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Advancing Regional and Transboundary Cooperation in the Conflict-Prone Hindu Kush–Himalaya

The International Centre for Integrated Mountain Development (ICIMOD) supports regional and transboundary cooperation to meet challenges of climate change, disaster risks, and sustainable development in the Hindu Kush–Himalaya (HKH). Action to sustain the HKH has the potential to directly improve the lives of more than one fourth of the world's population. However, facilitating cooperation and policy coherence among the countries sharing HKH resources is a persistent challenge in a region that is prone to conflict and is highly variable regarding development. At ICIMOD, we work across HKH countries to help attain common goals related to sustainable development, using our skills in bringing together different groups within programmatic transboundary approaches covering topics such as river basins or transboundary landscapes. In addition, the Hindu Kush Himalayan Monitoring and Assessment Programme and the Himalayan University Consortium have made strides in promoting regional and transboundary cooperation among HKH countries, particularly emphasizing research synthesis and the role of academia.

The Hindu Kush–Himalaya region

The Hindu Kush–Himalaya (HKH) is well known for its cultural, biological, aesthetic, and geohydrological value. Its vast complex of hills, valleys, plateaus, and mountains contains some of the world's tallest peaks and more than 60,000 km^2 of glaciers and 760,000 km^2 of snow cover. These snow and ice reserves represent a massive store of freshwater, providing resources for energy, tourism, sanitation, and food production, among many other regional needs. The region's 10 major river basins—the Amu Darya, Brahmaputra, Ganges, Indus, Irrawaddy, Mekong, Salween, Tarim, Yangtze, and Yellow—connect upstream and downstream areas in terms of trade, culture, communication, and resource management. Furthermore, they (directly and indirectly) provide goods and services to 1.3 billion people throughout South Asia, including 210 million people who live in the HKH region (Figure 1; ICIMOD 2017).

Four of the world's 36 biodiversity hotspots are located in the HKH region. Thirty-nine percent of the HKH region is covered with protected areas that harbor a range of ecosystems and provide numerous services in terms of food, water, and climate regulation (Sharma et al 2010). Most ecosystems in the region are subject to climatic and nonclimatic changes affecting their function and sustainability, thereby affecting livelihoods and community resilience in the region, as well as downstream (ICIMOD 2017).

