

Upper Indus Basin Experts' Field Visit

Gilgit Baltistan, Pakistan

15--24 April 2014

1. Background

ICIMOD, in collaboration with its partner organizations - Pakistan Meteorological Department (PMD), Water and Power Development Authority (WAPDA), WWF-Gilgit Baltistan and the Government of Gilgit Baltistan, organized an Upper Indus Basin (UIB) Expert's Field Visit to Gilgit Baltistan (GB) from 15 to 24 April 2014. The overall agenda of the field visit is provided in Annex 1. A group of forty-five participants from ICIMOD Nepal/Pakistan, EV-K2-CNR, WWF Pakistan, University of Bonn, Karakoram International University, and other Pakistani organizations participated in the field visit (Annex 2). The objectives of the field visit were: a) to strengthen collaboration between various actors working in the Upper Indus Basin and develop a framework of UIB research, b) to understand and relate to the impact of climate change on the GB environment, and c) to explore options to minimize the adverse impacts. Above all, the purpose of the field visit was to learn about the ground reality of the Upper Indus Basin through first-hand observation and to develop a joint research framework for the Upper Indus Basin based on scientific knowledge.

2. Highlights of the Field Visit

2.1 Consultative Workshop

The field visit began on 16th April with a consultative workshop with the government of Gilgit Baltistan (GB) at the Serena Hotel in Gilgit. Additional Secretary at the Ministry of National Food Security and Research, Islamabad, Mr Iftikhar Ahmad Rao, was the chief guest for the opening session. The workshop had two technical sessions devoted to a) understanding the UIB scenario, and b) scope, opportunity and challenges related to the natural environment and climate change in GB. National and international experts and various government departments of GB presented on specific topics. At the end of the workshop, a round-table discussion was held on the technical presentations and the way forward.

Mr Khalid Mohtadullah, senior advisor at ICIMOD and chair of the UIB Working Group, talked about the importance of the Indus irrigation network and the potential of the UIB to improve people's livelihoods. He also raised concerns over the decreasing per capita water availability and likely impacts of climate change on water resources, agriculture and the socioeconomic status of the region. He stressed the need for multidisciplinary and coordinated work grounded in science to enhance understanding of the mountain environment.

Mr Khadim Hussain, Secretary of Forest, Wildlife and Environment Department delivered a welcome address in which he appreciated the congregation of national and international players on one stage and for a common agenda.

In his opening remarks, Dr David Molden, Director General (DG) of ICIMOD, introduced ICIMOD's vision, mission and activities. He also highlighted the importance of sharing knowledge and building regional cooperation in generating scientific evidence and making impact in Gilgit Baltistan, a region that is critical for ensuring food security and energy supply in Pakistan but is also vulnerable to climate change.

Mr Arif Mahmood, DG of Pakistan Meteorological Department (PMD), presented on PMD's ongoing activities in Gilgit Baltistan, with a focus on the Automatic Weather Stations (AWS) installed in the glaciated areas of UIB.

The President of Ev-K2-CNR, Mr Agostino Da Polenza, shared the activities of Ev-K2-CNR in UIB including the establishment of Central Karakoram National Park, and discussed the importance of generating and sharing data for scientific research and development.

Mr Iftikhar Ahmad Rao, Additional Secretary at the Ministry of National Food Security and Research, said that mechanisms of climate change study should be structured in a coordinated way to address challenges faced by the local communities. He also said that technological innovations should be promoted for building solutions for various issues faced by communities.

The first technical session was chaired by the Dr David Molden. Presentations were made by Dr Arun. B. Shrestha, ICIMOD, Prof. Alberto Bianchi, EVK2CNR, Dr Ghulam Rasul, PMD, Mr Daniyal Hashmi, WAPDA, Prof. Matthias Winiger, University of Bonn, and Dr Yinsheng Zhang, Institute of Tibetan Plateau Research (ITP), CAS. These presentations illustrated some issues specific to UIB, such as 'Karakorum Anomaly', inadequate capacity of the monitoring system to address the knowledge gaps, potential for improving the data quality and data sharing, and some new findings on future water availability scenario of UIB.

