effective. Part of the reason for this is that the communities themselves have not been part of system development. However, the fact that attempts have been made on early warning systems shows that the regional administrations are aware of their value and interested in their development. The early warning systems that have been attempted do not meet international safety standards in part because they were based on mobile telephone technology that, in the more remote areas of the Greater Caucasus, has inadequate coverage to support such an important, potentially life-saving system.

135. The project will develop and introduce community-based early warning systems for water stress and flood hazards for the pilot sub-basin. The community will fully participate in the development of the system thereby developing a thorough understanding of how it works, what their roles will be and how they will assist in operating and maintaining it. This is one part of an overall, community based, flood management scheme to be demonstrated in pilot communities in order to catalyze the development of such systems across the region.

136. In the baseline situation, farmers in mountain communities across the Greater Caucasus are already faced with new opportunities and new challenges in water and land management due to the impacts of CC. Climate change, particularly increasing temperatures, drives the need to better manage both water and land. However, rural WUA and farming communities lack this capacity to manage soil and water proactively because they have never been trained or done this before. Project support will strengthen the capacity of farmers and rural WUAs to manage soil and water at the farm level in order to manage water demand effectively in addressing water stress.

137. Alternative: The alternative is regional and national water and flood management organizations which are fully capable of responding to the challenges imposed by climate change and to support and assist communities to reduce their vulnerability to climate risk. The challenges of climate change require effective water and flood management through strong, knowledgeable management institutions. Outcome 2 will provide a firm base through a combination of targeted training, introducing modern, climate risk management (CRM) tools and showing how properly linked institutions are a more effective management system. The project will build capacity within the various organizations by focusing on core principles and practical skill development and the use of strategic non-structural measures and tools to enable effective adaptation in the face of climate change. These include practical flood risk mapping customized for each river's unique morphology, strategic placement and extended coverage of improved hydrometeorological monitoring capacity, and establishing new community-based early warning systems.

138. **Output 2.1:** Targeted training program in adaptive water and flood management, scenario planning and risk assessment for MoES and other stakeholders.

139. The first step under this output will be an institutional capacity review to clarify and refine the specific training needs for key institutions (particularly the SAWR, which is still recruiting staff as of this writing) to be able to apply a robust adaptive strategy for water and flood management for mountain communities in the Greater Caucasus. It will be led by the Institutional expert, supported by the IWRM, Land and Flood Management experts. The capacity review and needs assessment will be a collaborative and participatory process, linking directly with the MoES/SAWR at the national level, and the CoES and RAE at rayon level, which then involves the other relevant institutions: MoENR, AJSC, AzerSu and others. It will initially involve the offices of the organizations named above from the pilot rayons (Sheki, Zagatala and Gabala) and at the national level. The product will be a report on the review and highlighting the needs for improvement and training. The training needs assessment will be completed by the end of Year 1 and will inform the development of the training program.

140. Working from the results of the institutional review and needs assessment, a comprehensive and targeted training program will be designed. The training will focus upon enabling stakeholders to apply practical steps in their daily work to strengthen the adaptive elements of current water and flood management capacity.

141. The areas of focus to be covered by the training program will include specialized instruction on:

IWRM practice - will enable stakeholders to develop a working knowledge of IWRM concepts and how to apply and to customize IWRM to the unique context that is Azerbaijan's Greater Caucasus region.

information management: covering hydrometeorological data, flood depths and land use.

watershed management planning practice: will enable practitioners to understand how land use impacts water availability and floods and how land use can be managed in that context with hand-on training in identifying areas of concern, mapping, data management and related.

conjunctive water management: this highlights the primary steps of a model CWM process to develop an understanding of how conjunctive water management works, and how it may be applied in the pilot sub-basins, leading into the preparation of a CWM model.

water conservation measures: for water supply, irrigation, other commercial uses, etc. to train stakeholders where conservation efforts are most usefully put and how to apply them, and how to analyze the situation at a sub-basin level to balance demand with supply.

flood risk assessment: this will enable the communities and the flood management practitioners to carry out community based, participatory flood risk assessments, identifying the steps in flood risk mapping and what the final maps are used for, prior to carrying out a full flood risk mapping exercise.

flood zoning methods: identifying the types of flood zones, why they are used and what the communities will do with the knowledge of flood zones and flood risk in their sub-basin.

development of early warning systems: enabling the communities and practitioners to jointly develop their own early warning systems, elaborating the components of a system, how they can be set up, options for response to an early warning, etc.

flood hydraulics and types of structural flood protection options that are able to cope with the new climate change induced flooding environment, which is significantly more volatile.

142. As has been noted earlier, climate change has led to much greater flows of mud, sediment and large rocks which are the most damaging feature of floods in the project area. The flood protection walls currently being constructed in the area are no longer appropriate to the new conditions created by climate change, but the AJSC and MoES do not have the specialist knowledge needed to improve the structures. While the project focuses on and emphasizes non-structural approaches to flood damage mitigation, of the types noted above, this problem with flood protection that may actually increase vulnerability needs to be addressed. Including training on modern approaches to structural flood mitigation will make the project more encompassing of the larger flood management process. The preparation of the training package will be completed by the end of Year 2.

143. Implementation of the training program will be done by the training contractor with support from the IWRM and Flood Management specialists. Training will take place at the MoES training facility in Baku. The participants in the training will be drawn from the strategic cross section of institutions and stakeholders that underlie effective adaptation centered water and flood management in the Greater Caucasus, including: MoES/SAWR, Rayon Executive Authorities, MoENR, AJSC, AzerSu, with specific participation from rayon-level staff. Training will encompass all nine of the rayons in the project area: Balakan, Zagatala, Gakh, Sheki, Oghuz, Agsu, Goychay and Ismayilli, to better facilitate the replication process. It is anticipated that about 80 people will participate. The training programme will take place during Years 3 and 4. The impact of the training programme will be assessed on an ongoing basis.'

144. This training program will give participants a solid basic grounding in adaptation-critical knowledge and skills. The remaining outputs under Outcome 2 below will enable stakeholders to build on this knowledge by applying specific non-structural tools and approaches for adaptation.

145. **Output 2.2:** Soil and water assessment tool (SWAT) introduced for watershed level climate risk assessment and planning.

146. SWAT will be introduced as a new analysis tool for land use management and watershed level climate risk assessment and planning. SWAT is a specialized soil and water assessment tool used to quantify the impact of land management practices on water, sediment, pollution, etc. in watersheds with varying soils, land use and management conditions. It is applicable for carrying out watershed level assessments of climate change risk, planning and determining the potential for land development. SWAT is a public domain model actively supported by the USDA, so there are no issues with licensing and user support will remain available after the project has ended. There are several organizations that offer training in its application.

147. SWAT will be introduced by applying it in each pilot sub-basin. The introduction of and training for SWAT will be for a more focused group, including the MoES/SAWR and Hydromet Department of MoENR, AJSC, and the CoES and REA. Training will be carried out at the national level for staff of these organizations, and staff from the regional offices of MoENR and AJSC from the nine rayons of the project area: Balakan, Zagatala, Gakh, Sheki, Oghuz, Agsu, Goychay and Ismayilli. Including staff from the nine rayons will facilitate the replication of SWAT to their respective areas. MoENR will provide their Training Centre facilities in Baku for this. The training will be completed by the end of Year 3.

148. A SWAT model will be prepared for each pilot sub-basin, working with the regional MoENR and AJSC staff. This will require a fairly extensive programme of soil sampling, land assessment, physical surveys for current land cover and land use, assessing water resources. The MoES/SAWR, MoENR and AJSC staff will participate in this important aspect of model development. The IWRM and Land Management experts will also participate. The model for the three pilot sub-basins (Kishchay Talachay and Turyanchay) will be completed by the end of Year 3. This will be passed on to WUAs in each pilot

area so that members of the WUA and other members of the farming community are better able to manage their own land and water in the face of climate change (See Output 2.7). This will considerably improve the local farming decisions, with particular focus on water demands and distribution requirements that WUA are charged to deal with. Staff from all nine rayons will participate in the SWAT training and will develop the capacity to implement it in other areas.

149. **Output 2.3:** Model flood risk hazard maps and participatory mapping processes improve flood management as part of the land use planning and management.

150. Based on project generated data, flood risk maps will be elaborated in the project's three pilot sub-basins utilizing the by-laws and guidelines prepared under Output 1.2. These maps and the mapping process will in turn support the watershed management planning process under Output 3.3 to improve flood management and reduce vulnerability. Experience generated under this output will also be used as feedback to improve and refine by-laws and guidelines produced under Output 1.2.

151. Flood risk mapping will be a participatory process, directly involving members of the pilot communities in a hands-on joint effort with regional staff through the CoES, and including MoES/SAWR, MoENR, AJSC and others, with project IWRM and Flood Management experts. The final products will be the flood risk and zone maps, prepared for the three pilot sub-basins/rayons. This will be completed by the end of Year 3. Beginning in Year 4, these flood risk mapping process will be adopted in the remaining six rayons as part of the project's replication work under Outcome 3.4. In doing this, the approach and method will become incorporated into regional, and national, flood management strategies. This activity will be completed by the end of Year 5.

152. The preparation of the flood risk assessments, flood risk maps and flood zone delineations are new concepts in Azerbaijan. Participatory flood risk assessments, which involve the affected communities in the process from the outset, will be based on a combination of modern mapping, using high resolution satellite images and GIS technology, and participatory risk assessments, which involve the communities directly in the mapping process. Selected community members will walk the rivers with the flood management experts and identify specific locations where floods have caused damage and important locations will be marked using GPS technology, which will then be translated to maps by the GIS expert. Flood impact scenarios are overlaid on the maps so that the communities can develop an understanding of their own risks and vulnerabilities. This will interest the communities and regional authorities, and provide invaluable historical knowledge of flooding situations, former land use practices, settlement configurations, and so on. One difficult aspect of flood management that will need to be addressed as one of the mitigation options is flood zoning, which implies the possibility of relocating some parts of existing communities. Involving the community in flood mapping allows them to develop an understanding of the real problems and real solutions themselves. This allows them to take ownership of those solutions, which makes it easier to make the hard choices on allowable land use within the flood zone if and when those choices arise. The pilot flood risk assessment, flood risk maps and zoning delineation will be completed by the end of Year 3.

153. Other project components, such as the introduction of SWAT (Output 2.3) and the training programme, will significantly improve the knowledge of flood risk and other aspects of sub-basin level water and flood management. The approach and methodology and the software and tools will be transferred to the MoES and their regional counterparts of CoES, and other relevant flood management authorities, such as AJSC, as part of the replication process. The replication process will also include training of staff from the nine rayons of the project region.

154. **Output 2.4:** Hydrometeorological observation capacity strengthened by extending the coverage by automated hydromet stations in the highly hazard prone areas.

155. Work under this output will strengthen the hydrometeorological observation capacity by extending the coverage of automated hydrometeorological (weather and river flow) stations in the hazard prone areas of the project region. The target is for six new, fully automated meteorological stations in the project area and three hydrological (river flow) stations, one on each of the three pilot rivers, Kishchay,

Talachay and Turyanchay. Identification and installation of the network should be completed by the end of Year 4. Through their co-financing of the project, MoES and MoENR will support the costs of the hardware, installation, operations and maintenance. While the final cost will be determined by specific need, selected manufacturer and installation difficulty, typical costs per meteorological unit are on the order of US$100,000 for the hardware, with additional costs for installation. The total cost installed for all six units will be approximately US$750,000. For hydrological stations, the hardware cost is lower, approximately US$40,000 plus installation, for a total of US$150,000. Telemetry will require a further US$100,000.

156. GEF support will be used to identify the optimum locations for the new meteorological stations to maximize climate risk mitigation potential and assist MoES and MoENR in making the decision of the specifications for the hardware. The project will support a Hydrometeorology Expert for this specific task. It will be done collaboratively with national and regional staff of the MoES and the Hydromet Department of MoENR. The equipment will include telemetry to send information to directly regional authorities as part of an early warning system. By the end of Year 1, locations for new automated stations will be identified and the equipment types identified and costed in collaboration with MoENR, who will order the equipment and be responsible for its installation.

