

Reducing Risks and Vulnerabilities from Glacier Lake Outburst Floods in Northern Pakistan

INCEPTION REPORT



Adaptation Fund Project
Climate Change Section, Ministry of Environment & National Disaster Management,
Government of Pakistan
and
United Nations Development Programme - Pakistan

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DEFINITION OF TERMS

Atmosphere:

Cloud Burst:

GLOF:

Moraine:

Snout:

Glacial Melt:

Bright Glacier:

Dark Glacier:

Glacial Lake:

Debris Flow:

Flash Flood:

Snow Melt:

Westerly System:

Monsoon:

Tectonic Plate:

Subduction:

List of Acronyms

AKRSP	Aga Khan Rural Support Programme
EWS	Early Warning System
ERRA	Earthquake Relief and Rehabilitation Authority
GIS	Geographical Information System
GCISC	Global Change Impact Studies Centre
GLOFs	Glacier Lake Outburst Floods
GFDRR	Global Facility for Disaster Reduction and Recovery
HKH	Himalayan Karakorum Hindukush
ICIMOD	International Centre for Integrated Mountain Development
ISDR	International Strategy for Disaster Reduction
IPCC	Intergovernmental Panel on Climate Change
IGIS	Institute of Geographical Information Systems
LDCF	Least Developed Country Fund
MTE	Mid-Term Evaluation
NDMA	National Disaster Management Authority
PMD	Pakistan metrological department
PRSP	Poverty Reduction Strategy Paper
PMCs	Project Management Committees
PCRWR	Pakistan Council of Research on Water Resources
SLMP	Sustainable Land Management project
TFCC	Task Force on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
WWF	World Wide Fund for Nature

EXECUTIVE SUMMARY – INCEPTION REPORT

This Inception Report describes the initial start-up activities and refinements to the design of the project, Reducing Risks and Vulnerabilities from Glacier Lake Outburst Floods in Northern Pakistan. The project was jointly approved by the government, the Adaptation Fund and UNDP in May 2011. This Inception Report is an amendment to the approved Project Document (ID # 00077650; PIMS # 4454).

The objective of the project is to reduce climate change-induced risks of Glacial Lake Outburst Floods (GLOFs) in Gilgit-Baltistan and Chitral and that national, provincial, district and communities are able to prioritize and implement climate change adaptation measures. The project seeks to achieve four outcomes:

Outcome 1: Strengthened Institutional capacities to implement policies, plans and investments that prevent human and material losses from GLOF events in vulnerable areas of Northern Pakistan.

Outcome 2: Improved access of disaster management planners and policy makers to knowledge, information and research on GLOF risks.

Outcome 3: Reduced human and material losses in vulnerable communities in the Northern areas of Pakistan through GLOF early warnings and other adaptation measures

Outcome 4: Project experiences documented and replicated

The inception phase resulted in four major changes to the Project Document, as summarized below in Table 1:

PROJECT STRATEGY REFERENCE	TYPE	ORIGINAL	REVISION / ADDITION
OUTPUT 1.1	Output	Policy Framework and guidelines to address GLOF risks in northern Pakistan institutionalized	Policy recommendations and guidelines to address GLOF risks in northern Pakistan institutionalized
OUTPUT 2.2	Target		By year 2, GLOF specific simulation models for at least 2 GLOF prone mountain valleys are developed
OUTPUT 3.2	Output		A special watch group for each GLOF prone valley will be formed to establish a new or to strengthen an existing Early Warning System
OUTPUT 3.3	Target	By the end of the project, concrete engineering measures are in place to reduce the impact of GLOF events on vulnerable communities in each target valley (as appropriate: check dams, mini dams, ponds, spill ways, slope stabilization, tree plantation, controlled drainage)	By the end of the project, concrete engineering measures are in place to reduce the impact of GLOF events on vulnerable communities in each target valley (as appropriate: effective drainage systems, check dams, mini dams, ponds, spill ways, slope stabilization, tree plantation, controlled drainage)

Institutionalization of policy framework and guidelines is beyond project's scope. Rather a set of recommendations supported by a guideline prepared jointly by the Gilgit Baltistan and the project

management will be developed for passage to the Federal Secretary for National Disaster Management.

Due to the complexities involved in the hazards related to GLOF, existing disaster management plans will be modified in light of valley specific simulation models. Modified or completely new disaster management plans will emerge out of the subsequent hazard zonation and vulnerability assessment which will inform both land use and disaster management planning in a particular valley.

Regardless of peoples’ lack of sensitivity to or knowledge of GLOF; traditional early warning systems exist in all valleys due to perpetual occurrences of natural hazards such as flash floods, landslides, debris flow and seismic activity. Depending upon the preparedness of the residents of a GLOF prone valley, either existing systems will be strengthened or new systems will be installed.

Improvement in the drainage of glacial lakes will be a top most priority. All other engineering solutions will be in line with the drainage channels to ensure safety of the people and protection of property and public infrastructure.

The key project design assumptions were discussed in the inception phase workshop. The stakeholders have re-categorized following assumptions as shown in Table 2 below:

Project Document	Inception Workshop	Key Project Design Risks / Assumptions
High	High	Adverse climatic conditions may damage adaptation measures being implemented.
Medium	Low	The political and security situation in pilot districts may affect project implementation or weaken the interest of stakeholders to address adaptation planning issues.
Low	Low	Delays in recruitment of qualified project staff may affect the timeframe of different project activities.
Medium	Low	Project stakeholders may disagree on institutional mechanisms for project implementation and refrain from providing the necessary coordination.
Medium	Medium	Government co-financing contributions may only come forth in batches and may not be available in full at the beginning of the project.
Medium	Low	Lack of incentives for particular local communities to cooperate in activities that do not yield immediate financial value, but aim at longer-term resilience, may reduce stakeholder engagement and comprehensive participation.
Low	Low	Implementing partners for local level initiatives and pilot sites for project implementation may shift during project implementation, due to unforeseen (e.g. political) reasons.

The implementation strategy is summarized as follows:

The proposed project will reduce risks and vulnerabilities from GLOFs and snow-melt flash floods in Northern Pakistan. The main objectives of the project are as follows:

- To develop the human and technical capacity of public institutions to understand and address immediate GLOF risks for vulnerable communities in Northern Pakistan

- To enable vulnerable local communities in northern areas of Pakistan to better understand and respond to GLOF risks and thereby adapt to growing climate change pressures

Project implementation strategy envisions to setup two valley-based ‘Centers of Learning.’ Bagrot and Drongah valleys will serve as GLOF Prevention Field Schools where project will demonstrate how communities and district administrations are sensitized about GLOF, simulation models are developed, hazard zonation is done, hazard and vulnerability risk assessment is undertaken on participatory basis, land use and disaster management plans are prepared with stakeholder consultation. Broader multi-stakeholder involvement and community participation will ensure presence of an early warning system in each GLOF prone valley.

Early warning systems can be categorized according to the level of preparedness of each valley. Most prepared valleys will be Bagrot and Drongah that will serve as the centers of learning as GLOF prevention schools. A Project Management Unit within the Climate Change Section of the Ministry of National Disaster Management will oversee implementation of the project through its National Project Director. A multi-stakeholder Project Steering Committee based in Islamabad will provide the overall direction to the project team whereas Project Management Committees based in Gilgit Baltistan and Chitral will provide the necessary input and support for achieving project outputs.

Several amendments are proposed to the project’s Risk Log. Overall, the project is deemed low risk due to the uncertainties about viable adaptation measures and the weak project delivery systems within government.

INTRODUCTION

Background to the Project

The project titled Reducing Risks and Vulnerabilities from Glacier Lake Outburst Floods in Northern Pakistan was jointly approved by the government, the Adaptation Fund and UNDP in May 2011. The project period is May 2011 – April 2015. The project budget is \$7,600,000 with \$3,600,000 and \$500,000 in cash contributions from Adaptation Fund and UNDP respectively and the remainder in contributions in kind from the Government of Pakistan.

This Inception Report describes the initial start-up activities and refinements to the project design Project Document (ID # 00077650; PIMS # 4454). The changes identified in this report can be considered amendments to the final project design.

The major climate hazards to which the Northern Pakistan is exposed regularly include glacial lake outburst floods, flash floods from snow melt and heavy rains, landslides, debris flow and seismic activity. Climate change is expected to increase the frequency and intensity of existing climate hazards and lead to long-term vulnerability of the hundreds of thousands of people exposed to multiple natural hazards

The Himalayan Karakorum Hindukush (HKH) mountain ranges in northern Pakistan possess the largest glaciers in the world outside the Polar Regions. A major part of the snow and ice mass of the HKH region in Pakistan is concentrated in the watersheds of the Indus basin. As a result of rapidly changing climatic conditions, the glaciers in Pakistan are receding at a rate of almost 40 – 60 meters per decade. The melting ice from these glaciers is increasing the volume of water in the glacial lakes. According to the IPCC'S fourth assessment report, eleven of the last twelve years (1995 – 2006) rank among the 12 warmest years of in the history of global surface record since 1850. This rapid change in the world's temperatures is related with a faster rate of glacier melt.

Various studies suggest that the warming trend in the HKH region has been greater than the global average (ICIMOD, 2007). The most severe threat of this effect is related to the rapid melting of glaciers. The ice or sediment bodies that contain the lakes can breach suddenly, leading to a discharge of huge volumes of water and debris. These are termed Glacier Lake Outburst Floods (GLOFs) and have the potential to release millions of cubic meters of water and debris, with peak flows as high as 15,000 cubic meters per second.

