

Upper Indus Basin Network and Indus Forum Collaboration Meeting



WORLD BANK GROUP



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 (HKH) – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – based in Kathmandu, Nepal. Globalization 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 and downstream issues. ICIMOD supports regional transboundary programmes through partnerships with regional partner institutions, facilitates the exchange of experiences, and serves as a regional knowledge hub. We strengthen networking among regional and global centres of excellence. Overall, we are working to develop economically and environmentally-sound mountain ecosystems to improve the living standards of mountain populations and to sustain vital ecosystem services for the billions of people living downstream – now and in the future.



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Workshop Report

Upper Indus Basin Network and Indus Forum Collaboration Meeting

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This document summarizes the workshop based on the individual presentations, group work and results of the panel discussions.

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Acronyms and Abbreviations

ADD	Abu Dhabi Dialogue
BCCC	Bosch China Charity Center
CC	Climate change
CMA	China Meteorological Administration
DFAT	Department of Foreign Affairs and Trade (Australia)
DFID	Department for International Development (UK)
GCM	General circulation model
GLOF	Glacial lake outburst flood
GW	Ground water
HI-AWARE	Himalayan Adaptation, Water and Resilience (ICIMOD)
HKH	Hindu Kush Himalaya
HUC	Himalayan University Consortium (ICIMOD)
IBKP	Indus Basin Knowledge Forum
ICIMOD	International Centre for Integrated Mountain Development
IF	Indus Forum
IWMI	International Water Management Institute
KIU	Karakoram International University
MW	Mega Watt
NCC	National Climate Center (CMA)
NUIST	Nanjing University of Information Science and Technology
PMD	Pakistan Meteorological Department
RCP	Representative Concentration Pathways
SAWGP	South Asia Water Governance Programme
SC	Strategic Committee
SDG	Sustainable Development Goals
SDIP	Sustainable Development Investment Portfolio
TERI	The Energy and Resources Institute
TWGs	Technical Working Groups
UIB	Upper Indus Basin
UIB-N	Upper Indus Basin Network
WAPDA	Water and Power Development Authority (Pakistan)
WQ	Water quench

Executive Summary

The Upper Indus Basin Network and Indus Forum Collaboration Meeting, a joint workshop, was conducted from 22–25 May 2017. A majority of the participants came from Afghanistan, China, India, and Pakistan, countries that share the transboundary Indus River Basin. Among the participants were senior government officials from Afghanistan, Pakistan, and several international organizations.

The key objective of the joint meeting was to synergize the efforts of institutions and individuals affiliated to the Upper Indus Basin Network (UIB-N) and the Indus Forum (IF) to generate and share knowledge on adaptation, climate, the cryosphere, water, and hazards and vulnerability; and support national governments in developing evidence-based policies to serve inhabitants of the Indus Basin.

The meeting facilitated the sharing of updates related to the state-of-the-art knowledge generated by UIB-N and IF, and featured discuss joint proposal development to better understand the impact of climate change and variability on water resources, energy, and agriculture. It explored avenues for the development of adaptation strategies at the local and basin levels.

The meeting also discussed the way forward for the Indus Forum Research Proposal and preparations for the Indus Basin Knowledge Forum to be held from 4 to 6 July 2017 in Colombo, Sri Lanka.

The workshop witnessed active participation from academicians, researchers, policy makers, development practitioners, and scientists—all of them with expertise, experience, and good knowledge on the Indus River Basin. The participants said that the event created a good platform for them to work towards fostering collaboration between UIB-N and IF. They expressed hope that through collaboration, knowledge sharing and policy engagement would provide valuable contributions to the governments and communities of the Indus Basin.

About the Indus Basin

The transboundary Indus River Basin, shared by Afghanistan, China, India, and Pakistan, is ranked among the world's most significant basins in terms of agricultural livelihoods and human dependency on its water resources. Home to nearly 215 million people, the basin has six main rivers originating from glaciers in the Western Himalaya, the Karakoram, and the Hindu Kush, which are sources of irrigation for over 16 million hectares of agricultural land. Because of this, population density in the basin is very high, with approximate water availability measured at 1,329 m³ per capita. In total, the Indus River Basin is estimated to have a total hydropower potential of 55,000 MW, out of which approximately 35,700 MW are technically feasible. At present, only 6,444 MW, about 12% of the potential, are harnessed. The socioeconomic development of the countries sharing the basin, therefore, largely depends on the optimum utilization and prudent management of the precious water resources of the Indus River Basin.

The basin is already water scarce, yet the demand for water continues to grow rapidly, putting further stress on 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 driver of change in upper high mountain areas, affecting upstream and downstream populations.

Information about the UIB-N and IF

The Upper Indus Basin Network (UIB-N) is an informal knowledge and research network of national and international researchers working in the upper part of the Indus Basin. Its mission is to 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 Indus Forum (IF) serves as the coordinating initiative to identify strategic opportunities for collaborative action to achieve on-the-ground results. It does so by influencing the thinking and decision of national governments in the sphere of water resources management and transboundary cooperation.

In the current scenario, researchers are not fully aware of each other's work and decision-makers are disconnected from what is happening in the scientific community. In this context, IF can bring together UIB-N and other initiatives for interactions between researchers, policymakers, stakeholders, and the media. It is a platform that coordinates and can bring research outputs to policy support in the basin countries.



Chapter 1 : Inaugural Session

The four-day workshop commenced with Arun Bhakta Shrestha from the International Centre for Integrated Mountain Development (ICIMOD) welcoming the participants and providing an overview of the event, highlighting the key objectives and expected outcomes of the meeting. Shrestha stressed on ways in which the meeting could foster more collaboration between partners working in common areas, both thematically and geographically, in the Indus River Basin. He said such collaboration could be strengthened by bringing IF and UIB-N together. He also said that the meeting could provide a valuable platform for addressing challenges and finding opportunities together.

Facilitator

Arun Bhakta Shrestha, Regional Programme Manager River Basins, ICIMOD

Speakers

- Eklabya Sharma, Deputy Director General, ICIMOD
- Alok Sikka, Head of Delhi Office, IWMI
- Mir Ahmad Ahmad, Water Resources Specialist, World Bank

Key Messages

Eklabya Sharma, ICIMOD

- Both the Sustainable Development Goals (SDG) and the Climate Change Meeting in Paris recognize the importance of mountains. Food produced in the river basin of the Hindu Kush Himalaya (HKH) feeds close to four billion people, which is half of humanity. The region is therefore very significant.
- Over 35% of the Indus Basin comprises of glaciated area. Much of the water supply downstream comes from glaciers located in the Upper Indus Basin, an area that is likely to face more impacts due to climate change.
- Upstream-downstream linkages are very important. While in the past, ICIMOD's focus was only on mountains, it now also focuses on upstream-downstream linkages through its Cryosphere and River Basins programmes, among others. UIB and IF represent a good connect of upstream-downstream linkages.
- Mountain-specific adaptation measures should be adopted to achieve the target of the Climate Change Meeting in Paris ie, limiting temperature increase to below 2°C.
- In many parts of the HKH, most monitoring stations are located in the valleys and the lower basin. Through forums such as these, we can support joint monitoring. This workshop presents the perfect situation for us to co-share and co-generate knowledge. ICIMOD is honoured to play the role of facilitator for the UIB-N to promote active partnership among its network members. One of the hallmarks of this partnership was the [field visit](#) organized in Pakistan in April 2014, helping to generate ideas and accelerate thinking.
- The World Bank is a very important partner for us. At the heart of our partnership are the countries and people of the Indus Basin and the HKH at large. We would like to see more knowledge sharing and collaboration through both the networks from all four countries that share the Indus Basin. The International Water Management Institute (IWMI) has been an important player in promoting regional partnership, and we would like to see the network working closely. ICIMOD highly acknowledges the support of the Australian government through the Sustainable Development Investment Portfolio (SDIP).



