

# The Upper Indus Basin Network

A regional science forum

ICIMOD



FOR MOUNTAINS AND PEOPLE



The transboundary Indus River basin, shared by Afghanistan, China, India, and Pakistan, is ranked among the world's most significant basins in terms of human dependency on its water resources and agricultural livelihoods. Home to nearly 215 million people, the basin has seven main rivers originating from glaciers and snowfields in the Western Himalaya, the Karakoram, and the Hindu Kush, which are sources of irrigation for over 16 million hectares of agricultural land.

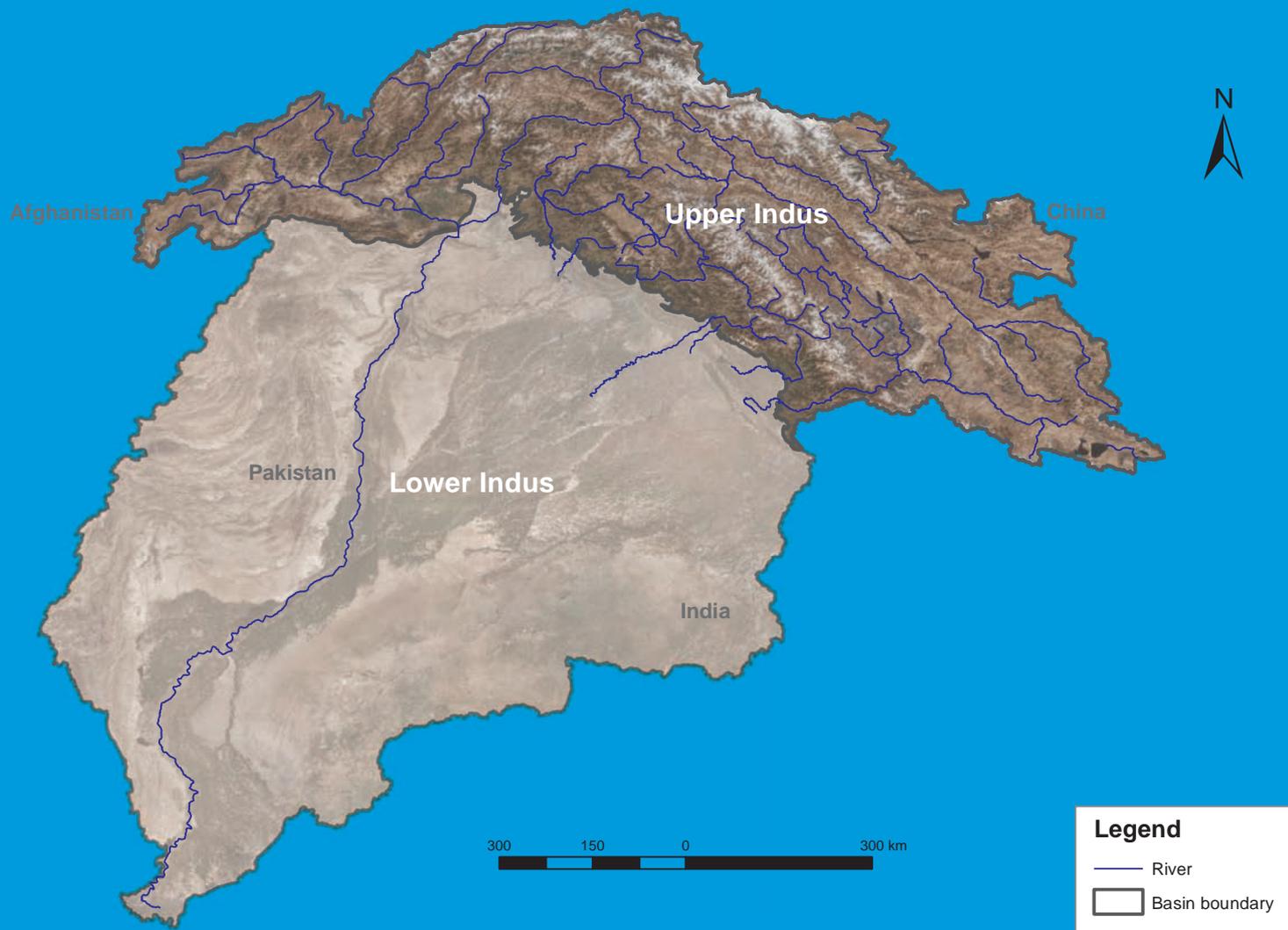
The upper Indus basin is composed of mountainous terrains of the Hindu Kush, Karakoram and Himalayan mountain ranges. The basin is already water scarce, and the demand for water continues to grow rapidly putting further stress on the resource owing to rapidly changing demographics and climatic conditions. Climate change is likely to exacerbate the problem. While there are more economic activities in the lower part of the basin, climate is likely the major driver of change in the upper high mountain affecting upstream and downstream populations.

