

PROCEEDINGS OF THE

# Koshi Disaster Risk Reduction Knowledge Hub: Building a resilient Koshi basin

India country consultation

Patna, Bihar, India



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# Abbreviations and acronyms

<b>BIAG</b>	Bihar Inter Agency Group	<b>IDMR</b>	Institute for Disaster Management and Reconstruction
<b>BSDMA</b>	Bihar State Disaster Management Authority	<b>KBI</b>	Koshi Basin Initiative
<b>CBFEWS</b>	Community Based Flood Early Warning System	<b>KDKH</b>	Koshi Disaster Risk Reduction Knowledge Hub
<b>CSR</b>	Corporate Social Responsibility	<b>NGO</b>	Non-government organization
<b>DMD</b>	Disaster Management Department	<b>NDMA</b>	National Disaster Management Authority
<b>DRR</b>	Disaster risk reduction	<b>SDGs</b>	Sustainable Development Goals
<b>EWS</b>	Early warning system		
<b>ICIMOD</b>	International Centre for Integrated Mountain Development		

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# Executive summary

Reducing disaster risk and building resilience are interrelated goals of the 2030 Agenda for Sustainable Development and the Sendai Framework for Disaster Risk Reduction 2015–2030. Multi-stakeholder participation in building resilience is emphasized in various global frameworks. One of the guiding principles of the Sendai Framework is “all-of-society engagement and partnership”. Disasters affect a wide spectrum of the Sustainable Development Goals (SDGs), which can be analysed in the context of poverty, food insecurity, school-dropout rates, gender inequality, urbanization and climate change. In particular, disaster risk reduction (DRR) and resilience-building are targets in the SDGs.

The Koshi River drains a large part (about 75,000 km<sup>2</sup>) of the east-central Himalaya as it flows from Tibet through Nepal before joining the Ganges in northern Bihar in India and eventually flowing into the Bay of Bengal. The Koshi is well known for its floods and capricious behaviour, posing common challenges to and displacing millions of people in Nepal and India in recent years. From 1954 to 2014, Nepal faced a total of 41 flood events, which killed almost 6,500 people and affected more than 3,500,000. Similarly, floods in Bihar have claimed 9,500 lives between 1979 and 2017.

The Koshi Basin Initiative (KBI) at the International Centre for Integrated Mountain Development (ICIMOD) has been working with its partners to increase understanding of disasters in the basin, improve regional cooperation for disaster risk reduction (DRR), and build the resilience of basin communities. The concept of the Koshi DRR Knowledge Hub (KDKH) was accordingly conceptualized as a platform that fosters transboundary collaboration and promotes science, policy, and practice interlinkages to address DRR in the basin as a multifaceted, interdisciplinary, and transboundary challenge. It aims to promote the development of collaborative activities and projects that will improve decision making related to the management of the Koshi River basin.

The country consultation was an important milestone in the roadmap towards establishing a knowledge hub on DRR for the Koshi basin, which transcends the boundaries of China, India, and Nepal. The event was hosted by the Bihar State Disaster Management Authority in association with ICIMOD, Plan India, Caritas India, and Yuganter. The

Government of Bihar has been working on building the resilience of the communities in the Koshi basin through the Bihar State DRR Roadmap (2015–2030) based on the Sendai Framework (2015–2030).

The consultation brought together 90 stakeholders from Bihar and other parts of India on 30 and 31 July 2019 to understand the issues and challenges related to the Koshi Basin and share good practices related to resilience building, as well as identify ways to improve transboundary cooperation for better accessibility and uptake of research for collective action.

Collaboration among multiple stakeholders for risk reduction in the Koshi basin, including with the communities upstream in Nepal, was identified as the need of the hour. Stakeholders agreed that disasters need to be managed at a basin scale, not in a scattered form. Understanding the Koshi River as a system would be necessary for effective management of floods and its impacts. In addition, a roadmap should be jointly developed by all the affected countries to also highlight the importance of improving the understanding of the basin for disaster risk reduction. Here, collaboration at different levels of governance could be the key for strengthening science-policy-practice interface where local knowledge and scientific knowledge support informed decision making.

