

PROCEEDINGS

Koshi Disaster Risk Reduction Knowledge Hub Inception Workshop

11–12 December 2018
Kathmandu, Nepal



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Koshi Disaster Risk Reduction Knowledge Hub Inception Workshop

11–12 December 2018
Kathmandu, Nepal

Co-organized by

Bihar State Disaster Management Authority (BSDMA)
Institute for Disaster Management and Reconstruction
(IDMR), Hong Kong Polytechnic University, Sichuan
Center, China

International Centre for Integrated Mountain
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Acronyms and Abbreviations

AKDN	Aga Khan Development Network
ANSISS	A.N. Sinha Institute of Social Sciences
BAP	Bagmati Action Plan
BSDMA	Bihar State Disaster Management Authority
CBDRM	Community-Based Disaster Risk Management
CCA	Climate Change Adaptation
CSO	Civil Society Organization
DHM	Department of Hydrology and Meteorology
DMP	Disaster Management Plan
DPNet	Disaster Preparedness Network
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EWS	Early Warning System
GLOF	Glacial Lake Outburst Flood
HIMAP	Hindu Kush Himalayan Monitoring and Assessment Programme
HKH	Hindu Kush Himalaya
HUC	Himalayan University Consortium
ICIMOD	International Centre for Integrated Mountain Development
ICT	Information and Communications Technology
IDMR	Institute for Disaster Management and Reconstruction
IEC	Information, Education and Communication
IGSNRR	Institute of Geographic Sciences and Natural Resources Research
INGO	International Non-Governmental Organization
IoE	Institute of Engineering
IIT	Indian Institute of Technology
IUCN	International Union for Conservation of Nature



KBI	Koshi Basin Initiative
KMC	Knowledge Management and Communication
LULC	Land Use and Land Cover
MoHA	Ministry of Home Affairs
MoU	Memorandum of Understanding
MPA	Megh Pyne Abhiyaan
NGO	Non-Governmental Organization
NIDM	National Institute of Disaster Management
NRCS	Nepal Red Cross Society
PDGL	Potentially dangerous glacial lakes
TERI	The Energy and Research Institute
USLE	Universal Soil Loss Equation
UN	United Nations
WVI	World Vision India

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Executive Summary

Water-induced hazards are quite common in the Koshi River basin and often have transboundary impacts – upstream hazards lead to disasters in downstream areas, affecting millions of people. Moreover, extreme weather events have cascading impacts and are expected to magnify in frequency and intensity because of climate change and environmental degradation. Although there have been efforts to improve disaster risk reduction (DRR) mechanisms in the Koshi basin, related policies and practices need to be strengthened using a multi-hazard approach. The Koshi Basin Initiative (KBI) at the International Centre for Integrated Mountain Development (ICIMOD) works with its partners to increase the understanding about the impacts of disasters on the basin and to enhance preparedness towards DRR.

In December 2017, and in April and August 2018, the KBI organized three workshops that provided a platform for regional dialogue for policy and decision makers, scientists, and relevant practitioners to deliberate on strengthening regional collaboration for DRR and ensuring resilient livelihoods in the Koshi basin. The panel, group and open-floor discussions all recognized the need to address DRR in the basin as a multifaceted, interdisciplinary and transboundary challenge. The consensus was that regional collaboration should extend beyond information sharing and that a platform should be created to facilitate collaboration. In addition to these workshops, the KBI, during August to November 2018, approached 20 participants with a series of project-scoping questions as it sought to understand the needs and perspectives of potential members and stakeholders about the challenges and opportunities in setting up a knowledge hub.

A need was felt to share available knowledge on addressing water-related disasters; build common understanding of the issues and possible solutions; and pull in multiple stakeholders across boundaries to work together to identify priority areas. A Hub could be developed to address lack of opportunities and to co-develop knowledge and synergize existing opportunities for transboundary cooperation. In addition, it was identified that the key building blocks of the good practice would be to implement a partnership approach – scoping, common interest, contributions and responsibilities; establish ‘friends



and family circle’ around common issues to counter constant change in political systems and maintain momentum; and enable members to drive detailed strategies and activities.

Thus, a two-day inception workshop on the Koshi DRR Knowledge Hub – organized by the Sichuan University, China, the Bihar State Disaster Management Authority (BSDMA), India, and ICIMOD, Nepal – was held in Kathmandu from 11 to 12 December 2018. More than 60 participants from China, India, Nepal, Japan and the United Kingdom participated in the workshop. The outcomes of the discussions have been synthesized in a draft form that encapsulates the common vision, scope, and success potential of the venture, and it will be finalized during the next meeting of the hub in 2019.

The participants recognized that the Koshi DRR Knowledge Hub has the potential to bring together people to address the big challenges in the mountain region, an area vulnerable to climate change and disasters. At present, it’s the preparation to deal with disasters that’s most important. There is no better time than now to deal with disasters in a collaborative way, and transboundary cooperation is important for promoting peace, harmony, and mutual understanding among the three nations.



The participants also mentioned that it is critical to bring together researchers, relevant practitioners, and policymakers on a common platform where they can share their understanding and perspectives. Further, that there is a need for initiating basin-level multi-hazard risk assessments that take into consideration the aspect of gender vulnerability; these also have to identify disaster hotspots in order to develop appropriate mitigation and adaptation methods for protecting the livelihoods of the vulnerable groups and to safeguard private-sector investment.

In addition, a need was felt that transboundary collaboration is needed for conducting assessments on reducing GLOF risk, monitoring potentially dangerous glacial lakes, updating the glacial lake inventory, adopting early warning systems (EWSs), devising mitigation measures, and planning proper land use. Also, transboundary collaboration is needed to develop a common landslide inventory, identify critical/priority watersheds and hotspots through technical and scientific exchanges, and promote good practices in land risk management. Importantly, flood risk management should integrate modern scientific and traditional knowledge and also consider the bottom-up

approach, taking in civil society and community perspectives. It was pointed out that knowledge gaps exist in understanding sedimentation and landslide zones, and its effects on the sediment transported into the rivers; as also in understanding the integration of sediment management in designing hydropower facilities, quantification of the impacts of existing interventions, and the possible impacts of future interventions.