Alok Sikka, IWMI

- We would like to join hands with UIB-N and IF to support collaboration towards knowledge development and sharing that is beneficial for the people of the Indus Basin.
- This meeting provides a good platform to further strengthen knowledge on UIB. Workshops such as this one synergize our work and efforts across the four countries and forge better partnerships. We are very happy to see participants from all basin-sharing countries here.
- Indus is one of the key basins in the world in terms of the population it supports, and it is highly vulnerable to climate change.
- We have to remember that the health of the mountains is responsible for the welfare of the plains. So upstream-downstream linkages are crucial.
- Informing Change in the Indus basin, a DFID-supported initiative of IWMI, is aimed at helping people inform changes happening in the Indus Basin.
- The key basic objective of the Indus Forum is identify how best to improve knowledge, provide high value analysis, and understand gaps in the Indus Basin system. We have three major components: i) promoting Indus Basin knowledge, formally launched in 2016, ii) highlighting decision making and social mapping, and iii) facilitating dialogue across the partners and stakeholders. A key part of this media dialogue. The media is a powerful platform and can influence the mass as well as policy makers.
- We are going to organize an Indus Knowledge Forum from 4 to 6 July in Colombo, Sri Lanka, where we will hold discussions with a larger group of participants. We will be happy to receive your feedback for discussions in Colombo.



Mir Ahmad Ahmad, The World Bank

- We are all here once more in Kathmandu in the process of coming together to get a better understanding of the challenges that face the Indus Basin and the countries that share it, and identify the opportunities that the basin has to offer.
- This year's theme of collaboration is another step forward towards coordinating our initiatives in relation to the Indus and harmonizing our efforts to maximize impact.
- The river system is critical to the water, food, and energy security of more than 300 million people who live in the basin and in the four riparian countries.
- We all agree that transboundary scientific coordination on the impacts of climate change on the cryosphere of the Indus Basin is important. Such cooperation can provide the evidence needed for sound policy-making and create an environment of shared ownership of scientific work among stakeholders in the region, thereby increasing potential for the sustainable management of the Indus water resources.
- Collaborative platforms like the UIB and Indus Forum Meeting are key to obtaining a holistic perspective of the basin, detecting existing and anticipated challenges posed by climate change, and identifying common methodologies and protocols to address those challenges.



- Climate change and how it affects the Indus water resources are of particular relevance for the World Bank Group's twin goals of ending extreme poverty and boosting shared prosperity. The basin and its six main rivers – which originate from glaciers in the Western Himalaya, the Karakoram, and the Hindu Kush – are sources of food, energy, and water security for people, particularly in India, Pakistan, and Afghanistan.
- Glacial fluctuations and changes in precipitation patterns are expected to alter the hydrology of the river basin. This is expected to lead to an increase in extreme hydrological events such as floods and droughts, consequently threatening people's livelihoods. Further, climate-induced catastrophes not only cause destruction to lives and livelihoods, but also reverse hard-won development achievements.
- The World Bank acknowledges that if we do not confront climate change, we will not end poverty.
- The World Bank, through the South Asia Water Initiative, has been facilitating an Indus Forum Basin-wide dialogue process since 2013. Since then, a working group has been formed to develop a joint research programme proposal among institutions from the four basin countries, and participants have chosen climate change as a uniting topic.
- The Indus Forum's engagement with the Upper Indus Basin Network first started in March 2015 in Lahore, Pakistan. Since then, contacts and meetings with UIB and with other partners have been regular to ensure that all activities are coordinated and all efforts conjoined. We at the World Bank very much support and encourage this research and scientific collaboration among stakeholders from all four countries and international partners.
- We believe empowered groups of researchers across the basin engaging in joint-platforms like this one will promote sharing of knowledge and experiences, which in turn, will provide a sound evidence base for future work on sustainable water resources management in the Indus River Basin.

Chapter 2: Technical Session: Status Update on the Upper Indus Basin Network

The session provided an overview of the Upper Indus Basin Network (UIB-N) and highlighted its status (see [Annex 3](#) for more information).

Key messages

- **UIB-N** is a network of several national and international organizations and has evolved into a valuable knowledge contribution and sharing platform.
- Initially, there were challenges related to effective coordination and information sharing. That has improved as the network members have been meeting at least twice a year to share knowledge and information amongst themselves. This forum is a good example of basin-wide coordination.
- One of the milestones of UIB-N was the **field visit** organized in 2014 to the upper part of the Indus Basin for network members. The visit enabled members to interact directly with local people, helping to devise a clear strategy to address the problems – challenges related to water resources as well as socio-economic factors – communities living in UIB face.
- There is the need to strengthen a monitoring network in the basin, and this initiative can help enhance the basin's glacier monitoring mechanism with more regional collaboration.
- UIB-N will be exchanging knowledge and experience to strengthen knowledge systems, but the pace of this network needs to be consistent with a collaborative spirit. A crucial aspect of this effort will be enhanced with support from more funding agencies. This is where our joint proposal is imperative. It can gear the interest of donors for enhancing knowledge systems in the Indus Basin.

Floor discussions

- Among the topics discussed were engagement steps for Afghanistan in the UIB network. The sharing of grey literature, available data, and modelling work from Panjshir Basin can be initial steps towards this. Afghanistan has been invited to this meeting, and members will be joining technical working groups (TWGs), the Strategic Committee (SC), and the Advisory Board.
- ICIMOD has shared available data on UIB, but there is a second generation issue related to data quality and comparability of data from nearby stations that should be improved.
- The focus of the UIB network should be on regional research projects to get a good understanding of UIB.
- If governments of riparian countries of UIB participate in these meetings, data and information sharing should take place and government representatives should be encouraged to participate in the UIB-N meetings.