157. Each meteorological station will consist of several components. The first line of defense from the meteorological station for an early warning system is barometric pressure. As a storm approaches the atmospheric pressure drops and the rate of its decline is the first indicator of a storm. Pressure drops that indicate a storm can be several hours in advance of the storm allowing people to respond to a first warning. The second line for the early warning system is the measure of rainfall that is currently occurring. This requires a Light Emitting Diode Weather Identifier (LEDWI) to determine what type of precipitation is falling. The LEDWI sensor measures the pattern of precipitation as it falls through the sensor's infrared beam and determines from a pattern analysis of the particle size and fall velocity. This identifies the severity and intensity of the rainfall, which is the key factor in rainfall becoming a damaging flood. Once high intensity rainfall is occurring in the high upper catchment, there is much less warning time, perhaps as much as two hours, but not much more. There are other components of the meteorological station that are valuable for research, such as the measurement of total precipitation, wind speed and gust maxima, various types of temperature readings, etc.

158. Hydrological stations measure flow in the river by measuring the depth of water in the river and relating that to the cross sectional area of the river. Modern equipment consists of simple pressure transducers that detect the water pressure on top of the sensor, which is related to depth through pressure – density functions. Hydrological stations measure the flow at a given time and contribute to the early warning system by monitoring the rate of the rise of the water depth. A rapid rise indicates a likely flood and therefore acts as a warning.

159. Both meteorological and hydrological stations report to an early warning centre or office through telemetry. This is most often done through radio waves using automated VHF airband frequencies. Telephone based systems can also work, but this is unlikely in the project area as the stations will be in remote mountain valleys. The project will develop early warning centres in the three project rayons within the CoES offices. These will be the locations to which rainfall, storm and river flow warnings will be transmitted. From there, the warning will be passed to communities through radio to support the community-based early warning system established in Output 2.5.

160. Replication will consist of establishing early warning centres in the remainder of the nine rayons of the project region, also within the CoES offices.

161. MoES is expanding its work in the water related fields. MoENR has a long and significant history of establishing and managing a national network of meteorological stations across Azerbaijan. Combined, there is both the funding and the existing institutional mechanism to support the efficient management of the hydro-meteorological information. The Department of Hydrometeorology of the Ministry of Ecology and Natural Resources is the manager of information from hydrometeorological

stations and this will continue under close collaboration with MoES. This mechanism already exists through the long-established network of meteorological stations managed by MoENR/NHD, combined with the disaster early warning capabilities of MoES. This project's work will work with existing mechanisms to enhance sustainability and efficiency of use for the hydromet data.

162. **Output 2.5:** Community-based early warning systems to disseminate water stress and flood risk information to the local communities.

163. Under this output, new early warning systems will be established to enable the timely dissemination of information (water stress and flood related) to the local communities through innovative community-based methods (e.g. local radio for rainfed farmers, mobile sms for pastoralists, regular (seasonal) community meetings for both farmers and pastoralists etc), benefiting over 1,000,000 people of the Greater Caucasus region

164. Work under this Output will develop and introduce early warning systems for the pilot sub-basins and rayons of: Kishchay /Sheki Rayon, Talachay /Zagatala Rayon and Turyanchay/Gabala Rayon). Their development will also serve to instruct the flood management organizations (MoES and AJSC) for application in other parts of the country.

165. There are two separate early warning systems in this Output. Water stress warning systems work over a relatively longer period. They indicate water availability with regard to the water demands of the season to provide information to water users that conservation may be required. This allows communities to respond before the situation becomes a crisis, thereby reducing the financial impact of water shortages. The time element is very short term for flood early warning. In the steep upper sub-basins targeted by the project, the first stage early warning will be a matter only an hour or so prior to a potential flood. While this is a very short response period, flood early warning systems aim to save lives and property.

166. The indicators for water stress are based on rainfall and soil moisture measurements. Rainfall measurements come from Hydromet meteorological stations, including those newly installed with MoENR co-financing under Output 2.5. Soil moisture measurements will require special equipment which will also be installed under MoENR co-financing. The indicators for the flood early warning are based on rainfall and river flow measurements that will derive from the specialized hydrometeorological equipment installed with MoENR co-financing under this project.

167. The first step will be to determine the specific requirements for the early warning systems: what equipment is needed, where it will be located, how it will be used, who is responsible for it, and the mechanism for warnings distribution/communication. This will be done collaboratively, involving community members, through the LSC, and staff from the regional offices of MoENR, AJSC and, possibly, MoES. While the two types of warning system have somewhat different purposes, the regional organizations involved will be the same because of overlapping responsibilities. This allows the two systems to be developed and introduced together, saving resources and broadening the knowledge base. The project will supply expertise in the IWRM and Flood Management experts. This will be completed by the end of Year 2.

168. The project will also provide training to the WUAs in the three pilot communities covering the community component of the early warning system. The training will cover initial response and how the WUA disseminates information to the people, options for responses depending on the size of the flood and variations in the flood regime in each of the communities, how to implement those responses according to the different levels of severity of the flood. About 20 people will be provided with the training, which will be completed by the end of Year 2.

169. The next step will be to install and operationalize the system. This is specialized equipment and the supplier of it will be contracted to also provide training in its use and other expertise. The cost of the equipment will be met through the MoES co-financing. The equipment will be obtained and installed and training completed by the end of Year 3. GEF resources will be used to support the detailed design of the early warning systems through a collaborative effort of the users of the systems who will contribute to its

function and be fully aware of how it will work and what functions they will have within the system. This will also be completed by the end of Year 3. Activation of the systems will require installing the equipment, testing the equipment and fine tuning the system. By the end of Year 4, the early warning systems will be in place in the three pilot sub-basins.

170. The time frame of the project will not allow full replication to all communities in the project region. The replication will be at the rayon level, with an early warning centre established in each of the remaining six rayons, with training provided to regional staff of CoES and MoENR to enable them to work with WUAs in their rayon to establish community based early warning systems for themselves.

171. **Output 2.6:** Capacity of WUA farming communities increased to adapt to climate change by improving soils and managing land and water.

172. Under this output farming community water user associations will increase their capacity to adapt to climate change by improving soils and managing their land. This is related to the introduction of SWAT from Output 2.3 in that SWAT is a modelling analysis of the soil and water situation and this is to instruct farmers in what they can do to improve soil and water management and how to do it. This is especially important in the upper catchments where climate change is raising temperatures, driving new agricultural zones uphill and opening the possibility of expanded agriculture. Farmers will then need to know what to do to improve soil fertility and to manage soil, land and water effectively in the long term. Farmers in the region will not have considered cropping in those higher regions and are unfamiliar with the special needs of high mountain agriculture.

173. A soil survey will be completed under Output 2.3. An assessment of the water resources will be completed under Output 3.3 in the analysis of conjunctive use modelling. The capacity building of farmers follows on from these two exercises to provide them with practical, hands-on experience of water and land management at the farm level.

174. Coincident with the SWAT and CWM assessments, assessments of options for soil and land management improvements will be completed for farm areas and potential farm areas in the three pilot sub-basins by project staff, specifically the Land Management and Soils experts. This will also be a collaborative exercise, involving the community through the LSC, linking the WUA with the regional land and water management practitioners. The assessment will be completed by the end of Year 3.

175. A field based set of exercises will follow, with experts instructing farmers in soil and water improvement and conservations techniques. The instruction will cover a full agricultural season from soil preparation through the growing period to harvest and post harvest. Farmers will learn how to conserve water and how to manage soils to maximize crop yield sustainably. It is expected that about 30 farmers will take part in the training and field exercises.

176. Based upon the assessments and instruction for the pilot sub-basins, guidebooks will be prepared on soil, land and water management under conditions of climate change which will be disseminated initially around the pilot communities and rayons for comment and discussion. Following revisions, the guidebooks will be disseminated throughout the region through the participating REAs in each rayon. Guidebooks will be completed and disseminated by the end of Year 5.

Outcome 3: Community resilience to floods and water stress improved by introducing locally tailored climate risk management practices.

177. Baseline: Communities in the mountain areas of the Greater Caucasus are highly vulnerable to flood damage and to water stress, which is being exacerbated by climate change, and they do not have the capacity to cope with these increasing threats or adapt to their changing environment. Over the last decade, the typical number of floods recorded per year has risen ten-fold. Climate change is also increasing the volume of sediment and other rock material carried by individual floods, which has caused the riverbeds to rise, further increasing the risk of flood damage to the mountain communities. The region is also highly vulnerable to water stress. With an annual per capita water availability of just over 1000 m3 per person, the region is already close to the benchmark of ‘severe water scarcity.’ Climate change,

notably the rise in temperature, will increase water scarcity as higher temperatures cause higher evaporation rates from open surfaces and higher transpiration rates from native and cultivated plants.

178. Communities do not have the capacity to cope with the increasing threats from climate change. They do not have the opportunity to participate in the decision making process which would allow them to adapt to their changing environment because the current framework and institutional structure for water and flood management does not support community participation in the process.

179. For example, the single-solution mentality of most government efforts in water and flood management discounts the importance of the consultative process, emphasizing the importance instead of "concrete solutions" such as a flood protection wall instead. This narrow, pre-determined solution type of approach leaves little room for the exploration of other options and for reflective practice in collaboratively defining "the problem." Additionally, local people throughout the GC region do not have sufficient knowledge to fully understand the changes in their situation, the options for mitigation or to contribute meaningfully to the solutions to the problems. They are not aware of what changes are occurring from a climate perspective and how these may affect them. For the communities to be able to adapt adequately to decrease their vulnerability they must build their knowledge and in order to have the ability to participate meaningfully in the decision making process.

180. However, there are promising trends in Azerbaijan and in the project region. The Government of Azerbaijan and local communities are realizing that in order to manage certain natural resources on the local level more effectively, community institutions and associations must be created or strengthened for this purpose. The recent development of Water User Associations (WUAs) is one excellent example. At present five WUAs have been developed in Sheki Rayon, eight in Gabala Rayon and six in Zagatala Rayon, the three pilot rayons. The specific purpose of these WUAs is to assist in management of large irrigation schemes, largely through collecting water user fees. This is separate from the aims of the proposed project, the WUA are extremely relevant to this project's baseline for two important reasons: a) their establishment paves the way for participation from community based organizations and; b) their functions can be expanded to encompass the larger areas of water resources management and flood management. Through the project communities will become fully engaged in the process of water and flood management and will take an active role in mitigating the impacts of climate change on water stress and flood risks.

181. Good water and flood management is most effectively achieved with an informed and active community, which can collaborate with regional organizations responsible for water, flood and land management. The project will ensure that the communities are fully engaged with regional organizations and with the management process. This will be accomplished through introducing and developing community based planning for land, water and flood management and flood early warning systems.

182. The project will introduce participatory forecasting and response planning. This will be done through several community-based initiatives, linking the communities with the water and flood management organizations through a Local Multi-stakeholder Committee (LSC), which the project will establish. The project adds to the current stakeholder participation situation, which is limited to the irrigation-focused WUAs. By the end of the project there will be community-oriented, stakeholder-based organizations which will significantly improve water and flood management and reduce the vulnerability of the mountain communities to climate change induced risks.

183. Alternative: The alternative is active and fully engaged communities, which are able to take charge of their own adaptation to climate change risks, in collaboration with the professional staff of the regional organizations responsible for water and flood management. Outcome 3 will develop an informed and active community which can collaborate with regional organizations responsible for water, flood and land management and is intended to fully engage the communities with these organizations, as well as introducing and developing community based planning for land, water and flood management and flood early warning systems. Communities will become aware of the risks and potential impacts of climate change, how these impacts will affect their communities and their livelihoods and the options for

mitigating these impacts. Outcome 3 is aimed at preparing the communities and the responsible government organizations to be able to prepare for and respond to climate change threats.

184. **Output 3.1:** Water User Associations strengthened to improve forecasting and response planning mechanisms, and watershed planning and management skills to cope with CC-induced water stress and floods.

185. Water User Associations are relatively new in Azerbaijan. Their role is currently limited to assisting in the management of large-scale irrigation. However, as the only existing communal management system associated with water, work under this output will pilot the expansion of WUA roles to include broader water and flood management. This project will also ensure that the WUA will have an appropriate gender representation. There are 4 WUAs established in the pilot sub-basins of Talachay, Kishchay and Turyanchay, with 19 WUAs established within the three pilot rayons of Zagatala, Sheki and Gabala. While the pilot work in Outputs 3.2 and 3.3 will focus on the 4 in the pilot sub-basins, the other 15 WUAs will be included in the strengthening programme.