Most of the respondents strongly agreed that establishing a hub is a good idea; they expect collaboration and cooperation from the knowledge hub. Sustainability and trust are the major challenges that the participants foresee for such a platform. Learning, collaboration, networking, and knowledge sharing are the major opportunities that the hub can provide. The major expectations from the Knowledge Hub were impactful collaboration; building transboundary trust and carrying out work of common interest; platform for innovative and powerful partnerships; information repository for identifying research gaps; and a one-stop platform for all knowledge needs.

SECTION 1

Workshop background

The Koshi DRR Knowledge Hub is conceptualized as a platform led and driven by its members to foster transboundary collaboration and promote science, policy and practice interlinkages. The idea of the hub was developed through a consultative process with various stakeholders between December 2017 and December 2018 in order to address the issue of disaster risk reduction (DRR) in the basin as a multifaceted, interdisciplinary and transboundary challenge. The consultative process was led by the Koshi Basin Initiative (KBI) at the International Centre for Integrated Mountain Development (ICIMOD) with the support of several partners who have been working across the basin to understand disasters and enhance resilience.

SECTION 2

Objectives

The objectives of the Koshi DRR Knowledge Hub inception workshop were:

- To share knowledge and current understanding of transboundary water-related disasters in the basin
- To develop a common vision, success indicators, and probable governance structure
- To devise short- and long-term strategies for the Knowledge Hub

SECTION 3

Proceedings of the workshop

3.1 Welcome remarks

The two-day workshop commenced with the welcome remarks from the chief guests. The key points were:

DAVID MOLDEN, DIRECTOR GENERAL, ICIMOD

- The Koshi DRR Knowledge Hub has the potential to bring together people to address the big challenges in the mountain region, an area vulnerable to climate change and disasters. At present, it's the preparation to deal with disasters that's most important.
- Some of the challenges such as climate change can only be addressed if we work together across boundaries.
- There are opportunities to work together in the area of DRR and this Knowledge Hub aims to figure out where we can work jointly with various partners and how the hub can be utilized to make a difference.



HE PETER BUDD, AUSTRALIAN AMBASSADOR TO NEPAL

- There is no better time than now to deal with disasters in a collaborative way.
- The Koshi basin is rich in natural resources and has the potential to contribute to economic growth. However, it is also highly vulnerable to natural disasters arising from climate change.
- This Knowledge Hub provides the platform to identify the knowledge gaps and solutions for water-related hazards at both upstream and downstream reaches.
- Transboundary collaboration is critical to DRR.
- From the Australian government's perspective, the recent climate policy white paper reflects on the importance of regional stability and prosperity when it comes to dealing with the impacts of natural disaster.

GRETCHEN KALONJI, DEAN, HONG KONG POLYTECHNIC UNIVERSITY, SICHUAN CENTER, CHINA

- The university is committed to this partnership because transboundary cooperation is important for promoting peace, harmony, and mutual understanding among China, India, and Nepal.
- The scope and scale of a basin-level DRR Knowledge Hub is appropriate for the platform to generate and share knowledge through greater involvement of decision makers, communities, academia, and the private sector.
- Sichuan University is committed to take up a leadership role in international initiatives on new models of collaboration in research on disaster-related matters.
- The university wants to use this interdisciplinary platform for generating and sharing knowledge; this will be an exciting partnership.

VYAS JI, VICE CHAIRMAN, BIHAR STATE DISASTER MANAGEMENT AUTHORITY (BSDMA), INDIA (OPENING REMARKS SHARED IN HIS ABSENCE)

- Disasters can have multiple faces; the people in the Koshi River basin live in a multi-hazard environment, where floods, landslides, and droughts affect them every year.
- The annual flooding in Bihar accounts for about 30–40 percent of the flood damages in India; as much as 22.1 percent of the total flood-affected

population in India is reported to be located within the state of Bihar. As many as 28 districts of Bihar fall under most flood-prone category.

- The flood impacts on the downstream of the basin in Bihar can be better managed through a transboundary collaboration with decision makers, researchers, relevant practitioners, and communities.
- It is critical to bring together researchers, relevant practitioners, and policymakers on a common platform where they can share their understanding and perspectives.
- The BSDMA commits to further strengthen such collaborative efforts that inform decision making at a transboundary level.

3.2 Setting the stage: challenges and opportunities in the Koshi basin

Moderator: Kanchan Shrestha, ICIMOD

To lead up to the discussions at the workshop, a series of presentations was made on disasters in the Koshi basin; they focused on the existing knowledge and the gaps therein, and the areas where transboundary collaboration need to be strengthened for DRR.

Addressing the impacts of natural hazards on livelihoods in the Koshi basin¹

- Natural disasters in the Koshi basin have large socio-economic and cascading impacts that are often transboundary in nature. They are nonlinear and interlinked, with one disaster in an upstream region triggering another disaster in the downstream reaches. However, there is a dearth of analysis on this cascading effect.
- There is a need for initiating basin-level multi-hazard risk assessments that take into consideration the aspect of gender vulnerability; these also have to identify disaster hotspots in order to develop appropriate mitigation and adaptation methods for protecting the livelihoods of the vulnerable groups and to safeguard private-sector investment.
- Reducing the impact of disasters on vulnerable groups requires an understanding of socio-economic dynamics such as the high rate of migration of youth during the flood season, resulting in an increase in the households headed by women.

¹Contributors: Nilhari Neupane, Chanda Goodrich, and Amina Maharjan, ICIMOD

- At the basin scale, water resources development in areas such as irrigation, hydropower, and inland navigation should consider upstream–downstream linkages and DRR mechanisms.

critical/priority watersheds and hotspots through technical and scientific exchanges, and promote good practices in land risk management.

Glacial lakes and glacial lake outburst floods (GLOFs) in the Koshi basin²

- The number of glacial lakes in the Koshi basin decreased by 2% and the overall land area increased by 18% from 1990 to 2015. The basin experienced 23 GLOF events during this period, with 9 in Nepal and 14 in China, all of which had transboundary impacts.
- A total of 42 potentially dangerous lakes have been identified in the Koshi basin – 24 in China and 18 in Nepal – which put lives and infrastructure at risk
- GLOFs are difficult to predict as they are controlled by several factors – landslides, ice and snow avalanches, rock-falls, slope failures, dam breaches, earthquake, etc.
- The risks associated with GLOFs can be reduced by updating the information on glacial lakes and regularly monitoring the identified potentially dangerous ones.
- Transboundary collaboration is needed for conducting assessments on reducing GLOF risk, monitoring potentially dangerous glacial lakes, updating the glacial lake inventory, adopting early warning systems (EWSs), devising mitigation measures, and planning proper land use.