Dr Molden concluded the technical session by highlighting the transboundary nature of the Indus River and the importance of snowfall, glaciers and rainfall as a source of water. He encouraged everyone to work together to generate richer data and information and to find out the reality of climate change, including the mysterious 'Karakoram Anomaly'.

The second technical session was dedicated to presentations by provincial government agencies of Gilgit Baltistan. It was chaired by Mr Saiyat Alam Rehman, Home Secretary of Gilgit Baltistan. Mr Khadim Hussain Saleem, Secretary for Forest, Wildlife and the Environment in Gilgit-Baltistan, presented on biodiversity and climate, and stressed the need to promote science and research and to translate research findings into management prescriptions. He talked about the possibilities for promoting ecosystem services and REDD+, strengthening forestry and agriculture sectors and integrating policy for natural resources management in Gilgit Baltistan.

Mr Mir Waqar, DG of the Gilgit Baltistan Disaster Management Authority (GBDMA), presented on the establishment, functions and challenges of DMA, highlighting the major disasters observed in the past and their impacts in the region. He also presented DMA's disaster risk management activities and plans. Mr Muhammad Baqir, Assistant Chief of Planning and Development Department of Gilgit Baltistan, discussed the underlying causes of poverty and vulnerability in Gilgit Baltistan. The presentation by Mr Deedar Ali of Water and Power Department focused on the hydropower potential of Gilgit Baltistan, which is facing energy shortage and heavy power cuts despite its high hydropower potential.

All presentations of the consultative workshop are available on the Indus Initiative web page: <http://www.icimod.org/?q=13636>

A roundtable discussion was organized to address the issues raised in the two technical sessions and to find a way forward. The discussion was moderated by Dr Phillip Wester. Participants included Dr Bahadar Nawab Khattak, Comsat, Mr Ghazanfar Ali, GCISC, Mr Raffaele Del Cima, Ev-K2-CNR, Dr Liu Shiyin, CAREERI, Dr Muhammad Asif Khan, University of Peshawar, Ms Nusrat Nasab, Focus Humanitarian Assistance and Mr Rahmatullah Jillani, SUPARCO. Many of them stressed the need to build the capacity of local institutions and local universities in mountain specific topics. They agreed that more students from local universities need to be trained and that national institutions should

them after they are trained. Participants also underscored the need to align scientific research for the benefit of the communities. The media needs to be involved more as they play an important role in raising awareness. Finally, it was mentioned that geospatial tools can be useful in bridging some of the knowledge gaps in UIB.

Mr Khalid Mohtadullah concluded the consultation workshop, saying that Indus, being the largest contiguous irrigation system, has the capacity of storing water for only 30 days. Increasing the storage capacity for irrigating winter crops is a challenge in many ways and uncertain water availability due to climate change could be one of the major challenges.

Main messages of the workshop

- There is a need to improve the hydro-meteorological observation in UIB, and to strengthen data and information sharing among actors working in the UIB is a must.
- It is important to have a clear future vision of the roles of partners and a well-defined implementation mechanism for UIB research and development with better coordination among actors.
- There is need for more research and understanding about the cryosphere dynamics in UIB, upstream and downstream interactions.
- Need to improve scientific evidence for the perceived strengthening of monsoon in UIB
- Building capacity of youth and local institutions/ universities is important for the UIB research.
- More research is needed to connect science with local issues.
- Interaction with communities is needed to understand their issues and address them more effectively in research and development programmes.

2.2 Visits to glaciers, hydrological and meteorological observatories and Khunjerab National Park

The UIB team had the opportunity to visit several glaciers in the Hunza valley. The team visited Bagrot, Ghulkin, Passu and Hoper glaciers. It was interesting to see both advancing and retreating glaciers in the same valley. The team intensely discussed the issue of the 'Karakorum Anomaly', stressing the need to have a scientific understanding of this issue and to link it with water availability. The team observed that Ghulkin glacier, which, according to the local community, is advancing, poses the threat of outburst flood to the villages in its vicinity.

Prof. M. Winiger provided a handout on scientific background information related to environmental and socio-economic conditions of the area.