Facilitator

Arun Bhakta Shrestha, Regional Programme Manager River Basins, ICIMOD

Presenter

- Ghulam Rasul, Director General, Pakistan Meteorological Department (PMD)



Technical Session: Status Update on the Indus Forum

The session focused on:

- Indus Forum Research Proposal work packages (work package leads)
- Presentation of proposed governance structure and committees for the Indus Forum Research Proposal (World Bank)

The participants were divided into four groups for presenting separate work packages to develop the Indus Forum Research Proposal. Facilitator Joshua Newton explained that the proposal would have an integrated funding approach in which different packages could be funded separately.

Key highlights of the presentation:

Work Package 1

(see [Annex 4](#) for more information)

Baseline observations

- There are uncertainties in the estimation of glacier volume, distribution, amount of snow packs, and river discharge. Estimates vary in magnitude on how much water is stored in ice. There is scarcity of data. Observations on hydrology and cryosphere are scant in the region. This work package aims to reduce these uncertainties.
- This work package comprises of three sub-packages: statistical analyses of past hydro-meteorological, biophysical, and social data.
- There is a lot of variability within the UIB. One mountain range behaves differently from the other. Partners come from all four basin countries, and the package will look at data from different basin areas of the four countries. Satellite data will be used for change detection analysis. Different methods will be used to analyse socio-economic data. Data on biophysical, hydro-meteorological, and socio-economic factors can be a good source for determining any future course of action.
- Establishing long-term benchmark glacier monitoring sites is important. In the UIB alone, there are over 8,000 glaciers, but exactly how many are being monitored is unknown.
- Streamflow partitioning using isotope fingerprinting and modelling are necessary to studying how much glacier, snow, and rainfall are contributing to discharge in various sub basins of the Indus Basin.

Work Package 2 (see [Annex 5](#) for more information)

Climate change scenarios

- The UIB is a complex terrain hosting cryosphere and westerly disturbances, and monsoonal incursions. The observation network is poor. Through this work package, all in-site observation datasets will be put together, including physical and demographic datasets.
- Secondary datasets will be merged with in-situ data to generate data surfaces. Models will be selected from across the world. These models will be selected following strict criteria.
- Glacier hydrological modelling will be carried out under climate change scenarios. Data will be collected and compiled from pilot studies conducted and published by scientists on different aspects of the cryosphere. Several studies have been previously conducted on sub basin scales and climatic zones on melting processes and the performance of different models. Published research work will be used as secondary data source. Hydrological models will be selected based on the experience of a given area.
- The work package will quantify impacts of climate change and streamflow.

Facilitator

Joshua Newton, The World Bank



Work Package 3 (see [Annex 6](#) for more information)

Climate change adaptation

- Analyse the water-energy-food nexus across different ecosystems (mountainous, humid, arid, coastal, and rural and urban) in different sub-basins of the Indus Basin, and their competitive stress with other sectors of the regional economy. Project their interdependence into the future for near- and long-term developmental scenarios.
- Create robust understanding of potential approaches and practices to harmonize stress among water, energy, and food requirements in the basin. Develop an integrated river basin management plan for the Indus Basin, and provide guidance for informed decision making at different domains to achieve specific SDGs.
- There are two sub-packages: i) assessing potential impacts of plausible future scenarios of cryosphere and climate on water, energy and food, and ii) utilizing insights from observations and simulations from all the activities to construct a sophisticated modelling framework for developing robust adaptation strategies.
- The key outputs are: understanding the socio-economic, food, and energy scenarios of the basin countries, and water demand and supply in various basins, as well as water availability in contexts specific to water-based industries like hydropower producers, beverage industries, and food processing industries, among others.
- A total of 12–15 sites may be selected, depending on practicality and manageability. A key output will be the development of a framework for integrated river basin management (IRBM), including various adaptation strategies that streamline socio-economic, governance and, gender perspectives in the basin, leading to the achievement of sustainable development goals.

Work Package 4 (see [Annex 7](#) for more information)

Capacity building and knowledge exchange

- The main objective of this work package is to strengthen and develop the capacity of riparian countries in order to improve the evidence base to enhance the reliability of adaptation and climate resilience models at the basin level. The work package proposes a specialized Master's programme for students from India, Pakistan, and Afghanistan on climate change science, and climate system dynamics, risks and policies at the Nanjing University of Information Science and Technology (NUIST), China.) It also proposes the organization of targeted short-term training courses for mid-career professionals on themes related to climate change, water resources, adaptation strategy, and other related issues.



- Intake capacity: the programme is designed for 40 students. There will be one group of 20 students each year for two consecutive years.
- Course details: a two-year Master's degree programme with specialization in glaciology, hydrology, meteorology, high altitude research, and related subjects. The objective is that the enrolled students will pursue a PhD in one of these fields. The programme will comprise of two groups, and will start from the second year of the programme.

Presentation of proposed governance structure and committees for the Indus Forum research proposal (World Bank): Joshua Newton

- Each work package will have a lead organization to coordinate activities. In each work package, there will be a coordinating lead, also at the national level, to collaborate further on sub-packages.
- The proposal is quite new and needs further discussion and consultation. There is to be a Programme Secretariat, which both ICMOD and IWMI have offered to host. The Secretariat will coordinate research, administration and finance duties, convene annual meetings, and coordinate review and steering committees.
- A Steering Committee is proposed, and will be made up of 11 members. It will serve a five-year term concurrent with the first phase of the programme. The committee will provide direction, policy guidance, and oversight to the programme. A Review Committee of four international expert, will be created to provide quality control and review programme deliverables.

Floor discussions

- The participants debated on whether the Steering Committee members should be from the government or the private sector. Various opinions were expressed about what the composition of both the Steering and Review Committees should be and what their technical capacity/knowledge should be in order for them to be able to perform their functions most effectively.
- Participants also suggested that there is the need for more thorough discussions on management structure. This, they said, should be done through partnership workshops, which can be discussed in the future and also during side discussions at the Colombo Workshop in July. An ICMOD participant said that the partnership approach should be kept in mind. As an example, the participant pointed out that the outcomes of the ongoing two-day partnership workshop would reflect what the partners want, and said that the participants should always keep each other informed.

Chapter 3: Breakout Groups Session: Discussion on UIB-N/IF Collaboration

The session focused on how the two networks, UIB-N and IF, can collaborate. The participants were distributed into groups to discuss and interact on these key questions:

Where can the UIB-N and IF collaborate?

How to keep each other informed?

What should the collaboration and governance structure look like?

Where the UIB-N and IF can collaborate

- The networks need to expand into all four countries that share the Indus Basin. Until now, UIB-N is more focused on Pakistan.
- The two networks cannot be merged but can work together using their strengths. IF should focus on policy while UIB-N should focus on scientific research and studies. Both networks can use a common platform for reporting with ICIMOD as the host.
- Share their data, information and knowledge, methodology and plans regularly with network members.
- Ensure that indigenous knowledge is well documented and shared.
- There is scope for research collaboration between two networks on every identified theme in the HKH. Emphasize the need for collaboration on understanding issues that are of common concerns in the basin [climate change (CC), water quench (WQ), and groundwater (GW)] so that the two networks might help in de-securitizing water sharing in the Indus Basin.
- Join hands to sensitize and better inform policy and decision makers on various identified themes using all the means and platforms available.
- Frequent interaction and exchange of ideas to avoid replication of and optimize the resources of the working groups (WGs) and work packages in IF.
- There is need for coordination and cooperation not only between the two networks, but within each network at the WG level.
- Strong monitoring, evaluation, and learning embedded in the collaboration process.