According to a study conducted by ICIMOD (2007), 5218 glaciers (15040 sq km) and 2420 lakes were identified and mapped in Pakistan. Among the identified lakes, 52 lakes have been classified as potentially hazardous, and likely to cause GLOFs over the next few years to decades. Records show that on average, GLOF events occur in the Himalayas every 3-10 years, with varying degrees of socio-economic impact. A total of 35 destructive outburst floods have been recorded in the Karakoram region in the past 200 years and at least 11 surges of exceptional scale have been recorded so far in the Upper Indus Basin.

At present, the country faces a critical gap in knowledge of hydrological forecasting, risk mapping and disaster prevention planning. The information currently available about the glaciers in the water shed of the Indus basin is limited and scattered, and the understanding of the snow and ice conditions associated with the mountainous headwater of the Indus is largely inadequate.

As the current status of the identified glacial lakes is changing, the number of potentially hazardous lakes and their location/origin is shifting, and new lakes are developing rapidly, a need has developed for a formal monitoring and evaluation system to validate the information on the status of potentially hazardous glacial lakes.

Inception Phase Status

The Inception Phase from May – December 2011 includes and will include following activities:

- Appointment of a National Project Director by the Ministry of Environment & National Disaster Management.
- Appointment of a National Project Manager and an Associate Finance & Administration by UNDP.
- Recruitment process for the two Field Manager positions is underway.
- Project Results Framework was further refined in consultation with stakeholders.
- NPM has started a round of consultations with potential partner organizations for identifying activities for each of the Project Outputs.
- Draft 2012 Annual Work Plan and Budget are being prepared.
- Draft Project Workplan and Institutional Cooperation Framework have been initiated.
- Recommendations of the Government of Pakistan’s Task Force on Climate Change were incorporated in the project document.
- Inception Workshop was held on November 16th – 17th.
- Bagrot and Drongah valleys have been declared as GLOF Field Schools to serve as the Centers of Learning.

Considerations of the Government of Pakistan’s Task Force on Climate Change

A meeting of the Government’s Task Force on Climate Change was held earlier in the inception phase to consider technical, geographical, cultural, and institutional matters related to prevention of GLOF related disasters. Vulnerability analysis on the basis of GLOF hazard exposure and sensitivity mapping was considered as a critical feature for the selection of target communities to participate in and benefit from this project. The target areas have been selected on the basis of the following criteria:

1. *Technical geography:*

The target demonstration sites are representative with respect to their geographical location, area and height of glaciers, track of glacier lakes, hydrology, direction of sloping land surface, disintegrating ice and/or sediment barriers, geological structure and build-up, size of affected communities, and their general vulnerability profile. The geographical locations and other related features of the glaciers and lakes will be captured and analyzed by means of a Geographical Information System (GIS) under Component 2 of the project.

2. *Recurring GLOF events / history:*

Recurring GLOF events have been identified through a time series analysis, using existing maps, satellite data and other records available from different years.

3. *Affected communities and accessibility of the area:*

Considerations have included: The size of the community under consideration, the number of persons exposed to flooding risk; population density, traditions/culture of the community, present land use, accessibility and livelihood structure, awareness level of community about the possible impacts of GLOF.

Based on verification of the above criteria with local stakeholders, two potentially hazardous glacier lakes in Gilgit-Baltistan and Chitral have been identified as target sites for the project: The **Bagrot valley** in Gilgit-Baltistan is considered at high risk of GLOF from the Bagrot Glacier. Bagrot valley covers an area of 452 km². It is characterized by an extreme geomorphological relief, ranging from 1500 m up to 7788 m at the summit of Rakaposhi. The main valley glaciers are Hinarche, Burche, Gutumi, and Yune while several smaller cirque glaciers exist in the higher reaches.

The glaciated area is about 42.3 km² and major part of the lower tongue is covered by supra-glacial debris, similar to the other glacier tongues in the valley. The valley has 1100 households with an estimated population of 10,000 people. Similarly, **Drongah** has been selected as a demonstration site in Chitral. The village lies in the vicinity of Gohkir Glacier. has almost 500 households with a population of almost 3500 people and lies at a distance of approximately 40 kms from Chitral municipality. Both sites are highly vulnerable to flooding related to glacial lake outbursts or glacial outbursts, which occur almost every year. The floods do not only result in damages to community infrastructure, communication networks, roads and crops, but also cause human casualties.

Technical considerations for the design of an Early Warning System (EWS):

Existing flood early warning systems in the 2 target sites of Bagrot Valley and Drongah will be established to enable the dissemination of flashflood warning signals on a 24 hour basis. EWS design is expected to involve:

- i) Threat detection (sensor), relay and warning stations;
- ii) GLOF watch advisories issued by Pakistan metrological department (PMD) to communities at risk via print and electronic media
- iii) Establishment of an SMS messaging system to communicate warning signals to community based organizations, local NGOs and Government departments;
- iv) Establishment of a central voice response system where end users may get flood risk information via phone/mobile call around the clock;
- v) Early warning awareness and training workshops for community, NGOs, government and media representatives to ensure that EWS procedures are internalized;
- vi) Real-time mock drills at community level to simulate a GLOF disaster and verify functionality of the EWS

Selected community and NGO members will be trained in the calibration, operation and maintenance of sensor equipment installed by PMD at the target sites.

Technical considerations for the design of community-based GLOF risk mitigation measures:

Potential outburst flood hazards can be alleviated by various techniques. The primary objective is to reduce the risk of a flood from the lake. However, coordinated measures to protect life and property in the downstream area must also be undertaken, hence the importance to combine these techniques with EWS-based mechanisms downstream. The most common structural mitigation measures are aimed at reducing the volume of water in the lake. Reduction of the volume of water in the lake should reduce the potential peak surge discharge as well as the hydrostatic pressure exerted on the moraine dam, and is the most effective mitigation measure. There are different ways to achieve this that can be used alone or in combination:

1. Controlled breaching of the moraine dam
2. Construction of an outlet control structure
3. Pumping or siphoning the water from the lake
4. Tunneling through the moraine barrier or under an ice dam

Mitigation measures must be brought into play in such a way that no unintentional increase in danger occurs. Since moraine dam stability is a major part of the problem, it follows that artificial disturbance of the dam itself during construction activity could actually increase the degree of danger while mitigation measures are being put into place. Thus, choice of an appropriate method for each individual lake is critical. Physical monitoring systems for the dam, lake, glacier, and surroundings are necessary at all stages of the mitigation process.

In addition to reducing the volume of lake water, there are other preventative measures around the area that can help reduce the likelihood, or impact of, a GLOF. These include removing masses of

unstable rocks to guard against avalanches or rock falls hitting the lake surface and causing a surge wave, and protecting infrastructure in the downstream area. Other measures include check-dams, mini dams, spill-ways, slope stabilization and -reinforcement. Check dams are helpful in reducing the flow of water coming down by gravity flow and conserving soil and thus provide downstream protective measures. Removing or restraining trigger mechanisms include stabilization of adjacent slopes. Slope stabilization may be through vegetation or engineering structures.

In all structural mitigation measures undertaken by the project, experience from other GLOF risk reduction projects (including GLOF risk reduction projects in India, China, Nepal and Bhutan) will be integrated and adopted where appropriate.

PROJECT DESCRIPTION

Project Design Concept

The project will help by reducing climate change induced risks and vulnerabilities from GLOFs in the Northern Areas of Pakistan by encouraging community based adaptation measures for climate change induced GLOFs. The components of the project are described below.

Component 1: Policy recommendations & institutional strengthening to prevent climate change induced GLOF events in northern Pakistan

This project component responds to the need for systematic integration of GLOF risk management into the processes, policies and plans of institutions that have a stake in avoiding human and material losses from GLOF events in vulnerable areas of northern Pakistan. Project inputs will be utilized to develop the capabilities of local level institutions and federal level institutions to understand the nature and extent of GLOF risks in Pakistan, and their effects on human and economic development in all sectors. Targeted, evidence-based policy recommendations on GLOF prevention and risk management will be prepared and disseminated for adoption at national and provincial levels, which will enable the integration of GLOF risk awareness in all potentially affected sectors. Contingency plans & incentive schemes to address GLOF risks at the policy level will be developed, based on collaboration between affected stakeholders.

Component 2: Strengthening Knowledge and Information about GLOF risks in northern Pakistan

This project component addresses the need for more accurate and comprehensive knowledge of glacier lakes and their associated flooding risks in northern Pakistan. Such knowledge is essential for better risk mapping, early warning and disaster prevention planning. Based on a targeted mapping exercise of flooding hazards downstream of potentially hazardous glacier lakes, a locally anchored knowledge base & analytical framework for long-term tracking & management of GLOF risks will be developed. Systematic networking and exchanges with global & regional research institutions and resource centers, as well as with other GLOF risk management projects in the region will contribute to a widening the knowledge base about GLOF risks in Pakistan, eventually leading to a critical mass of knowledge required for specific and targeted risk reduction investments. Existing indigenous knowledge, cultural beliefs and coping mechanisms to address flooding risks in Northern Pakistan will be documented and factored into the risk reduction and preparedness activities employed by this project.

Component 3: Demonstration of community-based GLOF risk management in vulnerable mountain valleys of northern Pakistan

Adaptation Fund resources will be used to demonstrate GLOF risk management at the village and district levels, with the aim to provide an evidence base for replication and up-scaling. Based on the systematic capturing of hazard information and vulnerabilities in Component 2, awareness raising

activities will be undertaken to educate disaster-prone communities about the nature of GLOF risks, the particular behavior of GLOF events, evacuation routes and appropriate early warning and risk reduction measures. These awareness activities will be connected with the production and dissemination of communication products, such as posters, leaflets and videos illustrating the topic. Institutional arrangements to devise, operate, test, and maintain a community-based GLOF risk monitoring & early warning system will be established in at least 2 high-risk target communities, providing an evidence base on the strengths and weaknesses of different types of high- and low-tech early warning systems. Based on such analyses, a prototype GLOF Early Warning system will be devised for replication in other vulnerable areas. In addition to the demonstration of an Early Warning system, the project will demonstrate targeted GLOF risk mitigation measures for at least 2 communities which are located in high-risk sites.

