

# Policy Roundtable on Building Climate Resiliency in Gilgit Baltistan

26 June 2018, Gilgit, Pakistan



# About ICIMOD

The International Centre for Integrated Mountain Development, ICIMOD, is a regional knowledge development and learning centre serving the eight regional member countries of the Hindu Kush Himalaya – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – and based in Kathmandu, Nepal. Globalisation and climate change have an increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people. ICIMOD aims to assist mountain people to understand these changes, adapt to them, and make the most of new opportunities, while addressing upstream-downstream issues. We support regional transboundary programmes through partnership with regional partner institutions, facilitate the exchange of experience, and serve as a regional knowledge hub. We strengthen networking among regional and global centres of excellence. Overall, we are working to develop an economically and environmentally sound mountain ecosystem to improve the living standards of mountain populations and to sustain vital ecosystem services for the billions of people living downstream – now, and for the future.



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Workshop Report

# Policy Roundtable on Building Climate Resiliency in Gilgit Baltistan

26 June 2018, Gilgit, Pakistan

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# Executive Summary

On 26 June 2018, the Indus Basin Initiative (IBI) of ICIMOD, in partnership with the Pakistan Council of Research in Water Resources (PCRWR), Karakorum International University (KIU), and Worldwide Fund for Nature, Gilgit Baltistan (WWF-GB), organized a high-level policy roundtable to present the successes and learning experiences of the pilot interventions of the IBI project to policymakers. The roundtable's objective was to share the potential for upscaling and outscaling by exploring options for integrating the learnings into relevant policies in Gilgit Baltistan. The policy roundtable was organized at KIU, Gilgit.

The policy roundtable was attended by Parliamentarians of the Gilgit Baltistan Legislative Assembly, Federal and Provincial Secretaries, the Australian High Commission Delegation, and representatives of government and non-government organizations.

The Indus Basin Initiative project is a comprehensive assessment of "Agricultural Water, Energy, and Hazard Management in the Upper Indus Basin for Improved Livelihood and Building Resilience". The guests of honour discussed the impacts of climate change on the environment and local communities and the adaptation measures under the IBI project were showcased. ICIMOD, along with other collaborating partners, was praised by the government of Gilgit Baltistan for bringing together all the important stakeholders to discuss the upscaling and outscaling opportunities.

The technical sessions of the workshop included joint presentations by the project partners on the outcomes of pilot initiatives, followed by panel and group discussions. One of the key outcomes of the policy workshop was wider dissemination of IBI project interventions among relevant stakeholders.

## **Agricultural Water, Energy, and Hazard Management in the Upper Indus Basin for Improved Livelihood**

International Centre for Integrated Mountain Development (ICIMOD), under the Sustainable Development Investment Portfolio (SDIP) and with the support of the Department of Foreign Affairs and Trade (DFAT) of the Government of Australia, is implementing a programme related to Agricultural Water, Energy, and Hazard Management in the Upper Indus Basin for Improved Livelihood. This programme focuses on the vulnerability of local communities in Gojal Hunza and ways to improve their livelihood through agricultural water management and water-induced hazard management.

In Phase 1 of SDIP, major activities focused on demonstration of resilient solutions and developing the capacities of local organizations to improve water use efficiency, particularly the demonstration of solar-powered river water lifting at the community level, combined with micro-irrigation systems for growing high-value orchards in Passu and Morkhun in Gojal Valley. For hazard management, a Community-Based Early Warning System (CBFEWS) for Glacier Lake Outburst Floods in Passu, for flash floods in Sherqilla, and for debris flow in Damas, District Ghizar, was piloted at the community level. For protecting the developed agricultural base from riverbank erosion, biological measures like plantation of Seabuckthorn and Salix along river banks are being tested in Passu.

These activities are being successfully implemented through a strong consortium of national partners working with local communities. The consortium partners include World Wide Fund for Nature (WWF), Pakistan Council of Research in Water Resources (PCRWR), Gilgit Baltistan Disaster Management Authority (GB-DMA), Gilgit Baltistan Forest Wildlife & Environmental Department (GB-FWED), Mountain Agriculture Research Centre (MARC), Karakorum International University (KIU), and Aga Khan Agency for Habitat (AKAH).

# Acknowledgements

The organizers of the policy roundtable (i.e., ICIMOD, PCRWR, and WWF-Gilgit Baltistan) are highly thankful to the Parliamentarians of Gilgit Baltistan Legislative Assembly, Federal and Provincial Secretaries, the Australian High Commission Delegation, and the heads of government and non-government organizations for their participation and contributions to the workshop. The organizers would also like to express their gratitude to Karakorum International University for hosting and providing necessary facilitation for the policy roundtable. We would like to acknowledge the support of the Government of Australia's Department of Foreign Affairs and Trade (DFAT) provided through the Sustainable Development Investment Portfolio (SDIP) in South Asia.



# Chapter 1: Inaugural Session

Welcoming the participants, Abdul Wahid Jasra, Country Representative of ICIMOD Pakistan, highlighted the key objectives of the policy roundtable and forthcoming field visit.

## Key Messages from the Speakers



### Attaulah Shah, Vice Chancellor, Karakorum International University

Pakistan has been ranked in the top ten most vulnerable countries to climate change. Gilgit Baltistan, one of the most rugged and glaciated landscapes in the world, is already witnessing severe climate change impacts in the form of hazards that have resulted in the loss of precious lives and livelihoods. It is encouraging that the government of Gilgit-Baltistan has also developed its climate change Strategy and Action Plan in the light of the Climate Change Policy of Government of Pakistan. He emphasised the need to join hands to embark upon a well-conceived scientific collaboration for the betterment of the people of Gilgit Baltistan. "ICIMOD has facilitated KIU in strengthening the linkages with

regional mountain universities through the Himalayan University Consortium (HUC). Moreover, it has also supported KIU in capacity building through initiatives like Permafrost Summer School in 2017". As the only university in the region, KIU is rightly positioned to take the lead in the literary initiatives and policy dialogues to help the provincial government devise relevant policies. He praised ICIMOD and its partners for entrusting KIU to host the policy roundtable.