186. Work under this output will strengthen the capacity of the WUAs to improve local forecasting and response planning mechanisms as well as watershed planning and management skills, to cope with water stress and floods. The objective is to make the WUAs ready to work with the regional professionals as part of the Local Multi-stakeholder Committees established in Output 3.2 on the activities to be undertaken in Outputs 2.3, 2.5, 3.2 and 3.3. Output 2.3 is preparing participatory flood risk zone maps, Output 2.5 is to develop an early warning system for floods and water stress, Output 3.2 is to develop participatory watershed management plans, and Output 3.3 is the initiation of those plans. Output 2.1 is a comprehensive training package aimed at the regional professional staff. This Output 3.1 prepares the WUAs to take their part in the participatory process.

187. Several types of training will be delivered to the WUAs. Under Output 2.5 an early warning system will be set up in the three pilot sub-basins. Flood forecasting and the community link with the early warning system is the first training subject. This will entail developing an understanding of flood forecasting – how and why it is done, how it reduces damages and losses when a flood occurs, how the community maintains vigilance in watching for a flood. Much of the flood forecasting work is done by the regional professionals, but the community is also involved in the process and this training provides them the knowledge needed to participate. Specifics of the training will be detailed through the needs assessment but the following paragraphs provide an idea of what training will entail.

188. The WUA members will be trained in how to respond when a flood occurs and a warning is given and to develop flood response mechanisms specific to their situation and what their role will be in the response process and how the other members of the community will be involved. There are several levels of response depending on how soon a flood is expected. The lowest level of response is the ability to act well in advance in response to the knowledge that a flood will occur at some point in the future, which is related to effective flood zoning. The training will detail the process of how flood risk zones are determined, what they mean, and how the community responds to and respects those zones. The responses will range from acceptance of the losses, to insurance against those losses, to reducing buildings and activities in specific zones to restricting their use altogether. Responses in each flood zone also vary with the severity of the flood. The WUAs will learn how to lead in the event a flood warning is given, and how to activate the community in those circumstances. These are more short-term responses, ranging from moving livestock, to moving personal possessions, to moving people for safety.

189. Watershed planning and management is another form of response mechanism to both flooding and water stress, but is preventive rather than reactive. A healthy watershed will be able to absorb the impacts of climate change more and minimize floods and maximize its water retention properties. In Output 3.2 participatory watershed plans will be developed through a series of hands-on activities and the training is aimed at preparing the WUAs to do them. The watershed plans will be detailed and delineated in a geographical sense take place over the entirety of the watershed of the community, both in and out of the flood plain, emphasizing areas where all of the normal land use based activities of the community occur.

Parts of the area will require actions to reduce flood and water stress impact and these will be identified and located on the watershed management plan. The WUAs will learn about the types of actions that will have an impact, and where they may be best placed. These will include protected areas to allow natural regeneration of damaged land, actual reforestation of some areas, soil conservation in areas which will help reduce erosion and water retention capacity of the soils, land rehabilitation where land has been damaged and where restoration will contribute to soil conservation, erosion reduction, which maintains soils but also reduces sediment in flood flows, water retention, and others. They will also learn the techniques for watershed planning to contribute to the process in Outputs 3.2 and 3.3.

190. The training will be mainly classroom based, as the important hand-on aspects will be done as part of the work itself. The training for Output 3.1 will be for about 200 people, covering the 4 WUAs of the pilot sub-basin communities, plus those of the 15 other WUAs of the three pilot rayons. The community oriented training will take place in the regional offices of the REA in Sheki, which are most centrally located rayon offices. MoES will provide resources to support the training as part of their co-financing of the project. Strengthening of the WUAs will be completed by the end of Year 1, resulting in WUA members ready to link with LSCs on climate oriented watershed management planning and other activities.

191. **Output 3.2:** Local multi-stakeholder committees established to test and introduce participatory and consensus-based land use planning that integrates climate risks.

192. The project will prepare communities to become fully engaged with the process of water and flood management to mitigate the impacts of CC on water stress and flood risks. Output 3.2 will achieve this through linking the WUAs (with expanded responsibilities and strengthened in Output 3.1) with the government rayon level organizations responsible for the various aspects of water and flood management, through the Local Multi-Stakeholder Committee. Each of the rayons has a Rayon Executive Authority (REA) in addition to regional offices from key national agencies, including MoES, MoENR/Hydromet/Land Department, AJSC, AzerSu, MoA, Ministry of Social Development, Ministry of Planning, State Land and Cartography Committee, State Committee for Family, Women, and Children's Affairs and others important to water and flood management. Each rayon hosts a Commission on Emergency Situations (CoES) that is chaired by the Deputy Rayon Executive. With MoES responsible for most aspects of water and flood management and emergency situations, and other key line agencies represented, the RAE is the main counterpart for project work. The RAE will be linked with the WUA to form the Local Multi-Stakeholder Committee (LSC) in each of the three pilot rayons of Zagatala, Sheki and Gabala. Other elements of civil society will be included through social development and environmentally focused NGOs. Women's empowerment NGOs will be asked to provide inputs and guidance to ensure a gender balance is achieved.

193. Through the project, the LSC will undertake several community based initiatives to test and introduce participatory and consensus-based inputs into integrated water and land use planning to: 1) link community and rayon-level authorities and water and flood management practitioners and other relevant stakeholders to develop a collaborative approach to decision making in water and flood management; and 2) serve as the cross-sectoral entity that will provide the mechanism for conducting the pilot climate risk oriented watershed management planning developed under this Output, and initiated under Output 3.3. Activities under this output will coordinate with those under Output 1.1 to determine if there are elements in law which will require modification in order to make LSCs permanent bodies for water and flood management activities.

194. The project will introduce participatory approaches to several water and flood management actions under several project Outputs, linking the communities with the water and flood management. By the end of the project there will be stakeholder based, LSCs that are active in water and flood management and empowered to reduce the vulnerability of the mountain communities across the region to climate change induced risks.

195. Output 3.2 will also develop watershed management plans for the three pilot sub-basins of Talachay (410 km2), Kishchay (265 km2) and Turyanchay of 4,840 km2, for initiation under Output 3.3. In each case the WUAs from those sub-basins will work together with their respective LSCs from Zagatala, Sheki and Gabala rayons.

196. The watershed management planning process will be a participatory, hands-on learning exercise, and the deliverable will be a full watershed management plan. The LSC will take the lead on this, but many members of the communities involved will participate, including people who are not members of the WUA. The participation is expanded to include as many community members as possible. Many decisions in the watershed management planning process are contentious, for example, some land currently in use may be need to be put out of use. Full understanding by a larger part of the community is helpful in such cases. The watershed management plan will be partly geographical in scope, with problem areas identified, areas where interventions would take place and flood risk zones delineated and highlighted. It will also be oriented to climate change adaptation, identifying areas where specific actions will be carried out to mitigate climate change impacts, such as afforestation to reduce sediment loads in the rivers during floods, areas for watershed rehabilitation, such as rejuvenation of vegetation to maintain healthy soil for water retention to ensure a sustainable supply of water, and areas of locally controlled and managed flood zones.

197. The watershed management plans will be based on a combination of modern mapping, using high resolution satellite images and GIS technology and community participation in the mapping process. The mapping will require considerable fieldwork to identify and understand the impacts of poor land use choices, and to develop an understanding of the impact of actions to mitigate climate change.

198. The watershed management plan will be supported and guided by the international and national WMP experts and IWRM experts, with the LSC fully participating. The project GIS expert will also be a key part of the process as this is a mapping exercise, using GPS and GIS technology. Three satellite image based maps of the three sub-basins with current land types use marked on it will be the first deliverable. A digital data base will developed from the information gathered through the survey, forming the base information for the watershed planning initiation. This will be completed by the middle of Year 2.

199. The second stage will be connecting land use within the watershed with impacts on water resources and flood risk. Special attention will be given to flood risk zones, indicating where land use influences flooding and where floods impact land use. This will take the form of instruction or training, with the project WMP and GIS experts leading. The group will be instructed on how different land uses impact the environment, especially water and flooding. It is expected that 50-75 people will participate in this training in each of the three rayons.

200. The third step will be to produce a map-based watershed management plan that takes climate change into account and addresses mitigating water stress and flood risk. The map-based plan will indicate areas of particular concern, determining what may be done for risk mitigation in those areas, and other aspects, which will be clarified through the process. This will also be led by WMP and GIS experts. The result will be three full, community driven watershed management plans for the pilot sub-basins that will initially form the template for initiating the watershed plans in Output 3.3, and become the reference for land use decision making for the future and define the a method for replication. This will be completed by the end of Year 3.

201. Work under Output 3.2 will also inform the recommendations for modifications to the law, regulations and policy in Outputs 1.1 and 1.2.

202. **Output 3.3:** Pilot climate-risk oriented watershed management plans initiated in each pilot catchment to implement sustainable water and flood management measures and fully account for climate change risks from floods and associated mudflows.

203. Inclusive watershed management planning, as it relates to reducing vulnerability from water stress and from flooding and the rock and mudflows, is a new concept in Azerbaijan. Watershed management planning (WMP) for CC adaptation is also a new concept. Work under Output 3.3 follows on from Output 3.2 by enabling the LSC to initiate climate risk oriented watershed management plans (CR-WMP) in each of the three pilot sub-basins of: Talachay (410 km2), Kishchay (265 km2) and Turyanchay of 4,840 km2. GEF resources will support the activity with the international and national WMP experts and IWRM experts providing guidance and expertise, as with Output 3.2. In each case the WUAs from the pilot sub-basins will work as part of their respective LSCs from Zagatala, Sheki and Gabala rayons. The initiation of each CR-WMP will be based on the plan developed under Output 3.2. It will act as the base for a set of ground-based activities for initiation. It will focus on developing the several critical vulnerability reducing actions, which are presented in the following paragraphs.

204. Monitoring and data collection points will be established to facilitate community based data collection and monitoring in the watershed and on the flood plains. This will enable both the communities and the regional professionals through the LSC to update the watershed management plans as they progress and as changes take place. The continuing monitoring and data collection programme also facilitates continued collaboration between the community members and the regional professionals and ensures that the communities are fully engaged in the overall process of watershed management and planning so that they are part of the decision making process as climate induced changes continue. Typical data to be collected will include vegetation types, accumulations of rocks and other transportable materials, areas of degraded land and eroded soils, areas of good forest which may be expandable, activities in the flood plain which may be at risk from floods, and the level of that risk. The project will initiate the community based data collection activities for the communities themselves to continue indefinitely.

205. The initiation of the CR-WMP will include establishing locally controlled and managed flood zones. Flood zoning is a key component of the project because it is a primary flood damage mitigation intervention. The zones will be identified along with the types of land use that will not be permitted or to be permitted with restrictions, or specific actions to be taken when a flood occurs. Zoning decisions are generally community decisions, though there may be regional or national by-laws that will need to be followed, but the project experts and regional professionals that are part of the LSC will support the making of these decisions.

206. Flood zones themselves will have been identified through the activities under Output 3.2 and Output 2.3, both of which are community based, participatory exercises. For much of the sub-basin the flood plain is not very wide, but the combined river reaches are long. The Talachay has a sub-basin river length of some 80 km, including the two upper tributaries. The Kish itself is only 49 km in length, but totals more than 100 km when the upper tributaries are included. The Turyanchay is much larger, with 300 km of river including upper tributaries. The whole of the river length is considered a ‘flood zone’ but over much of the length there are no human activities and no specific problems currently associated with them. In zoning, emphasis is placed on reaches of river with human activity, though there may be areas which are not now those with human activities, but which may want to be restricted in the future as climate change alters land use across the watershed.

207. Finalizing flood zoning restrictions will take many years and cannot be completed within the time of the project. The project will therefore initiate the flood zone component of the CR-WMP by working with the LSC to detail options for each flood zone. This is an exercise done on the ground, but with the backing of the GIS and satellite maps of the watershed developed in Output 3.2. The project will also support the process of determining the land use to be allowed in each of the flood zones according to their classifications. This will require debate within the community decision makers, informed by the CR-WMP itself, and the ground based investigation of options.

208. The plan initiation will identify watershed rehabilitation measures for each of the ‘hotspots’ that have been shown to be of importance in the development of the CR-WMPs. These will range from

reforestation of areas that have been over cut, afforestation of areas that are not now forested, identification of vegetated areas which need to be protected to be allowed to expand, areas of land degradation which need rehabilitation, areas of land which need to be revitalized to prevent degradation, etc. Climate change will induce rising temperatures. In the upper areas of the watersheds this will mean the potential for tree lines to expand to higher elevations – in other words areas where forests do not grow now. This will help significantly in reducing rock material from entering the streambeds and contributing to riverbed rising in the lower part of the sub-basin. However, human intervention will speed the process, which is important as climate change is already occurring and impacting the communities.