Landslides in the Koshi basin³

- Landslides have an equal or greater impact than floods, but do not receive adequate attention.
- The landslide–sedimentation–flood nexus needs to be considered holistically.
- A consistent framework and methodology needs to be developed for landslide risk assessments.
- Transboundary collaboration is needed to develop a common landslide inventory, identify

Transboundary floods between Nepal and India: challenges and opportunities⁴

- Floods in the Koshi basin are recurrent and often have transboundary impacts, reducing the people’s capacity to utilize properly the region’s rich natural resources.
- Flood risk management should integrate modern scientific and traditional knowledge and also consider the bottom-up approach, taking in civil society and community perspectives.
- Transboundary collaboration is needed for initiating improved river basin management and devising a flood early warning system (EWS) that addresses flash floods, flood moderation, and water resource development.
- There are immense opportunities to showcase effective multi-scale transboundary collaboration in the Koshi basin.

Impact of sedimentation on the Koshi basin⁵

- Sedimentation in the Koshi basin is a major problem connected to other issues such as land use, river dynamics, floods, embankment instability, and infrastructure development. This underlines the strong linkages between upstream activities and processes and downstream environmental changes.
- Knowledge gaps exist in understanding sedimentation and landslide zones, and its effects on the sediment transported into the rivers; as also in understanding the integration of sediment management in designing hydropower facilities, quantification of the impacts of existing interventions, and the possible impacts of future interventions.
- Transboundary collaboration is needed to develop and implement solutions to the complex sedimentation processes and impacts.

²Contributor: Finu Shrestha, ICIMOD

³Contributors: Prem Paudel, Department of Forest and Soil Conservation, Government of Nepal; Jianqiang Zhang, Institute of Mountain Hazards and Environment, China; Deo Raj Gurung, Aga Khan Agency for Habitat, Tajikistan; Kripa Shrestha, ICIMOD

⁴Contributors: Abinash Mohanty, ADRI; Allwyn Navaraj, WVI; Anil Kumar Gupta, NIDM; Anil Maharjan, NRCS; Anjal Prakash, TERI University; Aparna Unni, MPA; Chandan Kumar, Oxfam, India; Dinesh Mishra, independent consultant; Eklavya Prasad, MPA; Kanchan Shrestha, ICIMOD; Mandira Singh Shrestha, ICIMOD; Mukul Kumar, Save the Children-India; Nishikant Gupta, ICIMOD; Rajan Subedi, Oxfam, Nepal; Rakesh Tiwari, ANSIS; Ramesh Tuladhar, DPNet-Nepal; Sanjay Pandey, Yuganter; Santosh Dahal, Lutheran World Relief; and Toya Nath Subedi, UNICEF, Nepal

⁵Contributors: Rajiv Sinha, Kanchan Mishra and Shobhit Singh, IIT Kanpur; Santosh Nepal, Kabir Uddin, ICIMOD; Basanta Adhikari, Sichuan University; Liu Linshan, IGSNRR, China; Biraj Singh Thapa, Kathmandu University

3.3 Introduction and concept of the Koshi DRR Knowledge Hub

Presenter: Kanchan Shrestha, ICIMOD

The background and conceptualization of the Koshi DRR Knowledge Hub was briefly introduced, highlighting the hub as a platform that interlinks and integrates research, policy, and practice at a transboundary scale for improved Koshi basin management. The need for such a platform was identified during the stakeholder consultations. The hub is envisioned as follows:

- Members defining specific strategies and activities
- Research policy and practice interface
- Self-guided groups within complementary transboundary teams
- Proposing/showcasing solutions together
- Ultimately using their own networks and the network/platform provided by the hub to influence practice, research, and policy in the Koshi River basin and beyond

3.4 Developing a common vision, and understanding the success of the DRR Knowledge Hub

Facilitators: Farid Ahmad and Lalu Kadel, ICIMOD

By splitting themselves into three groups, the participants held discussions on the nature of the vision for the Koshi DRR Knowledge Hub. The outcomes of the discussions have been synthesized in a draft form that encapsulates the common vision, scope, and success potential of the venture, and it will be finalized during the next meeting of the hub in 2019.

Common vision

Contribute to a resilient Koshi basin through better understanding and evidence-based decision-making on transboundary water-related DRR.

Scope of the Knowledge Hub

The groups discussed some of the issues that the hub could address and what it could achieve. The participants presented the following:

Issues that need to be addressed together

- Trust building and collaborative work on DRR at a transboundary level
- Information sharing and mutual understanding among the key stakeholders of the Koshi basin areas; issue/risk/vulnerability identification/hazard mapping
- Research and data sharing (data, methods, models-exchange resolution)
- Strengthening science–policy–practice linkages (transdisciplinary and transboundary)
- Platform for researchers and government agencies to discuss issues
- Customizing information into user-specific products
- Need to create value for the private sector

What will the hub achieve together?

- Arriving at a common understanding of transboundary issues and preparing an action plan
- Networking for DRR
- Data/information sharing and filling the data and knowledge gaps
- Improving the opportunities for transboundary cooperation
- Enhancing the capacity of local communities regarding DRR
- Employing a holistic approach to solve identified transboundary issues
- Action research led by young researchers
- Establishing trust; consolidating evidence and evidence-based science; installing better models and data sets
- Establishing a gender-sensitive DRR mechanism
- Bridging science, policy, and engineering
- Reducing uncertainty
- Avoiding duplication, and forging links
- Addressing the issue of equity in river basin management
- Hazard mapping for different disasters

After the deliberations, the scope of the hub was drafted by the organizers of the workshop for finalization during the next meeting.