### Rab Nawaz, Senior Director (Biodiversity), WWF-Pakistan

WWF and its strategic partners have been undertaking initiatives to build resilience among mountain communities for the past 15 years. These successful initiatives are always climate-smart, economic-smart, and social-smart. WWF has made progress in Pakistan through its partnership approach. One example is the partnership between the Wildlife Department, the Irrigation Department, IUCN, the Fisheries Department, and WWF, which has successfully doubled the population of the Indus River dolphin, one of the five most endangered fish species, in the last 15 years. Gilgit Baltistan has been witnessing drastic changes in climate and seasonal patterns. The increasing tourist inflow in the last few years (1.6 million tourists visited

Gilgit Baltistan in 2016) is impacting the local environment both in positive and negative terms. It is now time to think and collaboratively work for "what is good to Gilgit Baltistan and Pakistan". For environmental conservation, we must identify the local champions. "The partnership consortium model introduced by ICIMOD is excellent,

successful, and replicable for making a difference with small financing”.

### **Mirza Habib Ali, Chairman, Pakistan Council of Research in Water Resources (PCRWR)**

The whole of nature is based on relationships. Man is the biggest threat to the globe when he starts juggling with nature, such as by wasting resources. The Hindu Kush Himalaya (HKH) is very important to 230 million residents, as it provides resources for their survival. It feeds the largest irrigation system in the world. With increasing population in the last few decades, the demand for water has increased, causing vulnerabilities to locals’ livelihood and food security. Under the IBI project, PCRWR with ICIMOD and WWF, has successfully piloted effective and climate-

smart technologies for enhancing the local communities’ livelihood and food security. Among these technologies are solar water lifting and zero energy hydro ram-powered water lifting (up to 175 feet), tunnel farming for off-seasonal vegetables, and growing block orchards of high-value fruit plants. These interventions are climate-, energy-, and water-smart, and have great potential for upscaling and outscaling to upgrade the existing traditional agricultural system to combat changing climate. “Involvement in ICIMOD’s initiative has broadened PCRWR’s understanding on the changing climate, with particular reference to the mountain watershed and its impacts on downstream waters. This is why PCRWR has started studying the upstream and downstream linkages, for which a project on ‘Integrated Watershed Management for Sustainable Improvement of Livelihood in the Upper Indus Basin’ has been secured from the Ministry of Science and Technology”.



### **Abdul Wahid Jasra, Country Representative, ICIMOD (on behalf of Director General, ICIMOD)**

ICIMOD was invited by the Government of Gilgit Baltistan in 2013 to assist in building resilience towards climate change. In response to this request, a mission comprising 70 national and international experts visited the UIB to physically observe the impacts of climate change on glaciers and dependent communities. Based on the interaction and needs assessment of local communities, a pilot project on innovative adaptation measures against climate change was approved. Since the capacity of partners in Gilgit Baltistan was meagre, the innovation of a partnership consortium was brought into the project. Under this approach, strategic partners were identified

and selected based on their strength (i.e., KIU for situational analysis and impact studies; PCRWR for agricultural water and energy management; MARC for high-value agriculture; GBDMA for effective hazard management through enhanced local capacity; and AKAH for resilience building through Community-Based Flood Early Warning Systems). WWF-P, having vast experience with climate conservancy and community mobilization, is taking the lead in the implementation process of the project, coordinating and integrating the partners’ efforts, and engaging communities through all aspects of the interventions. This consortium of partners has worked in close collaboration with local communities to implement the project interventions focused on energy, water, agricultural, and hazard management. The pilot project has so far been successful in terms of its ownership by local communities and the government. “Through this policy roundtable, we intend to disseminate the success of the project and through discussion find opportunities for upscaling and outscaling of these technologies”.

## Fida Muhammad Nashad, Speaker, Gilgit Baltistan Legislative Assembly

The introduction of Gilgit Baltistan could be done in verses of poetry as:

پہاڑی سلسے چاروں طرف ہیں، بیچ میں ہم ہیں  
مثال گوہر نایاب ہم پتھر میں رہتے ہیں



**Translation:** The mountain ranges all around and we live in between them like the precious jewels.

This event is very important, as Gilgit Baltistan is the home of the world's largest glaciers, such as Siachen. The agriculture of this area depends on the glacier-melt water; however, in recent years, it has been affected by flooding events due to the rapid melting process. This area has the potential to produce and feed the country with niche agricultural products such as fruits (apple, apricot, cherry) and seasonal and off-seasonal vegetables. Each year, floods in major rivers like the Indus, Shyok, Hunza, and Ghizar erode thousands of acres of land, with almost none of it being reclaimed. Million-dollar infrastructure like bridges on the Indus River are under threat from these flooding events. I hope that speakers will

keep the focus on these issues and suggest appropriate adaptation measures during this important event. Finally, he recommended to all development partners that, although ICIMOD and its partners have successfully piloted innovative resilient livelihood interventions in Gojal, "now it becomes our responsibility to upscale and outscale them throughout Gilgit Baltistan for better climate change adaptation".



# Chapter 2: Technical Sessions

## **Muhammad Ashraf, Director General, Pakistan Council of Research in Water Resources (PCRWR)**

During the last century, the simple problems have been resolved and the rest are complex ones. For resolving these issues, the multisectoral and multi-professional partnership approach is required. The major issue among institutions is a lack of coordination, but it can be overcome through the partnership model. The same partnership model was developed by ICIMOD, under which research, development, Governmental Organizations, Non-Governmental Organizations (NGOs), and Community-Based Organizations (CBOs) are working together. "PCRWR had been working with a larger focus only on downstream areas from its establishment. However, since beginning the partnership with ICIMOD, it has found an opportunity to work in the Upper Indus Basin, where it realized the gaps in upstream and downstream linkages for water resources management. To overcome such gaps and research challenges, it has upgraded the water quality laboratory at Gilgit as a Regional Research and Development Centre".

