

Enhancing cooperation to address cascading climate risks in the Hindu Kush Himalaya

KEY MESSAGES

- In a globalised and interconnected world, the impacts of climate change propagate across national borders and pose risks not only to neighbouring countries but also to those on the other side of the world: we call these **cascading climate risks**.
- Different types of cascading climate risks, including those that originate within the Hindu Kush Himalaya (HKH) and those that originate beyond it, have the potential to **severely threaten the region's societies, economies, and ecosystems**.
- **Collaboration and cooperation**, bringing together state and non-state actors from multiple countries in the region and beyond, are crucial for achieving effective adaptation to cascading climate risks, beyond adaptation at local and national scales.
- Research indicates that regional cooperation on adaptation to climate change in the HKH has the potential to yield **multiple benefits**: reducing the costs of climate action, helping overcome national-level resource constraints which limit the scale of ambition and action by state and non-state actors, adding credibility to voluntary climate pledges and targets, and enhancing climate diplomacy.
- Around the world, regional cooperation mechanisms for addressing environmental issues encounter **various challenges**, including a lack of legitimacy and authority to propose mandatory measures, an absence of management structures and governance instruments to achieve high-level goals, and insufficient guidelines on policy implementation.
- **We propose the establishment of a regional cooperation mechanism on adaptation to cascading climate risks in the HKH**. This mechanism, taking on board lessons from others, could aim to lead and facilitate regional cooperation in four key areas: research, information sharing, and knowledge exchange; cross-scale governance capacity and policy support; climate diplomacy, negotiations, and coalition building; and capacity strengthening, implementation, and finance.

Introduction

In a globalised world, our economies, societies, and ecosystems are deeply interconnected. When climate events such as droughts and floods occur, the consequences are not only experienced directly but can be experienced by, or 'cascade' to, communities on the other side of the world¹⁻³. As global heating accelerates, no country or region is immune to the risks posed by direct and cascading climate impacts.

The Hindu Kush Himalaya (HKH) region faces significant risks from climate change, due to its topography and geography, growing population, and political, financial and development status. Extending from Afghanistan to Myanmar, crossing Pakistan, India, China, Nepal, Bhutan, and Bangladesh, the region is a source of twelve major river systems which provide essential resources to nearly two billion people. The risks generated by climate change pose grave and immediate threats to the people of the HKH and the region's development, biodiversity, and sustainability. These include **direct climate risks** that have long been recognised by research and policy communities, if insufficiently understood, mitigated and managed, such as the consequences of climatic effects on the cryosphere. Yet the region is even more vulnerable to the impacts of climate change than previously recognised if we consider **cascading climate risks** – the subject of this brief.

Decisive international action to limit global heating is imperative to protect the world's mountain environments. Transformative adaptation at local and national scales is essential to sustain the HKH's biodiversity and the livelihoods at the heart of its communities. In addition, collective and concerted action at the regional level is vital in the face of cascading climate risks. A regional cooperation mechanism is crucial to coordinate collective activities, effectively respond to the cross-border nature of climate risk, and pursue region-wide resilience.

“Climate change impacts and risks are becoming increasingly complex and more difficult to manage. Multiple climate hazards will occur simultaneously, and multiple climatic and non-climatic risks will interact, resulting in compounding overall risk and risks cascading across sectors and regions. Some responses to climate change result in new impacts and risks (high confidence).”

– Headline Statements from the Summary for Policymakers, IPCC Sixth Assessment Report, Working Group II – Impacts, Adaptation and Vulnerability

This brief sets out the rationale for strengthening regional resilience to cascading climate risks in the HKH, illustrating the benefits that cooperation and collaboration can achieve. It also explores what a regional cooperation mechanism could consider and advance in policy and practice, proposing a set of potential areas for collaboration to move the discussions from the realm of ambition to action.

Cascading climate risks for the HKH region

Cascading climate risks can be understood and assessed through multiple approaches. Risks can be classified based on the varying pathways they flow through, the geographical scales or economic sectors they affect, and the dynamics in which they manifest.

Pathway approaches focus on the flows or channels through which climate risks transmit across national borders. They call attention to the systems that connect countries together and which could be vulnerable to the impacts of climate change, and the relationships and dependencies that countries have with others. These pathways include the trade of food and other essential commodities via international markets, migration and movements of people across borders, and financial flows and investments, among others^{1,3}.