Scope of the hub

- Promote transboundary collaboration, understanding, and decision-making across the Koshi basin through scientific knowledge and experience sharing related to water-induced disasters
- Strengthen the science–policy–practice interface by developing and showcasing solution-oriented research and practices
- Synthesize and provide recommendations for policy advocacy that take into consideration upstream and downstream interlinkages
- Facilitate dialogue and trust building among the different stakeholders such as policy/decision makers, implementers, media outlets, and private-sector organizations

Success indicators for the hubs, as suggested by the participants

- Policymakers using the knowledge generated by the hub
- Joint projects among the members of the hub
- Implementation of evidenced-based solutions
- Impact reduction – saving lives and reducing economic damages
- Learning from others and applying them in own areas
- Data and information shared beyond boundaries
- Coherency, integrity and trust among the hub partners.
- Quantification of the benefits of risk reduction
- Agreeing on common goals
- Producing special issues and journal articles, as well as organizing international conferences/workshops

These success indicators were reformulated to fall within the scope of the hub

- Use of knowledge by the policymakers
- Production of evidence-based solutions and recommendations by the hub
- Exchange of knowledge and information

- Joint activities such as workshops and conferences, and production of knowledge materials such as journal articles
- Initiation of a number of joint projects among the hub members

The participants also deliberated on the hub's short-, medium-, and long-term goals, structural organization, working areas, and the strategies for sustainability.

Short-term goals

- Identify key issues for the hub
- Facilitate knowledge sharing
- Develop the hub's governance structure and working group
- Prioritize working area and form teams
- Prioritize “low-hanging fruits” such as student exchange programme

Medium-term goals

- Consolidate issues and recommendations
- Strengthen engagement with policy
- Develop plans for joint projects such as vulnerability assessment/risk mapping

Long-term goals

- Promote evidence-based decision-making for DRR in the Koshi basin
- Establish a trustworthy network

3.5 Leveraging partnerships for the Koshi DRR Knowledge Hub

Facilitators: Debabrat Sukla, Sadiksha Guragai, and Santosh Pathak, ICIMOD

At the outset, the session on “Leveraging partnerships for the DRR Knowledge Hub” shared the key outcomes of the scoping survey that had been conducted among around 20 partner organizations of the KBI after they had expressed their interest in joining the Koshi DRR Knowledge Hub.

A brief presentation focusing on the feasible partnerships that can take place for the Koshi DRR Knowledge Hub was presented. This session highlighted the partnership approach and its core principles of diversity, equity, openness, mutual benefit, and courage – as adopted by ICIMOD – and their significance in delivering the desired project results effectively and efficiently.

A Mentimeter survey was also conducted during the partnership session to get more inputs from the partner organizations regarding their interest in establishing the Koshi DRR Knowledge Hub and contributing to it. The major outcomes from this survey (see Annex 1) were:

- Most of the respondents strongly agree that establishing a hub is a good idea; they expect collaboration and cooperation from the knowledge hub.
- Sustainability and trust are the major challenges that the participants foresee for such a platform.
- Learning, collaboration, networking, and knowledge sharing are the major opportunities that the hub can provide.
- Major expectations from the Knowledge Hub:
 - o Impactful collaboration
 - o Building transboundary trust and carrying out work of common interest
 - o Platform for innovative and powerful partnerships
 - o Data repository for identifying research gaps
 - o A one-stop platform for all knowledge needs

The session ended with a group discussion which was conducted to enhance clarity on the topics of: the structure of the knowledge hub; possible working areas; and actions to be undertaken to ensure the sustainability of the hub functions. Some of the key outcomes of the group discussion are outlined below:

Structure of the hub

- Formation of thematic groups with common interests and participating in joint projects
- Establishment of a secretariat at ICIMOD
- Formation of various scientific departments related to DRR in each country, with each of them interacting and coordinating with others
- Inclusion of members from governments, academia, civil societies, media outlets, and private-sector organizations
- Installation of a virtual platform with a central server at ICIMOD so as to reduce duplication of activities, while paving way for sharing of solution-oriented ideas and reports

Strategies for sustainability

- Identify existing and upcoming regional, country-level, and organizational mandates and explore synergies between them
- Facilitate the functioning of the hub through financial contributions from the members
- Initiate adequate and relevant engagement at various levels through workshops, conferences, follow-up activities, and discussions
- Increase motivation and interest of the members by sharing success stories and enhancing regional visibility

POSSIBLE WORKING AREAS OF THE HUB WORKING AREAS OF THE HUB

Working areas

- Policy advocacy and strategy
- GLOFs
- Floods
- Sedimentation
- Landslides
- Droughts
- Community-based disaster risk management
- Environmental protection
- Information and knowledge management, and communication

Cross-cutting themes in the working areas

- Knowledge sharing
- Livelihood and gender
- Indigenous knowledge
- Capacity building
- Private-sector engagement
- Policy advocacy

How should the stakeholder institutions work?

- With short-, medium-, and long-term plans
- Forming discussion portals to hold virtual meetings
- Announcing events
- Holding student exchange programmes
- Compiling available publications, reports, data, etc.
- Drafting joint research proposals
- Conducting social media campaigns

Which are the institutions that will be working in the identified areas?

- Government agencies
- Non-government and development partners
- Private sector
- Media outlets

3.6 Action agenda for the hub

Moderator: Kanchan Shrestha, ICIMOD

The participants were divided into eight working groups on the basis of their area of interest. Each of

them prepared short- and mid-term goals for the sustainability of the Knowledge Hub.