## **Session 1: Joint Presentation on Results of Pilot Interventions and Policy Issues under the Project "Agricultural Water, Energy, and Hazard Management in the Upper Indus Basin for Improved Livelihood and Building Resilience"**

### **1. Theory of Change by Farid Ahmad, Head of Strategic Planning, Monitoring, and Evaluation Unit, ICIMOD**

Farid Ahmad highlighted the theory of change in the IBI project. He explained that the theory of change is associated with context, actions/interventions, and their outcomes.

#### **Key messages:**

- There has been a lack of coordination and integration among government and non-governmental organizations working in the Indus Basin. The innovative partnership consortium approach has been adopted to overcome this issue, and it not only reduced coordination gaps but also helped develop the technical capacity of local organizations.
- The land holding is very small (<0.73 ha) and scattered where agriculture is dependent only on glacial-melt water supply. Consequently, most of the cultivable land along riverbanks is still barren. To resolve these issues, alternate water has been supplied through smart river water lifting mechanisms (solar/hydro-ram), which are integrated with drip irrigation to: a) empower the women; b) increase the cultivated area and agricultural production.
- With climate change, water-induced hazards are frequent, causing greater vulnerability to local communities. The Community-Based Flood Early Warning System has been piloted for flash floods, debris flow, and GLOF for better prepared communities, reduced losses, and integration with provincial Disaster Risk Management Plans.

### **2. Project Implementation Process by Saeed Abbas, Head WWF-Gilgit Baltistan**

Saeed Abbas highlighted the project implementation process. He explained the development of the partnership consortium, implementation of project interventions, and various achievements.



#### Key messages:

- Since the local institutions/organizations have meagre capacity, it was impossible for a single institution to implement a multi-disciplinary project. Through expertise assessment, a consortium of partners was developed according to the strengths of the institutions/organizations. During the implementation process, the capacity of these institutions was developed with technical backstopping and trainings by ICIMOD.
- One of the key impacts of the current partnership consortium project is that WWF has secured a grant from UNDP for outscaling its innovative agricultural water and energy technologies in 7 other districts of Gilgit Baltistan.
- The Government ownership of this seed project is very important for its upscaling, otherwise, it wouldn't achieve its ambitious outcomes.

### 3. Situational Analysis and Impact Studies by Zafar Khan, Assistant Professor, KIU

Zafar Khan underlined the results of situational analysis studies carried out in project communities.

#### Key messages:

- Traditional and less productive agriculture is less attractive for 50% of educated youth (16-40 years). Accordingly, they opt for less laborious employment in the service and business sectors that matches their capacity. This leads to outmigration, particularly among males, resulting in females being responsible for 75% of farming among the communities in Gojal Valley.
- Although the irrigation water supplies are heavily dependent on glacial melt water (>65%) while their perception about possible future water supplies can be water lifting from glacial lakes (>60%) and rivers (<30%).
- The water application mechanism is very inefficient, as bed and furrow is popular for vegetables, while flood irrigation is used for the orchards.
- GLOF are the most frequent disasters, followed by flash floods and river bank erosion. These disasters mainly affected agricultural land and houses worth millions of PKR.

### 4. Climate-Smart Water and energy Technologies for Livelihood by Faizan-ul-Hassan, Director, PCRWR

Faizan-ul-Hassan presented the piloting of climate-smart water and energy technologies. He explained irrigation water lifting and irrigation water distribution separately.

**Key messages:**

- River water lifting through solar and hydro-ram pumping to more than 100 feet is possible; however, local customization is required for sustainability.
- The meagre water supply can be efficiently applied through a drip irrigation system for enhanced water and land productivity.
- Local capacity and entrepreneurship, particularly for youth

**5. High Value Agriculture for Improved Livelihood by Sher Ahmad, Director General, MARC**

Sher Ahmad highlighted the integration of innovative and climate-smart water and energy technologies with high-value agriculture for higher outputs

**Key messages:**

- The alley cropping enhances the land productivity through dense and diversified agriculture.
- The seasonal income can be enhanced by upgrading the traditional crops with high-value vegetable cultivation.
- The seasonal variations can be controlled under tunnel farming and drip irrigation, leading to enhanced yield production of high-value vegetables.
- High-yielding fodder (maize and oat) varieties can replace wheat as fodder.

**6. Early Warning Systems for Water-Induced Hazards by Deedar Karim, Geologist, AKAH**

Deedar Karim shared the piloting of Community-Based Flood Early Warning System (CBFEWS) in project areas. He explained the site identification process, installation, maintenance, and operation process.

**Key messages:**

- The vulnerability of 828 households to water-induced disasters has been reduced through CBFEWS piloting.
- An accurate warning by the Sherqilla CBFEWS on 3 August 2017 at 2:30 AM saved precious human lives and livestock.
- Local manufacturing of CBFEWS is very much needed to reduce the initial costs and enhance the local capacity, which can play a vital role in reducing vulnerabilities throughout Gilgit Baltistan.

**Session 2, Part 1: Panel Discussion**

The panel discussion was moderated by Dr Qamar uz Zaman Chaudhary. The panelists were as below:

- Ghulam Rasul, DG-Pakistan Meteorological Department (PMD)
- Muhammad Ashraf, DG-PCRWR
- Amanullah Khan, Assistant Country Director, UNDP
- Farid Ahmad, DG-GBDMA
- Ahsanullah Mir, Programme Coordinator, Economic Transformation Initiative, Gilgit Baltistan
- Muzaffar Uddin, GM, AKRSP
- Walayat Noor, Chief Conservator, Gilgit Baltistan Forest, Wildlife, and Environment Department
- Ayesha Khan, Country Director, Hashoo Foundation

The panel discussion is summarised below:

Panellist	Questions	Key Discussion Points
Ghulam Rasul	What are the climate variabilities and associated disaster potentials in Gilgit Baltistan?	<ol style="list-style-type: none"> <li>1. Seasonal variations are impacting the local agriculture and shortening the freezing period of snowfall, causing avalanches.</li> <li>2. Vertical and horizontal changes in precipitation patterns and forms are causing frequent events like GLOF.</li> <li>3. The Community-Based Flood Early Warning Systems are a very effective way to reduce vulnerabilities due to such disasters.</li> </ol>