Component 4: Documentation, analysis and continued application of lessons learnt

Building on participative processes initiated under Components 1 and 2 of the project, and drawing on the technical experiences in the establishment of early warning and risk mitigation measures under Component 3, Component 4 of the proposed project will introduce targeted activities to enable the analysis, replication and up scaling of the project approach in other communities who are vulnerable to GLOF risks. This will entail a campaign to present the findings from the project to different public entities and development partners, as well as other district entities with similar degrees of vulnerability. This campaign will integrate all vulnerable districts and aim at the replication of the project approach in at least 3 other vulnerable areas. Exchange programmes to the target sites will be facilitated to promote learning and transfer of experience (especially with regards to the design of coupled EWS that covers as many vulnerable mountain valleys as possible).

By taking a systematic approach to the codification, analysis and dissemination of knowledge about GLOF risks and how they can be addressed, the project will allow replication of effective risk reduction measures for GLOF both within Pakistan and beyond. This systematic management will assist the replication of early warning systems and targeted risk mitigation measures in other GLOF prone areas in northern Pakistan. Other countries facing GLOF risks, such as China, India, Nepal and Bhutan, will also benefit from the knowledge generated through the project. This proposed initiative will contribute to a critical mass of experience on GLOF risks in the Himalaya region and enhance systematic regional cooperation on this critical adaptation issue.

Key Challenges

Logistical remoteness of the area has increased after damages to Karakorum highway in the aftermath of the super floods in 2010. The time for road travel from Islamabad to Gilgit town has doubled, now it takes more than 20 hours of a road trip to reach Gilgit from the Capital. Then, it is another 2 hours drive to reach the glaciers from Gilgit. In Case of Chitral, it can be accessed from two roads one coming from Gilgit which takes 12 hours drive to reach Chitral town and the second that passes through a tunnel connecting Chitral with Islamabad take equally long travel time. Approach to the glaciers is Drongah takes another 4 hours of drive from the proposed field office. Northern Pakistan is still recovering from the disaster of the 2010 super floods caused by cloud burst.

Domestic air routes are available with daily flights to both Gilgit and Chitral towns from Islamabad. However, flights are subjected to weather.

Since 2004, climatic conditions of Gilgit Baltistan and Chitral have become harsher than before because of the extreme temperatures of both summers and winters. Glacial sites of the project are only accessible from May till November. Five months of the year most of the glacial sites in the region remain snow bound.

Will of the communities has to be matched by the skills of the project team members and capacities of the potential partner organizations, especially line departments. Project will have to do a careful

selection of the field managers and their immediate team members because human resource turnover is high in Gilgit Baltistan and Chitral because professionals from down country rarely seek opportunities in such remote and logistically difficult areas. Availability of experienced professionals in the project's targeted area is scarce and it takes much longer to find the right candidates for the job. This explains the delay in the hiring of a full project team.

GLOF prone valleys are afflicted with multiple hazards such as flash floods caused by heavy rains and snow melt, landslides, debris flow and seismic activity. The ultimate early warning systems, land use management, and disaster management plans will have to incorporate all prevailing hazards in the area for the sake of the participating communities without losing focus on GLOF.

The most critical challenge faced by the project is its small size and limited time in comparison to the sheer size of the GLOF problem in Northern Pakistan (Gilgit Baltistan and Chitral).

PROCEEDINGS OF THE INCEPTION WORKSHOP

Day One (15 November 2011): Project Launching Ceremony

The project launching ceremony held on 15 November 2011 at Serena Hotel in Gilgit was chaired by the Gilgit Baltistan Administration Secretary for Environment, Forests, Wildlife, and Minerals Haji Abdul Hameed. The National Project Manager Mr. Khalil Ahmed in his welcome remarks expressed his gratitude to the guests who had gathered to attend the ceremony in spite of a public holiday (see annex # 1 for the workshop agenda and list of participants). The National Project Director Syed Mujtaba Hussain elaborated on the inception phase of the project and highlighted the importance of the Glacial Lake Outburst Flood (GLOF) prevention for the people and the government. He used this opportunity to express Government's sense of urgency in addressing the impact of climate change and unfolded the mandate of the newly restructured Ministry of Environment and National Disaster Management. Later Syed Mujtaba Hussain spoke about the project implementation arrangements in detail. He stressed upon the need for greater stakeholder participation in achieving project goals.

The Regional Technical Adviser to UNDP Mr. Gernot Laganda speaking on the occasion highlighted the methodical approach used to assess the risks associated with GLOF. He stressed that GLOF prevention requires scientific modeling, hazard zonation and vulnerability assessment before any land use or disaster management planning is done. He hoped for greater cooperation amongst international non-profit organizations such as WWF, IUCN, Red Crescent Society, and others that have conducted hazard mapping and vulnerability assessment in the project area for multiple natural hazards. However, he realized that GLOF related hazards and vulnerabilities have not been understood well and require much needed cooperation amongst similar projects being implemented in the Himalayas, Karalorum, HinduKush, Alps and the Andes.

The Assistant Country Director for UNDP Mr. Abdul Qadir Rafiq speaking on the occasion highlighted the fact that UNDP understands Pakistan's need for adaptation to climate change, especially in the Northern part of the country. He highlighted the fact that since 1996, UNDP has assisted the Government of Pakistan in implementing various projects to enable the government in adaptation to the climate change. These projects are Biodiversity Conservation Project, Mountain Areas Conservation Project, Pakistan Wetlands Programme, Promotion of Energy Efficient Cooking and Heating, and now in collaboration with the Adaptation Fund a project for Reducing Risks and Vulnerabilities from Glacier Lake Outburst Floods in Northern Pakistan in being launched with full government support.

The Guest of Honor, Secretary to the Gilgit Baltistan Administration Haji Abdul Hameed addressed participants by emphasizing on the need for unity of purpose for making our efforts for the adaptation to the climate change, especially GLOFs. He noted that in recent years GLOF related events have

increased tremendously. Since 1994, over a dozen of GLOF events have occurred in Northern Pakistan. GLOFs have been reported in Drongah area, Buni, Sanoghar, Darkut, Karamber, Bagrot, Gulkin, Gulmit, Passu, Astore, Diamer and Skardu area. Then formation of Hunza Lake is just another phenomenon altogether. He welcomed UNDP's assistance to the Government of Pakistan and appreciated Adaptation Fund's interest in minimizing the climate change related risks in Pakistan. He wished the project team successful implementation of the project and extended his full support.

Field Visit to Bagrot Valley

Thirty out of seventy participants were invited to the field visit to Bagrot valley, one of the two project sites. The purpose of the field visit was to familiarize representatives of the potential partners organizations and relevant line departments with the project site and more importantly with the community representatives with whom the project team will work for next four years. The field exposure was planned to enable the thirty participants to review project documents and discuss strategies in light of ground realities.

Day Two (16 November 2011): The Objectives of the Inception Workshop

The inception workshop facilitator Mr. Faisal Farooq Khan presented the objectives of the workshop to the participants. The presentation informed the partner organization representatives about the expectations from them and what is it that they can expect from the project. Facilitator informed them that he will assist them in identifying their organization's role and responsibilities in project implementation. Following are the sessions of the inception workshop that were delivered over a period of two days:

- Informing Stakeholders about Project Design
- Verification of Results Framework
- Fine Tuning of Annual Work Plan (Year-1)
- Understanding Project Management (PCOM) Requirements of UNDP assisted Projects
- Defining M&E Methodology and Climate Change Risk Management Strategy
- Institutional Cooperation Needed from Partner Organizations
- Describing Governing Structure of the Project
- Way Forward

Introduction to the Project Design and Strategy

National Project Manager (NPM) Khalil Ahmed presented the overall project design and implementation strategy of the project (please see pages 4 and 5 above). Elaborating on project strategy he explained that selection of two valleys is entirely for demonstration purposes and does not necessarily address the top two GLOF hotspots in the region. The participants enquired why Karamber valley, Yarkhun valley, Diamer valley and Skardu valley were not considered for demonstration purposes. Facilitator Faisal Farooq Khan explained that the idea is to develop logistically manageable sites as 'the centers of learning' by conducting simulation modeling, hazard zonation, vulnerability assessment for developing land use-cum disaster management plans in participation with the communities and organizations like WWF, IUCN, PRCS, FOCUS and GBDMA that have already done a lot of work to address risks emanating from flash floods, landslides and earthquakes. He further added that an early warning system for preventing safety from GLOF can only be effectively developed after above mentioned outputs have been delivered. NPM said that selection of Bagrot and Drongah offers the opportunity to capitalize on the enhanced capacities of the potential partner organizations, which will save time and as well as make already trained staff available.

Realizing the increased vulnerability of the populations living in other hotspots of Northern Pakistan, facilitator stressed that the overall remote sensing mentioned earlier by NPM will enable the project team in pinpointing trouble spots while the work in the two selected sites for demonstrating GLOF

safety and an early warning system will set the benchmark for other communities. Workshop participants endorsed the project strategy to treat two selected GLOF prone valleys as GLOF Field Schools where communities, government line departments, partner organizations and the project team will collaborate mutually to demonstrate GLOF safety measures and arrange for exposure visits by other vulnerable communities to learn and adapt. Selected representatives of vulnerable communities from each GLOF prone valley will visit the project sites to develop their own valley-specific early warning systems.