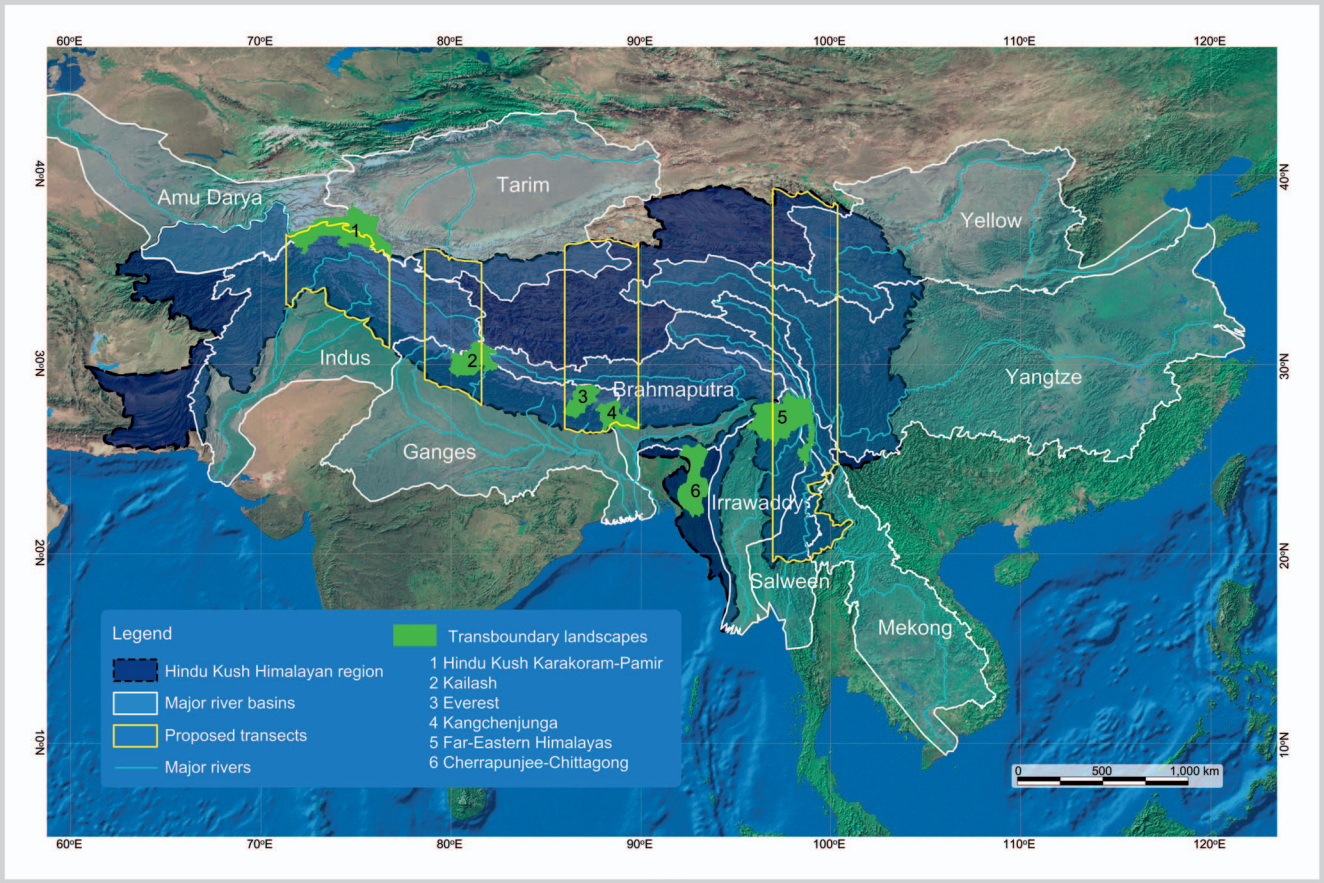
Eight countries—Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan—share the HKH. We know that better development outcomes could be achieved with shared management of HKH resources. For example, improved cooperation could enable better cross-border flood preparation, ecosystem management, and water and energy sharing to optimize resource use in the region. However, shared management of HKH resources remains a challenge. Of the 8 countries in the HKH, 5 qualify as least developed countries, according to the Human Development Index (UNDP 2016). Furthermore, 5 of the 8 countries have been given alert status by the Fund for Peace's Fragile States Index (2017). Finally, the Global Peace Index indicates that 4 HKH countries range from low to very low (Institute for Economics and Peace 2017) in terms of relative peacefulness. Against this backdrop, working together to better manage shared resources could yield important dividends that go beyond immediate development benefits, including improved understanding among countries and long-term peace building.

At the International Centre for Integrated Mountain Development (ICIMOD), our mission and niche as a regional intergovernmental organization is to promote knowledge and action aimed at shared management of the HKH. Our work focuses on issues and priorities that are common across the HKH. The organization generates and shares knowledge across countries and communities on issues of common concern, such as poverty alleviation, adaptation, and resilience building. We seek to address resources that cross boundaries, such as water and ecosystems. Our experience has been that countries can and will collaborate on science and development issues, even when political negotiations are difficult.

This paper outlines ICIMOD's regional approaches and programs focusing on regional cooperation, including our work on river basins, ecosystem management, the Himalayan University Consortium (HUC), and the Hindu Kush Himalayan Monitoring and Assessment Programme (HIMAP).

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FIGURE 1 River basins, transboundary landscapes, and transects of the HKH region. (Map courtesy of ICIMOD)



Key issues and regional priorities

Key drivers of change in the HKH include migration (especially male), climate change, urbanization, globalization, population growth, and rapid land use transformation in contexts in which poverty and ecosystem degradation persist. As a result, we have witnessed changing social roles for men and women, because women are often forced to take on more responsibility for managing rural resources. The vast ice reserves of the HKH are shrinking, and accelerated glacial melting is complicating water availability in the mountains and in downstream areas. The frequency of floods and droughts has increased, while rising commercialization and persistent rural poverty have led to degradation of forests, wetlands, and rangelands, thus endangering livelihoods and biodiversity (ICIMOD 2017).