Muhammad Ashraf	<p>What are the common issues/challenges of agricultural water management in GB?</p> <p>What innovative technological interventions can be helpful in dealing with the challenges?</p>	<p>There are three types of common issues and corresponding measures for agricultural water management:</p> <table border="1" data-bbox="708 215 1437 678"> <thead> <tr> <th data-bbox="708 215 1043 253">Issues</th> <th data-bbox="1051 215 1437 253">Measures</th> </tr> </thead> <tbody> <tr> <td data-bbox="708 264 1043 376">1. Watershed degradation increased sedimentation in the country's reservoirs.</td> <td data-bbox="1051 264 1437 376">1. Watershed management practices</td> </tr> <tr> <td data-bbox="708 387 1043 477">2. Inefficient use and inaccessibility of water</td> <td data-bbox="1051 387 1437 544">2. The simple and smart technologies for alternate irrigation water supplies i.e., river water lifting through solar/hydro-ram</td> </tr> <tr> <td data-bbox="708 555 1043 678">3. Traditional and subsistence-based agriculture</td> <td data-bbox="1051 555 1437 678">3. High-value agriculture production 4. Well-coordinated and integrated approach</td> </tr> </tbody> </table>	Issues	Measures	1. Watershed degradation increased sedimentation in the country's reservoirs.	1. Watershed management practices	2. Inefficient use and inaccessibility of water	2. The simple and smart technologies for alternate irrigation water supplies i.e., river water lifting through solar/hydro-ram	3. Traditional and subsistence-based agriculture	3. High-value agriculture production 4. Well-coordinated and integrated approach
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Amanullah Khan	Brief the GLOF project components	<p>The GLOF-2 project is an upscaling of the previous pilot phase-1, which is funded by the Green Climate Fund and is to be implemented in 15 districts of Gilgit Baltistan and Khyber Pakhtunkhwa, benefiting 29 million people. It has four components:</p> <ol style="list-style-type: none"> <li>1. Capacity building at different levels</li> <li>2. At least 250 small-scale engineering structures</li> <li>3. Early Warning Systems and hydro-meteorological monitoring systems</li> </ol>								
Farid Ahmad	<p>What are the potential challenges faced by GBDMA?</p> <p>What measures is GBDMA taking to manage the disasters?</p>	<table border="1" data-bbox="708 999 1437 1525"> <thead> <tr> <th data-bbox="708 999 1043 1037">Challenges</th> <th data-bbox="1051 999 1437 1037">Measures</th> </tr> </thead> <tbody> <tr> <td data-bbox="708 1048 1043 1149">1. Multi-hazard vulnerabilities in Gilgit Baltistan</td> <td data-bbox="1051 1048 1437 1205">1. Multi-hazard vulnerabilities assessment in Gilgit Baltistan with support of Government of Gilgit Baltistan and the World Bank</td> </tr> <tr> <td data-bbox="708 1205 1043 1283">2. Meagre capacity (recruited staff in 2017)</td> <td data-bbox="1051 1205 1437 1361">2. Capacity building trainings by partners like ICIMOD, WWF, and UNDP, etc. Latest machinery at district level for rehabilitation</td> </tr> <tr> <td data-bbox="708 1361 1043 1525">3. Post-disaster response approach (contingency plans)</td> <td data-bbox="1051 1361 1437 1525">3. Revising the Disaster Risk Management Plan of Gilgit Baltistan in the wake of climate change, with the support of ICIMOD and AKAH</td> </tr> </tbody> </table>	Challenges	Measures	1. Multi-hazard vulnerabilities in Gilgit Baltistan	1. Multi-hazard vulnerabilities assessment in Gilgit Baltistan with support of Government of Gilgit Baltistan and the World Bank	2. Meagre capacity (recruited staff in 2017)	2. Capacity building trainings by partners like ICIMOD, WWF, and UNDP, etc. Latest machinery at district level for rehabilitation	3. Post-disaster response approach (contingency plans)	3. Revising the Disaster Risk Management Plan of Gilgit Baltistan in the wake of climate change, with the support of ICIMOD and AKAH
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Ahsanullah Mir	ETI activities in Gilgit Baltistan	<ol style="list-style-type: none"> <li>1. ETI/IFAD to bring 50,000 acres of land under cultivation by 2019 in four districts, benefiting 100,000 households through water channels and High-Efficiency Irrigation Systems in the project areas</li> <li>2. Market linkages through road network</li> <li>3. Enhancing the capacity of youth</li> <li>4. The value chain will be linked with the high-value agricultural production system.</li> <li>5. ETI team will explore the best replicable practice during the forthcoming field visit organized by ICIMOD and its partners. It will include the selected interventions in its future annual plans.</li> </ol>								
Muzaffar Uddin	What are the developmental challenges for integrating the learnings and knowledge into policy, strategy, and plans?	<p>The main challenges are:</p> <ol style="list-style-type: none"> <li>1. Lack of integrated approach</li> <li>2. Lack of benefit-sharing approach</li> <li>3. The higher outmigration and disengagement of youth with agriculture</li> </ol>								

Walayat Noor	What are the challenges faced by the Forest Department in upscaling the ICIMOD project interventions?		
		Challenges	Measures
		<ol style="list-style-type: none"> <li>1. Abundant river water and barren uplands</li> <li>2. Lack of political will</li> <li>3. Resource allocation</li> </ol>	<ol style="list-style-type: none"> <li>1. Water channels and river water lifting schemes piloted by ICIMOD</li> <li>2. Policy dialogues through policy roundtable</li> <li>3. Government of GB may allocate sufficient funds through ADPs</li> </ol>
Ayesha Khan	Highlight the activities of the Hashoo Foundation in Gilgit Baltistan	<p>The Hashoo Foundation has been actively working in Gilgit Baltistan since 2004. There are three important programmes being implemented by the Foundation:</p> <ol style="list-style-type: none"> <li>1. Skill development programme for the training of locals on hospitality and hotel management throughout Pakistan</li> <li>2. Education Centre Programme: Community schools and scholarship programme</li> <li>3. Humanitarian Relief and Assistance Programme to support the vulnerable communities in remote areas</li> <li>4. Entrepreneurship programme: Value chain development of honey bee and buckwheat farming for the empowerment of women</li> <li>5. Climate Change Programme</li> </ol>	

## Session 2, Part 2: Group Discussion

The group discussion was moderated by Mr Nisar A. Memon, who distributed the paper with discussion points to all participants for their inputs. These papers included following questions:

- Q.1 What are the outscaling opportunities from the already presented pilot intervention related to agriculture, water, energy, and hazard management?
- Q.2 How can these piloted interventions be upscaled through policies and integrated into the annual development plan of Gilgit-Baltistan?
- Q.3 What are the possible challenges and solutions associated with scaling up these water, energy, and hazard management interventions?
- Q.4 What are the key action points or the way forward?