Suggestions on how they can keep each other informed

- Form joint coordination body of UIB-N and IF.
- Facilitate joint communication between UIB-N and IF members.
- Designate focal person for each country.

Facilitator

Philippus Wester, Chief Scientist, ICIMOD
Priyanka Chaturvedi, The World Bank





Floor discussion: Key messages

- Whether to merge or not was a big question for the participants. Roles and definitions of the two networks need to be clearly defined. Some of the participants suggested that the roles of these networks should be very clearly defined. It was suggested that, at some point, both of these forums could merge because they will be dependent on one another. To set the priorities right, they could be merged into a single governance body.
- The larger consensus was that the two groups have distinct identities and should pursue their objectives independently. The need for coming together to advance the agenda on climate change impact on Indus water resources was reinforced during the discussions, but participants agreed that there should be a clearly defined framework which guides the partnership between the two groups.
- On the research aspect, some participants asked about the way research work is done in different basins and sub-basins. Those who have not visited basins don't know what is happening with the research.
- Participants asked about the sustainability of the Indus Forum as the proposal is for five years. Their question was whether the forum will stop to function after five years.
- One participant said a joint research proposal is a good idea since joint research has been a challenge. This forum has opened up doors for such a regional collaboration opportunity in that sense.
- On the issue of other countries' participation in UIB-N and IF, Indian participants said that India has a strong interest in studying UIB. There are studies already underway, and India's representation will be more visible as they look for more participation through both the networks.

The facilitators concluded the session by acknowledging the valuable contributions of the participants and said that the meeting had been engaging. There were debates and arguments, implying critical thinking on their part, which could help in producing a pragmatic proposal. Suggestions given by the participants will be streamlined to reach a consensus and to move forward looking at the commonalities and differences of both networks.

Chapter 4: Research Proposal and Next Steps

Day 2: 23 May 2017

The session focused on the joint research proposal and potential collaboration between UIB-N and IF, and the next steps for action. The participants were distributed into groups for interaction and presentation on the collaboration and proposal based on the four work packages.

Facilitator

Arun Bhakta Shrestha, ICIMOD
Priyanka Chaturvedi, The World Bank
Joshua Newton, The World Bank

PRESENTATIONS: Key highlights (see [Annex 9](#) for more information)

Proposals on Work Package 1: Baseline Observations

- There are three sub-packages: i) statistical analysis of past hydro-meteorological, bio-physical, and social data, ii) establishment of long-term benchmark glacier monitoring sites, iii) streamflow partitioning using isotope fingerprinting and modelling.
- The first sub package focused on analysing data and comparing data across boundaries, and developing standards. It also focused on highlighting past data to both compare and analyse data deficiencies. One of the outcomes will look at water and supply demand. There is the need to look at alternative sources, and use open source platforms and other options. This package is important given that there is little or no data from upstream areas due to shortcomings related to monitoring stations. It is a good idea to have transect observations and look at meta data and establish standards (technical and institutional details on Annex 9).
- The second sub-package will focus on strengthening the sparse network of hydro-meteorological, hydrological, and glaciological observations in the basin; and estimating glacier mass balance and volume, among others. Many partners should be included in this work package, and more international partners are needed. This proposal should be synergized with existing benchmark glaciers. There was a strong suggestion that more partners from basin countries, and countries in the region and outside it should be included.
- The third sub-package focuses on understanding relative contributions from base flow, and snow and glacier melt. Permafrost could be considered a significant contribution to stream flows, but this varies from basin to basin. Ice contribution is zero in 22 watersheds. Credible information based on different basin areas needs to be generated. There was a general suggestion the work package needs co-leads to share inputs that are received from different members. It would be useful for leads of the work packages to meet with UIB working groups. If we look at this work package, there are partners from Pakistan and India that could be included. Colleagues from other work packages also need to be included, and there should be diverse country representation.

Comments from the floor:

- Discussions on the cryosphere clearly explained the need for benchmark glacier monitoring to reach process understanding from the ground. Such in-situ monitoring from a small-scale needs to be up-scaled through a remote sensing-based approach and modelling. It is not just monitoring for the sake of monitoring, but for answering key scientific questions that have are relevant to development. There is a need to explore which relevant organizations outside UIB-N and IF could partner for research.

Proposals on Work Package 2: Climate Change Scenarios

- This work package focuses on climate change scenarios. Future projections of climate change should be limited not only to the UIB, but also include surrounding regions. Models need to be selected to analyse the differential

behaviours of glaciers of various typologies (debris, non-debris, size, socio-economic importance, etc). There is the need to analyse past trends with different parameters of the climate system. Selection of models will be needed, and strict criteria must be followed. Previous climatic trends and popular trends across the world should be analysed. There are limitations to climate models. This work package could collaborate with UIB Working Groups 1 and 2.

- Outputs will be developed for two representative concentration pathways (RCPs)—RCP 8.5 and RCP 4.5. Work Package 3 will focus on climate change adaptation and will depend on the output of Work Package 2. There are capacity gaps affecting the four countries. There is the need to analyse what type of training is required to fill this capacity gap.
- There are several innovative initiatives in other areas being led by some organizations. Bosch China Charity Center (BCCC), a WMO recognized regional climate centre, has its own climate models, for instance.
- ICIMOD and IWMI will be consulted at different levels. At the national level, climate research centres in all four countries will be involved.
- Civil society organizations which are working in the UIB have rich knowledge of glaciers dynamics and have impacts on society. They have been addressing different issues in the area.
- UIB riparian countries will benefit from how glaciers are selected and measured. UIB Working Groups 3 and 4 can be collaborate in selecting benchmark glaciers. Those benchmark glaciers will be researched to indicate impacts of climate change. UIB Working Groups 4 and 5 can collaborate while working on the impact of climate change. The information gathered can be generalized, but this does not mean these benchmarks will be representative of the Upper Indus Basin.
- Output will be achieved through different RCPs.

Comments from the floor

- There were suggestions that the team should be working only on RCP 4.5 and RCP 8.5 Another suggestion was the networks should be work on social impact scenarios.
- The presenting group responded saying they should work on all four RCPs and not restrict themselves only on two RCPs. They have reservations about RCP 2.6 as it seems quite challenging to achieve RCP 2.6.
- Some of the participants also suggested that even if the world manages to go through RCP 2.6, the average 1.5 °C is not for the region, but the global average. For the Indus, the mountains will be beyond 1.5 °C. The impact would be worse and this could be significantly highlighted at the global level through the analysis of RCP 2.6.
- There are a few papers on the dynamics of westerly disturbances. It would be worthwhile to analyse what is changing with them. Because of uncertainties of any specific model, it would be good to look at multiple models.
- Some of the participants expressed concerns about which scenario will be presented to the donors, and they said they would like to be quite specific and certain. Steps forward should be taken with precaution to try to engage all international partners and incorporate local wisdom from countries in the Indus Basin in the best possible way.
- The question about how precipitation is changing on the geographical scale has not been adequately addressed.