The team visited several hydrological and meteorological stations maintained by WAPDA and PMD. These included the meteorological stations at Gilgit and Khunjerab Pass maintained by WAPDA, and those at Passu Ghar maintained by PMD, as well as hydrometric stations and Passu outlet, Danyor Bridge and Ganish Bridge maintained by WAPDA. Discussions mainly focused on the inadequate capacity of the hydromet observations in the UIB to address the vertical and horizontal gradients in climatic variables. WAPDA and PMD provided their plans for expanding their observation and monitoring networks, and discussions focused on how other institutions can complement the efforts of WAPDA and PMD.

A presentation session was organized at Khunjarab National Park to share the activities of the national park and the Karakoram Pamir Landscape and the Himalayan Climate Change Adaptation Programme (HICAP) activities of ICIMOD.

2.3 Interaction with communities

The field visit laid much emphasis on understanding the socioeconomic conditions in the Upper Indus Basin. To that end, the team held interactions with seven different communities. A list of community interactions and major issues raised by the communities are provided in Annex 3.

These interactions were well-organized and informative, and they helped the field team better understand the community's perceptions of climate change and changes in the natural resources including glaciers and water supply in those specific areas.

Major points raised during the interaction can be summarized as follows:

Climate change and its impacts: People expressed mixed views about temperature change. Some perceived it to be decreasing, while others thought it was increasing. They also mentioned that the length of winter season has increased. On the other hand the community felt that winter snowfall is decreasing. Landslide and erosion are common in the region. Some seem to be experiencing climate change as a positive phenomenon, but for most it is causing disasters and water shortage.

Glacier behavior and its impacts: All except a few glaciers are retreating. Glaciers are shifting, leading to water scarcity and also destroying productive lands due to flood. Lowering of glacier surface disconnected many irrigation canals. Due to flood 5% of the total population left the old Passu village. Further, the community said that GLOF events are more frequent now.

Socioeconomic issues: Agriculture, horticulture and livestock are the main sources of livelihood. Labour shortage is a challenge for agricultural activities and the communities are forced to hire labour from outside the Hunza valley. Brain drain is also a major problem in the region. The hydropower potential has not been utilized and the communities are facing acute energy shortage. This is one of the major reasons for deforestation.

Opportunities: The team felt that there are several opportunities to support the communities. The region is an economic corridor. Attabad Lake can be promoted as a tourist attraction. The society is extremely motivated, which is an asset for this region, and if properly managed can lead to development of this area. Innovative ideas such as solar pump and good advice on agriculture can help create opportunities. It is also important to plant vegetation to reduce erosion and revitalize the area.

2.4 UIB Network discussion

One of the major objectives of the field visit was to develop a research framework based on field observations and interactions with government officials and community members. On 21st April, a planning workshop was organized at Passu. The workshop members agreed that the field visit experience had been crucial in providing a new direction to the working groups.

The Working Group felt the need to redefine its mission. The group agreed on the following mission statement:

“Promote coordination and collaboration among organizations working in the Upper Indus Basin for improved understanding of present and future water availability, demand, and hazards and to develop solutions for various stakeholders from local to national levels.”

The Working Group agreed to change the name of “Upper Indus Basin Working Group” to “Upper Indus Basin Network” and have six working groups within the network.

Below is the list of working groups and group leaders:

Data collection, quality and sharing (Group 1): Daniyal Hashmi and Matthias Winiger

Climate variability and trends (Group 2): Ghulam Rasul

Cryosphere monitoring and modeling (Group 3): Atif Wazir

Hydrology, water availability and demand-basin scale (Group 4): Yinsheng Zhang and Arun Shrestha

Hazards and risks (Group 5): Philippus Wester and Muhammad Asif Khan

Adaptation strategies at local level - water use and management and socioeconomic factors

(Group 6): Luca Listo and Muhammad Zafar Khan

The outcomes of the group discussions can be summarized as follows:

- There is a need to update the glacier inventory of 2005 prepared by ICIMOD and PARC
- Time line of the hydro-met-glacier data collection and sharing should be included in group work.
- PMD will soon share existing data on UIB.
- Standard procedure should be adopted in measuring and sharing data. Data should be shared with/transferred to Group 2 as this group has the important task of running climate models.
- River flow data is very sensitive. It should be limited within the UIB group. Data on water (hydrological data) shouldn't be shared without the permission of primary source as it is a sensitive issue.
- Networking and coordination among the six groups is important.
- Action-oriented umbrella proposal shared by the Khunjerab Village Organization (KVO) should be a basis for future research and development.
- There is a need to put together existing resources of the UIB network for developing a better monitoring system in UIB.
- Young local scientists from the national universities should be used for UIB research.