It was agreed that the Koshi DRR Knowledge Hub is a platform that everyone can contribute to and learn from. However, there is a need to integrate livelihoods in the Hub and also understand the impact on the most vulnerable communities. Stakeholders also provided critical recommendations for improving sediment management, and for curbing illegal infrastructure on the flood plains to help manage floods. They agreed that joint efforts are necessary to ensure that relevant policies and practices are incorporated into the broader DRR framework of governments. Collective action across countries, communities, and stakeholders would be important for ensuring disaster resilience in the Koshi basin.



# Introduction

## The Koshi River basin

The Koshi River is a silt-laden river with a steep gradient (8,000 to 60 m within a span of 720 km). The river starts from Tibet in China, flows through Nepal and is fed by many tributaries, and enter India to join the Ganges. The total catchment area of the river at its confluence with the Ganges is 74,030 km<sup>2</sup>. About 43% of this total area lies in China, 42% in Nepal and the remaining 15% in India. If we take Chatara as a nodal point, the Koshi has shifted westward about 120 km in the past 250 years. The major goal of the existing Koshi barrage between Nepal and India was to control floods in Bihar; irrigation, hydroelectricity generation, land reclamation, fishing and navigation were less important. Flash floods are frequent in areas along the Nepal-India border. In 2008 there was a major flood in the region due to a breach in the Koshi embankment at Nepal. The flood caused damage in Nepal but the major devastation was in India, where it claimed 42 lives (as of 25 August 2008), destroying 35,000 ha of cropland, and affected more than one million people with more than 70,000 being displaced.

Bihar is one of the first states in India to develop a DRR Roadmap (2015–2030) based on the Sendai Framework to build 1) resilient villages; 2) resilient livelihoods; 3) resilient critical infrastructure; 4) resilient basic services, and 5) resilient cities. One of the guiding principles for this roadmap is ‘resilience in development’. Understood simply as “the capacity of an individual, household, community or system to anticipate, absorb (through effective preparedness, response and mitigation) and recover from hazards and other shocks and stresses without compromising its existence and functioning in the long term,” resilience provides clarity about both the ‘end’ and the ‘means’ for disaster risk reduction actions in this roadmap.

Research, policy and practice for improving disaster risk reduction requires collaboration with upstream communities and institutions. The Koshi DRR Knowledge Hub (KDKH) provides a platform for such collaboration. The BSDMA with other government agencies including the Disaster Management Department, Water Resources Department, Government of Bihar, has been implementing/ promoting various initiatives on DRR. The BSDMA's emphasis has been on strengthening the structural

and non-structural aspects of the system to reduce disaster risks and mitigate their impacts. These activities include awareness generation and capacity building of the affected population and other stakeholders.

## The Koshi DRR Knowledge Hub

The Koshi DRR Knowledge Hub (KDKH) has been conceptualized as a member-led platform for fostering transboundary collaboration and promoting science-policy-practice interlinkages for water-related disasters. The hub was developed through a consultative process with various stakeholders between December 2017 and December 2018. It seeks to address DRR in the basin as a multifaceted, interdisciplinary and transboundary issue. The consultative process was led by the Koshi Basin Initiative of ICIMOD, which is now the Secretariat of the KDKH, with support from several partners across the basin who have been working in collaboration to comprehensively understand disasters in the basin and enhance its resilience. At the KDKH's inception workshop in December 2018, the hub's common vision, scope, success indicators, working areas, and possible governance structure were discussed.