Proposals on Work Package 3: Climate Change Adaptation

- This work package focuses on climate change adaptation in the UIB. The presenters clarified that there are different components that specify driving factors and how they impact the basin.
- The key drivers are changes in flow regime, temperature and flood frequency, droughts, rainfall, landslides, and glacial lake outburst floods (GLOFs). Climate change impacts people, physical properties, crop patterns and irrigation practices, domestic water supply, as well as on the local economy which depends on the basin's natural resources. Migration, a result of the driving factors, is also a big issue.
- Adaptation strategies could focus on how the farmers use the land and adopt new agricultural practices. They could also take into account the use of livestock and varieties of crop. There should be more awareness and education in the agricultural sector, and communication is crucial for that.
- Droughts and floods should be mapped, and the information generated used to design strategies for better disaster management and early warning systems, zoning of flood prone land, building embankments, and the adoption of infrastructure protection measures.
- Local governments and agencies should be engaged, but they need more knowledge support. Local communities should be involved in designing their own adaptation strategies.

Comments from the floor

- Along with flood frequency, drought frequency as well as the frequency of avalanches should be also covered.
- There should be more talk about water quality, not just water availability.
- Damages such as bank erosion are the result of a lack of appropriate policies. Policies can help initiate proper land use, and enforce building codes and irrigation management.
- The proposal should also mention the impact of land pressure and anthropogenic activities on wildlife habitat.

Proposal on Work Package 4: Capacity Building and Knowledge Exchange (see [Annex 10](#) for more information)

- This work package focuses on capacity building and knowledge exchange. There are two specific sub-packages:
 - i) specialized Master's degree course in climate change science, climate system dynamics, impact, risks, and policies for students from three riparian countries (India, Pakistan, and Afghanistan) in China, ii) specialized training/capacity building courses/programmes on climate change impacts, water resources management, climate risk, adaptation strategies, and related themes for government officials, teachers, policy makers, and civil society members from India, Pakistan, and Afghanistan.
- In the first sub-package, a two-year Master's degree programme will be offered by NUIST, Nanjing, China, designed for 40 students to specialize in glaciology, hydrology, meteorology, high altitude research, and related subjects. Working Groups 3 and 4 can collaborate on this sub-package.
- In the second sub-package, specialised short-term courses are offered in partnership with partner institutes including Karakoram International University (KIU), Kashmir University, TERI, and others. All partner institutes will be encouraged to participate in the course development:
 1. Kashmir University will offer courses on glacier field investigations.
 2. The Pakistan Meteorological Department (PMD) will offer courses in numerical weather forecasting, climate change scenarios, rainfall/snowfall dynamics in the future, seasonal rainfall predictions, and drought and flood forecasting/modelling.
 3. Kashmir University, with support from TERI, will offer courses in applied remote sensing and geographical information system (GIS). All UIB-N working groups can collaborate on this activity.
 4. PMD and the Glacier Monitoring Research Centre (WAPDA) will offer courses on glacier studies, hydro-meteorological data processing, and analysis. UIB-N Working Groups 2, 3, and 4 can collaborate on this sub-package.

5. TERI will offer courses on glacier hydrology. UIB-N Working Group 6 can collaborate with TERI on this activity.
6. The National Climate Center (NCC), China, will offer short-term courses in monitoring, modelling, forecasting, water resource management, socio-economic, risk assessment and vulnerability assessment. Further, NCC could also offer courses on arid research with a focus on water saving and irrigation technology.

Comments from the floor

- The participants said that this initiative could help promote professional academic programmes. They said it would be a good idea to include professionals from both private and public organizations.
- There were also suggestions that the courses should not be limited to academic programmes but should also include innovative courses to help create knowledge portals, leverage technology, and ensure good use of social media.
- Participants said that more partner universities should be explored. KIU should be also included in the list of capacity building institutions.

Collaboration between UIB-N and IF:

The four work packages (WPs) of the IF and the activities of the six technical working groups (TWGs) of UIB-N share many commonalities. Mapping should be carried out to see where exactly the crossover between the two initiatives is. The UIB-N can be actively engaged in the implementation of the IF research proposal.

Indus Forum Working Group

The closed group meeting session focused on the continued drafting of the IF research proposal and discussed the next steps.

Chapter 5: Indus Basin Knowledge Platform and Forum

Day 3: 24 May 2017

Facilitator

Diana Suhardiman, IWMI

Session: Indus Basin Knowledge Platform and Forum

This session comprised of a presentation and a group discussion on the status of the Indus Basin Knowledge Platform (IBKP) and the agenda of the Indus Knowledge Forum (IKF) which is to be part of the workshop to be held in Colombo, Sri Lanka, from 4 to 6 July 2017 (see [Annex 11](#) for more information). The third part of the session included a presentation on media dialogues.

Diana Suhardiman: Objectives of IBKF and agenda of Colombo workshop

- The IKF meeting (4–6 July 2017) and media dialogue are to be held in Colombo (7–8 July 2017). A draft agenda of the Colombo meeting has been prepared. Inputs from the participants will be incorporated to give the agenda its final shape.
- This brings together representatives from the four Indus Basin countries to discuss common challenges and the role of information exchange and knowledge sharing in strengthening transboundary water cooperation.
- The Indus Basin Knowledge Platform was developed by IWMI through a partnership with DFID under its South Asia Water Governance Programme (SAWGP). It is housed at the IWMI headquarters in Sri Lanka which represents a neutral custodian of the platform.
- IBKP consolidates existing knowledge on the Indus Basin from a variety of sources and provides a mechanism for continually updating, expanding, and developing the provision of this knowledge to a wider audience.
- It provides a regional knowledge platform as an alternative means for key stakeholders to come together to discuss the state of knowledge of the basin and establish stronger networks for future collaboration.
- It provides a platform for key stakeholders, including the media, to share different perspectives on key challenges in the basin and identify common grounds and ways forward.
- The user-friendly IBKP [website](#) is a valuable source of information. Its web-based user interface is linked to two main databases; one storing biophysical and socioeconomic data and the other storing the metadata and links to over 1,000 publications covering a range of topics related to natural resources management and human development in the Indus Basin.