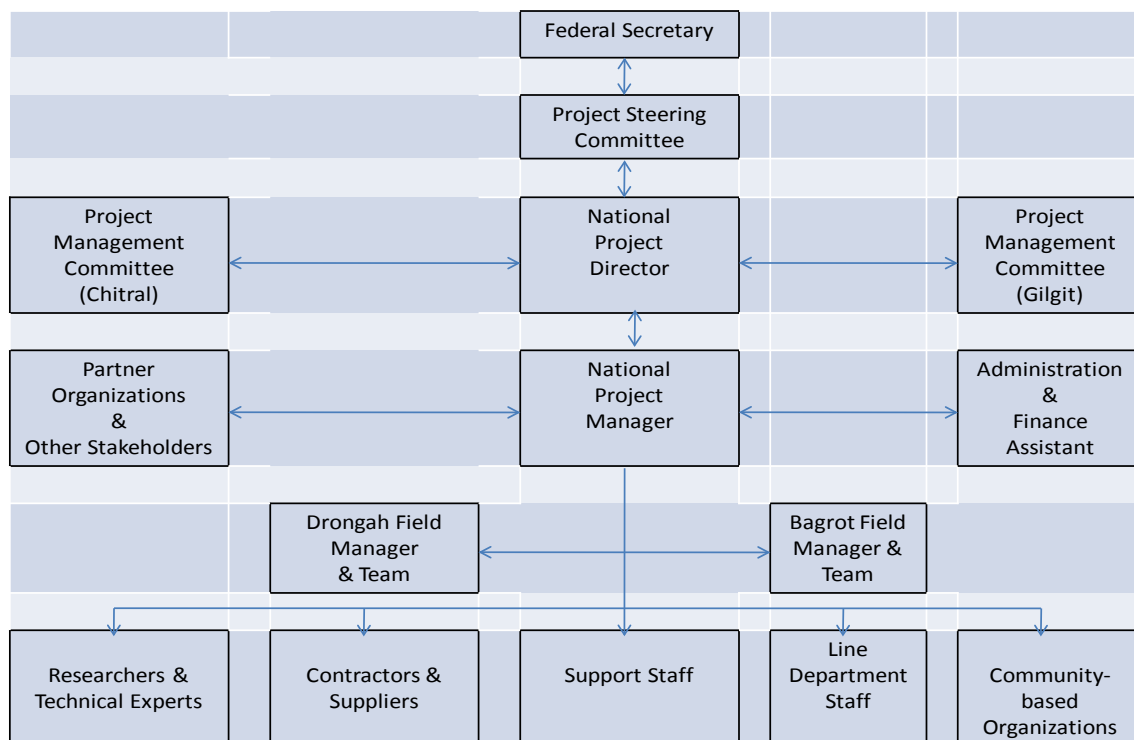
UNDP Assistant Country Director Mr. Abdul Qadir Rafiq explained that during the year 1, project team will focus on streamlining baseline information, strengthening partnerships, and bring every relevant government department on board. A list of prioritized valleys will be developed after involving on-ground government functionaries at the district level. The prioritization of the GLOF prone valleys will be endorsed by the Director General of GBDMA.

Regional Technical Advisor of UNDP Mr. Gernot Laganda stressed on the importance of the scientific input required to ensure GLOF safety measures. He seconded Mr. Rafiq’s statement and said that baseline information needs to be categorized as scientific, technical, social and economic. Explaining further, he said that a repository of imagery and other knowledge products have to be built in the form of a database with web-links to other participating organizations. Similarly, other partner organizations such as WWF, IUCN, PRCS, FOCUS and GBDMA will share their secondary data with the project team and make it available to the project database.

Project Implementation

In absence of the National Project Director (NPD), the facilitator made references to NPD’s presentation made on the first day of the workshop. Facilitator revisited the project organizational chart to reiterate the roles and responsibilities of both key positions and stakeholders. Please see figure 1 below for a complete picture.

GLOF Project Organizational Chart



The Project Steering Committee (PSC) to be Chaired by the Federal Secretary for Environment and National Disaster Management or his/her appointed representative will exercise overall executive authority and responsibility for project activities, results, performance and reporting, as well as financial management and expenditures oversight. The PSC is assisted by two regional Project Management Committees (PMC)s which are an advisory and technical guidance body intended to engage an array of stakeholders in project activity planning and implementation in Gilgit Baltistan and Chitral. Membership of PMCs will be much broader to include regional representatives of partner organizations, government line departments, local academia and communities. NPD will provide routine support and direct guidance to NPM and his team and Contractors in the implementation of specific components of the project.

The facilitator described an overall implementation strategy aiming at achieving eight major objectives, which are mentioned below:

1. To ensure application of adaptive management and setting of annual milestones to monitor performance of partner organizations and overall project progress.
2. To serve as a grant manager for partner organizations. Disbursements will be strictly tied to performance, accountability and transparency in fund utilization. Moreover, each project partner will be required to contribute financially and/or in-kind depending upon the nature of deliverables.
3. To leverage existing financial, material, and social resources separate contracts will be signed with potential partners including community-based organizations to ensure value addition through resource multiplication and timely delivery of project outputs.
4. To resolve the trained human resource scarcity problem the project will access trained manpower through partnerships.
5. To bring dispersed information and data to a common platform the project will establish a web-linked database.
6. To ensure Government's support of the overall approach, methodology and implementation strategy the project will engage both GBDMA and KPK-PDMA in the field activities.
7. To enhance technical skills of the project team and relevant staff members of partner organizations the project will seek to firm up cooperation with international organizations implementing climate change risk management projects in the HKH, the Alps and the Andes regions.
8. To disseminate and replicate best practices in other hotspots of the HKH region the project will showcase two selected valleys as GLOF Field Schools.

Project Results Verification Exercise

Facilitator conducted a comprehensive results verification exercise on the second day of the workshop. Four major changes were proposed after long deliberations that were necessary for seeking clarifications largely for conceptual understanding and identifying roles and responsibilities of each potential partner organization. In table 3 below changes are highlighted in bold for each reading.

PROJECT STRATEGY REFERENCE	TYPE	ORIGINAL	REVISION / ADDITION	REMARKS
OBJECTIVE	Indicator	Number of people living in Gilgit-Baltistan and Chitral suffering losses from extreme weather events	Number of people living in Gilgit-Baltistan and Chitral suffering losses from GLOF	Northern Pakistan is a multi-hazard prone region and it is necessary to distinguish GLOF related events to ensure resources are used for GLOF related initiatives only.

OUTCOME 1	Indicator	Number of policies introduced to address GLOF risks or adjusted to incorporate GLOF risks	Number of policy recommendations made to address GLOF risks or adjusted to incorporate GLOF risks	It is beyond the scope of project to introduce policies rather the NPD will make policy recommendations to his Federal Secretary who will then cooperate with the Planning Commission to formulate a policy for the Cabinet Committee's consideration.
OUTPUT 1.1	Output	Policy Framework and guidelines to address GLOF risks in northern Pakistan institutionalized	Policy recommendations and guidelines to address GLOF risks in northern Pakistan institutionalized	A set of recommendations supported by a guideline prepared jointly by the line department cooperating with the project management will be developed for passage to the Federal Secretary for National Disaster Management.
	Target # 2	By the end of the project, existing DRM guidelines integrate longer-term climate risk planning	By the end of the project, existing DRM guidelines integrate longer-term climate change risk planning	Climate risk planning is rephrased to climate change risk planning.
	Baseline	No comprehensive disaster management guidelines exist for the Gilgit-Baltistan and Chitral regions	No comprehensive disaster management guidelines addressing GLOF exist for the Gilgit-Baltistan and Chitral regions	GBDMA in collaboration with UNDP has developed a Disaster Management Plan which were further elaborated into nine valley specific plans. However, none of them refer to GLOF related risks.
OUTPUT 1.2	Risk/Assumption		NOCs are obtained from relevant authorities for accessing restricted sites	Gilgit Baltistan is an internationally disputed area therefore it is anticipated that project might need NOCs from the government if

				necessary. Moreover, Pakistan Metrological Department is a potential project partner that can obtain required NOCs.
OUTPUT 2.1	Source of Verification		MoUs / agreements Website linkages	To firm up cooperation with global and regional research networks and centers working on GLOF issues a series of MoUs and agreements will be signed with the project and the ministry respectively.
OUTPUT 2.2	Target		By year 2, GLOF specific simulation models for at least 2 GLOF prone mountain valleys are developed	Due to the complexities involved in the hazards related to GLOF a simulation model and fore/back casting will be done to inform the hazard zonation and vulnerability assessment process.
OUTCOME 3	Language			“No” is changed to number and spelling of “Drongagh” is corrected to Drongah.
OUTPUT 3.2	Output		A special watch group for each GLOF prone valley will be formed to establish a new or to strengthen an existing Early Warning System	Regardless of peoples’ lack of sensitivity to or knowledge of GLOF; traditional early warning systems exist in all valleys due to perpetual occurrences of natural hazards such as flash floods, landslides, and debris flow. Depending upon the preparedness of the residents of a GLOF prone valley, either existing systems will be strengthened or

				new systems will be installed.
	Source of Verification		GLOF watch group meeting attendance and note for records	Strengthening of traditional practices on more methodical basis in the form of GLOF watch groups will be further complimented by documentation of their concerns, decisions and actions throughout project's life time.
	Risk / Assumption		Valley wide traditional communication systems are in place	The communities of Northern Pakistan have a centuries old tradition of survival on self-help basis.
OUTPUT 3.3	Target	By the end of the project, concrete engineering measures are in place to reduce the impact of GLOF events on vulnerable communities in each target valley (as appropriate: check dams, mini dams, ponds, spill ways, slope stabilization, tree plantation, controlled drainage)	By the end of the project, concrete engineering measures are in place to reduce the impact of GLOF events on vulnerable communities in each target valley (as appropriate: effective drainage systems , check dams, mini dams, ponds, spill ways, slope stabilization, tree plantation, controlled drainage)	Improvement in the drainage system of the glacial water is a top most priority. If barriers or constraints in draining of a GLOF prone glacier remain unresolved than other options discussed will be considered.
	Source of Verification		Structural designs Completion designs	For every physical intervention proper technical designs or plans will be prepared and implementation will be confirmed by preparing built drawings to assess compliance.
	Risk/Assumption	EIA yields positive result for the mitigation	IEE yields positive result for the mitigation measures under	EIA takes longer and is by law only required for mega construction projects.