### COMMON VISION

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

### SCOPE OF THE HUB

- Promote transboundary collaboration, understanding, and decision making across the Koshi basin through scientific knowledge and experience sharing related to water-related disasters
- Strengthen the science-policy-practice interface by developing and showcasing solution-oriented research and practices
- Synthesize and provide recommendations for policy advocacy that takes into consideration upstream and downstream inter-linkages

- Facilitate dialogue and trust building among different stakeholders such as policy/decision makers, implementers, media outlets, and private-sector organizations

#### SUCCESS INDICATORS

- Use of knowledge by policy makers
- Initiation of a number of joint projects by hub members
- Production of evidence-based solutions and recommendations by the hub
- Exchange of knowledge and information
- Joint activities such as workshops and conferences and knowledge products such as journal articles

## Country consultation

A country consultation was organized in Patna, Bihar on 30–31 July 2019 to share the outcomes of the Koshi DRR Knowledge Hub (KDKH) Inception Workshop (December 2018) and discuss how

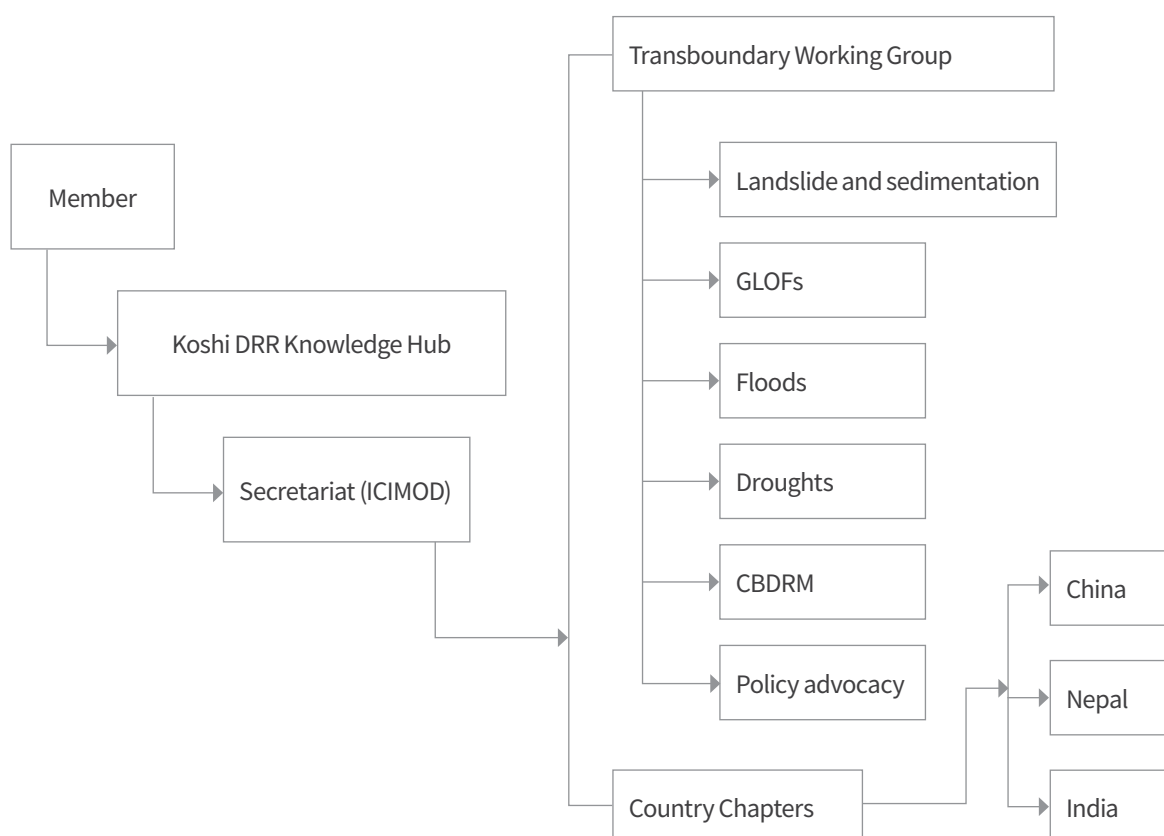
stakeholders in India (in particular Bihar) can benefit from and contribute to the KDKH. The inception workshop allowed participants to share knowledge gaps and opportunities for collaboration for disasters such as floods, landslides and sedimentation. The consultation was organized by Bihar State Disaster Management Authority (BSDMA) with support from ICIMOD, Plan India, Yuganter and Caritas. The objectives of the consultation were:

- Discuss and understand the issues and challenges related to the Koshi River basin – floods, siltation, sedimentation, livelihood, human migration, and climate change effects
- Initiate transboundary interaction and sustainable (community) actions and solutions towards achieving a resilient Koshi
- Share resilience actions and best practices in the Koshi River basin

The workshop was interactive and included over 90 participants from government and non-government agencies, academic institutions, and media and other stakeholders.

FIGURE

PROPOSED STRUCTURE AND OPERATION SYSTEM OF THE KOSHI DRR KNOWLEDGE HUB (KDKH)





# Sessions

## Inaugural session

Sanjay Pandey, Convener of the Bihar Inter Agency Group (BIAG), and Executive Director of Yuganter, welcomed the participants to the consultation. He said it was important for multiple stakeholders to work collaboratively, including with the communities upstream in Nepal, for risk reduction in the Koshi basin. He gave the example of the Community Based Flood Early Warning System where flood early warning information from the upstream community in Nepal saved lives and livelihood in Sitamarhi, Bihar.

Kanchan Shrestha, Koshi Basin Initiative Coordinator, ICIMOD, shared the objectives of the consultation. She said despite several DRR efforts in the Koshi basin, three challenges remain:

1. limited knowledge and information sharing;
2. lack of informed policy and decision making (e.g., decisions based on scientific and local knowledge and upstream downstream interlinkages),
3. lack of trust between stakeholders.

The Koshi DRR Knowledge Hub has been established to address these challenges. Transboundary working groups on floods, landslides, drought and community-based disaster risk management can help enhance the interlinkages among scientists, policy makers and practitioners. Establishing a country chapter would enable the transboundary working groups to work effectively and also promote the uptake of good practices and recommendations at the institutional level.

Dushyant Mohil, Director, Wetlands International South Asia, remarked that the Knowledge Hub is a platform that we all can contribute to and learn from.

Praveena Sridhar, Frank Water, United Kingdom, emphasized that we need to integrate livelihoods in the Knowledge Hub.

Dinesh Mishra, National Expert on Rivers of Bihar, India, said, “Our ancestors have been living with floods for centuries. Why have these become disasters now? What actions are we taking now that are causing these disasters?”

Ras Bihari Prasad Singh, V.C., Patna University, began the workshop with his insightful remark: “Flood is a function of the river. Disasters need to be managed at a basin scale, not through scattered efforts.” Singh said we need a comprehensive

understanding of the nature of the Koshi River, which has a very different character as it is heavily laden with silt. He further emphasized that for effective management of floods, a roadmap should be jointly developed by all the affected countries. He also highlighted the importance of improving the understanding of the basin for disaster risk reduction, and expressed his good wishes for the KDKH.

## TECHNICAL SESSION I (A)

### Understanding the issues and challenges of the Koshi River basin

Santosh Nepal, Water and Climate Specialist, ICIMOD, briefed the participants about the challenges of sedimentation and the meandering nature of the Koshi River. He emphasized “transboundary collaboration for integrated assessment of climate change, floods and sedimentation, which is most important for disaster risk reduction in the Koshi basin.” His presentation highlighted the key challenges in the basin, and provided critical recommendations for improved sediment management.

Dinesh Mishra emphasized the need for a river drainage commission in Bihar for the management of the drainage system, which is extremely critical for managing excess water during flooding. He noted that we should learn to live with floods and rivers within their natural habitat. He cited the example of the Koshi embankment breach which resulted in the siltation of the agriculture fields, which could have been avoided had there been planned river management. He also spoke about the need to work on flood tolerant crops and houses.