209. In the upper catchments, areas of potential afforestation are large. In both the Talachay and the Kish sub-basins, the areas are on the order of 5,000 or 6,000 ha. In the Turyanchay this is as much as 20,000 ha. To do all of this during the project period will be impossible, and drain project funds. Therefore the project will initiate these actions at levels of 200 or 300 ha to instruct the stakeholders in how to do it, as well as building the collaboration of the LSC – between the communities and the regional practitioners.

210. Forecasting climate change impacts at the watershed level is also an important component. By developing the current base line, which is done in Output 3.2, and following that with initiated plans for rehabilitation, land use restrictions, etc. the LSC develops a good understanding of impacts already occurring due to climate change and can forecast what is likely to occur over the next several years. They can then plan in advance to adapt to the changes to mitigate damage from them. As time progresses, they can update the plans, including their responses to changes. The response mechanisms must therefore be both strong and flexible to work effectively.

211. Work under Output 3.3 will also inform the recommendations for modifications to the law, regulations and policy in Outputs 1.1 and 1.2.

212. **Output 3.4:** Pilot CR-WMP processes replicated across Greater Caucasus region.

213. Work under this output will focus on replicating the project's vulnerability reducing measures across the remaining six rayons within the project region. Each pilot sub-basin and rayon will replicate its work in neighboring rayons and respective sub-basins (Zagatala → Balakan, Qax; Sheki → Oguz; Gabala → Ismayilli, Goychay and Agsu). A key element of the pilot work in each of the three pilot rayons will be the participation of "leaders" from each of six replication rayons for the purpose of bringing them in on the CR-WMP work in the pilot regions as it goes on to jump start interest in the other 6 rayons/sub-basins targeted for replication.

214. The project will utilize existing regional institutional mechanisms of key stakeholder institutions to facilitate replication, working through the REA, especially the CoES regional offices in Gabala rayon, which is responsible for project's nine rayons. Also key will be including the MoENR's two regional offices: regional center #9 in Zagatala city covers the five GC rayons: Balakan, Zagatala, Gakh, Sheki and Oguz and regional center #11 in Ismayilli city covers the remaining four of the project's nine GC rayons: Agsu, Goychay, Gabala and Ismayilli. MoENR's Hydromet Department has a separate Center in Sheki, which covers the entire project area.

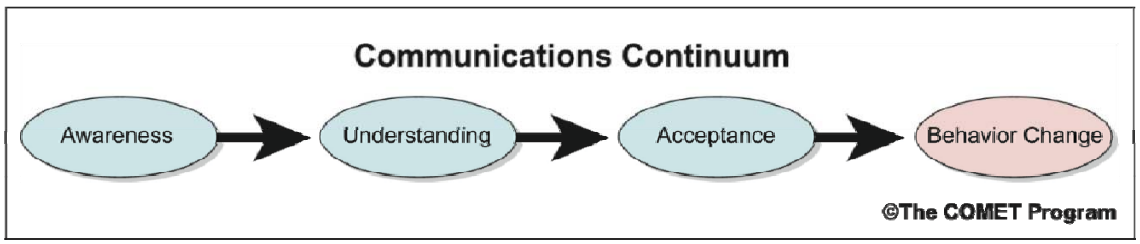
215. **Output 3.5:** Locally tailored public information campaign implemented to make flood-prone communities aware of flood risks and effective risk management.

216. Work under this output will design and implement tailored public information campaigns to make water stressed and flood prone communities aware of the risks and the means to manage those risks to minimize impacts. Particular focus will be placed on local enforcement of flood zoning and land use regulations and watershed protection, risk mitigation and flood response strategies for communities.

217. Measures for flood mitigation will include watershed management and planning flood zoning to be taken at community level to address flood risks and risk management will be agreed with the LSC in a series of discussion meetings during Year 2. Approaches to the public awareness campaign will also be agreed and finalized. This will be led by the international and national stakeholder experts.

218. Effective education under this output will be based on a thorough understanding of the process that individuals go through when they make decisions about modifying their personal behavior in order to reduce vulnerability. Figure 4 shows the key stages in the continuum of persuasive communication that leads to behavior change. The success of a warning rests in the public's/ individual's awareness, understanding, and acceptance of their risk.

Figure 4: Stages of persuasive communication
(http://www.meted.ucar.edu/hazwarnsys/ffewsrg/FF_EWS.pdf)



219. For example, in order to motivate residents to heed flood warnings, the residents must first be aware of their risk. Second, they must understand the impacts an event may have on their family and community. Third, they must accept the idea that not following a warning message can result in property loss, injury or death. Finally, they must take action and heed the warning. If the intent is behavior change or action then public outreach must focus on moving the public through the initial stages of awareness, understanding, and acceptance.

220. Public campaign materials will be prepared and finalized between the project and the LSC and rolled out to the three pilot sub-basins by the end of Year 3. Feedback will be sought in order to revise campaign materials and revisions will be completed by the middle of Year 4, with replication of PA campaign in 6 other GC rayon's in Year 5.

3: PROJECT RESULTS FRAMEWORK

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: **Outcome 1.** By 2015, non-oil development policies result in better economic status, decent work opportunities and a healthier environment in all regions and across all social groups
Country Programme Outcome Indicators:
Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): Promote climate change adaptation.
Applicable GEF Strategic Objective and Program: **CCA-1:** **CCA-2:**
Applicable GEF Expected Outcomes: Outcome 1.1. Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas Outcome 2.1. Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas Outcome 2.2: Strengthened adaptive capacity to reduce risks to climate-induced economic losses
Applicable GEF Outcome Indicators: The project is aligned with CCA Objectives 1 and 2 and with the Results-based management focus under Climate Change Adaptation, as evidenced by the completion of the Adaptation Monitoring Assessment Tool (AMAT) at this CEO endorsement stage. AMAT Outcome indicators relevant to this project are: Outcome Indicator 1.1.1: Adaptation actions implemented in national development frameworks; Outcome Indicator 2.1.1: Relevant risk information disseminated to stakeholders; Outcome Indicator 2.2.1: Number and type of targeted institutions with increased adaptive capacity to reduce risks of and response to climate variability; Outcome Indicator 2.2.2: Capacity perception index; These indicators in turn are reflected in the project's results framework below.

Project Strategy	Indicator	Baseline value	Target by end of Project	Sources of verification	Risks and Assumptions
Goal	**To sensitize the water management policies to the long term risks of climate change.**				
Objective: to reduce the vulnerability of the communities of the Greater Caucasus (GC) region of Azerbaijan to water stress and hazards by improved water and flood management.	# of hectares in the GC affected by improved CRM practices.	Zero. There are no programs in place currently focused on improving climate risk management in the areas of flood and water management.	Improved climate risk management affecting over 22,067 sq. km (2,206,700 ha) of land in highly vulnerable region of Greater Caucasus.	Climate-risk oriented watershed management plans.	
	# of people who benefit from locally tailored CRM practices for flood	Zero. There are no locally tailored climate change adaptation practices in place.	1,000,0000 people benefit from improved CRM practices across the GC region.	- Calculation of # of people benefitting from improved CRM	Water code and policy changes will affect people nationwide.

Project Strategy	Indicator	Baseline value	Target by end of Project	Sources of verification	Risks and Assumptions
	and water risk management.			across the nine catchments in GC. - Location and impact of community-based early warning systems.	
	Number and Type of adaptation actions implemented in national development frameworks; (AMAT Outcome Indicator 1.1.1.)	0 Normative Legal Acts (NLA); water code does not have IWRM relevant normative legal acts 0 NLA; water code does not have relevant normative legal acts 0 NLA; water code does not have relevant normative legal acts 0 NLA; water code does not have relevant normative legal acts	1 NLA; IWRM principles integrated in water policy 1 NLA; Flood zoning regulations introduced in water code 1 NLA; Conjunctive water management part of the water policy 1 NLA; Public participation and gender representation rules as part of the water and flood management policy	AMAT; APRs; Legal reports	
Outcome 1: Water and Flood management framework is modified to respond to adaptation needs and improve climate risk management.	# of articles included into the Water Code supporting non-structural climate change adaptation practices and their implementation.	Zero. The Water Code is not sensitized to climate risks in water and flood management.	At least 3 new CC-A focused articles included into the water code by end of project.	Parliamentary notice of modification. Official revised Water Code enactment notice.	There is willingness in national, regional and local administrations to integrate CC risks into water management plans, policies and strategies.
	Development frameworks include specific budgets for adaptation actions;	Type: no flood zoning policies and regulations — Level of Action: national, local and community Type: no conjunctive water management practice — Level of Action: national, local and community	Type: flood zoning regulations included in flood and river management — Level of Action: national, local and community level covering 400km of the target river body Type: conjunctive water management model developed — Level of Action: national, local and community level river	Actual state budgets	
	Water Code does/does not mandate unified management or collaborative approaches to reduce climate-induced risk of increased flood damage and water stress.	Water Code is not sensitized to the importance of collaborative approaches to climate risk reduction.	Amended water code mandates unified management and/or collaborative approaches to reducing CC risk of increased flooding and water stress.	Official Gazette.	MoES will have the clout to win approval of modifications to the Water Code.
Outcome 2: Key	Capacity Perception	Baseline Score for Male and Female = 1.	Target Score for Male and Female = 3.	Before and after	Key

<table>
<tr><th>Project Strategy</th><th>Indicator</th><th>Baseline value</th><th>Target by end of Project</th><th>Sources of verification</th><th>Risks and Assumptions</th></tr>
<tr><td>institutions have capacities, technical skills, tools and methods to apply advanced climate risk management practices for water stress and flood mitigation.</td><td>Index

Score (1 - 5) to be disaggregated by gender

1. No capacity built
2. Initial Awareness raised (e.g. workshops, seminars)
3. Substantial training in practical application (e.g. vocational training)
4. Knowledge effectively transferred (e.g. passing examination, certification)
5. Ability to apply or disseminate knowledge demonstrated.
(AMAT Outcome Indicator 2.2.2)</td><td>No capacity built for climate change adaptation and risk reduction.</td><td>Substantial training in practical application (e.g. vocational training).</td><td>simple tests to document improved understanding.

Documentation on tools and training provided.

Minutes of workshops and other forms of training.

Evaluations of improvement in capacity, knowledge, etc.</td><td>organizations open to new ideas and able to devote time to capacity building.</td></tr>
<tr><td></td><td>AMAT Output Indicator 2.1.1.1: Updated risk and vulnerability assessment. Yes/No</td><td>No, there is no updated risk and vulnerability assessment</td><td>Yes. There will be an updated risk and vulnerability assessment by end of project.</td><td>Risk and vulnerability assessment document ; SWAT Tool results.</td><td></td></tr>
<tr><td></td><td>AMAT Output Indicator 2.1.1.2: Updated risk and vulnerability assessment conducted. Yes/No</td><td>No, there is no updated risk and vulnerability assessment conducted.</td><td>Yes. An updated risk and vulnerability conducted by end of project as part of project’s work to produce model flood risk maps and participatory mapping processes.</td><td>Risk and vulnerability assessment document from</td><td></td></tr>
<tr><td></td><td>AMAT Output Indicator 2.1.2.1: Number and Type of monitoring systems in place.</td><td><table><tr><th>Number</th><th>Type</th></tr><tr><td>0</td><td>High elevation meteorological stations</td></tr><tr><td>0</td><td>River Monitoring meteorological stations</td></tr><tr><td>0</td><td>Community-based early warning for floods</td></tr></table></td><td><table><tr><th>Number</th><th>Type</th></tr><tr><td>6</td><td>High elevation meteorological stations</td></tr><tr><td>3</td><td>High-altitude river monitoring meteorological stations</td></tr><tr><td>3</td><td>Community -based early warning for floods</td></tr></table></td><td></td><td></td></tr>
</table>

Project Strategy	Indicator	Baseline value	Target by end of Project	Sources of verification	Risks and Assumptions
		0 Community-based water stress early warning	3 Community-based water stress early warning		
Outcome 3: Community resilience to floods and water stress improved by introducing locally tailored climate risk management practices.	Number of WUA created / and or strengthened for CRM with respect to water stress and floods in project area. Percentage increase in representation of women in pilot WUAs.	Zero Water User Associations (WUA) strengthened for CRM in project area. Women are underrepresented in WUAs.	At least 5 by end of year 2; 10 by end of year 4; and 15 by end of project. At least 20% women in all pilot WUAs by end of project.	Documentation of formation of WUAs, minutes of meetings, documentation of training, evaluation of the various activities at specific stages in the project to monitor progress.	Regional and local authorities able and willing to participate in taking on new, community based approaches and join activities. Communities are interested in participating in the process.
	Number of Local Stakeholder Committees with at least 20% women representation.	Zero. There are no such LSCs in place.	By end of Year 2, at least 3 Local Multi-Stakeholder Committees (LSCs) actively involved with regional administration in addressing climate change responses and water stress and flood damage mitigation. 6 by end of year 4 and 9 by end of project, all with at least 20% women membership.	Documentation of formation of LSCs, minutes of meetings, documentation of training, evaluation of the various activities at specific stages in the project to monitor progress.	
	Relevant risk information disseminated to stakeholders. (AMAT Outcome Indicator 2.1.1).	No, relevant risk information is not disseminated to stakeholders.	Yes, relevant risk information will be disseminated to stakeholders.	Risk information; dissemination results.	
	Number of rayon's to which climate-risk watershed management planning is replicated.	Climate-risk watershed management planning has not yet been piloted, much less replicated.	6 climate-risk watershed management plans in addition to the 3 pilot rayons for a total of 9.	Actual watershed management plans.	