Floor discussions on IKF:

- Positive response to how this hub will be different than other knowledge hubs. The legacy of past transboundary dialogues should not be ignored while planning this event.
- This is a collaborative effort and the messages should be very clear. All participants have the common understanding that this is not a standalone initiative, but a collaborative effort.
- Knowledge partners should be clearly defined, and they must be subjects of discussion.
- It is good to start the discussion with the focus of this programme. Important topics to discuss are the parallel process of development and whether this is a new dialogue process or a knowledge exchange platform.
- This is more of a collaborative knowledge exchange and needs to be clear about what we want to achieve.
- IWMI has conducted various diagnoses in Pakistan and it would be good to mention the outcomes of past

discussions in China, Nepal, Pakistan, and Afghanistan to know which direction the platform is moving towards and decide which initiatives should continue.

- Key milestones of this IKF journey should be mentioned so that lessons can be learnt from past shortcomings and future opportunities.

Divided into three groups, the participants discussed: i) knowledge sharing, ii) interlinkages between IF, UIB-N, and other initiatives, and iii) linkages between the past and the IF legacy. They provided input to improve the draft agenda. They also shared their take on the meeting as well as ideas about how to take it forward.

Key messages from their presentations:

i) Knowledge sharing:

- Include the upper basin, transboundary issues, and lower basin. Share best practices among ongoing projects. The thematic focus needs to be narrowed down to accommodate time constraints.
- Appoint a focal person from each country in the Indus Basin to facilitate sharing of knowledge generated in their respective nations.

ii) Interlinkages between IF, UIB-N and other initiatives

- Emphasis must be on a full basin approach (from upper to lower basin), on giving a historical perspective—the history of past activities and how this forum is a result of past discussions, and on explicitly mentioning that the forum builds on existing and ongoing initiatives.
- Documents on past learning from ICIMOD, IWMI, UIB, and IF are to be circulated.
- Organizers should develop communication plans and present them as an outcome of the event.

iii) Linkages with the past and the IF legacy

- Provide linkages with the past and share the IF legacy among members.
- Water, climate change, adaptation and mitigation, capacity building, and infrastructure can be dedicated themes.
- Share details of all the four working groups. Look how far the forum has gone, and suggest ways to continue to make existing knowledge visible.
- Discuss transboundary and local issues.

Floor comments from participants

- The key challenge was to earn each other's trust.
- Ensure 50% of the Colombo workshop participants are women.
- Data information sharing is a challenge that must be overcome.
- Status update needed on research done in the Indus Basin and the outcome of the same.
- Share lessons from the 2008 Abu Dhabi Dialogue (ADD) Knowledge Forum agenda.
- The organizers, IWMI, ICIMOD, and the World Bank, should look at the comparative advantage of UIB-N (upstream research focus) and Indus Forum (policy focus).
- Innovative thinking needed on how to go forward in the Colombo workshop.

Nitisha Nair, IWMI: Media Dialogues (see Annex 12 for more information)

Nair shared experiences and outcomes from the series of media dialogues held in 2016 in Kathmandu (February), Pakistan (May), India (September), and Afghanistan (October). Key messages were:

- Key objectives were to overcome limited reporting on the Indus and increase in-depth analysis, inform the media about key science issues in the Indus Basin, bring scientists and journalists together through a platform to facilitate interaction between experts and journalists.
- Some key outcomes: created a WhatsApp group of media professionals and scientists in India and Pakistan; a Facebook group in Afghanistan; and a common group to share articles and opinions, and ask for contacts and information.
- One of the visible impacts was the support provided to journalists in writing in-depth analyses, helping simplify complicated issues. Among the participants were senior journalists. In a short span of time, media coverage on the Indus Basin increased and the media dialogue participants from 2016 had reported differently, with high quality, informed analysis.

Chapter 6: UIB-N Technical Working Group and Strategic Committee Meetings and Discussions

Day4: 25 May 2017

Session: UIB-N Technical Working Group and Strategic Committee Meetings and Discussions

Chair

Ghulam Rasul, PMD

This session included discussion on the structure of UIB-N. New members were welcomed and technical working group (TWG) leads gave general updates. Also discussed were membership of UIB-N, TWG, and the strategic committee. There was reporting on the follow-up to the UIB-N meeting and discussion on the next steps for UIB-N. In the absence of Khalid Mohtadullah, Chair of UIB-N, Ghulam Rasul, Director General, PMD, chaired the session.

[Structure of UIB-N \(see Annex 3 for more information\)](#)

Arun B Shrestha presented on the structure of UIB-N and briefed participants on technical working groups, new members of UIB-N, and the strategic committee and its members. He also spoke about the recommendation of the Technical Working Group and Strategic Committee Meeting held in August 2016.

[New UIB-N members](#)

Discussion on working group members

- Need to discuss the continuation of retired government personnel as TWG leads.
- Co-lead of TWG 2 and lead of TWG 6 are from EV-K2-CNR and they haven't participated in many meetings. The secretariat should remind them about sharing their reasons for not attending the meetings.
- For TWG 3, as Pradeep Mool of ICIMOD retired, Anna Sinisalo of ICIMOD has agreed to take the lead.
- Philippus Wester, ICIMOD, (co-lead of TWG 5) said that he has not been able to contribute much to the TWG. The same is true for the other co-lead of the working group. There is the need to revisit the TWG co-leads.
- Arun B Shrestha requested new members from four countries be suggested. He said the Aga Khan Agency for Habitat (AKAH) can be a part of the TWGs.

Ghulam Rasul and David Molden, Director General, ICIMOD, welcomed the new members of UIB-N. They said that UIB-N will now expand to four countries and have more diverse groups. They said the regional collaboration through UIB-N should yield better results.

The participants asked about the procedure of the nomination of membership and said it would be a good idea to have the same in written form. The members were nominated from organizations which have been involved in the six TWGs of the UIB-N. The Afghanistan team suggested that an official letter be sent to government ministries for general membership, and involvement in TWGs, the SC, and advisory bodies.

Participants suggested that meeting/presentations be organized for people working in the Indus Basin. These would be people other than those directly involved in the working groups. This, they said, will help future planning as well as it will reflect the number of people working as well as country-specific work. These ideas should be useful when shared during the Colombo meeting. It was also recommended that the strategic committee and advisors be reviewed.

Six technical working groups (details of TWG presentations in Annex 13, Annex 14 , Annex 15, and Annex 16)

The session focused on updates from UIB-N working groups:

TWG 1

- Highlighted the work of the group members WAPDA, PMD, EvK2CNR, University of Bonn, and the Ministry of Energy and Water (MEW), Afghanistan. The group's goals include comparable and joint approaches, and individual components; and coordinated campaigns, selected common data base, and educational components. Their focus is on developing standard methods for data collection and quality data sharing.
- Presented on different results in rainfall and the warming process.
- Suggested a joint field visit which would be helpful in observing current station networks, and new sites and stations to fill data gap.
- Steps forward include field campaigns, courses, and workshops, agreement on operational procedures, and meta-data development.