## About the Upper Indus Basin Network

The Upper Indus Basin (UIB) Network is an informal knowledge and research network of national and international researchers working in the basin. It aims to foster coordination in research related to climate, cryosphere, water, hazards and vulnerability, and adaptation. The members are from national departments, organizations, universities from Afghanistan, China, India, and Pakistan. The International Centre for Integrated Mountain Development (ICIMOD), a Kathmandu-based regional knowledge centre, and other international partners are also members.

The UIB network is currently supported by several organizations in Pakistan including the Pakistan Meteorological Department (PMD), the Water and Power Development Authority (WAPDA), WWF-Gilgit Baltistan, and international organizations such as Ev-K2-CNR and the University of Bonn. The ICIMOD country office in Pakistan hosts its secretariat.

The network was formed in 2012 through a UIB Monitoring Working Group (MWG) of national and international partners for "Building Resilience to Climate Change Impacts on Water Resources of the UIB".



## Key mission of UIB Network

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 ranging from the local to national levels.

The network collaborates with key national networks and forums such as the Indus Forum in Pakistan, which actively promotes the linking of evidence-based research with national policy. It shares research findings with national policy makers through various platforms.

In the upper Indus basin, limited studies have been conducted on climate, cryosphere, water, hazards, and adaptation. There is a gap in scientific knowledge sharing and coordination between the concerned institutions and professionals.

### Members of Strategic Committee

Arun B Shrestha, ICIMOD  
 Babar Khan, WWF, Pakistan  
 Daniyal Hashmi, WAPDA  
 Ghulam Rasul, Pakistan Meteorological Department

### Advisors

Asif Khan, Karakoram International University  
 Matthias Weniger, University of Bonn  
 Nusrat Nasab, Aga Khan Agency for Habitat, Dushanbe, Tajikistan

## Key Structure

The UIB Network is chaired by Khalid Mohtadullah, former senior advisor and country director at the International Water Management Institute (IWMI) Pakistan, senior advisor to the Global Water Partnership, and senior advisor to ICIMOD.

ICIMOD's country office in Pakistan functions as the network secretariat which facilitates and provides logistical support to network members for the implementation of UIB action plans. Currently, the network is limited to Gilgit-Baltistan of Pakistan, and there are plans to expand it to Afghanistan, China and India.

The network is guided by a strategic committee, a group of advisors and technical working groups in thematic areas. The strategic committee provides strategic inputs to the different working groups. It communicates with technical working group leads and members to synergize their work and integrate their scientific knowledge.

The advisors provide advice and technical inputs to UIB network on priority actions. There are six technical working groups which meet twice a year to share updates on their progress and discuss socioeconomic issues and future strategies and actions.



## 10 Crucial Questions UIB attempts to address

1. What were the climatic trends and variabilities in the basin in the past, and how will they be in the future?
2. What is the state of various cryosphere components (glacier, snow, permafrost), how are they are changing with time, and how will they change in the future under climate change?
3. How can the present observation system be strengthened to support previous questions?
4. How to enhance the effectiveness of data collection, quality control and dissemination at the national and regional levels?
5. How will climate change and cryosphere dynamics impact water availability in the future?
6. What will be the water demand scenario of the future?
7. How can supply-demand gaps be addressed?
8. What are the most suitable and sustainable development options for the upstream part of the basin?
9. What are the natural hazard hotspots, and how is vulnerability changing?
10. What could be the impact of cryospheric changes on the ecosystem?

## The six technical working groups (TWG) of the UIB Network

### *Group 1: Data collection, quality and sharing:*

Collects meteorological, hydrological, and glaciological and hazards related data. This group also ensures data quality by defining data collection methodologies and uniform database.

*Group 2: Climate and air pollution variability and trend:* Analyzes data to generate scenarios using climate models. This group further shares the impacts of climate change on cryosphere, hydrology, natural hazards and communities.

*Group 3: Cryosphere and black carbon monitoring and modeling:* Interpolates glaciological data shared by TWG-1 and incorporates the results of climate change and black carbon impact studies on the cryosphere by TWG-2. This is done to study cryosphere and black carbon dynamics under a changing climate in UIB using a glacio-hydrological model.