While all of these impacts pose challenges to traditional livelihood strategies and ecological stability, they also provide opportunities in which mountain people can adapt, build resilience, and move forward equitably. To do so will require knowing the impacts of these various changes, tapping into the innovative capacity of people in the region, and marshaling the strongest capabilities in science and development from around the world, as well as tailoring potential solutions and innovations to the needs of the region.

In recent years, ICIMOD has been working across countries at the regional scale to do the following:

- Generate knowledge on water, the cryosphere, livelihoods, biodiversity, land use, natural disasters, climate change, and atmospheric pollution;
- Address regional data gaps in the HKH through data generation;
- Engage with policymakers at all scales with evidence-based knowledge;
- Develop human and institutional capacities on transformative change, including foci on adaptation, gender equality, disaster risk reduction, and climate change mitigation and resilience;
- Scale out and scale up local innovations to the subnational, national, and regional levels to help achieve the United Nations (UN) sustainable development goals;
- Promote regional science–policy dialogues using evidence from ICIMOD programs and HIMAP;
- Support regional and transboundary cooperation by

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implementing ICIMOD's river basin and transboundary landscape management approaches that enhance upstream–downstream relationships and integrate people and ecosystems across boundaries; and
- Draw global attention to mountain issues and promote investments in mountains to address climate change, disaster risk reduction, and the sustainable development goals.

ICIMOD's river basin and transboundary landscape management approaches

Our river basin and transboundary landscape management approaches provide opportunities to work across borders and achieve shared goals. ICIMOD's framework covers the 10 major river basins of the HKH, 7 of which are transboundary. We also work in 6 transboundary landscapes along 4 North–South transects (Figure 1; ICIMOD 2017).

Despite substantial economic growth in certain HKH countries over the past decade, regional knowledge, development, and management of water resources remains limited compared with most other large river basins around the world (eg Danube and Murray–Darling). Many HKH mountain people and communities remain disproportionately vulnerable to natural hazard risks and receive far less than an equitable share of mountain water. The changing HKH waterscape—including changing supply, use, and management approaches—aptly illustrates that the management challenges of today and tomorrow differ greatly from those of the past. Resource utilization today has expanded and intensified because of new technologies, emerging markets, and systems of governance, frequently based on centralized decision-making that does not include mountain perspectives. Thus, there is a strong case for interaction and efforts to reconcile the interests of various actors in the region. A more focused cooperative approach will entail a shift in the water-resource development paradigm from development only to cooperative development and management.

The ICIMOD River Basins and Cryosphere program works at the river basin scale on cryosphere and water-resource issues. These include a range of concerns such as resource conservation and use, monitoring and assessment, water-induced risk management, climate change adaptation, and resilience of poor people. The program operates according to 4 fundamental pillars (ICIMOD 2017):

- Adopting an integrated water-resource management approach to improve our understanding of upstream–downstream linkages and the links between natural resource management and sustainable livelihoods of poor people;
- Developing resiliency and climate change adaptation in the water sector, including mountain community water-management benefit sharing, climate services (eg flood information sharing), and disaster risk reduction (eg floods, droughts, and landslides) for poor and vulnerable communities;
- Supporting the implementation of important global agreements on water and livelihoods such as the Sendai Framework, the Paris Climate Agreement, and water-related sustainable development goals; and
- Building a regional cryosphere knowledge hub to collate and share information throughout the region regarding snow, glaciers, permafrost, glacial hazards, glacial lakes, and the potential for glacial lake outburst floods.

In line with the UN Convention on Biological Diversity (CBD), ICIMOD adopted transboundary landscape approaches to address the challenge of conservation and development by engaging diverse stakeholders across different countries and sectors to reduce poverty, promote shared prosperity, and conserve biodiversity and ecosystems. Since its endorsement in the past decade, the landscape approach has earned the reputation of being vital for sustainable, equitable development. ICIMOD's transboundary landscape approach addresses conservation and sustainable use of natural resources at the scale of larger transboundary landscapes defined by ecosystems.