		measures under consideration	consideration	Due to the expected limited scope of construction activities in the GLOF project, only initial environmental examination (IEE) will be conducted.
OUTPUT 4.1	Indicators		Number of knowledge products	A dearth of maps exist with PMD, SOP, NDMA, Flood Commission, MoE (MoNDM), WAPDA, WWF, FOCUS, PRCS and IUCN. However, none of them adequately if at all dealt with issues related to GLOF. Over a period of four years, the GLOF project will generate new relevant maps, reports, models, integrated educational communication materials, case studies and teaching modules.
	Baseline		Inaccessibility to maps, reports, remote imagery and case studies	Over a dozen entities have produced multipurpose materials on natural hazards but have not been compiled and deposited in a repository or database. Information is rather dispersed and difficult to access.
	Target	By the end of the project, a project website is established and linked to the GLOF risk database developed under Outcome 1	By year 2 of the project, a project website is established and linked to the GLOF risk database developed under Outcome 1	A database developed by the project and web-linked with all partner organizations is necessary and cannot be delayed till end of the project. Rather it should start functioning by the year 2 if not earlier.

OUTPUT 4.2	Typo error	Output 4.2. Project experiences disseminated to policy makers ad disaster management planners in Pakistan and the wider HKH region	Output 4.2. Project experiences disseminated to policy makers and disaster management planners in Pakistan and the wider HKH region.	
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Summary of Discussions held on Day Two

Introducing new policies or new policy guidelines will be beyond the scope of the project. Rather project will focus on making policy recommendations to all relevant ministries and sectors to mainstream GLOF across the board. Policies identified for mainstreaming of GLOF are National Conservation Strategy, National Water Management Policy, National Disaster Management Policy, National Environmental Action Plan, Poverty Reduction Strategy Paper, etc.

Synergies between and amongst various organizations emerged. For example for policy related work IUCN and KIU can converge their energies to translate valley based disaster management plans, land use plans, HVRA reports, socio-economic survey reports, best practices in disaster risk reduction and indigenous wisdom into policy recommendations and guidelines.

For baseline studies PMD, WWF, IUCN, UNDP, and SLFP can integrate their existing knowledge to develop a comprehensive baseline data that can serve as a baseline for the project. Similarly, imagery produced by GBDMA, WWF, FOCUS, Flood Commission, Nazir Sabir Expeditions, WAPDA and PMD can provide a solid remote sensing foundation for overlaying GLOF related information. A cohort of volunteers will be provided by PRCS and KIU for undertaking surveys and field visits. Together remote sensing, ground truthing and secondary data can provide a solid baseline for project by end of the first quarter of 2012 whereas remote sensing for baseline should be completed by second quarter of 2012.

Project has the potential to develop key partnerships for which it will enter into output based contracts with each organization. Bagrot and Drongah valleys will serve as GLOF field schools for which project will enter into MoUs with valley wise community-based organizations. A need for proper training of volunteers was noted and KIU offered its facilities for providing short courses for GLOF sensitization. However, KIU will have to hire an instructor who has the required knowledge of GLOF, probably a glaciologist. All project team members, staff members of partners organizations, relevant government officials, community activists and media representatives will be sensitized about GLOF. Moreover, capacity building of GBDMA, PDMA (KPK), district authorities and communities is absolutely necessary and requires a need assessment exercise to determine the scope and extent of trainings.

Project duration of four years is too short for a comprehensive baseline and inventorying of all glaciers in Gilgit Baltistan and Chitral. Therefore, project baseline will be updated periodically and identification/prioritization of glacial hotspots will be reviewed annually in a port-project scenario. Field surveys will be conducted in close coordination with district authorities. The project can seek verification of data accuracy from community-based organizations, district authorities, GBDMA, and PMD.

Cooperation with international experts for glacial lake modeling and hazard zonation will be secured before the year 1 of project implementation because simulation modeling is a must before embarking upon HVRA and hazard zonation which leads to land use and disaster management planning. A peer

review group will be formed for quality control and quality assurance of maps, plans, reports and any other knowledge products. The peer review group might be led by PMD.

For prevention of GLOF, physical intervention could take any shape but the preferred choice would be to drain a glacial lake by building a spill way or a drain. All other interventions like check dams, slow action dams, gavial walls, retention walls, tree plantations, and soil stabilization will be preferably in support of the drainage channel because due to the magnitude of the GLOF these interventions cannot provide protection on their own. EIAs will only be required for large size physical interventions whereas for all smaller or associated interventions IEEs will be sufficient.

Community representatives from both Bagrot and Drongah valleys reported that indigenous early warning systems are already in place. Importance of existing communication systems was highlighted by the office bearers of community-based organizations with a caution that modern early warning systems should be closely linked to the traditional practices and existing communication lines. A need for safe havens for the vulnerable communities was strongly felt and it was hoped that after simulation modeling and hazard zonation safe havens can be easily identified. Indigenous knowledge and traditional practices have to be documented for informing modern early warning systems.

Special watch groups consisting of herders, trekkers, guides, CERTs, etc. will be formed in each GLOF prone valley to monitor glacial lakes and debris flow during and after heavy precipitation. The watch groups will also be tasked with monitoring of the newly automate early warning water systems. The watch groups will also serve as the link between automated early warning systems and traditional communication system for enhanced sustainability and reliability of new arrangements for GLOF safety.

A knowledge-attitude-practices survey will be conducted in every hot spot to map the existing behavior towards natural hazards and corresponding safety measures. Then on the basis of the findings, a GLOF communication strategy will be developed for awareness raising. New tools based on integrated education and communication methods will be developed to reach out to school children, college students, household women, elderly, and working wo/men that daily commute to work outside their valleys.

A need for safe havens and associated stockpiles was strongly felt not only for GLOF related risks but also for other natural hazards such as flash floods caused by snow melt and flash floods, debris flow, avalanches, landslides and earthquakes. It was discussed that early warning systems should be developed in such a way that regardless of the nature of hazard, it should enable the vulnerable population to reach a nearby safe haven well in time.

It is possible that after project is informed by survey reports, spatial analyses, simulation models and newly realized ground realities the PSC might consider modifying the project design in the aftermath of the mid-term review to be held after two years of project implementation.

Project Cycle Operations Management

UNDP's Finance & Administration focal point for the project Mr. Muhammad Saleem made a detailed presentation on PCOM to familiarize project team and the potential partner organizations with the standard operational procedures for cash flow management, procurement, recruitment, human resource management, inventory management, and overall reporting. Mr. Saleem also elaborated upon authority matrix for approval of expenditures and managing project bank account.

Monitoring & Evaluation for Climate Change Risk Management

The M&E mechanism based on UNDP's prescribed approach as detailed out in the project document was adopted by the participants in its true spirit after UNDP RTA Mr. Gernot Laganda emphasized on the importance of the baseline verification and criticality of monitoring and evaluation function for

reducing GLOF related risks in the project area. The following passage of the project document was adopted in the inception workshop.

Project monitoring and evaluation (M&E) will be in accordance with established UNDP procedures and will be carried out by the Project team, verified by the Ministry of Environment, Government of Pakistan and the UNDP Country Office in Islamabad. Dedicated support by the technical adaptation teams in the UNDP Regional Center for Asia/Pacific and UNDP New York will be provided on a regular basis. A comprehensive Results Framework of the project will define execution indicators for project implementation as well as the respective means of verification. A Monitoring and Evaluation system for the project will be established based on these indicators and means of verification.

A UNDP risk log will be regularly updated in intervals of no less than every six months in which critical risks to the project have been identified. Quarterly Progress Reports will be prepared by the Project team and verified by the Project Steering Committee. Annual Project Reports will be prepared to monitor progress made since project start and in particular for the previous reporting period. These annual reports include, but are 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);*
- *Lessons learned/good practices;*
- *Annual expenditure reports;*
- *Reporting on project risk management.*

Government authorities, members of Steering Committees and UNDP staff will conduct regular field visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress.

In terms of financial monitoring, the project team will provide UNDP with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of funds according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted by a legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

The project will undergo an independent Mid-Term Evaluation (MTE) at the mid-point of project implementation, which will determine progress being made toward the achievement of outcomes and 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. A summative Terminal Evaluation will be conducted 3 months before project closure.