Praveena Sridhar, Frank Water, United Kingdom, mentioned the positive effects of floods, such as making the land fertile, and giving opportunity for one crop cycle for floodplain farmers. Among the destructive effects, she mentioned flooding of homes, damage to property and fields, and waterborne diseases. She explained the reasons behind the increase in the destructive effects of floods such as population growth, and change in land use patterns. Her ideas for disaster risk reduction in the Koshi River Basin included technically sound holistic planning, and anchoring the intervention in local economy.

## TECHNICAL SESSION I (B)

### Understanding the issues and challenges of the Koshi River basin

Banku Bihari Sarkar, UNICEF-DRR, Bihar, stressed that one of the key challenges facing the state is child trafficking in times of disaster such as floods. He mentioned that there is a considerable amount of evidence to support this, and agencies should look also into this aspect while talking about DRR in the Koshi River basin. Only when we address such ground level impacts can we think about building a resilient Koshi.

Tushar Kanti Das, Head of DRR, Plan India, spoke about the impacts of disasters on children. He stressed that they are the most vulnerable group and need direct interventions during disasters. He highlighted the work that Plan India is doing to address the key challenges across India, and said the KDKH is a useful platform for addressing this issue through its working groups.

Ravi Prakash, SDO, Forbesganj, Bihar, shared case studies where illegal infrastructure development has blocked the outlet of flood water in towns and cities, thus becoming a major culprit for floods. In one case he legally demolished such a structure and ensured that flood water would cause less harm. He highlighted that the government needs to work with local communities on this issue, and it is possible to manage floods in a resilient manner if the stakeholders work together.

## TECHNICAL SESSION II

### Strengthening coordination and collaboration among transboundary development agencies

Ranjana Das, State Manager, OXFAM, called for a joint effort to ensure that relevant policies and practices are incorporated into the broader DRR framework of governments. She also highlighted the need to “incentivize upstream communities to relay important and life-saving information to at-risk communities downstream.”

Adding to the issue mentioned above, Sanjay Pandey, Executive Director, Yuganter, highlighted the effectiveness of the CBFWS. “The transboundary collaboration between communities of Nepal and Sitamarhi during the 2017 flood and in 2019 has shown that telemetry-based early warning systems can be highly effective when coupled with a human

interface. The KDKH could act as a platform to initiate dialogue to replicate such effort,” he said.

Babul Prasad, Chairperson, Mission DRR, Bihar, reiterated that a collaborative common platform of upstream and downstream stakeholders would be immensely helpful in ensuring risk-informed decision making. He shared the experience of establishing a volunteer-based non-technical flood early warning system in 40 villages in Supaul district of Bihar, India. He reckoned that the KDKH can be a good platform for sharing experiences in various types of early warning.

Kapileshwar Ram, Chairman, Dalit Adhikar Manch, Bihar, underlined the issues of the most vulnerable communities who are waiting for relief, especially Scheduled Caste communities, women and children. He said that “the above mentioned groups often get left out, so a conscious effort should be made to mainstream their abilities and challenges.” He highlighted the importance of forming a grassroots coordination team at the field level and training them in capacity building both for women and men.

Ranjeet, Convenor, Nadi Wapasi Abhiyan, Bihar, spoke from his four decades of experience working on the rivers and people. He stated that “collaboration at different levels of governance is the key for strengthening the science-policy-practice interface where local knowledge and scientific knowledge support informed decision making.”

Raju Thapa, DPNET, Kathmandu, Nepal, was optimistic about the formation of the KDKH. Keeping in view the challenges of international boundaries through which the Koshi River meanders, he suggested the “development of an online meeting platform to respond during any emergency.” He also shared information about the Government of Nepal’s Disaster Information System ([www.bipad.gov.np](http://www.bipad.gov.np)), and expressed his hope that all information would be synced with the KDKH platform.