TWG 2

- Analysed data for temperature and precipitation change, and showed that observed climate trends are consistent with crude data. Four models were selected and applied for future projection. Studies on bias correction, linear interpolation, projected temperature, heat waves, and hydro-meteorological behaviour are necessary. AWS data monitoring at Passu Glacier—snow cover and cryosphere monitoring is ongoing. A paper which presents the methodology to select and downscale CMIP 5 GCMs for impact assessment was recently published.

TWG 3

- Field activities underway. These include installation of hydro-meteorological equipment, mass balance experiments on glaciers, GPR profile experiments on glaciers and lakes, and isotope analyses. Various organizations, including PMD, WAPDA, and ICIMOD, are involved in cryosphere monitoring in UIB.

TWG 4

- Presented new developments in research since the last reporting of the working group. The key presentation was about the impact of monsoon change on precipitation and showed that discharge showed both increasing and decreasing trends. ICIMOD conducted training of SPHY and VIC models to strengthen the capacity in the region.

TWG 5

- Informed about the identification of hazards and early warning systems. Stated that a lot of work has been done by the geological survey of Pakistan. UIB-N can play a role in capacity building and offering research grants.

TWG 6

- Summarized the progress made since September 2016. These initiatives involve climate change policy, permafrost summer school climate change sensitization workshop for legislative assembly members, climate smart irrigation, agriculture, alternative energy and disaster risk reduction, high altitude mountain value chains, and environmental improvements along the Gilgit River, among others.

Discussion:

- Ground water research/springshed management is a grey area in UIB. It should be taken into consideration by relevant TWGs as ground water is important for sustaining the ecology of UIB.
- Members of TWGs should be selected based on their experiences. Group leads should propose relevant group members.
- Looking at the mission of UIB-N and its main focus, general membership should be decided by the UIB chair and all invitations must be sent from the secretariat.
- It would be better to keep members who leave the strategic committee due to retirement in the advisory committee.
- All TWGs are encouraged to develop proposals based on the major research questions of UIB-N.

Chapter 7: Conclusion and the Way Forward

Key Messages from the Strategic Committee Meeting:

- Revisit and expand membership in UIB-N working groups. The UIB-N strategic committee structure also needs to be reviewed and should include representatives from all four member countries, preferably from government departments and ministries.
- The issue of groundwater extraction seems to have been neglected and needs to be addressed by one of the working groups. Pakistan's PCRWR could initiate the issue.
- The strategic committee should find representatives in UIB who actually have field knowledge and experience.
- As gender and social equity are at the core of UIB-N, the network should also have greater women's participation and highlight women's participation in disaster management and early warning systems as disasters.
- The issue of how to approach donors for funding is crucial, for which it was recommended that the working groups should develop good proposals and all activities should be linked to SDGs and low carbon emissions.
- Air pollution should also be included in the working group tasks. There is still the question of whether to include air pollution with carbon monitoring. ICIMOD already has a dedicated atmosphere programme and it would be good to include atmospheric scientists.
- Ensure that the tasks of the working groups are clear and specific to avoid any complexities and that there is clear communication on their goals and expected outcomes.
- Government ownership is important as officials should know about UIB's goals, target beneficiaries, and its vision.
- As a follow up, the members will be reminded to suggest names for UIB-N, TWG, and the strategic committee. This is to be further discussed in Colombo.



Closing Remarks

In his concluding remarks, Ghulam Rasul spoke about how UIB-N had evolved and is progressing since its start in 2014. He also welcomed new members who joined the network and said that the team will accelerate the network's momentum together.

David Molden thanked the participants for their active engagement in the four-day workshop. He was positive that UIB-N expansion was moving forward in a good direction. He said there was enthusiasm from other country members in this collaborative effort, which was a good sign. He suggested that the focus be on vulnerable mountains areas and the links between science and policy. He said that ICIMOD is ready to offer any support and facilitate consistently.

Nisar Memon, Chair, Water Environment Forum, said that he has observed significant progress in UIB-N. He proposed that ICIMOD be the coordinator of the IF project proposal. He also stated that the four work packages of the Indus are important and stressed on setting a deadline for the finalization of the proposal development in order to avoid delay. He suggested that the budget for each proposal be finalized before the Colombo meeting. He also said the mapping of knowledge institutions was another task for both networks.

Joshua Newton thanked the participants on behalf of the World Bank. He said that forums help create an environment for better water resources management in the basin. The meeting showed convergence on a willingness to work together from all the country, he remarked.

Arun Bhakta Shrestha thanked ICIMOD senior management for supporting the event and the World Bank for their partnership in organizing the event. He thanked all the participants for their contributions and all ICIMOD staff who supported the event. He requested all strategic committee members of UIB-N to attend the Colombo meeting to be held in July 2017.



Annexes

Annex 1: Agenda of the Regional Meeting on UIB-N/IF Collaboration

Day 1 (May 22): Introductions, status updates and UIB-N/IF collaboration	
Rapporteurs: Naresh Newar and Smita Ghimire	
9:00 onwards – Registration	
9:30 – 10:15	Welcome Remarks <ul style="list-style-type: none"> ▪ Eklabya Sharma, Deputy Director General, ICIMOD ▪ Dr Alok Sikka, Head Delhi Office, IWMI. ▪ Mir Ahmad, Water Resources Specialist, The World Bank ▪ Introduction of participants
10:15 – 11:30	Status Update: Upper Indus Basin Network <i>(Facilitated by Arun Shrestha)</i> <ul style="list-style-type: none"> ▪ The mission and achievements of Upper Indus Basin Network – Dr Ghulam Rasul, DG, PMD ▪ Discussion
11:30 – 11:45	Group Photo and Coffee break
11:45 – 13:00	Status Update: Indus Forum <i>(Facilitated by Joshua Newton)</i> <ul style="list-style-type: none"> ▪ Presentations on Indus Forum research proposal Work Packages (Work Package leads) – 30 minutes ▪ Presentation of proposed governance structure and committees for the Indus Forum research proposal (World Bank) – 10 minutes ▪ Discussion – 25 minutes
13:00 – 14:00	Lunch
14:00 – 17:30	Breakout Groups (Session 1): Discussion on UIB-N/IF Interaction <i>(Facilitated by Philippus Wester and Priyanka Chaturvedi)</i> <ul style="list-style-type: none"> ▪ Introduction/explanation of the session (Facilitator) – 10 minutes ▪ Break out into small groups to discuss the following questions (each table chooses rapporteur): - 1 hour 20 minutes <ul style="list-style-type: none"> ○ Where can the UIB-N and IF collaborate? ○ How can they keep each other informed? What should the collaboration and governance structure look like (e.g. regular meetings, joint coordination committee, coordination secretariat, etc.)? ▪ Small group feedback and plenary discussion – 1 hour <p>Coffee break during the session</p>
18:30	Dinner Hosted by ICIMOD at Summit Hotel