The group leaders will select additional group members in the near future. The network will provide an opportunity for the participating institutions to individually or collectively to design projects based on the priority actions, seek funding and implement projects. ICIMOD will act as the secretariat of the UIB network and prepare reports of the visit. A steering meeting of the UIB network will be organized at least once a year. The next network meeting will be organized in November 2014 in Islamabad, with meetings of the working groups organized every 3 months by email or phone.

3. Interaction with Provincial and Federal Government

At the end of the field visit, on the evening of 22nd April, a debriefing session was organized to present findings from the field visit to the officials of Gilgit Baltistan Government. In the debriefing session, Chief Secretary of Gilgit Baltistan, Mr Mohammad Younis Dagha thanked the team for spending their valuable time on exploring water resources issues and solutions for improving people's livelihoods. He also informed the team about the activities of the government and other organizations working in the UIB including the government's plan for launching 30 micro-hydro

projects with the expectation that they will need ICIMOD experts' advice for the development of water resources.

After returning to Islamabad, a debriefing session was held for the Government of Pakistan on 24th April in Islamabad. Federal Minister for National Food Security and Research, Mr Sikandar Hayat Khan Bosan was the Chief Guest, and Additional Secretary, Mr Malik Zahoor Ahmad along with other high officials of the nodal ministry participated in the debriefing session.

Dr David Molden, Mr Arif Mahmood, DG, Pakistan Meteorological Department and Mr Khalid Mohtadullah, Chairman of the UIB working group, shared the rich learning experience that the team had with communities and from the activities of the UIB partners. They presented information on the impacts of climate and socioeconomic changes on the mountain people of Gilgit Baltistan. They also highlighted the need for research for improving understanding of glacier behaviour, hazards, energy potentials and livelihoods. They proposed possible solutions and ways to move forward to address related hazards, energy production and livelihood issues. The Federal Minister for National Food Security and Research stressed the importance of the Indus basin for the nation and requested the scientists to contribute toward addressing the issues that people are facing. During the discussion most of the participants raised the issue of data sharing and access to data from the countries that share Indus water. Mr Malik Zahoor Ahmad thanked ICIMOD for its role in knowledge generation and technology dissemination.

Presentations made during the debriefing session are available on the Indus Initiative web page: <http://www.icimod.org/?q=13636>

4. Major Lessons and Way Forward

Understanding the impact of climate change and glacier dynamics in the UIB is imperative for the security of large infrastructural investments in the downstream. More research and data is required on the cryosphere, upstream and downstream interactions, and the anomalous behaviour of glaciers. A deeper understanding of the perceived stronger monsoon pattern in UIB is needed, and this requires increasing the hydro-meteorological stations in UIB and strengthening various kinds of environmental monitoring. A clear future vision of the role of partners and a well-defined implementation mechanism for UIB research and development with better coordination among the actors is needed. A means of collecting data and sharing information in a systematic manner needs to be established by the groups collecting field data.

More research is required on what climatic changes are occurring in UIB and what it means to the local communities. Integration of science for the benefit of people is a must, and building the capacity of the youth and local institutions is important for the UIB network. Interaction with communities is essential for understanding and effectively addressing these issues through research and development programmes. Rapid social and demographic changes are occurring in the UIB, which should be studied together with biophysical science.

The group identified water, energy with its related hazards and livelihoods as the key areas demanding the attention of the UIB network. Uncertain glacier behavior has resulted in the decline of water availability and even forced some communities to abandon their agricultural land. Moreover, the communities are experiencing various forms of water related hazards such as GLOF events, landslides, erosion, flash floods and debris flows. Potential energy resources have been underutilized and development of these potentials can offset many of the detrimental impacts (deforestation, health, hazards) and can create development and livelihoods opportunities. A rise in population with a limited carrying capacity of the ecosystem, water scarcity both for people as well as for agriculture and environment and value chain development for high value products are some

of the concerns of the communities. The UIB network can bring scientific evidence with an integrated approach to develop alternative options that address those issues and create some areas for immediate intervention:

- Identification of hotspots, risk mapping, land use planning
- Early Warning System (EWS) and monitoring systems combining scientific and community knowledge
- “Soft” structural measures to control erosion and sedimentation
- Development of micro hydro systems, alternate energy (solar, wind) and promotion of improved cook stoves
- Alternative irrigation systems (solar pumps, in situ water conservation)
- Introduction of improved animal breeds and value chain improvement for high value products such as fruits and nuts.