Furthermore, ICIMOD's transboundary landscape approach focuses on 4 North–South transects for the HKH and 6 specific transboundary landscapes, each including at least 3 participating countries: Kailash, Everest, Kangchenjunga, Far Eastern Himalaya, Cherrapunjee–Chittagong, and Hindu Kush–Karakoram–Pamir (Figure 1). ICIMOD's regional Reduced Emission from Deforestation and Degradation - Plus (REDD+) Initiative is embedded in this program to incorporate incentive-based mechanisms related to greenhouse gas emissions, carbon sequestration (including soil reserves), and biodiversity conservation at landscape and regional scales. Our Transboundary Landscapes program operates based on 4 fundamental pillars (ICIMOD 2017):

- Promoting integrated and participatory approaches in ecosystem management to mountain development throughout the HKH countries, starting from the premise that ecosystem services flow beyond administrative boundaries and thus require regional and multilateral cooperation in transboundary landscapes;
- Adopting approaches that integrate multistakeholder priorities with scientific data in such a way that trade-offs between conservation

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and development can be properly assessed;
- Promoting cross-country and regional acceptance of common frameworks, long-term research and monitoring, common methodologies, information sharing, and collaborative management for the purpose of converting science into conservation and development policy and practice; and
- Contributing scientific input to global policy processes, such as the Ramsar Convention, CBD, the Intergovernmental Platform on Biodiversity and Ecosystem Services, and the Global Landscape Forum.

Progress in transboundary and regional cooperation

Until recently, transboundary and regional cooperation in the HKH region was limited. In 2007, the Intergovernmental Panel for Climate Change (IPCC) Assessment Report identified the HKH as a data gap region and indicated that all glaciers in the HKH region would disappear by 2035 (IPCC 2007). This triggered major concern and debate among the 8 HKH countries, because people in the mountains and downstream highly depend on the glacier-related water resources of the HKH. The latest IPCC report (2014) noted that data availability for the region remained lacking despite the passage of 7 more years.

Nevertheless, after the 2007 IPCC report, HKH countries began more concerted efforts to collectively address climate-related challenges. This was an opportune moment for ICIMOD to increase its presence as the only intergovernmental organization serving the mountain region, and HKH countries responded positively. This has uniquely positioned ICIMOD so that it has the ability to facilitate dialogue on many important environmental issues at the regional scale.

River basin progress

Regional political and economic processes offer opportunities to link water management to emerging issues of energy, economics, and food security. The Indus Treaty of 1960 signed by India and Pakistan stands as a key moment in water-sharing potentials in the region and the world. In this context, ICIMOD has been engaged in fostering regional cooperation in these areas related to water and river basins:

- The HKH Hydrological Cycle Observation System strengthens the hydrometeorological monitoring capacity and establishment of a regional flood information system based on state-of-the-art communication and information dissemination technology to save lives and property in the region. Effective cooperation among Bangladesh, Bhutan, Nepal, and Pakistan started in 2013. Hydrometeorological data from these country networks are shared in real time to enable accurate forecasting and effective early warning in the region. During the August 2017 floods, for example, Nepal shared hydrological data with India about river levels to help with flood preparation in downstream areas.
- The Koshi Basin Programme (KBP) promotes cooperation among China, India, and Nepal to maximize benefits such as irrigation and hydropower while minimizing adverse events such as floods and landslides. It integrates scientific, economic, social, and ecological knowledge to support policymaking and decision-making. KBP promotes the sustainable use of transboundary water resources and develops win-win solutions. Particular focus is given to issues of gender and inequality and their linkages to drivers of change and river basin management, as well as the potential for incentive-based mechanisms to improve water and benefit sharing.
- In the high mountains, the Indus River Basin is shared among Afghanistan, China, India, and Pakistan. The Upper Indus Basin Network (UIBN)—a knowledge and research network of national and international researchers working in that area—works to improve our understanding of the impacts of climate change and associated changes in the cryospheric and cryohydrological regimes. The knowledge produced by UIBN partners supports development of better strategies for adaptation and resilience building through the interaction of research institutions, governments, and civil society organizations.
- The regional cryosphere knowledge hub established 5 years ago is a collaborative effort that shares and disseminates cryosphere-related data and information through a network in the region and beyond. The knowledge hub integrates geospatial data to support knowledge development and decision-making and builds on capacity-building efforts in the region. It contributes to improving and coordinating regional cryosphere data sharing between regional and global platforms.
- Transboundary cooperation at the community level is an emerging opportunity in the water sector. While formal government-level cooperation in sharing flood information and early warning have been taking longer to establish, community-level cooperation in bordering villages is emerging as an effective mechanism of collaboration. Early warning systems established in Terai of Nepal and Bihar State in India were effectively used in the August 2017 floods. Communities saved countless lives and substantial property because of these early warnings (Box 1).