## TECHNICAL SESSION III

### Improving upstream-downstream cooperation for cross-border floods and resilience building

Neera Shrestha Pradhan, Senior Water and Adaptation Specialist, ICIMOD, explained how the community based flood early warning system (CBFEWS) can improve upstream-downstream cooperation for cross-border floods and help build

resilience. CBFEWS is an integrated system of tools and plans to detect and respond to flood emergencies that is managed by communities, especially for flash flood prone rivers. Although the detection of a flood risk and its communication to vulnerable communities is driven by technology, the CBFEWS primarily relies on communities' preparedness for responding to floods. CBFEWS has been piloted in Nepal, India and other countries in the region.

The four elements that strengthen CBFEWS and helps in effective implementation where highlighted:

- Risk knowledge and scoping: Systematically collect data and undertake risk assessment and scoping.
- Community based monitoring and early warning: Install an early warning instrument and ensure flood monitoring by upstream communities
- Dissemination and communication: Gather flood information from upstream community and provide early warning to downstream community
- Response capability and resilience: Strengthen community response capabilities and build resilience

P.N. Rai, Member, BSDMA, Patna, Bihar, acknowledged that BSDMA will contribute to a resilient Koshi basin through better understanding and evidence-based decision making on transboundary water issues related to DRR. He expressed his desire that flood early warning system like CBFEWS be extended to other flash flood prone areas in Bihar and in this regard hoped that ICIMOD would provide technical support to the government of Bihar.

The panellists presented their views as follows:

Mahendra Karki (caretaker of the CBFEWS in Bardibas, Nepal) stated that the CBFEWS is helping the community in the flood prone area along the Ratu River in Nepal and India. He said that "it is a difficult and very challenging task to inform the community in an emergency situation because during emergency there is very little response time and due to international borders communication channels do not work properly." However, with the CBFEWS he is able to provide critical flood early warning through close communication with Ranjeet Jha, caretaker of the system in Bhittamore, India. He said that working voluntarily is a very challenging task, but that he was happy that he had got an opportunity to do humanitarian work.

Ranjeet K. Jha (caretaker of the CBFEWS in Bhittamore, India) is a dedicated volunteer of Yuganter. He said that the CBFEWS is very effective in providing early warning alerts to the community. In this regard, he expressed his satisfaction that due to cooperation from the upstream CBFEWS station at Bardibas and Sarpallo in Nepal, people in Bhittamore, India were able to get information roughly eight hours in advance both in 2017 and 2019. As a result of the early warning system, the lives of 19 children were saved in 2017. Similarly in 2019, women and children had ample time to evacuate with dignity and safety thanks to the early warning system.

Deepak Jha, Executive Director, Sabal Nepal, said that the training on CBFEWS provided by ICIMOD was extremely helpful to Sabal and the community. The community feels capable of protecting itself from floods due to early information as well as the training on safety measures. He mentioned that the establishment of *Jal Sambad Manch* can help manage struggles between Indian and Nepalese communities over the river Khando Khola.

Kamini Jha, Member, Zila Parishad, Sitamarhi, Bihar, expressed gratitude to ICIMOD and Yuganter for not only providing training on CBFEWS in Kathmandu but also for establishing a CBFEWS unit in her block. She stated that the CBFEWS in her block has been immensely helpful for people in Bhittamore and in the adjoining six panchayats. She said she was proud to have played a role in getting the first such unit in her block.

Satish Kumar Singh, Mayor, Tilathi Koladi Rural Municipality, Saptari, Nepal, said he is happy that his municipality is the first to establish an entirely government-run CBFEWS system in technical collaboration with ICIMOD for the Khando River. He expressed hope that the system would help in reaping the benefits of the river too. He shared how upstream and downstream municipalities are planning to create a basket fund for maintaining the CBFEWS in the long run. Upstream-downstream collaboration is critical for incentivizing upstream communities to share information with downstream communities. He also shared that the communities in downstream of the Khando River in India could also benefit from early warning information.