Day 2 (May 23): UIB-N/IF collaboration (continued)	
Rapporteurs: Madhav Dhakal, Naresh Newar, and Smita Ghimire	
9:30 – 11:30	<p>Breakout Groups (Session 2): Research Proposal and Next Steps <i>(Facilitated by Philippus Wester and Priyanka Chaturvedi)</i></p> <p>Introduction of the session (Facilitator) – 10 minutes</p> <ul style="list-style-type: none"> ▪ Break out into small groups to discuss the following questions (each table chooses rapporteur) – 1 hour 10 minutes <ul style="list-style-type: none"> ○ How do the UIB-N and IF move forward on the (IF) research proposal? What are the next steps? ○ How can the UIB-N and IF ensure strong participation from the four Indus basin states (in all activities)? ▪ Small group feedback and plenary discussion (ppt) – 40 minutes <p>Coffee break during session</p>
11:30 – 12:30	Wrap-up discussion, next steps and concluding remarks of UIB-N/IF collaboration Sessions 1 and 2 (Session 1 and 2 Facilitators)
12:30 – 14:00	Lunch
14:00 – 17:30	<p>Indus Forum Working Group Meeting (focus on research project proposal; facilitated by Joshua Newton)</p> <ul style="list-style-type: none"> ▪ Initiate work on research proposal ▪ Discussion on each Work Package (facilitated by Work Package leads) and governance (World Bank): - 30 minutes for each WP/Governance <ul style="list-style-type: none"> ○ Finalize content ○ Confirm interest (Google Form) and collaborations ○ Road map forward ○ Budget

Day 3 (May 24): Research Proposal and Indus Knowledge Forum	
Rapporteurs: Naresh Newar, Nisha Wagle, and Smita Ghimire	
9:30 – 11:30	<p>Work on Research Project Proposal (<i>facilitated by Joshua Newton</i>)</p> <ul style="list-style-type: none"> ▪ Work Package and governance discussion, continued, as necessary ▪ Research project proposal resource mobilization: <ul style="list-style-type: none"> ○ What has been done to date – 20 minutes ○ Presentations by participants on ideas for resource mobilization (questions sent prior to meeting): - 1 hour 20 minutes <ul style="list-style-type: none"> - Where to look (national, regional funding opportunities) - Who to partner with - Key deadlines <p>Summary of Discussions (by World Bank) outlining next steps – 20 minutes</p>
11:30 – 11:45	Coffee Break
11:45 – 13:00	<p>Joint preparation for the Indus Knowledge Forum Meeting (<i>Colombo, July 2017; facilitated by Diana Suhardiman</i>)</p> <p>Rapporteurs: Naresh Newar</p> <ul style="list-style-type: none"> ▪ Presentation on the Indus Forum process evolving into the Indus Knowledge Forum (World Bank) – 20 minutes ▪ Presentation of status of Indus Knowledge Forum (July 2017) (IWMI) – 20 minutes ▪ Questions to be discussed: - 1 hour 30 minutes <ul style="list-style-type: none"> ○ What key initiatives should be presented? ○ What key research should be presented? ○ What is the intended outcome of the meeting? ○ What are the cross-learning opportunities with other basins? <p>Summary of Discussions (by IWMI) outlining next steps – 20 minutes</p>
13:00 – 14:00	Lunch
14:00 – 17:30	[Field Visit to Godavari Knowledge Park]

Day 4 (May 25): UIB Network Meeting <i>(Parallel IF working group meeting as necessary)</i>	
Rapporteur: Naresh Newar, Nisha Wagle ,and Smita Ghimire	
9:30 – 12:50	<p>Upper Indus Basin Network Technical Working Group and Strategic Committee Meeting <i>(Chaired by Dr Ghulam Rasul)</i></p> <ul style="list-style-type: none"> ▪ Structure of UIB Network (TWG, SC and advisors, Arun) ▪ Welcoming new members in UIB network (David, Arun) ▪ General updates by technical working groups (working group leads) ▪ Discussion on the membership of UIB Network, TWG, SC and advisors (all) ▪ Reporting on the follow-up of the UIB-Network meeting (Arun) ▪ Discussion on next steps of UIB network (Chair) <p>Summary of discussion</p> <p>Coffee break during session</p>
12:50 – 13:00	<p>Closing Session</p> <ul style="list-style-type: none"> ▪ Remarks by Ghulam Rasul ▪ Remarks by David Molden ▪ Remarks by Nisar Memon ▪ Remarks by Joshua Newton ▪ Vote of thanks by Arun Shrestha
13:00 – 14:00	Lunch

Annex 2: Participants List

S.No.	Name	Designation	Office/Institutions	Email address
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1	Mr Sayed Sharif Shobair	Coordinator FAO/IRDP	Ministry of Energy and Water (MEW)	sayed.sharif@eirp-afg.org
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3	Mr Mir Ahmad	Operations Of- ficer	World Bank Office, Kabul, Afghanistan	mahmad3@worldbank.org
CHINA				
4	Dr Liu Shiyin		Institute of Internation- al Rivers and Eco-secu- rity, Yunan University, China	Shiyin.liu@ynu.edu.cn
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6	Dr Yinsheng Zhang	Professor	Institute of Tibetan Plateau Research Chinese Academy of Sciences, Beijing	yszhang@itpcas.ac.cn
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8	Dr Zhai Jianqing		National Climate Centre, China Meteorological Administration, 46 Zhongguancun Nandajie, Beijing 10081, China	zhaijq@cma.gov.cn
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10	Dr Renoj J Thayyen	Scientist	National Institute of Hydrology, Roorkee-247667, India. (M) 9412074258	renojthayyen@gmail.com
11	Prof Shakil Ahmad Romsho	Professor, Depart- ment of Geology	Kashmir University, Department of Earth Sciences, Hazratbal, Srinagar Kashmir, India 190006	shakilrom@yahoo.com

PAKISTAN				
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15	Mr Mujahid Tanvir		Glacier Monitoring Research Centre	mujahid.gmrc@gmail.com
16	Mr Nisar Memon	Chair	Water Environment Forum	namemon@gmail.com
17	Mr Adnan Shafique Rana	Meteorologist	Pakistan Meteorological Department Tel: +92 51 9250361	adnanshafiqrana@hotmail.com
18	Ms Ayesha Khan	Country Director	Hashoo Foundation, Islamabad	ayeshakhan@hashoofoundation.org
19	Mr Muhammad Waseem Azhar	Section Officer	Ministry of National Food Security & Research	
20	Dr Javed Humayun	Senior Joint Secretary	Ministry of National Food Security & Research	
21	Mr Muhammad Zafar Khan	Assistant Professor	Karakoram International University (KIU), Gilgit Baltistan, Tel: +92 5811 960010	zafar.khan@kiu.edu.pk
22	Mr Nawab Ali Khan	Chief Executive Officer	Aga Khan Agency for Habitat (AKAH) Global Office Tel: +92 51 2072500	nawabali.khan@akpbsp.org
23	Mr Muhammad Azam	Director General	PCRWR, Khayaban-e-Johar, Islamabad	m.azam@pcrwr.gov.pk
International Organisation				
<i>CSIRO</i>				
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