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BOX 1: Connecting communities across borders for flood risk reduction

Many rivers and tributaries flowing from the mountains and hills of Nepal enter the plains of Nepal and India, forming flat, flood-prone areas. Although early warning systems have been developed to provide flood information, there are gaps in ensuring the most vulnerable communities have access to this information. The gaps were confirmed by the Hyogo Protocol and the UNFCCC Special Report on Extreme Events and Disasters (SREX 2012). In response, ICIMOD has developed and tested a community-based flood early warning system (CBFEWS) to help address the challenge.

CBFEWS is an integrated system of tools and plans in which upstream communities, upon detecting flood risk, communicate flood information with vulnerable downstream communities, giving them more preparation time. Using local resources and capacities, the system follows 4 steps:

- Risk knowledge and scoping;
- Installation of instrument- and community-based monitoring;
- Networking and information dissemination; and
- Building response capability and enhancing resilience.

One system installed in sites along the Ratu River—3 in Mahottari district, Nepal, and 1 in Bhittamore, Sitamarhi district, India—has created important connections among communities living on either side of the India–Nepal border.

These connections were able to save lives and livelihoods when the Ratu River flooded in August 2017. When the system signaled a rising river level, caretakers of the CBFEWS in communities in Nepal communicated with their counterparts in vulnerable communities downstream in India. Caretakers and partner organizations in India received information about the flood 8 hours before it arrived, giving them enough time to prepare and evacuate.

The CBFEWS project was initiated by ICIMOD in early 2010. In 2012, ICIMOD piloted the CBFEWS in Assam, India, under the Himalayan Climate Change Adaptation Programme. The project was acknowledged by UNFCCC's Momentum for Change 2014 Lighthouse Activity Award for its impact in the field and innovative use of information and communication technology. Since 2015, CBFEWS has been replicated in Afghanistan, other parts of India, Nepal, and Pakistan.

Progress with transboundary landscape management

Since 2012, ICIMOD has employed the transboundary landscape management perspective to promote a shared regional goal of healthy landscapes that balance conservation and development. The integrated landscape management approach is flexible enough to be applied beneficially to a range of geographies, cultures, and types of actors, institutions, and livelihood needs.

This approach has contributed to the following:

- Creating common management of shared ecosystems and biodiversity given the plethora of local and transboundary-scale issues, such as forest fires, human–wildlife conflicts, illegal wildlife trade, and trade of non-timber forest products;
- Enhancing understanding among countries on water security and disaster mitigation in upstream–downstream contexts, given the degrading impacts of climate change on permafrost, glaciers, springsheds, and wetlands; and
- Piloting good practices and mainstreaming standardized frameworks, research protocols for long-term research, and monitoring to inform policy and national development strategies for transboundary cooperation.