The papers were collected at the end of the last session and compiled. The results of these inputs are summarized below:

Discussion Points	Inputs from Participants
Q.1 What are the outscaling opportunities from the already presented pilot intervention related to agriculture, water, energy, and hazard management?	<ol style="list-style-type: none"> <li>1. The UNDP grant of USD 5 million for outscaling agricultural water and energy management interventions is a great example of taking good work in a forward direction.</li> <li>2. Keeping in view the step by UNDP, other development agencies like AKRSP, Asia Foundation, Hashoo Foundation, GBRSP, WWF, and ETI may prioritize the outscaling of these innovative technology packages.</li> </ol>

<p><b>Q.2</b> How can these piloted interventions be upscaled through policies and integrated into the annual development plan of Gilgit-Baltistan?</p>	<ol style="list-style-type: none"> <li>1. ICIMOD, in collaboration with WWF, PCRWR, and PARC, will document the piloted technologies as a package for the farmers of Gilgit Baltistan, which should be promoted through the annual development plans of the GB Government.</li> <li>2. The GB water management and extension department may identify the potential sites through extensive field surveys.</li> <li>3. Based on assessment studies, a feasibility plan may be developed, taking into account the financial and technical requirements, and presented to the GB Government.</li> <li>4. The Government of Gilgit Baltistan may ensure financial support for subsidising the technology packages to promote them among small farmers for at least five years.</li> <li>5. GBDMA, in collaboration with AKAH and ICIMOD, may update the GB Disaster Risk Management Plan and, accordingly, prepare a list of potential hazards sites for establishing a CBFEWS network.</li> <li>6. The Government of Gilgit Baltistan and NDMA may allocate appropriate resources to support GBDMA in this regard.</li> <li>7. The learnings from the interventions of Gilgit Baltistan can then be replicated in other mountain areas of Pakistan, such as Chiral, FATA, etc., with a similar ecological setting in the long run.</li> </ol>
<p><b>Q.3</b> What are the possible challenges and solutions associated with scaling up these water, energy, and hazard management interventions?</p>	<ol style="list-style-type: none"> <li>1. Lack of technical capacity in the relevant departments</li> <li>2. Lack of local entrepreneurship and enterprises</li> <li>3. Limited incentive for local youth in the agriculture sector</li> <li>4. Ownership and involvement of the security agencies in piloting, upscaling, and outscaling of new interventions</li> <li>5. Lack of political will</li> <li>6. Lack of integration among organizations/institutions</li> <li>7. Lack of relevant private sector engagement</li> </ol>
<p><b>Q.4</b> What are the key action points or ways forward?</p>	<ol style="list-style-type: none"> <li>1. The Government of Gilgit Baltistan, in consultation with the Federal Government, can take certain policy measures to ensure upscaling and outscaling of technology packages.</li> <li>2. ICIMOD, PARC, PCRWR, and WWF may develop cost-effective technology packages for the Government of Gilgit Baltistan.</li> <li>3. Develop mechanisms for establishing local enterprises and entrepreneurship for local youth</li> <li>4. The Government of Gilgit Baltistan may declare these pilot sites as policy, education, and training sites for parliamentarians, policy, and decision makers and farmers.</li> <li>5. PARC, PCRWR, and other institutions may come at front to build the capacity of local departments.</li> <li>6. Under the Prime Minister's Youth Loan Scheme or any other financial/community benefit sharing schemes, GB youth is granted loans for these specifically designed packages.</li> </ol>



# Chapter 3: Closing Session

## **Sajjad Haider, Secretary Agriculture, Livestock and Fisheries, Gilgit Baltistan (on Behalf of Chief Secretary, Gilgit Baltistan)**

Gilgit Baltistan provides 72% of mean annual flow into the Indus River, which the agriculture and power sectors of Pakistan depend on. This watershed also contributes to a higher sediment load of 640 ton/km<sup>2</sup>/year due to the arid environment. Its ecosystem is fragile and the climate is changing; i.e., a 0.15 °C /decade increase in average temperature has been observed from 1984 to 2013. The climatic variabilities are also changing the precipitation trends during the winter and summer seasons. These variabilities have caused hydro-meteorological disasters with greater frequency and ferocity. Since 2010, the disasters have claimed the lives of 306 people and 5,000 livestock animals, and damaged 250,000 trees, 608 km of roads, 12,500 acres of the agricultural base, 500,000 feet of irrigation channels, 87,000 protective bunds, and 57 drinking water schemes. The seasonal changes have also introduced alien plant diseases.

Recognizing the situation and being cognizant of the National Climate Change Policy of Pakistan, the GB Government has framed the GB Climate Change Strategy and Action Plan, which was approved by the GB Cabinet on 11 December 2017. The GB Cabinet also decided to spare .01% of the cost on major infrastructure projects for adaptation measures against climate change.

“The interventions by ICIMOD and its consortium of partners, with financial assistance from the Australian Government, are very much in line with the Climate Change Policy of Pakistan, as well as the GB Climate Change Strategy and Action Plan. The development sector organizations are requested to align these interventions with their annual plans for outscaling it to other parts of Gilgit Baltistan. It is hoped that these interventions will help to enhance livelihoods and food security and build climate resilience among the residents of Gilgit Baltistan”.