4: TOTAL BUDGET AND WORKPLAN

Award ID:	*00062260*	Project ID(s):	*00079670*
Award Title:	PIMS 3929 SCCF FSP Azerbaijan "Integrating Climate Change Risks into Water and Flood Management by Vulnerable Mountainous Communities in the Greater Caucasus Region."		
Business Unit:	AZE10		
Project Title:	PIMS 3929 SCCF FSP Azerbaijan "Integrating Climate Change Risks into Water and Flood Management by Vulnerable Mountainous Communities in the Greater Caucasus Region."		
PIMS no	3929		
Implementing Partner (Executing Agency)	MoENR		

GEF Outcome / Atlas Activity	Responsible Party / Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Notes
Outcome 1: Water and Flood management framework is modified to respond to adaptation needs and improve climate risk management	MoENR	62000	GEF	71200	Int'l Consultants	33,000	18,000	9,000	6,000	3,000	69,000	1.
				71300	Local Consultants	30,900	32,100	28,200	18,000	10,800	120,000	2.
				71600	Travel	33,763	22,016	15,266	13,519	8,769	93,333	3.
				72100	Contractual Services	0	0	0	0	0	0	4.
				72200	Equipment	0	0	0	0	0	0	5.
				74200	Publications	0	8,000	0	2,000	0	10,000	6.
				75700	Misc-Training	18,000	40,000	20,000	40,000	80,000	198,000	7.
				74500	Misc - Services	4,750	5,000	5,000	5,000	5,000	24,750	8.
				Total Outcome 1:		**120,413**	**125,116**	**77,466**	**84,519**	**107,569**	**515,083**	
Outcome 2: Key institutions have capacities, technical skills, tools and methods to apply advanced climate risk management practices for water stress and		62000	GEF	71200	Int'l Consultants	18,000	18,000	15,000	6,000	3,000	60,000	9.
				71300	Local Consultants	34,800	46,500	38,700	39,300	34,200	193,500	10.
				71600	Travel	17,516	19,016	18,766	10,516	8,769	74,583	11.
				72100	Contractual Services	30,000	40,000	90,000	80,000	30,000	270,000	12.
				72200	Equipment	4,000	0	0	0	0	4,000	13.
				74200	Publications	6,000	0	12,000	12,000	0	30,000	14.
				75700	Misc- Training	28,000	60,000	70,000	50,000	30,000	238,000	15.
				74500	Misc - Services	1,000	1,000	1,000	1,000	1,000	5,000	16.

flood mitigation.				**Total Outcome 2:**		**139,316**	**184,516**	**245,466**	**198,816**	**106,969**	**875,083**	
Outcome 3: Community resilience to floods and water stress improved by introducing locally tailored climate risk management practices.		62000	GEF	71200	Int'l Consultants	27,000	30,000	18,000	12,000	9,000	96,000	17.
				71300	Local Consultants	52,200	56,100	57,000	42,600	39,000	246,900	18.
				71600	Travel	25,766	26,016	17,516	17,016	15,270	101,584	19.
				72100	Contractual Services	40,000	30,000	40,000	38,000	70,000	218,000	20.
				72200	Equipment	0	0	0	0	0	0	21.
				74100	Professional Services	6,000	24,000	6,000	6,000	44,000	86,000	22.
				74200	Publications	7,000	8,000	8,000	8,000	10,000	41,000	23.
				75700	Misc- Training	60,000	70,000	50,000	60,000	100,000	340,000	24.
				74500	Misc - Services	5,600	4,000	4,000	4,000	8,000	25,600	25.
				Total Outcome 3:		**223,566**	**248,116**	**200,516**	**187,616**	**295,270**	**1,155,084**	
Project Management Costs		62000	GEF	71400	Project Personnel	30,950	30,950	30,950	30,950	30,950	154,750	26.
				Total Management		**30,950**	**30,950**	**30,950**	**30,950**	**30,950**	**154,750**	
GRAND TOTALS		62000	GEF	71200	Int'l Consultants	78,000	66,000	42,000	24,000	15,000	225,000	
				71300	Local Consultants	117,900	134,700	123,900	99,900	84,000	560,400	
				71400	Project Personnel (Management)	30,950	30,950	30,950	30,950	30,950	154,750	
				71600	Travel	77,045	67,048	51,548	41,051	32,808	269,500	
				72100	Contractual Services	70,000	70,000	130,000	118,000	100,000	488,000	
				72200	Equipment	4,000	0	0	0	0	4,000	
				74100	Professional Services	6,000	24,000	6,000	6,000	44,000	86,000	
				74200	Publications	13,000	16,000	20,000	22,000	10,000	81,000	
				75700	Misc -Training	106,000	170,000	140,000	150,000	210,000	776,000	
				74500	Misc - Services	11,350	10,000	10,000	10,000	14,000	55,350	
				Total Project		**514,245**	**588,698**	**554,398**	**501,901**	**540,758**	**2,700,000**	

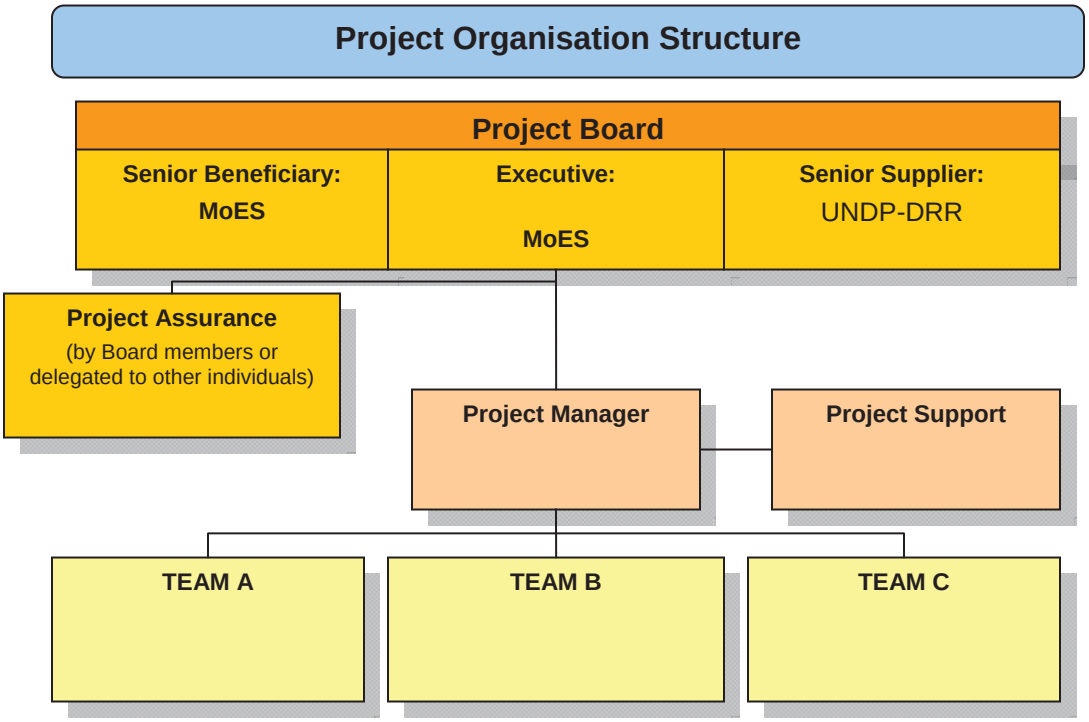
#	**Budget Notes**
1.	Int'l IWRM expert (11 wks, 33k); Int'l Water and Env. Law Expert (7 wks, 21k); Int'l Climate Change Expert (2 wks, 6k); Int'l Flood Mgmt Expert (2 wks, 6k);Int'l Watershed Management Planning Expert (1 wk, k);
2.	PM technical input to law and policy, conjunctive management modelling (32 wks @ 600wk = 19200). Nat'l Stakeholder/Gender Participation expert to develop participation plan;

	(16 wks @ 300/wk = 4,800); Nat'l GIS expert (72 wks @300/wk = 21600); Nat'l Water Law expert (68 wks @300/wk = 20400); Nat'l Climate change expert (12 wks @300/wk = 3600); Nat'l training specialists (32 wks @300/wk = 9600); Nat'l Flood Mgmt Expert (68 wks @300/wk = 20,400); Watershed Mgmt & Planning Expert (68 wks @300/wk = 20,400)
3.	Travel costs for five int'l experts, total 12 air fares, plus DSA. Project site specific, 6 field missions to the target regions.
4.	N/A
5.	N/A
6.	Translation, publication, etc. of recommended modifications to law in year 2 and final documentation in year 4.
7.	Training of national Working Group on Law and Policy on international best practice in Water Law. Initial training of community members and regional staff on IWRM and conjunctive water management toward a collaborative conjunctive water management plan and to inform modifications to law.
8.	Workshop and associated costs for participatory activities on law and policy.
9.	Int'l IWRM expert (7 wks, 21k); Int'l Climate Change Expert (1 wk, 3k); Int'l Flood Mgmt Expert (7wks, 21k); Int'l Watershed Management Planning Expert (2wks, 6k); Int'l Agriculture Expert (3wks, 9k)
10.	PM technical input to institutional assessment, IWRM training, flood risk assessment, etc. (44 wks, $26400). Nat'l Stakeholder/Gender Participation expert to support participatory activities, (16 wks, $4,800); Nat'l GIS expert to support various mapping activities, (76 wks, $22800); Nat'l Climate change expert (17 wks, $5100); 6 Nat'l training specialists for all aspects of training for capacity building (160 wks, $48000); Nat'l Flood Mgmt Expert (72 wks, $21600); Watershed Mgmt & Planning Expert (72 wks, $21600); Nat'l Soils expert (42 wks, $12600); Nat'l MET expert (32 wks, $9600); Nat'l Telemetry expert (14 wks, $4200); Nat'l Agriculture expert (32 wks, $9600), (all Nat'l consultants @ $300/wk, except for technical PM time @ $600/wk).
11.	Travel costs for 4 int'l experts, total 3 air fares, plus DSA. Project site specific, 6 field missions to the target regions.
12.	Contracts for: 1) GIS development and satellite imagery, with training of regional staff for Output 2.4; 2) SWAT model preparation, assessment, publication and dissemination for Output 2.3; 3) Participatory Watershed Management and Planning for Output 2.4 and 2.7.
13.	Hand held GPS devices for participatory watershed management planning and flood risk mapping.
14.	Translation and publication of findings of institutional capacity assessment (Output 2.1) , guidelines on land and soil improvement (Output 2.7), documentation of early warning systems for dissemination to stakeholders (Output 2.6).
15.	Training for community stakeholders, regional and national staff of government organizations for training package in Output 2.2.
16.	Meeting logistics costs associated with pilot activities, community working groups, etc.
17.	Int'l IWRM expert (11 wks, 33k); Int'l Stakeholder/Gender Participation expert, (11 wks, $33,000); Int'l Flood Mgmt Expert (6wks, 18k); Int'l Watershed Management Planning Expert (4wks, 12k).
18.	PM technical input to participatory planning, flood risk assessment, etc. (24 wks, $14400). Nat'l Stakeholder/Gender Participation expert to support participatory activities, (92 wks, $27600); Nat'l GIS expert to support various mapping activities, (76 wks, $22800); Nat'l Climate change expert (17 wks, $5100); 6 Nat'l training specialists for all aspects of training for capacity building (132 wks, $39600); Nat'l Flood Mgmt Expert (72 wks, $21600); Watershed Mgmt & Planning Expert (68 wks, $20400); Nat'l Soils expert (96 wks, $28800); Nat'l MET expert (96 wks, $28800); Nat'l Telemetry expert (96 wks, $28800); Nat'l Agriculture expert (30 wks, $9000), (all Nat'l consultants @ $300/wk, except for technical PM time @ $600/wk).
19.	Travel costs for 4 int'l experts, total 7 air fares, plus DSA. Project site specific, 6 field missions to the target regions.
20.	Contracts for: 1) GIS development and satellite imagery, with training of community and regional staff for Outputs 3.3, plus replication in 3.5; 2) SWAT model dissemination for replication in Output 3.5; 3) Participatory Watershed Management and Planning for Output 3.3 and replication in Output 3.5.
21.	
22.	Audit (30k); Mid-Term Evaluation (18k) and Terminal Evaluation (38k)
23.	Guidelines on participatory Watershed Management and Planning in Output 3.3, materials for the public awareness campaign in Output 3.4.
24.	Training for strengthening WUAs (Output 3.1) and for pilot watershed management and planning (Output 3.3), several aspects of training for government and other stakeholder staff under the replication process in Output 3.5.
25.	Costs for workshops, meetings, etc. for establishment of LSC in Output 3.2 and for WUA meetings for strengthening in Output 3.1. Plus associated costs with travel, workshops, etc. for the replication process.
26.	PM at 60% time for whole project period @ $600/wk, PA at 90% for project period @ $250/wk.