Neera Shrestha Pradhan, moderator of the session, appreciated the positive views of BSDMA and agreed to provide any technical support that might be required for building CBFEWS for other rivers in Bihar. She commended the community panellists

as “the heroes of the CBFWEWS programme who tirelessly and selflessly work for the community.”

#### TECHNICAL SESSION IV (A)

### Transboundary interactions and sustainable actions for a resilient Koshi

Atul Aditya Pandey, Patna University, Bihar, discussed the flood hazard assessment of the Koshi River Basin. He presented the broad spectrum of problems associated with the Koshi, and stated that these are due to a combination of factors such as climate change, human interference and the river pattern. He mentioned that the Department of Geology at Patna University is studying the geological aspects of the Koshi basin. He added that it is important to understand the effects of the Koshi in the basin and catchment areas, and geological studies could be useful in that regard.

Maulik Jagnani, Yale University, USA, discussed the real-time flood information system, an initiative of Google. It is a high-accuracy, high-resolution flood inundation and warning system delivered to android smartphone users. He stated that “the mission of Google is to create a free platform for flood forecasting to vulnerable people.” In this system, models are used and it predicts when the water level will rise and where flood can be in an area. The Google system will then send the notification or push message to every android smartphone user in this area.

Rakesh Tiwary, Assistant Professor, Centre for Social Geography, A.N. Sinha Institute of Social Sciences, Patna, Bihar, talked about the water discourse on the Koshi basin. He mentioned that the water management part is mostly crisis driven and relief oriented and focused on structured solutions. He pointed out that the Government of India’s proposed river linking can be an adaptive measure for flood management. He highlighted that the water management cycle is identified as the flood management cycle. The problem of urban flooding in Forbesganj, Bihar is a problem of every small city in Bihar, and the urban department should focus on this. Wetlands are being destroyed and this should be stopped. He said community driven solutions could be more beneficial. Yuganter has been working in this sector for a long time. The government sector also needs help from the private sector. In the south and in some other parts of India, government and private sector partnership is working very well. We can learn many things from Bangladesh and Nepal. He reiterated that “local livelihood practices such as

fisheries and jute, makhana cultivation, and corn production can be supported by policies that create enabling conditions for utilizing flood waters.”

#### TECHNICAL SESSION V

### Role of media in informing the communities

Kulbhushan Gopal, senior journalist from News18, Bihar, said that we always take sound bites from experts and play it on our news channels. Santosh Nepal asked media persons why we do not use media channels for prevention of disaster rather than merely reporting on disasters. Abhay Singh, senior journalist from the Times of India, replied that media companies are now hiring experts from different fields. Media start reporting as soon as it is possible, and do not wait for the disaster to happen. Ahmad, Care India, said that during emergencies, it is very important to ensure that news is coming from authentic sources such as concerned government agencies. Atul Aditya Pandey, Patna University, Bihar, inquired if the media could report on the differential experiences of the affected people, community members that are not affected, and what actions are being taken by policy makers.

#### KOSHI DRR KNOWLEDGE HUB

### Country chapters and transboundary working groups

Kanchan Shrestha, Koshi Basin Initiative Coordinator, ICIMOD, said that the Koshi DRR Knowledge Hub is a platform where partnerships can be built to improve the understanding of the Koshi basin, share good practices and jointly develop solutions for disaster risk reduction in the basin. Many of the issues and solutions discussed in the previous sessions highlighted the need for upstream and downstream collaboration and to increase the engagement between scientists, practitioners and policy makers. The KDKH seeks to address these issues. Santosh Pathak, Partnership Officer, ICIMOD, said that developing a structure for partnership would be critical for ensuring that members of the platform can work together effectively.