TABLE 1 GOALS SET BY THE WORKING GROUPS OF THE KNOWLEDGE HUB	
Short-term goals	Mid-term goals
Working area: Policy advocacy and strategy	
<ul style="list-style-type: none"> Find the entry points for convergence with the accreditation of the hub by the government Find champions of change within the system Understand the hub's financial outlays Push policy advocacy for transboundary collaboration 	<ul style="list-style-type: none"> Finalize the priority action points and feedback mechanism. Pilot the models, and map the collateral benefits (quantum action plan/guidelines for principal investigator) Build the capacity of government officials regarding Tier-I and Tier-II of the Sustainable Development Goals (SDGs)
Working area: Floods	
<ul style="list-style-type: none"> Identify the various types of floods Process the data (e.g., climate projection) Conduct mapping of hydrologic inundation, hazards and risks 	<ul style="list-style-type: none"> Promote capacity building and awareness (on gender, children's issues, and overall social aspects) Draw up a revival strategy plan for the wetlands Drawing up a preparedness plan for all the levels.
Working area: Droughts	
<ul style="list-style-type: none"> Collect evidences on frequency and intensity of rainfall, and on its patterns/variability; as also on climate change, and groundwater conditions Conduct drought impact studies on agriculture, livelihood, freshwater fishery, navigation, food security, and animal husbandry Promote community- and household-level adaptation measures such as switching to less water demanding crops, growing drought-tolerant varieties, and adopting traditional practices like water harvesting 	<ul style="list-style-type: none"> Implement a transboundary intervention mechanism for drought mitigation Initiate Koshi surface irrigation projects Find remedies to the water-sector crisis (diesel subsidy, crop insurance); employ drought mitigation measures like solar-pumped irrigation; adopt good practices; and project future drought disaster risks
Working area: Landslides	
<ul style="list-style-type: none"> Form a thematic group on landslides Take stock of the state of knowledge regarding landslides Formulate a landslide assessment methodology specific to the Koshi basin 	<ul style="list-style-type: none"> Investigate landslides in major road corridors Study the cascading effect of landslides Analyse the impacts (including displacement) of landslides on people and communities Long-term goals: <ul style="list-style-type: none"> Study the spatio-temporal variations of landslides Conduct landslide risk assessments and propose mitigation measures Promote community-based landslide EWSs
Working area: Sedimentation	
<ul style="list-style-type: none"> Sediment connectivity and landslides: <ul style="list-style-type: none"> Produce sub-basin-scale sediment connectivity maps based on remote-sensing data Integrate hill slope channels and along-channel connectivity with the landslide data Delineate critical areas of intervention Suggest mitigation measures Engineering aspects of sediment management: <ul style="list-style-type: none"> Prevent sediment flux through innovative methods Design dams and other interventions as flood mitigation and sediment control measures Identify industrial challenges in sediment-induced erosion Knowledge management and sharing Map activities related to sedimentation in different countries Support team-based student projects Sediment characterization Characterize in terms of specific zones 	<ul style="list-style-type: none"> Understanding the drivers and impacts of land use and land cover (LULC) changes: <ul style="list-style-type: none"> Natural versus anthropogenic drivers Study the impact of sediment delivery over time Spatial variability of sediment production across the Koshi basin: <ul style="list-style-type: none"> Identify the major sources of erosion (based on universal soil loss equation methods) Conduct field measurements and visits Improve data collection on sediment load and measurement in different sub-basins Review the available literature on sediment load from all participating countries Measure the sediment load data at different points, both upstream and downstream Sediment management plan: <ul style="list-style-type: none"> Propose technical solutions Formulate a management framework/policy for silt utilization

Working area: Environment protection

- Produce data and promote data sharing
- Build a data base on watershed, hydrology, and water quality control Produce research on pollution through surveys (of industries and towns: sewage outlets; and use of fertilizers)
- Study the drinking water supply system (and map the protection zone)
- Improve environment management
- Optimize waste treatment and water supply
- Conduct watershed/river basin numerical modelling (e.g., digital river)
- Study water quality stability and biodiversity self-purification
- Enhance the management, emission permits and sectoral policies
- Review upstream–downstream emission permits and policies

Working area: Information and knowledge management, and communication

- Formulate strategy for better supervision and delegation of knowledge management and communication roles and responsibilities
- Produce newsletters/bulletins, blogs, and social media content for the Koshi DRR Knowledge Hub
- Create a data server spatial information system and data-sharing policies
- Review the existing database or knowledge hub to see how it is functioning
- Collect the available data
- Design the hub's structure through analysis
- Gather the short-term knowledge useful for DRR, such as pre- and post-disaster activities
- Use advanced data and data-driven solutions to register evidence of change
- Conduct advanced data/information collection and their analysis by statistical inferences (statistical tests and their application)
- Organize workshops and platforms for sharing short-term activities
- Set up and maintain a portal for data collection and information sharing

Working area: Community-based disaster risk management

- Make an inventory/status record of community-based disaster risk management (CBDRM) initiatives
- Maintain a roster of experts in DRR and climate change adaptation
- Scope out donors for funding DRR projects
- Develop a mechanism for involving experts
- Design a two-year CBDRM project across the region, targeting transboundary locations upstream, midstream, and downstream
- Implement this CBDRM project
- Disseminate best practices for sharing the lessons learnt

Working area: GLOFs (Note: No group discussion was carried out on this subject during the workshop, and tentative goals were set on the basis of a pre-workshop event on GLOFs and the plenary presentation)

- Compile comprehensive data on and promote data sharing on potentially dangerous glacial lakes (PDGL)
- Propose, share, and discuss ideas for joint collaborative research on GLOF risk reduction
- Build a network among decision makers, media outlets, and practitioners from a range of disciplines, including climate change, disaster risk management (DRM), and environment and development planning, to enhance the knowledge on GLOF by exchanging ideas, research, and best practices, thereby reducing risks and increasing resilience

Long-term goal:

- Strengthen institutional mechanisms and governance structures for coordination and communication of GLOF warnings in order to enable prompt action

3.7 Panel discussions

During the inception workshop, three different panel discussions were conducted.

3.7.1 Perspectives on transboundary collaboration in disaster risk reduction

Moderator: Mandira Singh Shrestha, ICIMOD

Guided questions:

- What are the challenges and opportunities in transboundary collaboration?
- What could be the possible win-win outcomes of collaboration?

Key messages

GRETCHEN KALONJI, DEAN, HONG KONG POLYTECHNIC UNIVERSITY, SICHUAN CENTER, CHINA

- There's a need for a strong research base to address transboundary challenges and strengthen the education system at both primary/secondary and university levels, and coupled with these, there's a need to move towards the multinational project-based approach to integrate research and the education agenda.
- There's a need for transboundary higher education partnerships, and identification of potential areas for research.

- The DRR knowledge hub will be instrumental in the exchange of scientific and technical knowledge in multi-hazard risk assessment. This assessment will take into consideration the aspect of gender vulnerability; it will also identify disaster hotspots in order to develop appropriate mitigation and adaptation methods for protecting the livelihoods of the vulnerable groups.