Summary of Funds:

	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Amount Year 5	Total
GEF	514,245	588,698	554,398	501,901	540,758	**2,700,000**
UNDP	$60,000	$50,000	$50,000	$50,000	$50,000	**$260,000**
Government	$1,400,000	$1,400,000	$1,400,000	$1,400,000	1,400,000	**$7,000,000**
TOTAL	$1,974,245	$2,038,698	$2,004,398	$1,951,901	$1,990,758	**$9,960,000**

5: MANAGEMENT ARRANGEMENTS



221. **National Execution:** The project will be nationally executed by the Ministry of Emergency Situations (MoES) that will act both as the Implementing Partner and the Beneficiary of the project. Implementation support will be provided by the UNDP Country Office (see Project Governance Arrangements below). In its capacity of Executing Entity the MoES will be responsible for overall project management. Besides, the MoES will be responsible for the facilitation of all project activities such as international consultant missions, trainings for respective staff, ensuring appropriate access to project sites, relevant data, records, agencies and authorities. UNDP will provide support services including procurement and contracting, human resources management, and financial services in accordance with the relevant UNDP Rules and Procedures and Results-Based Management guidelines.

Project Governance Arrangements.

222. The project will have a governance structure, aligned with UNDP's new rules for Results Based Management.

223. Project Executive Group. The Project Board will be the executive decision making body for the project, providing guidance to the Project Manager and approving project revisions, annual workplans and budgets. It will be responsible for reviewing project progress reports, the risk log, issue log and the monitoring and communication plan. The Project Board will consist of the Deputy head of MoES, the Director of the MoES/SAWR, the UNDP Deputy Resident Representative (DRR), and the Representative of UNDP's Energy and Environment Unit Azerbaijan.

224. The Project Board (PB) is responsible for making management decisions for a project in particular when guidance is required by the Project Manager. The Project Board plays a critical role in project monitoring and evaluations by quality assuring these processes and products, and using evaluations for performance improvement, accountability and learning. It ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems with external

bodies. In addition, it approves the appointment and responsibilities of the Project Manager and any delegation of its Project Assurance responsibilities. Based on the approved Annual Work Plan, the Project Board can also consider and approve the quarterly plans (if applicable) and also approve any essential deviations from the original plans.

225. In order to ensure UNDP's ultimate accountability for the project results, Project Board decisions will be made in accordance to standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. In case consensus cannot be reached within the Board, the final decision shall rest with the UNDP-DRR. The functions of the PB will be distributed as follows:

1) **An Executive**: individual representing the project ownership to chair the group. The Ministry of Emergency Situations will fulfill the Executive role, and will convene the Project Board's meetings. The Deputy Head of MoES will hold this position.
2) **Senior Supplier**: Represents the interests of the parties that provide funding for specific cost sharing projects and/or technical expertise to the project. The Senior Supplier's primary function within the Board is to provide guidance regarding the technical feasibility of the project. This position will be held by the UNDP DRR, or a designated UNDP Development Advisor.
3) **Senior Beneficiary** is the individual representing the interests of those who will ultimately benefit from the project. This function will be performed by the Director of the MoES State Agency for Water Reserves (SAWR). The Senior Beneficiary's primary function within the Board is to ensure the realization of project results from the perspective of project beneficiaries.
4) The **Project Assurance** role supports the Project Board Executive by carrying out objective and independent project oversight and monitoring functions. The UNDP-Azerbaijan Representative of the Energy and Environment Unit will provide independent project oversight and monitoring functions to ensure that project activities are managed and milestones accomplished. The UNDP HEP will be responsible for reviewing Risk, Issues and Lessons Learned logs, and ensuring compliance with the Monitoring and Communications Plan. The UNDP-GEF Regional Technical Advisor located in Bratislava will also play an important project assurance role by supporting the annual APR/PIR process.

226. The PB will provide guidance based upon project progress assessments and related recommendations from the PM. The PB will review and approve annual project reviews and workplans, technical documents, budgets and financial reports. The PB will provide general strategic and implementation guidance to the PM. It will meet annually, and make decisions by consensus. The specific rules and procedures of the PB will be decided upon at the project inception meeting.

227. The success of the project implementation is dependent upon strong project guidance, coordination and advocacy from the PB. The PM, which will be responsible for arranging PB meetings, providing materials to members prior to the meeting, and delineating a clear set of meeting objectives and sub-objectives to be met.

228. Project Management. The national Project Manager (PM) will be tasked with the day-to-day management of project activities, as well as with financial and administrative reporting. The Project Manager's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The PM will be responsible for project implementation and will be guided by Annual Work Plans and follow the RBM standards. The PM will prepare Annual Work plans in advance of each successive year and submit them to the Project Board for approval. The PM will be supported by the Administrative /Finance Assistant. The PM *will have the authority to run the project on **a daily basis** on behalf of the PB within the constraints laid down by the PB. The PM's prime responsibility is to ensure that the project produces the planned outputs and achieves the planned indicators by undertaking necessary activities specified in the project document to the required standard of quality and within the specified constraints of time and cost. This will require linking the indicators to the workplan to ensure RBM.*

229. Project Support. UNDP will provide financial and administrative support to the project including procurement, contracting, travel and payments.

6: MONITORING FRAMEWORK AND EVALUATION

222. The project will be monitored through the following M&E activities. The M&E budget is provided in the table below.

Project start:

223. A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

224. The Inception Workshop should address a number of key issues including:

a) Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis à vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
b) Based on the project results framework and the relevant GEF Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
c) Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
d) Discuss financial reporting procedures and obligations, and arrangements for annual audit.
e) Plan and schedule Project Board meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

225. An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

226. **Quarterly:**

- Progress made shall be monitored in the UNDP Enhanced Results Based Managment Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).
- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned, etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

227. **Annually:**

- Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

228. The APR/PIR includes, but is not limited to, reporting on the following:
    - Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
    - Project outputs delivered per project outcome (annual).
    - Lesson learned/good practice.
    - AWP and other expenditure reports
    - Risk and adaptive management
    - ATLAS QPR
    - Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

229. **Periodic Monitoring through site visits:**

UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

230. **Mid-term of project cycle:**

The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation (insert date). The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC).

231. The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

232. **End of Project:**

An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC).

The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.

During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

225. Learning and knowledge sharing:

Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

226. Communications and visibility requirements:

Full compliance is required with UNDP's Branding Guidelines. These can be accessed at http://intra.undp.org/coa/branding.shtml, and specific guidelines on UNDP logo use can be accessed at: http://intra.undp.org/branding/useOfLogo.html. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects needs to be used. For the avoidance of any doubt, when logo use is required, the UNDP logo needs to be used alongside the GEF logo. The GEF logo can be accessed at: http://www.thegef.org/gef/GEF_logo. The UNDP logo can be accessed at http://intra.undp.org/coa/branding.shtml.

Full compliance is also required with the GEF's Communication and Visibility Guidelines (http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf.) Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.

Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

227. M&E workplan and budget

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project staff time*	Time frame
Inception Workshop & associated arrangements	▪ Project Manager ▪ UNDP CO ▪ UNDP GEF	Indicative cost: 10,000	Within first two months of project start up

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project staff time*	Time frame
Inception Report	▪ Project Team ▪ UNDP CO ▪ Consultancy support if needed	Indicative cost 5,000 (stakeholder consultations, consultancy translation)	Immediately following IW
Measurement of Means of Verification for Project Purpose Indicators	▪ Project Manager will oversee the hiring for specific studies and institutions, delegate responsibilities to relevant team members, and ▪ Ensure hiring outside experts if deemed necessary	To be finalized in Inception Phase and Workshop. Indicative cost 5,000	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	▪ Oversight by Project GEF Technical Advisor and Project Manager ▪ Measurements by regional field officers and local IAs	To be determined as part of the Annual Work Plan's preparation. Indicative cost 10,000	Annually prior to APR/PIR and to the definition of annual work plans
APR/PIR	▪ Project Team ▪ UNDP-CO ▪ UNDP-GEF	Indicative cost: 0	Annually
Steering Committee Meetings and relevant meeting proceedings (minutes)	▪ Project Manager ▪ UNDP CO	Indicative cost: 5,000 (travel costs for relevant project stakeholders)	Following Project IW and subsequently at least once a year
Quarterly status reports	▪ Project team	Indicative cost: 0	To be determined by Project team and UNDP CO
Technical reports	▪ Project team ▪ Hired consultants as needed	Indicative cost: 5,000	To be determined by Project Team and UNDP-CO
Project Publications (e.g. technical manuals, field guides)	▪ Project team ▪ Hired consultants as needed	Indicative cost: 20,000	To be determined by Project Team and UNDP-CO
Mid-term External Review	▪ Project team ▪ UNDP- CO ▪ UNDP-GEF RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 18,000	At the mid-point of project implementation.
Final External Evaluation	▪ Project team, ▪ UNDP-CO ▪ UNDP-GEF RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 38,000	At the end of project implementation
Terminal Report	▪ Project team ▪ UNDP-CO	Indicative cost: 0	At least one month before the end of the project
Lessons learned	▪ Project team ▪ UNDP-GEF RCU (suggested formats for documenting best practices, etc)	Indicative cost: 0	Yearly
Audit	▪ UNDP-CO ▪ Project team	Indicative cost: 30,000 (average $6000 per year)	Yearly

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project staff time*	Time frame
Visits to field sites (UNDP staff travel to be charged to IA fees)	▪ UNDP Country Office ▪ UNDP-GEF RCU (as appropriate) ▪ Government representatives	Indicative cost: 2,000 (average one visit per year)	Yearly
TOTAL INDICATIVE COST Excluding project team staff time and UNDP staff and travel expenses		US$ 148,000	

7: LEGAL CONTEXT

This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

The implementing partner shall:

a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;

b) assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

ANNEXES

Annex 1: Risk Analysis.

Use the standard UNDP Atlas Risk Log template. For UNDP GEF projects in particular, please outline the risk management measures including improving resilience to climate change that the project proposes to undertake.