Annex 1. Agenda of the field visit

Date (April 2014)	Day-Number	Activity
15	Day 1	Arrival at Gilgit
16	Day 2	Consultative Workshop with Government of Gilgit Baltistan
17	Day 3	Interaction with Bagrote valley community
18	Day 4	Study visit to Gulkhin glacier and community interaction with Gulkhin and Passu communities
19	Day 5	Visit to Passu glacier PMD/WAPDA/GIUB-Installations Interaction with Borith community
20	Days 6	Visit to Khunjerab National Park, WAPDA AWS at Kunjerab and Zero Point Interaction with Khunjerab Village Organization
21	Day 7	Planning workshop Return to Karimabad
22	Day 8	Visit to Hoper and Minapin glacier Interaction with Hoper and Minapin communities Return to Gligit Debriefing to Chief Secretary, Gilgit Baltistan
23	Day 9	Travel back to Islamabad
24	Day 10	Debriefing to the Federal Government

Annex 2. List of participants

S. N.	Name	Organization	Contact details
01.	Mr Iftikhar Ahmad	Add. Secretary, Ministry of National Food Security and Research-MNFS&R	Tel: 051 9203307 Email: secretarynfsr@yahoo.com
02.	Mr Arif Mahmood	Director General, Pakistan Meteorological Department , Headquarters Office Sector H-8/2, Islamabad	Tel: +92-51-9250367 Email: dgpakmet@gmail.com
03.	Dr Ghulam Rasul	Chief Meteorologist, Pakistan Meteorological Department, Headquarters Office Sector H-8/2, Islamabad	Tel: +92-51-9250369 Mob: +92-301-5577145 Fax: +92-51-9250361 Email: rasul@pmd.gov.pk
04.	Mr Atif Wazir	Glaciologist, Pakistan Meteorological Department, Headquarters Office Sector H-8/2, Islamabad	Email: atifwazirpk@yahoo.com
05.	Mr Muhammad Rana Atif	Pakistan Meteorological Department, Headquarters Office Sector H-8/2, Islamabad	Email: atifpmd@gmail.com
06.	Mr Daniyal Hashmi	Director, Snow & Ice Hydrology Project, WAPDA, Mall Road, Lahore	Tel: +92-42-35302454 Mob: +92-300-4344584 Fax: +92-42-35302454 Email: Daniyal_hashmey@hotmail.com
07.	Mr Imtiaz Hussain	WAPDA, Mall Road, Lahore	Mob:+92-321-4301498
08.	Mr Muhammad Aslam	WAPDA, Mall Road, Lahore	Mob: +92-321-4601085
09.	Dr Bashir Ahmad	Principal Scientific Officer, Climate Change, Alternate Energy and Water Resources Institute(CAEWRI), NARC, Islamabad	Tel: +92-51 8443647 Mob: 0333-5487506 Email: Dr.bashir70@gmail.com
10.	Mr Ghazanfar Ali	Global Change Impact Studies Centre (GCISC) , National Centre for Physics Complex (NCP)Near Quaid-e-Azam University Campus, Shahdara, Islamabad	Tel: +92-51 2077300 Ext. 456 Email: Ghazanfaar.ali@gmail.com
11.	Dr Muhammad Asif Khan	National Centre of Excellence in Geology, NCEG-P, University of Peshawar, Peshawar	Tel: +92-91-9216767 Mob: +92-301-5946165