## **H.E. Margaret Adamson, Australian High Commissioner to Pakistan**

The bilateral relationship between Australia and Pakistan is as longstanding as the existence of Pakistan. The people-to-people links between both countries go back to the 19th century. During the natural disasters in Pakistan, Australia mobilized all possible assistance. The Gilgit Baltistan is a beautiful part of Pakistan, but it is also the most vulnerable to natural disasters. The Australian Aid programme to Pakistan is also a longstanding one which aims to build human capacity, especially educational support through scholarships in the areas of sustainable water management, agriculture, veterinary sciences, public policy, education, and gender studies. The GB is considered a “must-see” destination worldwide, and it is hoped that international tourism will resume again in this region.

Gilgit Baltistan is experiencing the impacts of climate change on environmental and livelihood sustainability. Since the agricultural economy is dependent on glacial melt water, the entire economy of Pakistan is vulnerable to climate change impacts.

The richness of participation and the experiences being shared in this policy roundtable is very vital. ICIMOD has done a magnificent and long-term sustainable job in gathering the political leadership, governmental institutions, local and international development partners, and academia. “The partnership consortium approach by ICIMOD is a successful example which is already in vogue in Australia. The Government of Australia encourages you to work in integration with civil society, academic research, and other state research organizations. The showcase of this approach in Gilgit Baltistan by ICIMOD has set an example for the rest of Pakistan. Since it has been a pilot project, it has a great scope of outscaling and upscaling throughout the mountainous parts of Pakistan”. She indicated that gender inclusion, particularly women’s contribution intellectually as well as in the economy, is the core priority of the Australian aid program. Therefore, the resourcefulness of women, together with the natural beauty of the region, cultural heritage, ecosystem, and water resources, needs to be utilized to the fullness of its potential for the benefit of the mountain communities. During the next couple of days, the mission will witness the achievements of the ICIMOD project under the partnership consortium approach. Excellency congratulated ICIMOD and its partners



for organizing such a wonderful event and hoped such events will also be organized in the future to monitor the progress made, particularly related to the Australian Aid-supported initiatives of ICIMOD.

### **Fazal Abbas Maken, Federal Secretary, Ministry of National Food Security & Research (BoD ICIMOD)**

This is a very good demonstration of a multi-stakeholder gathering including participants from research, academia, public and private sector, national and international development partners, and end beneficiaries (local community). Climate change is no longer a theoretical possibility, but is instead a reality making Pakistan one of the most vulnerable states globally. The vulnerability of low income groups is much higher than others, especially in mountainous areas. The arable land is limited and landholding is less than 06 ha/capita in this region. To uplift the agriculture, vertical as well as dense horizontal agriculture practices would be vital. Under these practices, high value niche agricultural practices should be adopted. He indicated that income and vulnerability are interrelated, so interventions should be designed to increase the income of the mountain communities. This will improve their resilience to the effects of climate change, which is crucial, as the mountain communities are the custodians of the Indus River, on which the whole agri-ecosystem of Pakistan depends.

The national food security policy also focuses on climate-smart agricultural practices and drought-resistant crops. In this connection, a pilot project with FAO has been initiated in many districts of Pakistan. The Mountain Agriculture Research Centre is being strengthened with the financial support of USD 636 million for five years, which focuses on developing agro-ecological zones, high value crops, climate change, and capacity building of communities and farmers.

“ICIMOD and its partners have simulated the innovative way of using the unutilized and inaccessible river water through lifting schemes and applying it through High Efficiency Irrigation Systems, meaning more crop per drop. The Ministry of Food Security and Research would like to help in upscaling these innovative practices”. He suggested arranging a workshop with relevant government and other development organizations focused on what and how

to upscale and outscale the learnings and good practices of the pilot interventions. At the end, His Excellency congratulated the organizers of this wonderful event and hoped that the key objectives of this meeting were achieved.

### **Hafiz Hafeez ur Rehman, Chief Minister, Gilgit Baltistan**

Climate change is a very complicated subject, and it has been neglected in Government policies. Many development and research organizations like ICIMOD, WWF, and UNDP have been working to pilot the adaptation measures; however, the Government of Gilgit Baltistan is the main responsible party for carrying out and upscaling these initiatives. All organizations/institutions are working on this aspect, but coordination and integration needs to be strengthened. All research outcomes must be aligned with the policy-making process, which is still missing. It is emphasized that each research project should be practicable and convertible into policy, considering the local needs and available natural resources. The three rivers flowing through Gilgit City are causing riverbank erosion. All the development and research organizations, including ICIMOD, are asked to help the GB Government in an assessment study of the biological engineering measures that would tame the riverbanks, which are currently a potential disaster for the locals, as well as a source of silt to the dams in Pakistan. Taming the riverbanks flowing through the middle of cities like Gilgit and Skardu can turn the potential disaster into tourist attractions. The GB Government, with the support of the Federal Government, has strengthened the GBDMA by inducting human resources and providing the latest machinery for rehabilitation. The GB Government has established a Disaster Management Endowment Fund. With AKHA, the GB Government has developed maps of multi-hazard vulnerabilities in GB in which the hot spot has been identified. "The Early Warning Systems installed by ICIMOD are very useful. ICIMOD is requested to extend its technical support, while the provincial government is willing to extend its financial support for reducing the vulnerability of hundreds of endangered settlements in Gilgit Baltistan".

The Government of Gilgit Baltistan has successfully planted 1.5 to 3 million trees with community and religious scholars' involvement to save the nature through the program "aik bashar do shajar" (one human two trees). WWF audited this plantation and found a survival rate of 70%. GB Government is developing a policy on "one tourist, one tree" in which each tourist will pay 100 rupees for one plant. It is also developing a tourist insurance policy for attracting more tourists to the region. The GB Cabinet approved the GB Climate Change Strategy and Action Plan



on 11 December 2017. Moreover, the GB Cabinet also decided to spare 01% cost of major infrastructure projects for adaptation measures against climate change. The solid waste management companies are working efficiently in Gilgit and Skardu cities, and more companies would also be established in all district headquarters to ensure a clean environment. The GB Government is planning to enforce an Environment Trade Tax on each vehicle passing through this region, which would be utilized for adaptation measures for environmental sustainability.