Over the past 5 years, ICIMOD has made significant progress within the transboundary landscapes in which it works (Table 1). All of its activities in these landscapes have buy-in from participating national governments. Within these landscapes, ICIMOD has piloted several interventions in the fields of tourism, commerce, and protected area management, among others. To successfully bring together policy, science, and practice in transboundary landscapes, our experiences show that the following elements are necessary:

- Establishing common understanding and priority setting on conservation and development needs at scale across countries;
- Developing a jointly owned transboundary platform for collaborative planning, knowledge generation, and effective implementation that uses a systematic program cycle; and
- Customizing local and national learning to global agendas, and vice versa.

HIMAP: enhancing scientific collaboration

HIMAP brings together more than 300 scientists and policymakers to create a comprehensive assessment of the HKH on a variety of topics (Sharma et al 2016). The assessment is an evaluation of existing knowledge of the HKH with the aim of developing policy-oriented solutions for the region and beyond. The assessment addresses social, economic, and environmental pillars

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TABLE 1 Transboundary landscapes with active ICIMOD programs.

Transboundary landscape	Countries sharing the landscape
Kailash	China, India, Nepal
Kangchenjunga	Bhutan, India, Nepal
Far Eastern Himalaya	China, India, Myanmar
Hindu Kush–Karakoram–Pamir	Afghanistan, China, Pakistan, Tajikistan

of sustainable mountain development and seeks to provide a basis for evidence-based decision-making with a regional perspective, thereby safeguarding the environment and advancing people's wellbeing. A corresponding assessment report and key messages have been drafted in line with the UN sustainable development goals. The first HIMAP assessment report is slated for publication in late 2017. It is anticipated that the report will make a significant contribution to better understanding regional issues, triggering action and promoting regional cooperation.

HUC: advancing academic cooperation

Academia and capacity development provide an opportunity to enhance understanding of the HKH and a chance to collaborate across country boundaries. The HUC—consisting of 47 full members from the HKH region and 15 associate members from outside the region—offers opportunities for HKH universities to collaborate on research and capacity building across HKH countries. This, in turn, offers a way of promoting better cross-country networks and more cooperation in the region. In the future, the HUC will expand its network to include more universities and other related organizations and connect with mountain educational institutions around the world. The HUC aims to build a new generation of transformational leaders committed to advancing HKH-specific research and innovative policy solutions.

Lessons and emerging opportunities

ICIMOD, in collaboration with its partners, has made significant progress in establishing mechanisms and platforms to facilitate regional cooperation and bring voices from the HKH to the global stage. These have helped us provide an interface among science, policy, and practice, ensuring that the knowledge we generate is put to use for positive development outcomes. We have found that science and knowledge sharing on issues of environment, livelihoods, and development provide a good entry point for collaboration among countries. For example, greater sharing of knowledge on the cryosphere could improve understanding of cryosphere dynamics and possible downstream impacts. This is especially important for river basins highly dependent on glacial meltwater.

By leveraging our niche as a regional organization, we have brought countries together to work on issues such as climate change, ecosystem management, adaptation strategies, disaster risk reduction, and local water management. Regional knowledge hubs, data-sharing platforms, cross-border research programs, and forums and networks hosted and supported by ICIMOD promote collaboration and contribute to the development of knowledge required to effectively respond to emerging challenges.

All 8 HKH countries are committed to global targets such the UN sustainable development goals, the Paris Agreement within the United Nations Framework Convention on Climate Change (UNFCCC), the Sendai Framework for Disaster Risk Reduction, and Aichi Biodiversity Targets of the CBD. Through regional-scale work and formation of regional alliances, ICIMOD and its partners contribute HKH and mountain perspectives to the global agenda.

While ICIMOD has been able to foster collaborative work and enhance the knowledge available on the HKH, we recognize that official policy discussions and negotiations around these issues are needed to foster deeper, long-term collaboration. Evidence from our work can and is used to inform the highest levels of decision-making, but moving forward, ICIMOD also envisages a regional policy forum in which HKH countries could deliberate on issues of common interest. This could evolve into something similar to the Arctic Council, in which countries could make joint decisions; however, we recognize that this evolution takes time, requires political buy-in, and must take a form suitable to the region. As an initial step, ICIMOD plans to host regional science–policy dialogues based on the findings of the HIMAP assessment.

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