			Fax: +92-91-9218183 Email: masifk@upesh.edu.pk
12.	Dr Bahadar Nawab Khattak	Associate Professor/Head Department of Development Studies/Sustainable Water Sanitation Health and Development COMSATS Abbottabad, Pakistan	Mob: +92-345-5854226 Email: bahadar@ciit.net.pk
13.	Dr Babar Khan	Head, WWF, Gilgit Office	Mob: +92-312-5088876 Email: babarwwf@gmail.com
14.	Mr Muhammad Zafar Khan	Conservation Manager, WWF, Gilgit Office	Mob: +92-313-5115121 Email: mzkhan@wwf.org.pk
15.	Ms Nusrat Nasab	CEO, FOCUS, Serena Business Complex, Khayaban-e Suharwardy, Islamabad	Tel: +92-51-2072500 Email: nusrat.nasab@focushumanitarian.org
16.	Mr Deedar Karim	Programme Officer/ Senior Geologist	Tel: +92 344 9351066
17.	Mr Rahmatullah Jilani	SUPARCO Headquarters, P. O. Box No. 8402, Karachi-75270	Tel: +92-21-34690785 Email: rahmatullahjilani@googlemail.com
18.	Mr Muhammad Younis Dagha	Chief Secretary, Gilgit Baltistan	Tel: +92-5811-920430 +92-5811-920200-5 Email: younus.dagha@gmail.com
19.	Mr Khadim Hussain Saleem	Secretary, Forest, Wildlife and Parks Department (FWPD)	Mob: +92-346-9548157 Email: khsaleem73@gmail.com
20.	Mr Wallayat Noor	Conservator, Wildlife & Parks Department, Gilgit Baltistan	Tel : +92 5811-9201460 Email: wnoorcwgb@yahoo.com
21.	Mr Muhammad Ismail Zafar	Conservator of Forests, Northern Areas, Gilgit Baltistan, Gilgit	Tel: +92 5811 920274 Mob: 0346 9555375 Fax: +92 5811 920270 Email: mibalghari@yahoo.com
22.	Mr Muhammad Latif	Divisional Forest Officer- KNP	Mob: +92-355-4119377
23.	Mr Muhammad Jaffar	Range, Forest Officer, Khunjerab National Park-KNP	Mob: +92-346- 9701825 Email: jaffarpassu@hotmail.com
	Mr Yaqoob Ali Khan	DFO	

24.	Mr Rehman Posh	Chairman, Khunjerab Villagers Organization (KVO)	Mob: +92-346-9237991
25.	Mr Rehmat Ullah Beg	Chairman, Shimshal Nature Trust	
26.	Mr Saeed Ullah	President, Ghulkin Conservation Community	
27.	Mr Zafar Iqbal	Chairman, Passu Development Organization	
28.	Prof. Dr Matthias Winiger	Department of Geography, University of Bonn, Germany	Tel: +49-171-1949791 Email: winiger@uni-bonn.de
29.	Dr Liu Shiyin	Glaciologist, Career, Lanzhou, China	Email: liusy@lzb.ac.cn
30.	Dr Yinsheng Zhang	Institute of Tibetan Plateau Research Chinese Academy of Sciences, Beijing	Email: yszhang@itpcas.ac.cn
31.	Mr Agostino Da Polenza	President, EvK2CNR	Email: adp@montagna.org
32.	Prof. Alberto Bianchi	Engineer, Department of Environment, Hydraulic, Infrastructure and Survey, Ev-K2-CNR	
33.	Ms Stefania Mondini	Executive Coordinator	Email: stefania.mondini@evk2cnr.org
34.	Luca Listo	GE & SD Manager c/o Ev-K2-CNR	Email: luca.listo@evk2cnr.org
35.	Mr Riaz Ul Hussain	Resident Representative	Email: riaz.hassan@evk2cnr.org
36.	Mr Aurang Zaib	General Coordinator Pakistan	Tel: +92 333 6438381 Email: aurangzaibbuzdar@gmail.com
37.	Mr Asif Farooqi	BBC Reporter	Mob: 0300-8559958 Email: asif.m.farooqi@gmail.com
38.	Mr Tanveer Ahmad Khan	Cameraman, BBC	
39.	Dr David Molden	Director General, ICIMOD	Email: David.Molden@icimod.org
40.	Mrs Karen Lynn Connif	ICIMOD	