Description	Date Id'd	Type	Impact & Probability	Countermeasures / Management response
Entrenched sectoral barriers among environment, water and land management, and emergency situations may hamper improved water and flood management for CC adaptation.	05/ 2011	Organizational	Med	The project is designed to both counter and minimize this risk. The organization of the entire project is cross-sectoral in and of itself. Under Outcome 1, the project's work to strengthen the legal and policy framework will address the importance of cross-sectoral approaches to effective CC adaptation. Under Outcome 2, the project's capacity building work will be cross-sectoral in its design and execution; and under Outcome 3, the project creates a new rayon level cross-sectoral mechanism called the Local Stakeholder Committee that will be the vehicle for the project's demonstration of improved cross-sectoral watershed management (land-use) planning to reduce vulnerability to climate change.
The legal process involved in modifying the Water Code and other legislation to address climate change adaptation and support the use of new tools and approaches may require more time than the project period itself.	03/ 2011	Regulatory	Low	The government, in endorsing this project, has committed to modifying and improving the Water Code and other legislation to better support climate change adaptation in the water and flood management sectors. The project's primary partner is the Ministry of Emergency Situations, which is an influential Ministry. In addition, the project design does not put all of its "legal eggs" in one basket: first the project will create and pass "normative legal acts" (NLA) to strengthen the legal framework's ability to support CC adaptation. NLA are easier and faster to write and pass. Secondly, the project resources will support MoES's effort to improve and update the Water Code itself.
People may incorrectly perceive that there will be additional financial costs in adopting new approaches to flood damage, which may hamper the project's efforts to reduce vulnerability.	03/ 2011	Financial	Med	The project will highlight the costs that local people, municipalities, rayon and national government agencies already incur due to flood damage. Plus, new financial mechanisms to provide incentives for improved flood risk planning (i.e. flood insurance only being available in areas outside the area zoned "high risk.") will be explored under

				Outputs 1.1, 1.2 and 2.3.
Climate change impacts may increase to the extent that even if the project reduces vulnerability, it may not be enough to make a difference.	03/ 2011	Environ-mental	Uncertain - Low	The project's approach to building capacity for adaptation focuses on practical tools and fundamental principles vis-a-vis water and flood management that will enable communities to modify adaptation approaches to the proper scale and scope needed. Under Outcome 1, the core elements of an adaptive approach will be incorporated into the legal framework; Under Outcome 2, the foundational capacity will be strengthened along with specific capacity to use specific critical tools for adaptation work and under Outcome 3, the project strengthens local communities ability to become more proactive stewards of their own watersheds, which will maximize community level resilience and ability to adapt.
Sometimes flood zoning can be initially unpopular because it requires a change in the land use habits of local communities. There may also be land ownership conflicts that hamper the project's ability to introduce this concept.		Organizat-ional	Med	The project emphasizes the importance of local engagement and initiative. Most of Outcome 3 is designed to catalyze this and involve the people in the activities of the project from the outset, thereby developing an understanding and an acceptance of the various adaptation measures for flood and water stress mitigation. Awareness raising is also a priority of the project.

Annex 2: Letters of Financial Commitment

Letter of Financial Commitment from Government of Azerbaijan and from UNDP-Azerbaijan.

THE MINISTRY OF EMERGENCY SITUATIONS OF THE REPUBLIC OF AZERBAIJAN

501st block, M. Mushfig str.,
AZ1073, Baku

Tel.: (994 12) 512 00 13
Fax: (994 12) 512 00 39
E-mail: info@fhn.gov.az

08 «10» 2011 №15/02-23/06515

UNDP Resident Representative
Mr. Fikrat Akcura

Dear Mr. Akcura,

I am writing on behalf of the Ministry of Emergency Situations of the Republic of Azerbaijan (MoES) to express support for the project proposal submitted by the United Nations Development Programme (UNDP) and the Government of the Republic of Azerbaijan "Integrating climate change risks into water and flood management by vulnerable communities in the Greater Caucasus region of Azerbaijan".

I confirm that the above-mentioned project proposal is in accordance with the priorities of the Government of Azerbaijan. MoES is a willing partner in the project and found it consistent with its own strategic plans and intentions. If the project is approved, the MoES will make contribution from its budget to the project totaling to 7 mln USD, out of which $6,760,000 will be contributed to the implementation of the project components and $240,000 to the project management.

We were also informed that total amount of the GEF/SCCC award equals to $2,700,00 and UNDP Azerbaijan makes cash contribution to the project implementation equal to $260,000.

Sincerely,

First deputy minister **Rafail Mirzoev**

United Nations Development Programme
Birləşmiş Millətlər Təşkilatının İnkişaf Proqramı

Azerbaijan

UNDP/OL/EEU/11/10700 20 July 2011

Yannick

Dear Mr. Glemarec,

Subject:: **Co-financing for the Project: "Integrating climate change risks into water and flood management by vulnerable communities in the Greater Caucasus region of Azerbaijan"**

I am writing to express support for the project proposal submitted by the United Nations Development Programme (UNDP) and the Government of the Republic of Azerbaijan "Integrating climate change risks into water and flood management by vulnerable communities in the Greater Caucasus region of Azerbaijan".

I confirm that the above-mentioned project proposal is in accordance with UNDAF for Azerbaijan for 2011-2015 and with the Azerbaijan's Second National Communication to the UNFCCC. If the project is approved, UNDP Azerbaijan will make cash contribution to the project in the amount of $ 260,000.

Thank you for cooperation.

Yours sincerely,

Fikret Akcura
UN Resident Coordinator
UNDP Resident Representative

Mr. Yannick Glemarec
GEF Executive Coordinator
United Nations Development Programme

3, UN 50th Anniversary street., Baku, Az1001, Azerbaijan; Tel: (+ 99412) 498 98 88; Fax: (+ 99412) 492 24 91; E-mail: registry@un-az.org; www.undp.org

Annex 3: Terms of Reference.

National Project Manager (NPm)

Background

The National Project Manager (NPM), will be a locally recruited national selected based on an open competitive process. He/She will be responsible for the overall management of the project, including the mobilization of all project inputs, supervision over project staff, consultants and sub-contractors. The NPM will report to the UNDP-Azerbaijan Environment Officer (or other duly designated UN officer) for all of the project's substantive and administrative issues. The NPM will report on a periodic basis to the Project Steering Committee (PSC). The NPM will be responsible for meeting government obligations under the project and will perform a liaison role with the Government, UNDP and other UN Agencies, NGOs and other project partners.

Duties and Responsibilities

- Supervise and coordinate the production of project outputs, as per the project document;
- Ensure the timely and effective implementation of all components of the project;
- Mobilize all project inputs in accordance with UNDP procedures for nationally executed projects;
- Supervise and coordinate the work of all project staff, consultants and sub-contractors;
- Coordinate the recruitment and selection of project personnel;
- Prepare and revise project work and financial plans, as required by Project Director and UNDP;
- Liaise with UNDP, MoES and other relevant government agencies, and all project partners, including donor organizations and NGOs for effective coordination of all project activities;
- Facilitate administrative backstopping to subcontractors and training activities supported by the Project;
- Oversee and ensure timely submission of all project reports, including technical reports, quarterly financial reports, and other reports as may be required by UNDP, GEF, and other oversight agencies;
- Disseminate project reports and respond to queries from concerned stakeholders;
- Report progress of project to the steering committee, and ensure the fulfilment of steering committee directives.
- Carry out regular inspections of all project sites and activities.

Qualifications

- A university degree (MS or PhD) in Management or Environmental Sciences;
- At least 10 years of experience in natural resource management or project/programme management;
- At least 5 years of project/programme management experience;
- Working experience with ministries and national institutions in Azerbaijan;
- Ability to effectively coordinate a large, multi-stakeholder project;
- Ability to administer budgets, train and work effectively with counterpart staff at all levels and with all groups involved in the project;
- Strong drafting, presentation and reporting skills;
- Strong computer skills, in particular mastery of all applications of the MS Office package and internet search;
- Strong knowledge of water and flood management issues in Azerbaijan, including the political, institutional and socio-economic contexts;
- Excellent writing and communication skills in English.

National Project Assistant (NPA)

Background

The National Project Assistant (NPA), will be a locally recruited national selected based on an open competitive process. He/She will report to National Project Manager (NPM) and assist the NPM in the coordination of the UNDP-GEF project. He/She will have two roles: as an Administrative Assistant and as an Accountant.

As an Administrative Administrator, he/she will:

- Provide assistance in the operational management of the project according to the project document and the NEX procedures.
- Undertake all preparation work for procurement of office equipment, stationeries and support facilities as required;
- Provide support in preparing project events, including workshops, meetings (monthly, quarterly and annual), study tours, trainings, etc., as required.
- Take care of project telephone, fax, and email system;
- Assist with preparation of TORs and contracts for consultants for project activities.

As a Project Accountant, he/she will:

- Prepare quarterly advance requests to get advance funds from UNDP in the format applicable.
- Assist the NPM and NPD in project budget monitoring and project budget revision.
- Set up accounting system, including reporting forms and filling system for the project, in accordance with the project document and the NEX procedures;
- Maintain petty cash transactions. This includes writing of receipts, preparation of payment request form, receipt and disbursement of cash and clearance of advances;
- Prepare cheques and withdraw money from the bank;
- Prepare project financial reports and submit to NPM and NPD for clearance and furnish to UNDP as required;
- Enter financial transactions into the computerised accounting system;
- Reconcile all balance sheet accounts and keep a file of all completed reconciliation;
- Check and ensure that all expenditures of projects are in accordance with NEX procedures. This includes ensuring receipts to be obtained for all payments;
- Check budget lines to ensure that all transactions are booked to the correct budget lines;
- Ensure documentation relating to payments are duly approved by the NPD;
- Bring any actual or potential problems to the attention of the NPD;
- Follow up bank transfers. This includes preparing the bank transfer requests, submitting them to the bank and keeping track of the transfers;
- Ensure Petty Cash to be reviewed and updated ensuring that there is up-to-date records;
- To continuously improve system & procedures to enhance internal controls to satisfy audit requirements.
- Ensure that bank statements be collected from the banks at the appropriate time;
- Ensure that bank accounts are reconciled and reported in a timely manner;
- Prepare monthly bank reconciliation statement, including computation of interests gained to be included into reports.
- Maintain the inventory file to support purchases of all equipment/assets.
- Undertake other relevant matters assigned by the NPM.

Qualifications and requirements

- University degree in accounting, finance or related fields;
- Solid experience of budgeting, planning and reporting on foreign funded projects; and experience with international auditing requirements.

- Good secretarial skills and good organizational capacity;
- Knowledge in administrative and accounting procedures of the Government
- Good computer skills in common word processing (MS Word), spreadsheet (MS Excel), and accounting software.
- Appropriate English and Azeri language skills, both spoken and written.

International Chief Technical Advisor (CTA)

Background

The Chief Technical Adviser on Water and Flood Management (CTA) will be an experienced expatriate recruited to provide overall technical backstopping to the Project. He/She will report to National Project Manager (NPM) and assist the NPM in the coordination of the UNDP-GEF project and provide advice and assistance on all technical aspects of the project, especially regarding international best practice, with reference to water and flood management, climate change adaptation, risk mitigation, institutional capacity building requirements, water management needs with respect to law and policy. The CTA will coordinate the provision of the required technical inputs, reviewing and preparing Terms of Reference and reviewing the outputs of consultants and other sub-contractors.

Duties and Responsibilities

- Provide technical and strategic assistance for project activities, including planning, monitoring and site operations, and assuming quality control of interventions;
- Provide hands-on support to the NPM, project staff and other government counterparts in the areas of project management and planning, management of site activities, monitoring, and impact assessment;
- Finalize Terms of Reference for consultants and sub-contractors, and assist in the selection and recruitment process;
- Coordinate the work of all consultants and sub-contractors, ensuring the timely delivery of expected outputs, and effective synergy among the various sub-contracted activities;
- Assist the NPM in the preparation of project annual reviews, quarterly financial reports for submission to UNDP, the GEF, and others as required;
- Lead the preparation of all technical reports;
- Assist in mobilizing staff and consultants in the conduct of a mid-term project evaluation, and in undertaking revisions in the implementation program and strategy based on evaluation results;
- Assist the NPM in liaison work with project partners, donor organizations, NGOs and other groups to ensure effective coordination of project activities;
- Document lessons from project implementation and make recommendations to the Steering Committee for more effective implementation and coordination of project activities; and
- Perform other tasks as may be requested by the NPM, Steering Committee and other project partners.

Qualifications

- Doctoral or master's degree in civil engineering or environmental sciences, with a specialization in water resources management.
- At least ten years of relevant professional experience in water management, especially in IWRM, and in flood management.
- Knowledge of water and environmental issues in Azerbaijan and its institutions for water, flood and environmental management is an asset.
- Knowledge of economic, political and social situation in Azerbaijan is an asset

Competencies

- Strong networking skills and demonstrated ability to liaise and involve partners including government officials, scientific institutions, NGOs and private sector.
- Familiarity with UNDP and UN systems desirable.
- Experience with international organizations/projects/programs.
- Excellent analytical skills.
- Capability to work under deadline pressure and to take on a range of tasks.