VISHAKA GULATI, RESEARCH SCHOLAR, IIT GUWAHATI, INDIA

Vishaka Gulati shared an experience in transboundary cooperation in the Brahmaputra basin. This was by way of the Brahmaputra Dialogue and collaboration at various levels, which highlighted the sociocultural aspects of transboundary cooperation.

- There are data sharing problems between different countries, particularly in the matter of hydrological data, and this leads to poor decision making.
- Dialogues and negotiations among riparian countries can give space to the stakeholders to talk about various issues and concerns, and thus help in building trust and confidence. But this is currently lacking in the Brahmaputra basin.
- The academic community should be roped in to develop data/information; this will eliminate the existing myths about rivers.

SANGEETA SINGH, ASSOCIATE PROFESSOR, INSTITUTE OF ENGINEERING (IOE), NEPAL

- In order to maintain the natural ecosystem within urban landscapes, eco cities should be developed. This is applicable to rural areas too.
- Academic institutions can be strong partners in reinforcing the research base required for DRR and transboundary collaboration.
- IOE, as an academic institution, focuses more on research related to SDGs; it also has gender action plans, and conducts various risk studies to deal with the practical issues of disasters.
- The Bagmati Action Plan (BAP) approach can be applied to the Koshi basin as well; this approach has a holistic perspective and divides the whole area into different zones, and then initiatives are planned accordingly.

ARUN BHAKTA SHRESTHA, REGIONAL PROGRAMME MANAGER, RIVER BASINS AND CRYOSPHERE, ICIMOD

- Building a network is a long-term and gradual process, for which a holistic basin-wise understanding or vision and is very important; as also its ownership by the individual country itself.
- The existence of myths in our river basins related to different issues is a major challenge. For example, the myth that flood in a downstream country occurs due to the opening of gates in the upstream country.
- The exchange of scientific knowledge is a good entry point for building trust, as observed in the Upper Indus Basin Network and the Brahmaputra Dialogue.
- To strengthen institutional mechanisms for transboundary collaboration, a science-policy dialogue and joint research as well as other activities can be conducted by the partners.

RAM GOPAL KHARBUJA, DEPUTY DIRECTOR GENERAL, MINISTRY OF ENERGY, WATER, AND IRRIGATION, NEPAL

Ram Gopal Kharbuja provided a governmental perspective on the necessity of transboundary cooperation and highlighted the areas, plans and scopes for achieving such collaboration.

- Early warning data, obtained from a real-time system and water sensors can help in reducing the risk to the vulnerable people in the downstream.
- There's a formal agreement with the Government of India on 63 hydro-meteorological stations to strengthen the EWS on floods and the disaster management mechanism to reduce and manage the risks.

Questions from the audience:

- How would you integrate the DRR and immediate response systems?
- How is the growth of urbanization – planned, unplanned or half-planned – perceived in the context of disasters related to the Koshi basin?
- How can the legacy of the Brahmaputra Dialogue project be continued and how can it be more sustainable? How can this legacy be continued beyond the project?

- If a seismometer is installed outside the riverbed, it can actually monitor flood. How can similar scientific technology be used at a transboundary level to issue early warnings on disaster?

Responses

SANGEETA SINGH

The IOE offers a master's course in DRM and has also formulated an alternative course in emergency preparedness and response, in an effort to club together the DRR and immediate response systems. With regard to how urbanization is perceived in the context of disasters, most of the municipalities in the Koshi basin are very rural in nature where there is a high potential for planned urban management. There's a need for risk-sensitive land-use planning.

RAM GOPAL KHARBUJA

Regarding the flood early warning and response systems, the DHM issues early warnings on critical systems of weather and water. This information is conveyed to the Ministry of Home Affairs (MoHA) which is responsible for taking immediate response actions, and then to the community. A disaster management authority is also convened to look after the response and recovery process.

Regarding the use of seismometer for flood monitoring, the accuracy and the operating cost of the instrument have to be explored. At present, there are only water-level sensors that are affordable.

GRETCHEN KALONJI

There's a need to integrate the disaster risk reduction mechanism and the immediate response system in the educational curriculum. The Knowledge Hub should include information about the curriculums and educational resources available in the various regions.

As for multinational projects, there is a lack of socio-economic elements; these elements constitute a really important aspect. Each project should incorporate social, political and economic reflections of various regions.

ARUN BHAKTA SHRESTHA

Globally and regionally, each country's interest and investment in DRR is increasing. The private sector has a lot of potential to contribute to DRR in terms of ideas, advanced technology, and innovation. It is in a position to work directly with the policymakers and

pressurize them to make things happen. Therefore, private-sector partnership in DRR is very important.

VISHAKA GULATI

As in the Brahmaputra Dialogue where Chinese and Indian academicians collaborated, it is important that academicians are brought together. A memorandum of understanding (MoU) has been signed among Yunnan University (China), IIT Guwahati (India) and the Institute of Water Modelling (Bangladesh) for conducting joint research activities. For sustainability of the network, a civil society organization (CSO) meeting was held where international non-governmental organizations (INGOs) like Oxfam and the International Union for Conservation of Nature (IUCN) working in the Brahmaputra basin participated. The major objective of this meeting was to bring them together in one platform to share what they have been working on. The building of such a network can increase the sustainability of such a dialogue.

3.7.2 Voices of young professionals on transboundary collaboration

Moderator: Santosh Nepal, ICIMOD

Panellists: Liu Rongkun, ICIMOD, China; Kripa Shrestha, ICIMOD, Nepal; Kanchan Mishra, IIT Kanpur, India; Rajan Subedi, Oxfam, Nepal

Guided questions

- What are the existing challenges in transboundary research topics?
- How can young professionals contribute to and benefit from the hub?
- What opportunities do you see in transboundary collaboration?
- How do you see the next-generation transboundary cooperation looking like?

Key messages (responses)

- These young professionals are optimistic about transboundary collaboration, especially in the areas of research and knowledge and skills exchanges.
- They often find that data gaps and methodological differences are a challenge in conducting their own research activities.