Working in groups, participants noted that it was important to establish the country chapter with the involvement of government bodies, representatives from civil society, media, knowledge institutions, private sector and community leaders. The group representatives shared the following points:



## CHALLENGES THAT THE KOSHI DRR KNOWLEDGE HUB COULD ADDRESS

- The platform should benefit the community and the knowledge generated should be shared with the community. Traditional knowledge should also be documented and shared. The gap between the community and research (e.g., at the university) should be closed.
- Solutions should be based on scientific evidence and aim to improve livelihoods.
- Knowledge on transboundary issues needs to be shared with relevant stakeholders so that good practices such as cross-border CBFWS can be replicated easily.
- An information platform with relevant information on DRR for the Koshi can be created for Nepal and India.
- A long-term action plan needs to be developed for the Knowledge Hub with specific targets.
- Research groups in the country chapter should be encouraged to build on existing knowledge and prioritize action.

## POTENTIAL OPERATIONAL MECHANISM FOR THE KDKH

- The country chapter for the KDKH can be established in Patna, Bihar and its role could be:
  - Coordinate with the other country chapters so that the basin perspective is integrated in the DRR and transboundary issues are considered.
  - Develop a deeper understanding of country specific DRR issues in the Koshi basin with various stakeholders on one platform.
  - Focus on issues specific to the country such as male outmigration from the basin and resource mobilization.
  - Knowledge generation and sharing, innovation and entrepreneurship.
- The government agency such as BSDMA should take the lead in setting up the country chapter as it requires coordination with different government agencies. Academic institutions, civil society and others can contribute as part of the working groups.
- Adequate human and financial resources should be allocated to sustain the KDKH in Bihar.
- Mission DRR would be happy host the secretariat for the country chapter if dedicated funds are allocated. However, as there are no dedicated funds available, Yuganter could be the secretariat for the India Country Chapter for the Koshi DRR Knowledge Hub, and more discussion will be needed to finalize the same.

## Closing session

P.N. Rai, BSDMA, said the partnerships need to be further strengthened and that BSDMA would be providing 85,000 volunteers in the state and extensive training on DRR. He said such a trained group could also be part of the early warning system. He was very enthusiastic to take forward the CBFWS and expressed hope that state of Bihar would upscale it at other small rivers. Vyas Ji, Vice Chairman, BSDMA, stated that this was an important gathering where participants working in the Koshi River basin had come together on a common platform to share their findings. He was enthusiastic about the setting up of the KDKH Country Chapter in India, and looked forward to further discussion with ICIMOD. Laxmeshwar Rai, Minister, Department, Government of Bihar, pointed out that it is important to give back to our community because although we have moved away from these areas due to our privilege, our brothers and sisters who remain in the community continue to suffer from disasters year after year. Anil Kumar Sinha, former Vice Chairman, BSDMA, mentioned that the KDKH is a very worthwhile endeavour, and BSDMA should be proud to take it forward. He spoke about the annual floods and how transboundary dialogue between India and Nepal is the need of the hour.

As part of the closing session, a working paper on gender was released by Minister Rai and Vyas Ji. The paper is titled “Gender dynamics of female-headed households in rural Bihar, India: Reflections from the Koshi River basin.” It focuses on the gender dynamics of female-headed households (FHHs) in rural Bihar, India, and spans 33 villages across 11 culturally and demographically diverse districts. The first phase of the study relied on data collected under an ongoing research on livelihood and policy analysis in the Koshi River basin. The data for the FHHs was extracted from a survey of 1,600 households. This gave a sample size of 264 FHHs. In the context of the Koshi region of Bihar, distressed male outmigration, driven by recurrent natural calamities and associated intensification of poverty and landlessness, has altered the scenario of work, survival, and food security of the women who are left behind. These women have thus become the de facto heads of rural households.

**Additional event information and materials are available at:**  
<https://www.icimod.org/event/koshi-disaster-risk-reduction-knowledge-hub/>

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