*Group 4: Hydrology, water availability and demand – basin scale:* Collects hydrological data from TWG-1, climate studies impact studies results from TWG-2, and cryosphere study results from TWG-3 to study the dynamics of UIB hydrology under the changing climate.

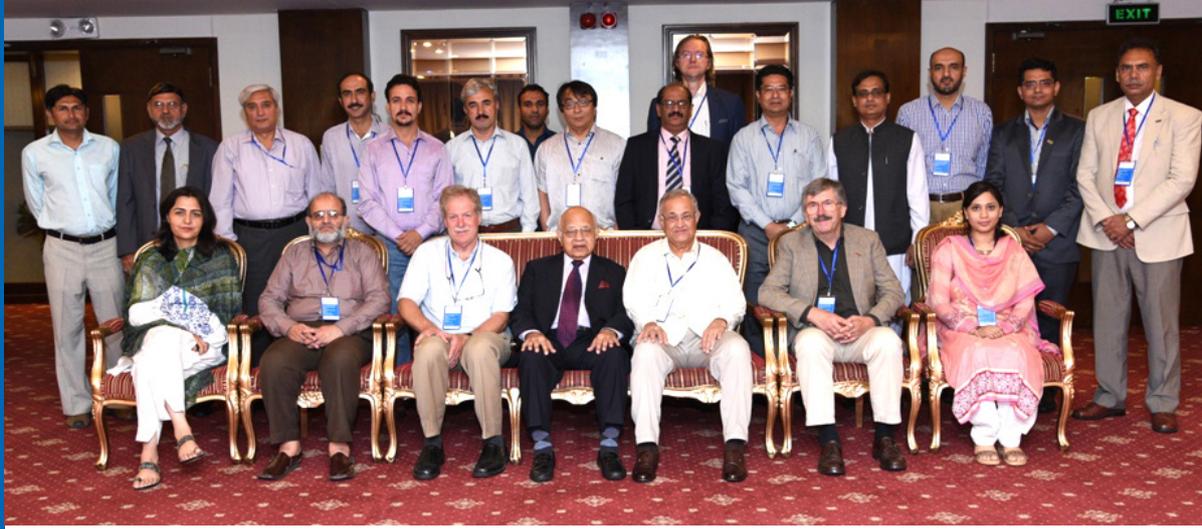
*Group 5: Hazards and risks:* Collects information/data from TWG-1, interpolation of climate change impact studies from TWG-2, cryosphere and hydrological dynamics from TWG-3 and 4 to map glacier- and hydrology-induced disasters under the changing climate.

*Group 6: Managing socioeconomic impacts through adaptation measures:* Develops adaptation strategies to manage the socioeconomic impacts of climate change at the local level based on results produced by the other TWGS.



## Key member organizations

- Pakistan Meteorological Department (PMD)
- Water and Power Development Authority (WAPDA)
- Pakistan Agriculture Research Council (PARC)
- Pakistan Council of Research in Water Resources (PCRWR)
- Space and Upper Atmosphere Research Commission (SUPARCO)
- Karakoram International University (KIU)
- COMSAT University
- Worldwide Fund for Nature, Gilgit Baltistan (WWF)
- Focus Humanitarian Assistance-Pakistan
- EvK2CNR
- University of Bonn, Germany



## Milestones of the UIB Network

**April 2014:** A field visit was organized in Gilgit Baltistan, upper Indus basin, for 45 international and Pakistan national experts. The team found that there was a need to increase environmental monitoring in the area. This would improve the understanding of cryosphere dynamics and the linkage between upstream and downstream communities, and support in building the capacities of both communities and institutions.

**February 2016:** An international conference on 'climate and environmental change impacts on the Indus basin waters' was held in Kathmandu, and brought together over 80 participants including policy makers and journalists from Afghanistan, China, India and Pakistan. Chief Minister of Gilgit-Baltistan Hafeez-ur-Rahman inaugurated the event, supported by ICIMOD, World Bank, the International Water Management Institute (IWMI) and South Asia Water Initiative (SAWA).

The key outcomes were:

- Participants agreed to collaborate on generating and sharing knowledge, implementing practices and influencing policy.
- UIB will facilitate coordination and cooperation among partners through the Indus Forum, and various stakeholders and policy makers.

**October 2016:** A national conference on 'water and environment: sustainable development under a changing climate' was held in Pakistan. It focused on collaboration for reducing knowledge gaps and water sector investment risks in the upper Indus basin. The event was supported by the Water and Environment Forum (WEF).

## For further information contact

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**Photos:** Arun Bhakta Shrestha, Madhav Dhakal

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