Gilgit Baltistan has plenty of arable land but is barren, as water is inaccessible. Through ETI, the Government is targeting the cultivation of 50,000 acres of land, which will provide livelihoods to 100,000 people. His Excellency hoped the innovative and climate-smart technologies disseminated by ICIMOD and its partners would be encouraging enough for ETI to outscale in targeted districts. He further asked that the outputs of this policy roundtable be shared with the Government of Gilgit Baltistan for utilizing in future policy formulation. In ending, he congratulated ICIMOD and its partners for this successful event and hoped it would bring some practicable way forward for the Government of Gilgit Baltistan to develop climate resiliency.

### **Vote of thanks: Babar Khan**

WWF's Babar Khan thanked Hafiz Hafeez-ur-Rehman, Chief Minister of Gilgit Baltistan; Margaret Adamson, Australian High Commissioner to Pakistan; Fazal Abbas Maken, Federal Secretary Ministry of National Food Security and Research; Senator Nisar A. Memon; Fida Muhammad Nashad, Speaker GBLA; Jaffarullah, Deputy Speaker GBLA; Muhammad Iqbal, Minister, Public Works Department, VC KIU; heads of federal and provincial government departments; national and international development organizations; and local community representatives for making this event successful.

He also appreciated all participants for giving important feedback during the group work session. He thanked all the panelists for sharing their enriching experience and knowledge. He also thanked ICIMOD's headquarter colleagues for visiting Pakistan and making the workshop successful. He also appreciated the efforts of facilitators of the event, from the PCRWR team, ICIMOD Pakistan Office, KIU, and WWF-GB Office. He thanked Abdul Wahid Jasra, country representative of ICIMOD, for guidance and support.



# Annex 1: Agenda

The economy of Gilgit Baltistan depends on agriculture, livestock herding, and tourism, which remains disproportionate in contrast with other provinces due to limited arable land (only 2%) and small landholdings (<0.73 ha). The province is characterised by subsistence-based agriculture, an arid landscape, dwindling irrigation water supplies, and seasonal shifts due to climate change, labor shortages (as a result of a higher male outmigration of 41%), insufficient research and development, government subsidies, and poor market linkages. The arable land is located along the river banks, out of which 50% is uncultivated due to lack of access to water. Although the area is highly arid, about 57,000 ha land has been cultivated through inefficient irrigation systems relying on meltwater, built over generations. In recent years, rapid deglaciation and the resulting lowering of glacier surface and water-related hazards have been disrupting vital irrigation infrastructure and reducing water availability for agricultural uses. The traditional irrigation system comprises unlined water conveyance and distribution channels. Furthermore, the poor on-farm water management techniques cause water losses and lower yields. Under these circumstances, agricultural productivity is insufficient to feed the rapidly growing population.

The province is also the location of many types of natural disasters, which people cope with on a daily basis. The most frequent and dominant hazards include earthquakes, flash floods, glacial outburst floods, riverine floods, heavy snowfall, snow avalanches, landslides, debris flows, rock falls, and torrential rain, which puts the lives and livelihood options of the inhabitants at risk.

Keeping in view the aforementioned impacts of climate change in the Upper Indus Basin (UIB), International Centre for Integrated Mountain Development (ICIMOD), together with the World Wide Fund for Nature-Pakistan (WWF-P) and its strong consortium of partners, including the Pakistan Council of Research in Water Resources (PCRWR), Gilgit Baltistan Disaster Management Authority (GB-DMA), IMARC of Karakorum International University (KIU), and Aga Khan Agency for Habitat (AKAH), has been implementing a project to develop the climate resilience of local communities. This project has been supported by the Sustainable Development Investment Portfolio (SDIP) of the Department of Foreign Affairs and Trade (DFAT) of the Australian Government.

The project aims to pilot climate-smart water, energy, and hazard management technologies and enhance local capacities for improved livelihood and resilience to deal with the effects of climate change in the UIB. The pilots are focused more on improving water use and energy efficiency, particularly demonstration of the solar pump or hydro-ram pump at the community level, combined with micro-irrigation systems. For hazard management, the Community-Based Flood Early Warning System (CBFEWS) has been piloted as an approach to enhance the resilience of vulnerable communities in the flood-prone areas.

The piloted interventions are expected to be upscaled and outscaled through the relevant public and private sector organizations. The learnings can be integrated into government policies and strategies to improve the resilience of the mountain communities. ICIMOD, together with AKAH, is already supporting GBDMA in revising the Disaster Risk Management Plan of Gilgit Baltistan to manage disasters with a planned approach. The project also aims to establish a province-wide network of Community-Based Flood Early Warning Systems following successful pilots and gathering of evidence of reduced loss of life and properties.

A policy-level Roundtable on Building Climate Resilience in Gilgit Baltistan is scheduled on 26 June 2018 at Gilgit with the Chief Secretary and other relevant high-level government officials of Gilgit Baltistan. Her Excellency Ms. Margaret Adamson, Australian High Commissioner to Pakistan; Mr. Fazal Abbas Maken, Federal Secretary Ministry of National Food Security & Research; Ms. Yasmin Masood, Federal Secretary Ministry of Science and Technology; Dr. David James Molden, Director General of ICIMOD; along with the heads of partner organizations are expected to join the roundtable. The objective of the session is to present the success and learning experiences of the pilot interventions to the policymakers for potential upscaling and outscaling by exploring options of integrating the learnings into relevant policies in Gilgit Baltistan.