The budgeted Monitoring & Evaluation plan adopted from the project document is shown in table 4 below:

Type of M&E activity	Responsible Parties	Time frame	Remarks
Inception Workshop (IW)	National Project Coordinator UNDP CO	Within first 6 months	IW conducted from 15 to 17 November, 2011
Inception Report	<ul style="list-style-type: none"> ▪ Project Team ▪ UNDP CO 	Within 1 month of IW	IW 'draft' report submitted on 22 November 2011
Measurement of Means of Verification for	National Project Coordinator	Start, mid and end of project	To be done by end of the year 2011

project indicators			
Annual and Quarterly Progress reviews	Project Team UNDP-CO	Quarterly and Annually	First Quarterly Report will be due in the second week of January 2012
National and Provincial Steering Committee Meetings	<ul style="list-style-type: none"> ▪ National Project Coordinator ▪ UNDP CO 	Following Project IW and subsequently at least once a year	PSC and PMCs will be notified in December 2011 followed by inaugural meetings
Periodic status reports	<ul style="list-style-type: none"> ▪ Project team 	To be determined by Project team and UNDP	Monthly short status reports mainly for programme communication
Technical reports	<ul style="list-style-type: none"> ▪ Project team ▪ Hired consultants as needed 	To be determined by Project Team and UNDP	On need basis
Mid-term External Evaluation	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP- CO ▪ External Consultants (i.e. evaluation team) 	At mid-point of project implementation.	Due by end of 2013
Terminal Report	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP-CO ▪ External Consultant 	At least 1 month before the end of the project	In April 2015
Audit	<ul style="list-style-type: none"> ▪ UNDP-CO ▪ Project team 	Yearly	Report due in second quarter of each year
Visits to field sites	<ul style="list-style-type: none"> ▪ Project staff ▪ Government representatives 	At all stages of project implementation	On-going
Final Evaluation	<ul style="list-style-type: none"> ▪ Independent external Consultants 	Six months prior to the terminal tripartite review meeting.	

Common Risks and Challenges in Climate Change Adaptation Projects

UNDP Regional Technical Advisor Mr. Gernot Laganda iterated that a climate change adaptation project helps a community to better understand and manage new and emerging risks in a changing environment. However, he cautioned about ten factors that could actually prove counterproductive if not managed properly, these are:

1. Institutional arrangements does not necessarily enable effective project delivery
2. Lack of involvement by other ministries or departments can slow down project progress

3. Poor or incomplete baseline information disable projects in measuring their success or failure
4. Projects get carried away with field activities losing focus on results
5. Technical aspects of the intervention gets compromised because of logistical and social pressures
6. Breakdown of project's communication with key stakeholders creates unnecessary information gap and perceptual issues
7. Remoteness of project location and hardship of actions isolate a project from larger risk management scenario, which neutralizes its impact
8. Absence of a phasing out or exit strategy makes a project unstable failing in realizing the impact expected from its activities
9. Overrating of achievements give a false sense of success which inhibits project team from analyzing critical factors affecting the project
10. Inability to reach out to the marginalized segments of the community can politicize a project

Towards the end of his presentation Mr. Laganda gave three principles of good project management, which are always keep the larger picture in mind, involve all stakeholders and communicate effectively with them.

Standard Risk Categories Each Project Should Monitor

UNDP Regional Technical Advisor Mr. Gernot Laganda emphasized that each project must monitor seven basic risks to ensure damage control through adaptive management. These seven categories of risks are as follows:

1. Environmental
2. Operational
3. Political
4. Financial
5. Organizational
6. Regulatory
7. Strategic

He explained that classification of above mentioned risks is based on the level of control over the project. However, some risks are uncontrollable such as environmental, regulatory, and political risks whereas operational, financial, organizational and strategic risks are manageable.

UNDP Services to the Project and Adaptation Fund

UNDP's Management Associate Mr. Bilal Ali Qureshi highlighted the value of UNDP's institutional support to the project and through the project to partner organizations. The following UNDP services documented in the project document were further stressed upon in the inception workshop for better understanding of the stakeholders.

Stage	UNDP Services
Identification, Sourcing and Screening of Ideas	Provide information on substantive issues in adaptation associated with the purpose of the Adaptation Fund (AF). Engage in upstream policy dialogue related to a potential application to the AF. Verify soundness and potential eligibility of identified idea for AF.

Stage	UNDP Services
Feasibility Assessment / Due Diligence Review	<p>Provide up-front guidance on converting general idea into a feasible project/programme.</p> <p>Source technical expertise in line with the scope of the project/programme.</p> <p>Verify technical reports and project conceptualization.</p> <p>Provide guidance on AF Board expectations and requirements.</p>
	<p>Provide detailed screening against technical, financial, social and risk criteria and provide statement of likely eligibility against AF requirements.</p> <p>Assist in identifying technical partners.</p> <p>Validate partner technical abilities.</p> <p>Obtain clearances from AF.</p>
Development & Preparation	<p>Provide technical support, backstopping and troubleshooting to convert the idea into a technically feasible and operationally viable project/programme.</p> <p>Source technical expertise in line with the scope of the project/programme needs.</p> <p>Verify technical reports and project conceptualization.</p> <p>Provide guidance on AF expectations and requirements.</p> <p>Verify technical soundness, quality of preparation, and match with AF expectations.</p> <p>Negotiate and obtain clearances by AF.</p> <p>Respond to information requests, arrange revisions etc.</p>
Implementation	<p>Technical support in preparing TORs and verifying expertise for technical positions.</p> <p>Participate, guide and train project teams on setting up operational plan for implementation of the project during inception phases of the approved project.</p> <p>Verification of technical validity / match with AF expectations of inception report.</p> <p>Provide technical information as needed to facilitate implementation of the project activities.</p> <p>Provide advisory services as required.</p> <p>Provide technical support, participation as necessary during project activities.</p> <p>Provide troubleshooting support if needed.</p> <p>Undertake a minimum of one technical support and oversight visit per year.</p> <p>Provide additional support and oversight missions as necessary.</p> <p>Provide technical monitoring, progress monitoring, validation, and quality assurance throughout.</p> <p>Allocate and monitor Annual Spending Limits based on agreed workplans.</p> <p>Return unspent funds to AF.</p>

Stage	UNDP Services
Evaluation and Reporting	Provide technical support in preparing TOR and verifying expertise for technical positions involving evaluation and reporting. Participate in briefing / debriefing. Verify technical validity / match with AF expectations of all evaluation and other reports Undertake technical analysis, validate results, and compile lessons. Disseminate technical findings

Institutional Cooperation

GLOF prevention or ensuring safety measures against a possible GLOF event requires involvement of a much larger group of stakeholders. UNDP is playing a role of a catalyst and standard bearer of quality of assurance. The Government of Pakistan through its Ministry of Environment & National Disaster Prevention and related Departments.

ICIMOD, PMD, WWF, IUCN, and ISDR all have contributed knowledge in the development of this project, its site selection and will continue to provide technical cooperation to the project team. Government's Task Force on Climate Change reviews these technical inputs and shares its considerations with the decision makers and policy formulators. The project team has the opportunity make policy recommendation to TFCC through its National Project Director.

At operational level, organizations represented in the inception workshop have been invited by the National Project Manager to identify project outputs that can be delivered through them. Sheer involvement of a large number of local, national, regional and international organizations in the project warrants for one-on-one sessions with each of them. To this effect the facilitator suggested to have a series of organization specific planning sessions to firm up the indicative work plan presented by the NPM. It was agreed that the project team will have a round of sessions within three weeks of the inception workshop to streamline the annual work plan with partner organization's input for submission to the PSC.

Two organizational structures PSC and PMC and a peer review process are available for supporting the project. Stakeholders expressed satisfaction over the composition and terms of reference of the PSC and PMCs, which are reproduced below.

A Project Steering Committee will be established to provide policy guidance to the project and monitor progress and performance. The PSC will facilitate inter-agency co-ordination of the project at the national level, provide avenues for maintaining inter-provincial linkages, and ensure that the lessons learned from implementation of the project are integrated into Pakistan's overall adaption programme. The Committee will be chaired by the Secretary, Ministry of Environment. Members will include ,UNDP, DG (Environment), Designated National Authority for Adaptation Fund, ICIMOD, Economic Affairs Division, Pakistan Metrological Department, Gilgit-Baltistan Disaster Management Authority, Chitral Disaster Management Authority, the Project Manager, the Inspector General of Forests General Manager, AKRSP, IUCN-Pakistan, WWF-Pakistan and community member representatives. The office of the National Project Manager's office will serve as the Secretariat to the Committee and will take responsibility for organising meetings, recording minutes and ensuring that decisions are implemented.

The frequency of PSC meetings will be decided by the Chair, but initially the Committee will be convened twice a year. The first PSC meeting each year will follow the preparation of a detailed Annual Project Report (APR) on implementation. The second PSC meeting will be convened during the middle of each year. PSC meetings will normally be convened in Islamabad.

The PSC will be responsible for the following activities:

- *Project review, monitoring and co-ordination;*
- *Approval of annual work plan (including training and consultancies) and annual budget, including all components;*
- *Co-ordination of government actions and provision of policy guidance;*
- *Facilitating policy and legislative reform regarding management of GLOF as part of adaptation measures*
- *Monitoring efforts to establish financial mechanism;*
- *Ensuring adherence to UNDP guidelines for the administration of project funds; and*
- *Ensuring linkages with the national environmental policies and adaptation plans.*

Whereas a PMC will be formed in both Gilgit-Baltistan and Chitral to supervise project implementation, ensure that project targets are met, and monitor on-the ground impacts.

In NAs, membership will be chaired by chief Gilgit-Baltistan Disaster Management Authority and Chief, Disaster Management Authority in Chitral respectively. The membership will include the Regional Programme Manager, AKRSP, ICIMOD, a local representative each from IUCN, and WWF.