- Collaborative research across academic institutes in the basin countries can easily be achieved and will benefit from identified priority areas.
- The value of collaboration can be realized in early professional development, which can be instrumental in showcasing transboundary collaboration in the region
- There's optimism regarding new-generation transboundary cooperation to create the enabling environment for trust building.
- The audience suggested to the young professionals to focus on local/traditional knowledge as much as possible and document the community-based disaster risk management approaches and indigenous knowledge practised in the community.
- The media should pay proper attention to information dissemination and transboundary issues.

KULBHUSHAN KUMAR GOPAL, NEWS18.COM, INDIA

- The Jure landslide of 2014 showed the importance of transboundary cooperation.
- News was circulated that a big boulder has blocked the Sunkoshi River, and if it's removed, 11 districts of Bihar will be completely flooded. On the basis of this information in the social media, the Bihar government shifted a whole community, but this wasn't found necessary in the end.
- If the correct information had been shared on time, then no such mass displacement would have taken place.
- This case demonstrates the importance of transboundary collaboration. If there was proper coordination between the authorities in Nepal and India, the people would have been spared of all the problems they had to face.

3.7.3 Role of media in enhancing transboundary collaboration

Moderator: Laurie Vasily, ICIMOD

Panellists: Hao Feng, China Dialogue, China;
Kulbhushan Kumar Gopal, News18.com, India;
Navin Singh Khadka, BBC, Nepal

Hindi to English Translator: Nishikant Gupta, ICIMOD

Guided question:

What are the challenges that you have faced in transboundary cooperation?

NAVIN SINGH KHADKA, BBC, NEPAL

- In 2016, during the flash flood in Khasa, the gap in data sharing became evident. The failure of EWS was a major reason behind the loss of life and property.
- Once this story was broadcast in the BBC, a meteorological station was built on the China–Nepal border; this shows the important role that the media plays in disseminating information globally.

HAO FENG, CHINA DIALOGUE, CHINA

- Hao Feng shared her story about the Mekong River which was heavily impacted by the drought of 2016. China, in trying to support the people living downstream, released water from an upstream dam to help the drought-stricken downstream region.

Questions and responses

- Do you think there is a lack of science-based journalism? Please highlight the importance of science-based journalism in DRR.
 - Science-based field journalism is important to capture the correct information.
 - Even though doing follow-up stories on environmental issues is not an easy task, they do it frequently.
 - In the case of the 2015 earthquake in Nepal, the media reported as if everything was destroyed in the country, which meant people living outside thought that nothing was left in Nepal. Thus, it is important how a message is conveyed.
 - Apart from scientific data collection, it is important to capture the stories of people in the field.
- The presence of media personnel in a disaster research/rescue team is very important. Is it mandatory that media houses send at least one journalist to cover the story on the field?
 - Yes, it's mandatory that one media person conducts a rapid assessment of the disaster.
 - However, in most cases, information is provided quite late to the media, so the

journalists are not able to go to the field to cover the story with the research or rescue team. This team usually circulates the information only when they are back from the field, so correct information is not shared at the right time.

- The news provided by the media is always exciting, even thrilling. However, it can be misleading too. How can misleading messages be avoided and the right message conveyed?
 - Media organizations do not intentionally disseminate false information. The intention is always to report correctly and to inform, not to excite or entertain. However, mistakes are made sometimes, and misinformation can be spread unintentionally.
 - Organizational communication and outreach units can play a big role in ensuring that factually accurate information is conveyed by getting journalists or young researchers to the field to witness accounts first hand and report on the same.
 - Engaging the media will help reduce mistrust between countries; it will also help connect upstream and downstream communities.
 - People tend to trust the news they get from the social media. This can be dangerous and destructive as it is easy for false information and wrong messages to be disseminated through social media accounts. Instead of copying and pasting content they come across on social media, individuals should verify the same before sharing them with others. Transboundary contacts can play a vital role in conveying the right information at the right time.
 - The relationship between journalists and governments is improving. The media should put pressure on governments to give the right information at the right time to other countries. Bilateral relationships are crucial for exchange of information. ICIMOD has a vital role to play in transboundary collaboration.
- How does the academia and the media work together in China?
 - There are short-term courses in journalism in Chinese universities.
 - The undergraduate students, both from the science and journalism streams, are doing joint research, and gathering stories from the field.
- How does the engagement of the media contribute towards DRR?

- A platform like the Knowledge Hub will improve the transboundary relationship among journalists and build trust within them.
- It will reduce misconceptions about individual countries.
- Working as a journalist is not only about ticking the boxes, but it's also about going beyond it.
- The impacts of a disaster can be reduced if the right information is disseminated at the right time.

At the end of the session, Laurie Vasily summarised that the engagement of the media as a component of the DRR Knowledge Hub was extremely relevant, as it emphasized the importance of getting the right information at the right time, a hallmark of transboundary collaboration.

3.8 Closing session

The participants expressed their gratitude to the organizers for organizing the inception workshop and were happy to contribute to the Koshi DRR Knowledge Hub. They also mentioned that the hub shouldn't be just about identifying the issues, but it should provide solutions as well. In his closing remarks, David Molden highlighted the importance of building transboundary partnerships. The two-day workshop came to an end with a vote of thanks from Kanchan Shrestha to all the participants for their contributions and continuous support.

WHY MOUNTAINS MATTER FOR DRR: INTERNATIONAL MOUNTAIN DAY

Each year, ICIMOD participates in and organizes associated events to further its mission to improve the lives and livelihoods of the mountain people in the Hindu Kush Himalaya through sustainable development. The theme of the "International Mountain Day 2018" was "Mountains Matter".