## Agenda

Time	Description	Remarks
09:00 – 09:30	Arrival of guests	Venue: KIU, Gilgit
09:30 – 09:40	Recitation of Holy Quran	Mr M. Mudassar Maqsood
09:40 – 10:20	<p><b>Welcome Remarks</b></p> <ul style="list-style-type: none"> <li>Vice Chancellor, KIU</li> <li>Senior Director, WWF-Pakistan</li> </ul> <p><b>Opening Remarks</b></p> <ul style="list-style-type: none"> <li>Chairman, PCRWR</li> <li>Director General, ICIMOD</li> <li>Guest of Honor: Speaker Gilgit Baltistan Legislative Assembly</li> </ul>	<p><b>MC:</b> Dr Abdul Wahid Jasra Dr Attaullah Shah Mr Rab Nawaz</p> <p>Dr Mirza Habib Ali Dr Abul Wahid Jasra for DG ICIMOD Mr Fida Muhammad Nashad <b>Rapporteur:</b> M. Mudassar Maqsood and Ms Breerah Fatimah</p>
10:20 – 10:40	Tea/Coffee and Group Photo	
10:40 – 11:25	<p><b>Results of Pilot Interventions and Policy Issues</b></p> <ul style="list-style-type: none"> <li><b>ICIMOD:</b> Theory of Change</li> <li><b>WWF-P:</b> Project Implementation Process</li> <li><b>PCRWR:</b> Climate-Smart Water and Energy Technologies for Livelihood</li> <li><b>KIU:</b> Situational Analysis and Impact Studies</li> <li><b>MARC:</b> High Value Agriculture for Improved Livelihood</li> <li><b>GBDMA+AKAH:</b> Early Warning Systems for Water-Induced Hazards</li> </ul>	<p><b>Moderator:</b> Dr Muhammad Ashraf</p> <ul style="list-style-type: none"> <li>Mr Farid Ahmad (7 Minutes)</li> <li>Mr Saeed Abbas (7 Minutes)</li> <li>Mr Faizan ul Hassan (7 Minutes)</li> <li>Dr Zafar Khan (7 Minutes)</li> <li>Mr Sher Ahmad (7 Minutes)</li> <li>Mr Deedar Karim (7 Minutes)</li> </ul> <p><b>Rapporteur:</b> Mr M. Mudassar Maqsood and Ms Breerah Fatimah</p>
11:25 – 12:10	<p><b>Part 1: Discussion Panelists</b></p> <ul style="list-style-type: none"> <li><b>Dr Ghulam Rasul</b>, DG-PMD</li> <li><b>Dr Muhammad Ashraf</b>, DG-PCRWR</li> <li><b>Mr Amanullah Khan</b>, Assistant Country Director, UNDP</li> <li><b>Mr Farid Ahmad</b>, DG-GBDMA</li> <li><b>Dr Ahsanullah Mir</b>, Programme Coordinator, ETI/IFAD</li> <li><b>Mr Muzaffar Uddin</b>, GM-AKRSP</li> <li><b>Mr Walayat Noor</b>, Chief Conservator, GBFWED</li> <li><b>Ms Ayesha Khan</b>, Country Director, Hashoo Foundation</li> </ul>	<p><b>Moderator:</b> Dr Qamar-Uz-Zaman Chaudhry</p> <p><b>Rapporteur:</b> Mr Saeed Abbas and Mr Ajaz Ali</p>
12:10 – 12:55	<p><b>Part 2: Roundtable Discussion</b></p> <ul style="list-style-type: none"> <li>Upscaling and Outscaling Opportunities</li> <li>Integration with the Annual Development Plan</li> <li>Possible Challenges and Solutions Associated with Scaling Up</li> <li>Key Action Points or Way Forward</li> </ul>	<p><b>Moderator:</b> Mr Nisar A. Memon</p> <p><b>Rapporteur:</b> Mr Saeed Abbas and Mr Ajaz Ali</p>
12:55 – 13:40	<ul style="list-style-type: none"> <li>Remarks by Chief Secretary, Gilgit Baltistan</li> <li>Remarks by H.E. Australian High Commissioner</li> <li>Remarks by Secretary, MNFS&amp;R</li> <li>Concluding Remarks by Chief Minister</li> </ul>	<p><b>MC:</b> Dr Abdul Wahid Jasra</p> <p><b>Rapporteur:</b> Mr M. Mudassar Maqsood and Ms Breerah Fatimah</p>
13:40 – 14:30	Group Photo and Lunch	

## Annex 2: List of Participants

S. N	Name	Organization	Email/Phone
<b>Federal Government</b>			
01.	Mr Fazal Abbas Maken	Secretary, Ministry of Food Security and Research	secretary@mnfsr.gov.pk
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<b>Provincial Government</b>			
11.	Mr Hafiz Hafeez ur Rehman	Chief Minister, Gilgit Baltistan	05811-920466/920627
12.	Fida Muhammad Nashad	Speaker, Gilgit Baltistan Legislative Assembly Govt of Gilgit Baltistan, Gilgit	05811-920423/920735
13.	Mr Jafarullah	Deputy Speaker, Gilgit Baltistan Legislative Assembly Govt of Gilgit Baltistan, Gilgit	05811-920445 safwaan44@gmai.com
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15.	Mr Sajjad Haider	Secretary of Agriculture, Govt of Gilgit Baltistan	sajjad.hyder@hotmail.com
16.	Mr Farid Ahmad	Director General, GBDMA	dggbdma@gbdma.com.pk
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<b>Community Representatives</b>			
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International Centre for Integrated Mountain Development (ICIMOD)			
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63.	Mr Haris Ayub	Administrative Finance Associate	haris.ayub@icimod.org

# Annex 3: Glimpses of Policy Roundtable



Figure 1: Guests of Honour at the Policy Roundtable



Figure 2: Hafiz Hafeez Ur Rehman, Chief Minister, Gilgit Baltistan



Figure 3: Margaret Adamson, Australian High Commissioner to Pakistan



Figure 4: Fazal Abbas Maken, ICIMOD Board Member and Secretary MNFS&R



Figure 5: Sajjad Haider, Secretary Agriculture, Gilgit Baltistan



Figure 6: Nisar A. Memon, Chairman, Water Environment Forum



Figure 7: Attaulah Shah, VC, Karakorum International University



Figure 8: Panelists Discussion Session



Figure 9: Farid Ahmad, Head, SP&ME Unit, ICIMOD



Figure 10: Qamar-Uz-Zaman, Senior Policy Advisor, ICIMOD



Figure 11: Sher Ahmad, DG-MARC



Figure 12: Faizan-ul-Hassan, Director-PCRWR



Figure 13: Saeed Abbas, Head, WWF-Gilgit Baltistan



Figure 14: Zafar Khan, Assistant Professor, KIU



Figure 15: Group Photo



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