The Project Manager and a UNDP representative will also be members of both PMC's. The PMC's will meet at least twice a year at times and locations to be decided by the Chair. The Committees will be responsible for:

- *Monitoring the results of efforts to establish and strengthen GLOF related activities in the project sites;*
- *Co-ordinating institutional arrangements for management of the activities;*
- *Co-ordinating policy and legislative development regarding GLOF*
- *Overseeing awareness and education activities;*
- *Ensuring that partner agency programmes are fully integrated into the project framework;*
- *Monitoring the results of the demonstration projects and supporting their integration into wider development programmes;*
- *Monitoring technical assistance provided by the contracting agencies, including all institutional strengthening services provided to local communities and government bodies;*
- *Monitoring all training activities;*
- *Ensuring linkages to regional GLOF activities; and*
- *Reviewing quarterly and annual work plans*

An indicative institutional cooperation framework was presented by the facilitator to the inception workshop participants, which will be finalized after NPM locks the annual work plan 2012 with the partner organizations. The framework tentatively identifies each partner organization for delivery of a particular target along with corresponding outputs. The project team has identified partners at five different levels—community, district, provincial, national and international. The matrix also reflects at the need for strong operational coordination, both horizontally and vertically to ensure effective control over project deliverables.

The Way Forward

Fifteen actions were identified that have to be taken within next six months:

- 1 Appointment of Field Managers by end of November 2011
- 2 Notification of PSC and PMCs by end of November 2011
- 3 Consultations with KPK stakeholders by end of November 2011
- 4 Finalization of the annual work plans by first week of December 2011
- 5 Firming up of partner organization roles & responsibilities by first week of December 2011
- 6 Approval of annual work plans and budget by the PSC in mid-December 2011
- 7 Signing of MoUs with partners organizations by end of December 2011

- 8 Establishment of field offices by January 2012
- 9 Baseline studies will be completed by March 2012
- 10 Remote sensing of Glaciers in Northern Pakistan to be completed by June 2012
- 11 NOCs, if required to be obtained by March 2012
- 12 Designation of Drongah and Bagrot valleys as GLOF Field Schools to serve as center of learning for all vulnerable communities in Northern Pakistan in the first PSC meeting
- 13 Collaboration with GLOF experts for simulation modeling, hazard zonation, and disaster management/land use planning to be secured by March 2012
- 14 Review existing hazard/vulnerability maps/reports by March 2012
- 15 Review of disaster management plans prepared by various partners for multiple hazards by June 2012

**Institutional Cooperation Framework
(Tentative)**

#	Targets	Institutional Cooperation						Outputs
		Project	Community	District	Provincial	Federal	INGOs	
1	All GLOF risk sites in Pakistan are identified and inventoried in a central, web-based GLOF risk database	NPM			GBDMA, PDMA	NDMA	UNDP, FOCUS, WWF	1.2
2	All GLOF risk areas in Pakistan are covered by remote sensing information	Consultant				NDMA, GSP	WWF, FOCUS	1.2
3	At least 80% of disaster management institutions in Gilgit-Baltistan and Chitral (national, provincial and district level) are able to access, interpret and use GLOF risk information for planning purposes	NPM	CERT/DRMC	DDMA	GBDMA	NDMA	LEAD, IUCN	1.1
4	At least 10 other GLOF risk reduction initiatives from other countries are analyzed to inform risk assessment and – planning under the proposed project	NPM	CERT/DRMC (exposure visits)		GBDMA	NDMA	UNDP, ICIMOD	2.1

#	Targets	Institutional Cooperation						Outputs
		Project	Community	District	Provincial	Federal	INGOs	
5	At least 2 GLOF-prone mountain valleys are analyzed by a detailed hazard zonation and vulnerability assessment	Consultant	CERT/DRMC				NESPAK	1.2 & 2.2
6	At least 2 GLOF-prone mountain valleys are comprehensively covered by a GLOF Early Warning system	Consultant	DRMC/CERT	DDMA	GBDMA	NDMA	PCSR, WWF	1.2, 3.1 & 3.2
7	100% of the national and 90% of district and community authorities in the Gilgit-Baltistan and Chitral regions are able to prioritize and plan measures to minimize potential losses from GLOFs	NPD	DRMC/CERT/LSO	DDMA	GBDMA	NDMA	WWF, IUCN	1.1, 1.2 & 2.2
8	The GLOF risk from at least 2 potentially dangerous glacier lakes in Gilgit-Baltistan and Chitral is successfully reduced	Consultant	DRMC/CERT/LSO	DDMA	GBDMA,	NDMA, FWO	ICIMOD	2.1, 2.2, 3.1, 3.2, & 3.3

Annex # 1: Inception Workshop Agenda and List of Participants

Annex # 2: Proposed Revised Project Results Framework

Project Strategy	Objectively verifiable indicators				
Goal	To enhance adaptive capacity to prevent climate change-induced GLOF disasters in Pakistan				
	Indicator	Baseline	Target	Sources of verification	Risks and Assumptions
Objective: To reduce climate change-induced risks of Glacial Lake Outburst Floods (GLOFs) in Gilgit-Baltistan and Chitral	<ul style="list-style-type: none"> No. of potentially dangerous glacier lakes in Gilgit-Baltistan and Chitral No. of institutions with increased capacity to minimize human and material losses from GLOF events Number of people living in Gilgit-Baltistan and Chitral suffering losses from GLOF 	<ul style="list-style-type: none"> There are 52 potentially dangerous lakes in Gilgit-Baltistan and Chitral areas. 35 destructive outburst floods are recorded in Gilgit-Baltistan and Chitral areas in last two hundred years. 	<ul style="list-style-type: none"> The GLOF risk from at least 2 potentially dangerous glacier lakes in Gilgit-Baltistan and Chitral is successfully reduced At least 80% of disaster management institutions in Gilgit-Baltistan and Chitral (national, provincial and district level) are able to access, interpret and use GLOF risk information for planning purposes At least 2 GLOF-prone mountain valleys are comprehensively covered by a GLOF Early Warning system 	<ul style="list-style-type: none"> Questionnaire-based surveys (QBS)/ Interviews at the beginning, mid-term and end of the project Impact assessment at the end of the project Satellite imagery of glacier lakes and vulnerable sites before and after the project 	<ul style="list-style-type: none"> The political situation stays stable throughout the project duration. Stakeholders are able to perceive reductions in vulnerability over the time-scale determined by project duration No flooding disasters in target communities occur throughout the project lifetime
Outcome 1: Strengthened Institutional capacities to implement policies, plans and investments that prevent human and material losses from GLOF events in vulnerable areas of Northern Pakistan	<ul style="list-style-type: none"> No. of targeted institutions with increased capacity to minimize exposure to GLOF risks Number of policy recommendations made to address GLOF risks or adjusted to incorporate GLOF risks 	<ul style="list-style-type: none"> National, provincial and local disaster management institutions and development planners are unable to design, finance and analyze GLOF risk reduction measures on the basis of reliable, comprehensive information 	<ul style="list-style-type: none"> By the end of Year 3, 100% of the national and 90% of district and community authorities in the Gilgit-Baltistan and Chitral regions are able to prioritize and plan measures to minimize potential losses from GLOFs By the end of the project, at least two policies have been reviewed and/or revised to address or incorporate GLOF risk reduction 	<ul style="list-style-type: none"> QBS, training protocols and attendance lists Review of CC, DRM and development policies and plans at the national, district, and community levels 	<ul style="list-style-type: none"> Government remains supportive to link longer-term climate change planning with current disaster risk management initiatives

Output 1.1: Policy recommendations and guidelines to address GLOF risks in northern Pakistan institutionalized	<ul style="list-style-type: none"> Number of policy recommendations made to address GLOF risks or adjusted to incorporate GLOF risks 	<ul style="list-style-type: none"> Climate change risks are mentioned in the current Task Force on Climate Change (TFCC) report No comprehensive disaster management guidelines addressing GLOF exist for the Gilgit-Baltistan and Chitral regions 	<ul style="list-style-type: none"> By the end of the project, a Disaster Management Act is formulated that incorporates GLOF and other climate risk issues By the end of the project, existing DRM guidelines integrate longer-term climate change risk planning 	<ul style="list-style-type: none"> Review of Disaster Management Act, DRM policies, plans, and institutional structures 	<ul style="list-style-type: none"> Government continues to support climate-resilient DRM.
Output 1.2: Indicators and criteria for GLOF vulnerability developed and systematically applied to enable priority allocation of risk reduction efforts and investments	<ul style="list-style-type: none"> Number of potentially GLOF-prone communities that are integrated in a centralized, web-based GLOF risk database Availability of a government action plan to address GLOF risks in Pakistan, starting from the highest risk zones and the most vulnerable communities 	<ul style="list-style-type: none"> No comprehensive database and action plans exist for addressing GLOF risk in Pakistan 	<ul style="list-style-type: none"> By year 1 of the project, all GLOF risk sites in Pakistan are identified and inventoried in a central, web-based GLOF risk database By the end of the project, a comprehensive disaster risk reduction plan is available to address the biggest GLOF threats in the most vulnerable communities 	<ul style="list-style-type: none"> GLOF risk database, Satellite imagery Action plan document 	<ul style="list-style-type: none"> Turnover of staff does not counteract benefits of capacity building efforts NOCs are obtained from relevant authorities for accessing restricted sites
Outcome 2: Improved access of disaster management planners and policy makers to knowledge, information and research on GLOF risks	<ul style="list-style-type: none"> No. and type of government-led initiatives which conduct and update risk and vulnerability assessments 	<ul style="list-style-type: none"> Level of knowledge about GLOF exposure and sensitivity in northern Pakistan is very limited 	<ul style="list-style-type: none"> By the end of the project, 95 percent of population has sufficient knowledge about GLOF risks and mitigation measures 	<ul style="list-style-type: none"> QBS Surveys on communication channels 	<ul style="list-style-type: none"> Continued government support for the project
Output 2.1: Systematic engagement of the project with global and regional research networks and centres working on GLOF issues	<ul style="list-style-type: none"> Number of specialized institutions actively connected in the exchange of relevant technical information that can inform GLOF vulnerability analysis and risk reduction planning 	<ul style="list-style-type: none"> Regional platform established by the regional GLOF risk reduction project, with punctual interaction until the project has ended 	<ul style="list-style-type: none"> By the end of year 2, at least 10 other GLOF risk reduction initiatives from other countries are analyzed to inform risk assessment and –planning under the proposed project Regional platform established by the regional GLOF risk reduction project, with punctual interaction 	<ul style="list-style-type: none"> Comparative analysis report MoUs / agreements Website linkages 	<ul style="list-style-type: none"> Other GLOF projects have codified their lessons in an accessible format Relevant partners remain interested in cooperation