List of winners:

- ICIMOD Mountain Film Award 2018: An Uncertain Winter – Munmun Dhalaria.
- The ICT for Mountain Development Award, 2018:
 - Kathmandu Living Labs, Kathmandu, Nepal
 - National Biodiversity Centre, Bhutan
- Gender in the Koshi Basin: Photo story competition:
 - First prize: "The lives of women in the Terai" – Suman Adhikari
 - Second prize: "Rainbow" – Suresh Mukhiya
 - Third prize: "On the banks of the Indrawoti" – Bashudev Neupane

Annexes

Annex 1: Menti poll

1. What is your expectation from the Knowledge Hub, in one word?

- Collaboration
- Cooperation
- Information
- Knowledge-sharing platform
- Collaborative research
- Data sharing
- Joint projects
- Networking/Trust building

2. What other challenges do you foresee for the hub?

- Sustainability
- Ownership
- Trust
- Funding/Financial viability
- Conflict of interest
- Political unwillingness
- Collaboration
- Data quality and management
- Geographical space
- Management modality

3. What could be the existing opportunities being a part of the hub?

- Learning
- Collaboration
- Networking
- Knowledge and idea sharing
- Ideas
- Information access
- Youth mobilization
- Research
- Communication
- Funding opportunities

4. Do you think a KMC (knowledge management and communication) strategy is needed for the hub?

- Most of the respondents voted “Yes, let’s manage our knowledge.”

5. What are the expectations of your institution from the Knowledge Hub?

- Collaboration, sharing of best practices
- Sharing data and building trust
- Collaborative research and academic exchange
- Be realistic and pragmatic
- Generating ideas for action solution
- Resolution of conflict of interest
- Transboundary research and accessible data bank
- One-stop platform for all knowledge needs
- Database creation and sharing for DRR, and resilience research and policy feed
- Platform for innovative and powerful partnerships
- Capacity building
- Empowerment
- Providing projects on transboundary interdisciplinary research for young scientists as well as students
- Creating spaces for joint initiatives and learning spaces
- Healthy watersheds
- Building connection from different countries, sharing the work done, discussing methods
- Recognition at national and international levels, networking, involvement in research and capacity building

Annex 2: Agenda

Day I: 11 December 2018, Tuesday

Venue: Kanchenjunga Hall, ICIMOD

Time	Activity
08:30–09:00	Registration
09:00–09:30	Welcome remarks <ul style="list-style-type: none">• David Molden, Director General, ICIMOD• Gretchen Kalonji, Dean, Institute for Disaster Management and Reconstruction (IDMR), Hong Kong Polytechnic University, Sichuan Center, China• HE Peter Budd, Australian Ambassador to Nepal Rapporteur: Sunita Ranabhat, ICIMOD
09:30–10:20	Setting the stage: challenges and opportunities in the Koshi basin <ul style="list-style-type: none">• Glacial lakes and GLOFs in the Koshi Basin – Finu Shrestha, ICIMOD• Landslides in the Koshi basin – Deo Raj Gurung, AKDN• Transboundary floods between Nepal and India: challenges and opportunities – Aparna Unni, Megh Pyne Abhiyan, India, and Rajan Subedi, Oxfam, Nepal• Impact of sedimentation on the Koshi basin – Rajiv Sinha, IIT Kanpur• Impacts of natural hazards on livelihoods in the Koshi basin – Nilhari Neupane, ICIMOD Moderator: Mandira Singh Shrestha, ICIMOD Rapporteur: Nisha Wagle, ICIMOD
10:20–10:30	Introduction and concept of the Koshi DRR Knowledge Hub <ul style="list-style-type: none">• Presenter: Kanchan Shrestha, ICIMOD• Rapporteur: Smita Ghimire, ICIMOD
10:30–11:00	Group photograph, followed by tea/coffee break
11:00–12:00	Panel discussions <ul style="list-style-type: none">• What are the challenges and opportunities in transboundary collaboration?• What could be the possible win-win outcomes of collaboration? Panellists: Gretchen Kalonji, Sichuan University, China Vishaka Gulati, IIT-Guwahati, India Sangeeta Singh, Institute of Engineering, Nepal Arun Bhakta Shrestha Ram Gopal Kharbuja, Ministry of Energy, Water and Irrigation, Nepal Moderator: Mandira Shrestha, ICIMOD Rapporteurs: Binu Maharjan and Finu Shrestha, ICIMOD
12:00 – 12:45	Voices of young professionals on transboundary collaboration <ul style="list-style-type: none">• How can young professionals contribute to and benefit from the hub?• What opportunities do you see in transboundary collaboration? Panellists: Liu Rongkun, China Kripa Shrestha, Nepal Kanchan Mishra, India Rajan Subedi, Nepal Moderator: Santosh Nepal, ICIMOD Rapporteurs: Anushilan Acharya and Nilhari Neupane, ICIMOD
12:45–13:45	Lunch break
13:45–14:45	Why mountains matter for DRR: International Mountain Day
14:45–17:00	Developing a common vision and understanding the success of the DRR Knowledge Hub Facilitators: Farid Ahmad and Lalu Kadel, ICIMOD Rapporteur: Kripa Shrestha, ICIMOD
17:15	Participants to be taken to the reception dinner venue
18:00–20:00	Reception dinner

Day II: 12 December 2018, Wednesday

Venue: Kanchenjunga Hall, ICIMOD

Time	Activity
09:00–10:30	Leveraging partnerships for the Koshi DRR Knowledge Hub Moderators: Santosh Pathak, Sadiksha Guragai, and Debabrat Sukla, ICIMOD Rapporteurs: Kripa Shrestha and Smita Ghimire, ICIMOD
10:30–11:00	Tea/coffee break
11:00–12:30	Forming collaborative structures for the Koshi DRR Knowledge Hub: towards an action agenda Moderators: Santosh Pathak and Mandira Singh Shrestha, ICIMOD Rapporteurs: Kripa Shrestha and Smita Ghimire, ICIMOD
12:30–13:30	Lunch
13:30–14:30	Action agenda for the hub Moderators: Kanchan Shrestha and Mandira Singh Shrestha, ICIMOD Rapporteurs: Kripa Shrestha and Smita Ghimire, ICIMOD
14:30–15:30	Role of media in enhancing transboundary collaboration Panellists: Hao Feng, China Dialogue, China Navin Singh Khadka, BBC, Nepal Kulbhushan Kumar Gopal, News18.com, India Moderator: Laurie Vasily, ICIMOD Hindi to English translator: Nishikant Gupta, ICIMOD Rapporteurs: Kripa Shrestha and Smita Ghimire, ICIMOD
15:30–16:00	Tea/coffee break
16:00–17:00	Closing session Summary and the way forward – David Molden, ICIMOD Closing remarks Vote of thanks – Kanchan Shrestha, ICIMOD

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