41.	Mr Khalid Mohtadullah	Senior Advisor, Upper Indus Basin Research, ICIMOD	Mob: +92-300-8440960 Email: Qkm1960@hotmail.com
42	Dr Abdul Wahid Jasra	Country Representative	Email: Abdul.Jasra@icimod.org
43.	Dr Arun Bhakta Shrestha	Regional Programme Manager	Email: Arun.Shrestha@icimod.org
44.	Mr Madhav Dhakal	Hydrological Analyst	Email: Madhav. Dhakal@icimod.org
45	Mr Philippus Wester	Chief Scientist, Water Resources Management	Email: Philippus.Wester@icimod.org
46	Mr Ghulam Muhammad Shah	Strategic Planning Division	Email: GhulamMuhammad.Shah@icimod.org
47	Ms Kanwal Waqar	Research Officer	Email: Kanwal.Waqar@icimod.org

Annex 3. Summary of community interactions and main issues.

Date	Community	Issues raised by the communities
17 April 2014	Bagrot valley community	<ul style="list-style-type: none"> • Among the three studied glaciers, one is advancing and two are retreating • Flash floods including GLOF are a major hazard • The GLOF project of UNDP is currently working towards establishing an early warning system in the valley. • Traditional Early Warning System (fire burning, blowing animal horn, using loudspeakers of mosque in the case of GLOF) practiced • Some settlements are located very close to the river bank.
18 April 2014	Ghulkin, Gulmit and Hussaini communities	<ul style="list-style-type: none"> • Advancing glaciers are posing the risk of outburst flood to Gulmit village. • A community monitoring system is in place with support from Focus Humanitarian Assistance, which could be strengthened by a complementary scientific monitoring system. • Mega landslide of 2010 dammed the Hunza river and formed Attabad lake, which inundated several settlements and destroyed farmlands. • Decreased winter precipitation • Increased frequency of glacial lake outburst events • Down wasting of glaciers rendering irrigation intakes dysfunctional • Labor shortage, brain drain, hydropower potential is not tapped.
18 April 2014	Passu community	<ul style="list-style-type: none"> • GLOFs and flash floods are serious problems • Once cultivable land is now barren due to flooding and

		<p>sedimentation.</p> <ul style="list-style-type: none"> • 5% of the total population left the old Passu village due to flood events. • Climate change brought few positive but more negative impacts, length of winter season increased. • Energy shortage
19 April 2014	Borith community	<ul style="list-style-type: none"> • Canals not in use due to retreat of glaciers • Agricultural terraces are left barren due to water scarcity • Only one crop is grown in the area during summer due to lack of irrigation water.
20 April 2014	Khunjerab Village Organization	<ul style="list-style-type: none"> • Less rainfall and snowfall but heavy flood events observed • Need for scholarship opportunities for local graduates • Hydropower potential not tapped • Deforestation, irrigation water scarcity, soil erosion, energy crisis • Environmental degradation due to road construction, value chain potential under-utilized
22 April 2014	Hopper community	<ul style="list-style-type: none"> • GLOF events are common. • Each year glacier damages fertile land. • A settlement was forced to relocate as the irrigation canal was disconnected from glaciers.
22 April 2014	Naunihal Development Organization (Minapin)	<ul style="list-style-type: none"> • No fish in the river • Damaged irrigation canal • Barren land due to shortage of irrigation water

Annex 4. Glimpses of the field visit



Consultation with the Government of Gilgit Baltistan, 16th April, Gilgit



At Passu Ghar, discussing the glacier dynamics in Upper Indus Basin



At the Passu glacier hydrometric station established jointly by WAPDA and ICIMOD



Community interaction in Sost



With the participants of the community at Sost



At the hydrometric station established by WAPDA and ICIMOD/HYCOS at Ganish Bridge



Zero point of Kunjerab National Park



With Chief Secretary of Gilgit Batista Mr Mohammad Younis Dagha during the debriefing to the Government of Gilgit Baltistan



With Federal Minister Mr Sikandar Hayat Khan Bosan and Additional Secretary Mr Malik Zahoor Ahmad, MNFS&R during the debriefing to the Federal Government



Mr Sikandar Hayat Khan Bosan, Minister MFS&R addressing the participants during the debriefing to the Federal Government