Output 2.2: Risk and hazard maps for mountain valleys with the highest GLOF risk and exposure of lives, livelihoods and infrastructure	<ul style="list-style-type: none"> Number of GLOF hazard and vulnerability maps for GLOF-prone mountain valleys 	<ul style="list-style-type: none"> No comprehensive risk and vulnerability maps for mountain valleys with highest GLOF risks available 	<ul style="list-style-type: none"> By year 1, all GLOF risk areas in Pakistan are covered by remote sensing information By year 2, GLOF specific simulation models for at least 2 GLOF prone mountain valleys are developed By year 2, at least 2 GLOF-prone mountain valleys are analyzed by a detailed hazard zonation and vulnerability assessment 	<ul style="list-style-type: none"> Hazard maps Vulnerability maps Risk maps 	<ul style="list-style-type: none"> Availability of field staff to conduct vulnerability assessment Availability of unrestricted satellite imagery No natural disasters in project area
Outcome 3: Reduced human and material losses in vulnerable communities in the Northern areas of Pakistan through GLOF early warnings and other adaptation measures	<ul style="list-style-type: none"> Number of vulnerable households in Bagrot in Gilgit-Baltistan and Drongah valley in Chitra covered by a GLOF early warning system Number of physical assets strengthened or constructed to withstand or mitigate the effects of GLOF events 	<ul style="list-style-type: none"> No GLOF early warning system for Bagrot and Drongah Valley in place Vulnerable households are not able to receive and react to GLOF early warning messages No physical structures in place to mitigate the effect of GLOF events 	<ul style="list-style-type: none"> By the end of the project, 90% of households in target communities are able to receive and respond to early warnings and take the appropriate actions following the warning By the end of the project, at least 2 targeted engineering structures (biological and/or mechanical) have been established to reduce the effects of GLOF events on livelihood assets 	<ul style="list-style-type: none"> QBS with households Site visits before/after the project 	<ul style="list-style-type: none"> No tampering with early warning system installations Community workforce available to support engineering measures
Output 3.1: Preparedness actions for vulnerable communities conducted to reduce risks from GLOF events	<ul style="list-style-type: none"> Percentage of targeted population aware of GLOF impacts and appropriate responses to the threat 	<ul style="list-style-type: none"> Limited awareness by vulnerable communities in the Gilgit-Baltistan and Chitral valleys on GLOF risks and risk reduction measures 	<ul style="list-style-type: none"> By the end of the project, at least 90% of households in the target area are aware of the functionality of the GLOF EWS and able to respond to warning signals By the end of the project, at least 2 full-scale GLOF early warning drills have been conducted, involving all households in the target communities 	<ul style="list-style-type: none"> QBS Video of mock drills, simulation protocol Debriefing notes 	<ul style="list-style-type: none"> Messages are delivered in an appropriate way to enhance awareness, receptiveness and understanding Messages are delivered in a concerted, coordinated and consistent manner
Output 3.2: A community based system for GLOF risk monitoring & early warning in priority communities	<ul style="list-style-type: none"> Number of households in Bagrot and Drongah valley reached by a GLOF early warning system 	<ul style="list-style-type: none"> No GLOF early warning system for Bagrot and Drongah valleys in place 	<ul style="list-style-type: none"> By the end of the project, 90% of households in each target valley are able to receive and respond to GLOF early warning signals and take the appropriate actions following the warning. 	<ul style="list-style-type: none"> QBS with households Mock drill protocols Field visits to 	<ul style="list-style-type: none"> No tampering with the early warning system installations, Functioning backup systems

	<ul style="list-style-type: none"> Percentage of households receiving and responding to warnings in time to avoid human losses 	<ul style="list-style-type: none"> Vulnerable households are not able to receive and react to GLOF early warning messages 	<ul style="list-style-type: none"> By the end of the project, at least 2 CBOs are trained in the operation and maintenance of the EWS and ensure its continued functionality A special watch group for each GLOF prone valley will be formed to establish a new or to strengthen an existing Early Warning System 	<p>EWS sensor, relay and communication sites</p> <ul style="list-style-type: none"> GLOF watch group meeting attendance and note for records 	<p>in place</p> <ul style="list-style-type: none"> Valley wide traditional communication systems are in place
<p>Output 3.3: Targeted GLOF risk reduction measures such as check dams, spill-ways, slope stabilization or controlled drainage established in Bagrot and Drongah valleys</p>	<ul style="list-style-type: none"> No. of physical assets strengthened or constructed to withstand or mitigate the effects of GLOF events 	<ul style="list-style-type: none"> No risk reduction measures for GLOF in place in the target sites 	<ul style="list-style-type: none"> By the end of the project, concrete engineering measures are in place to reduce the impact of GLOF events on vulnerable communities in each target valley (as appropriate: effective drainage systems, check dams, mini dams, ponds, spill ways, slope stabilization, tree plantation, controlled drainage) 	<ul style="list-style-type: none"> Field visits to engineering structures Structural designs Completion drawings 	<ul style="list-style-type: none"> Communities are receptive to the adoption of mitigation measures and participate actively in construction efforts IEE yields positive result for the mitigation measures under consideration
<p>Outcome 4: Project experiences documented and replicated</p>	<ul style="list-style-type: none"> Number of proposals, papers, and other documents that incorporate learning from the project 	<ul style="list-style-type: none"> Experiences regarding climate change-induced GLOF mitigation and preparedness in Pakistan have not been systematically captured and shared 	<ul style="list-style-type: none"> By the end of the project, at least 2 other GLOF mitigation and early warning initiatives or studies draw on learning from experiences in Pakistan 	<ul style="list-style-type: none"> Proposals, papers, and other documents referring to AF-funded GLOF project in Pakistan 	<ul style="list-style-type: none"> Political circumstances in Pakistan are conducive for international exchange on GLOF mitigation and preparedness efforts
<p>Output 4.1. Technical knowledge and project lessons documented for use in future initiatives</p>	<ul style="list-style-type: none"> Number of technical documents capturing project knowledge Number of knowledge products 	<ul style="list-style-type: none"> No technical papers capturing project knowledge available Inaccessibility to maps, reports, remote imagery and case studies 	<ul style="list-style-type: none"> By the end of the project, all technical decisions and lessons are captured in dedicated reports By the end of the project, a GLOF risk reduction manual is available and disseminated both nationally and internationally By year 2 of the project, a project website is established 	<ul style="list-style-type: none"> Technical briefs prepared by the project Manual Project website 	<ul style="list-style-type: none"> Technical knowledge is consistently codified and reflected upon over the lifetime of the project

			and linked to the GLOF risk database developed under Outcome 1		
Output 4.2. Project experiences disseminated to policy makers and disaster management planners in Pakistan and the wider HKH region.	<ul style="list-style-type: none"> • Number of organizations actively involved in knowledge transfer within and across district borders • Number of policy makers and disaster management practitioners within and outside of Pakistan who are aware of the project and willing to adopt lessons learned 	<ul style="list-style-type: none"> • No systematic knowledge transfer on GLOF risks from Pakistan to other countries 	<ul style="list-style-type: none"> • By the end of the project, at least 1 international exchange visit between GLOF risk reduction projects has taken place • By the end of the project, DRM planning authorities of at least 3 GLOF-prone districts in Pakistan visit the target sites with a view on replication of the project approach in other vulnerable sites • By the end of the project, at least 2 project dissemination workshops have been conducted in Pakistan, with attendance by stakeholders from all GLOF-prone districts 	<ul style="list-style-type: none"> • Study visit report • Site visits, consultation protocols • Workshop proceedings 	<ul style="list-style-type: none"> • Other regions and countries believe experiences from the project will be valuable for future GLOF mitigation and preparedness initiatives • Project is sufficiently visible to other GLOF-prone districts • Project is able to mobilize follow-up financing for replication and up scaling.

Annex # 3: Annual Work Plan
(Sample Template for AWP)

Annual Work Plan															
Goal	To enhance adaptive capacity to prevent climate change-induced GLOF disasters in Pakistan														
Objective: To reduce climate change-induced risks of Glacial Lake Outburst Floods (GLOFs) in Gilgit-Baltistan and Chitral															
Outcome 1: Strengthened Institutional capacities to implement policies, plans and investments that prevent human and material losses from GLOF events in vulnerable areas of Northern Pakistan															
Activities	Timeline												Partner Organization(s)	Outputs	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Establish an inter-agencies working group to incorporate climate change risk management considerations into existing disaster management policy frameworks and new legislation															Output 1.1 Policy recommendations and guidelines to address GLOF risks in northern Pakistan institutionalized
Revise the existing National Disaster Risk Management plan to incorporate climate risk and GLOF issues and submit for endorsement by NDMA															
Develop and institutionalize comprehensive GLOF risk management guidelines at the district and community level especially which are vulnerable to GLOF															

*Note: Indicative activities in the project document on pages 10-15 are being discussed with discussed with partner organizations and will be finalized for submission to PSC.