- Ability to work in a team, to motivate other team members, and to balance the inputs and work of team members.
- Self-motivation and ability to recommend options for resolutions of issues.

Technical skills

- Full working knowledge of spoken and written English, including the ability to draft and edit project documents.
- Excellent computer skills, including full working knowledge of standard word processing, spreadsheet and presentation software packages.
- Fluency in spoken Russian/Azeri is an asset

Annex 4: Key Stakeholders and Envisioned Roles in the Project.

Primary Relevant Institutions	Envisioned roles and responsibilities in the project.
National level	
Ministry of Emergency Situations (MoES)	Project Director will come from MoES Will be member of Project Board Key participants in Outputs 1.1 -1.3, Outputs 2.1 – 2.6, and Outputs 3.2 – 3.5. Regional office in Gabala will play an important role in replication (Output 3.4) Staff at rayon level will be key participants in project inspired local stakeholder committees (LSC) to be formed.
State Agency for Water Reserves (SAWR)	Agency still being created. Preliminary list of possible roles and responsibilities: - Management of mountain rivers - Protection of territories and people from floods - Informing them about approaching flood-related disasters (in collaboration with Hydromet and others) - Construction of protective structures - Responsible for safety of canals, water collectors
Greater Caucasus Northwest Regional Center - MoES	Located in Gabala, this will be a key counterpart of project's work in the GC region for MoES. All MoES work in the Greater Caucasus goes through this center.
Ministry of Ecology and Natural Resources (MoENR)	Will be member of Project Board Key participants in Outputs 1.1 -1.3, Outputs 2.1 – 2.6, and Outputs 3.2 – 3.5. Regional centers #9 and 11 will play an important role in replication (Output 3.4) Staff at rayon level will be key participants in project inspired local stakeholder committees (LSC) to be formed.
Department of Ecology and Environmental Protection Policy	Key actors under Outcome 1, with all outputs related to law and policy.
Regional Office on Hydrometeorology (MoENR)	The key actor under Output 2.5 and important participant under Output 2.6. In addition to the regional center in Sheki, there is a Hydromet representative in each rayon who will be an important member of the LSC at the rayon level. Separate Center in Sheki will play important role in replication.
Regional Office on Environment and Natural Resources.	Key offices to facilitate replication of improved vulnerability reduction practices across the GC region (Output 3.4)
Department of Geological Research and Engineering	Provides approval for usage of ground waters ("clears" applications). Important actor under Outputs 1.3 and 2.3.
Amelioration and Water Facility Joint Stock Company (AJSC)	Will be member of Project Board Key participants in Outputs 1.1 -1.3, Outputs 2.1 – 2.6, and Outputs 3.2 – 3.5. Regional offices in Sheki and Gabala will play an important role in replication (Output 3.4) Staff at rayon level will be key participants in project inspired local multi-stakeholder committees (LSC) to be formed. Drills groundwater wells for amelioration.
Parliamentary Commission on Energy and the Environment.	Will play a central role in all outputs under Outcome 1 as the key consultative body and venue for many round table expert working group discussions.
AzerSu Joint Stock Company	Will be member of Project Board

	Key participants in Outputs 2.1 – 2.6, and Outputs 3.2 – 3.5. Staff at rayon level will be key participants in project inspired local stakeholder committees (LSC) to be formed. Drills groundwater wells for drinking water purposes.
The State Land and Cartography Committee	Will be a key player in the LSCs and their work on CR-WMP development (Outcome 3.3) as they are responsible for land mapping and other related tasks.
Ministry of Agriculture	Staff at rayon level will be key participants in project inspired local stakeholder committees (LSC) to be formed.
Regional office of National Academy of Science (Sheki)	Members will play an important role in expert working groups which are formed to produce key outputs.
NGOs	
Alazani River Basin Council (Ganikh River)	This was established under an EU-TACIS project for a transboundary water management body. As such it is concerned with more macro-scale issues, but will be a stakeholder as activities in the project region will impact the larger Alazani (Ganikh) River basin.
Association on International Hydrological Program	This is a programme established between Armenia, Georgia and Azerbaijan to share hydrological information across borders to counter flooding. It is part of a planned large scale warning system. While on a much larger scale, there may be shared lessons important to both initiatives.
Local NGOs	Will play an important role in LSCs under Outcome 3.3 and in public awareness raising under Outcome 3.5.
Local level/regional level	
Rayon Executive Authority	Key stakeholder under Outcomes 2 and 3, particularly the demonstrating and adoption of new tools and planning approaches. Primary host/chair of each respective LSC; Deputy Executive of Rayon chairs the Commission of Emergency Services.
Commission on Emergency Situations (CoES)	Rayon level entity that is chaired by the Deputy Rayon Executive. Comprised of members representing the major ministries and agencies working in each respective rayon, the CoES is called together for emergency response or in cases of preparation for emergency response. One of the key entities through which this project will work at the rayon level.
Municipalities	Key stakeholder under Outcome 3.
Water User Associations	Key local –level stakeholder institution with which the project will interact on a number of levels. Will play key roles in the demonstrating and piloting of new tools, zoning and planning approaches. Will be an important target for training and capacity building under Output 2.1.

Annex 5: Climate Change Adaptation – LDCF/SCCF Adaptation and Monitoring Assessment Tool

Otherwise known as the "CCA Tracking Tool," this tool is a separate MS-Excel document that is too large to be inserted into this word document. It serves as the primary means for GEF (and UNDP) to track priority results as they relate to GEF's Climate Change Adaptation priorities. This Excel document is part of the project's core files and should be consulted or referred to periodically by the project team to ensure the targets are being met.

Annex 6: Important non-structural measures and tools in adapting water and flood management to the impacts of climate change.

230. The current national strategy for flood protection in Azerbaijan is based entirely on structural measures. Because of a long involvement in structural flood mitigation measures, national and local administrations have developed extensive experience in design and construction of flood protection walls and other structures. Many, especially those protecting major cities, have been well designed, constructed, and maintained and are still serving their purposes. However, examples of poor construction and neglected maintenance are also numerous, especially in rural areas.

231. The approach to flood management by MoES and AJSC is limited to structural measures mostly because of a lack of knowledge of the benefits of including non-structural measures in an overall flood management program. The inhabitants of flood prone areas still consider structures and channelization as the most reliable flood protection measures, again mostly because of a lack of experience in other methods. Other methods can also be more contentious, such as flood plain zoning that may require relocation of some structures and activities, and changes to land use which tend to take more time to have a measurable impact.

232. International experience shows that the best approach to flood management and protection is a combination of structural and non-structural measures. The most important first step is determining the correct mix of structural and non-structural measures and precisely how they will work.

233. Flood Management: Important Non-Structural Measures and Tools

234. 1) Flood zoning is a nonstructural measure that regulates land use in the flood plain to minimize flood damage. Such zoning is implemented through legislation, mostly at the level of bylaws but supported by a national Water Code, and are usually specific to municipalities and responsive to local conditions.

235. Relocating settlements, agricultural lands, and infrastructure is difficult and socially contentious and may have untenable costs, and therefore should be avoided wherever possible.. If communities are involved in the assessment of flood risks and delineation of flood risk zones, some of these issues can be eased. Zoning bylaws can also be structured to make the changes through attrition such that existing land use, such as buildings, can be allowed to stay for the remainder of their useful lives, and abandoned or removed at that time and no new building will be allowed. Similarly, on agricultural land, certain crop types in certain seasons may be allowed, but not others. How a particular zone is managed will depend on circumstances and is best decided at a community level. Flood insurance can be an important aspect of flood zoning, where insurance may become mandatory in certain high risk flood zones.

236. Flood plain related zoning laws are very limited in Azerbaijan. There is one law that restricts specific development on waterways and water bodies, but the purpose is to protect water quality (and the actual benefits of such protective strips are questionable in any case). A relatively new regulation does relate zoning to flood protection, but the regulation is poorly defined because it is generic with the flood prone zone related to a set distance from the river bank depending on the length of the river. It cannot work unless the delineation is based on the specific hydraulic conditions and individual flooding regime of each river, as is done in Europe and much of the rest of the world. Application of the regulations in its current form is practically impossible.

237. 2) Watershed management is another non-structural method that has proved effective for flood management in many parts of the world. Its aim in flood management is improving the hydrologic characteristics of the catchment, notably the retention capacity of the soil, thereby reducing flood peaks and sediment load, and stabilizing river channels. Watershed management requires a long-term commitment and the coordinated efforts of several government and civil society organization. Once taken on, though, watershed management has many benefits other than flood management.

238. One of the common components of watershed management is reforestation of catchments that have lost forest cover. In Azerbaijan, reforestation or afforestation amounts to only 1,500 to 3,000 ha annually nationwide, and is not done specifically to promote sustainability, reduce erosion, or improve the watershed hydrologic characteristics. Sadly, the efforts put into reforestation in the region have been done on a scale so small as to have little impact, reinforcing the attitude that only structural measures work.3) Flood forecasting and early warning is another non-structural measure that has great merit in saving lives, and reducing loss of livestock, and saving smaller personal items which reduce the impact of the floods on livelihoods. Mountain floods develop rapidly and response times are short. Therefore the time from warning to safety is also short. The main components include: a specialized, high elevation hydrometeorological network which is capable of sensing the possibility of high intensity rainstorms before they occur, then monitoring their progress; a telemetric network to send data to a central flood warning office; an information dissemination system to spread the word from the central office back to communities, and a well understood and rehearsed community level flood warning and response system which allows the people of the community to act quickly and effectively.

239. Water Stress Management: Important Non-Structural Measures and Tools

240. 1) Watershed management is also a non-structural measure for water management, using much the same process as for flood related management but with different emphasis. The health of the watershed is assessed in terms of land use and a watershed management plan is developed considering vegetation, soils, and other aspects. Vegetation and soil can be managed for water conservation to ensure a sustainable water resource.

241. 2) Conjunctive water management can also be considered a non-structural measure to improve access to water and reduce water stress. Groundwater and surface water are managed and used as one resource in situations where the two resources are hydraulically linked, as is the case in the project area. Conjunctive management can significantly increase access to the resource by using different infrastructure depending on the current hydrological conditions.

242. 3) Integrated Water Resources Management is another non-structural measure to reduce water stress. Essentially IWRM is a practice aimed at managing water as efficiently as possible so that water is not wasted, thereby having a more sustainable resource without large spending on infrastructure. The key word is integration, aiming at integrating fragmented water management organizations, integrating water and the land it flows over and through, integrating surface water and groundwater and integrating stakeholders into the water management process. IWRM has the added bonus of being highly environmentally sound, working to protect the ecological health of the catchment as it impacts water resources.

SIGNATURE PAGE

Country: Azerbaijan

UNDAF Outcome (s)/Indicator (s): **Outcome 1.** By 2015, non-oil development policies result in better economic status, decent work opportunities and a healthier environment in all regions and across all social groups

CPAP Outcome (s)/Indicator: Outcome 1.3. Relevant national strategies, policies, and capacities strengthened to address environment degradation, promote the green economy, and reduce vulnerability to climate change

CPAP Output (s)/Indicator (s): Output 1.3.3. Priority ecosystems/economic sectors vulnerable to climate change identified, strategies for improving their resilience developed; Output 1.3.6. Improved water resource management and strengthened transboundary cooperation on this issue in the Kura-Araz River Basin

Executing Entity/Implementing Partner: Ministry of Emergency Situations (MoES)

Implementing entity/Responsible Partner: UNDP

Programme Period:	2011-2016
Atlas Award ID:	00062260
Project ID:	00079670
PIMS #	3929
Start date:	Oct 2011
End Date	Oct 2016
Management Arrangements	NIM
PAC Meeting Date	tbc

Total resources required	9,960,000
Total allocated resources:	9,960,000
• Regular	260,000
• Other:	
o GEF	2,700,000
o Government	7,000,000
o In-kind	_____
o Other	_____
In-kind contributions	_____

Agreed by (Government):

NAME SIGNATURE Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

NAME SIGNATURE Date/Month/Year

Agreed by (UNDP):

NAME SIGNATURE Date/Month/Year