Geographical (or spatial) approaches investigate the physical borders across which risks spread, and the different localities or jurisdictions they affect. They focus on scale^{2,4}, transboundariness⁵, and spatial complexity⁶. Such approaches differentiate between risks that transmit between neighbouring countries (e.g., through shared river basins), risks that originate in one context but manifest in a geographically distant country (e.g. between two trading partners), and risks that cross multiple borders and propagate across several countries and regions (e.g. prolonged droughts in a major food-exporting country leading to higher prices in the global market and affecting multiple countries’ food security).

Definitions

Cascading climate risk	A risk that occurs when an impact of climate change in one place generates an adverse effect in another by cascading across a national border or administrative boundary; also a risk that occurs when a response to climate change (either a mitigation or adaptation action) generates a negative consequence beyond the jurisdiction where it is implemented.
Direct climate risk	A risk that occurs when an impact of climate change generates an adverse effect in the same locality.
Regional cooperation mechanism	A governance instrument that outlines technical, political, institutional and/or financial arrangements that countries in a geographical region devise together to strengthen their cooperation and collaboration.
Scale	The different levels or tiers at which cascading climate impacts may be propagated across borders.
Spatial complexity	The degree of complexity with which a cascading climate impact crosses borders (both sectoral and geographical).
Transboundariness	A serial attribute describing the boundaries a cascading climate impact crosses.
Transformational adaptation	As defined by the IPCC, transformational adaptation involves actions that result in significant changes in structure or function that go beyond adjusting existing practices.

Sectoral approaches assess how risk is propagated across economic sectors, within or across a national border. Such approaches emphasise our interconnected systems and examine how one sector's exposure or vulnerability to the impacts of climate change could generate risks that cascade into one or more others. Such an approach might explore, for instance, how flooding in one country could affect agriculture, but also infrastructure, human settlements, financial sectors, and insurance companies in downstream countries.

System approaches usually focus on the mode or dynamic of transmission – in other words, how the impacts propagate and cascade^{2,4}. Transmission modes of cascading climate risks could be simple (i.e. through a relatively linear process), complex (i.e. interacting with other climate or non-climate risks and amplifying throughout the cascade), or systemic (i.e. spreading through a non-linear process with multiple feedback loops).

These alternative approaches are not mutually exclusive. Assessing cascading climate risks through multiple dimensions can help to account for their complexity and interconnectivity and facilitate the development of effective responses, including strategies for adaptation and cooperation.

In this brief, we further explore three types of risk, broadly based on a geographical approach (while accounting for insights generated by the other approaches), that provide new and additional rationales for regional cooperation on adaptation. These are:

1. Intra-regional cascading climate risks: These are risks that both originate within the HKH (due to climate shocks and/or the slow-onset effects of climate change within the region) and also are realised within the HKH, generating consequences for societies, economies, and ecosystems within the region. Some of these risks are relatively well known and acknowledged, such as the transboundary risks to infrastructure generated by melting glaciers and shared river basins⁷⁻⁹; others, such as the transboundary effects of landslides, are only just starting to receive analytical attention.

Examples: In the 2008 Koshi flood disaster, a breach in the embankment of the the Koshi river in eastern Nepal resulted in the river changing its course, affecting more than four million people in Bihar, India¹⁰. In 2016, a Glacial Lake Outburst Flood (GLOF)^{*1} originated in the Tibet Autonomous Region of China and caused extreme flooding in Nepal. The flood waters damaged infrastructure and large stretches of road, including a



Aftermath of the flood in Melamchi, central Nepal in June 2021

(Photo: Jakob Friedrich Steiner/ICIMOD)

¹ A sudden release of water from a lake fed by glacier melt, that has formed at the side, in front, within, beneath, or on the surface of a glacier.

highway that links Nepal to China, and severely impacted the Upper Bhotekoshi Hydropower Plant in eastern Nepal. In addition, the sediment flowing to downstream areas triggered damaging secondary landslides and caused significant economic loss¹¹.

2. Endogenous cascading climate risks: These are risks that originate within the HKH (due to climate shocks and/or the slow-onset effects of climate change within the region) but manifest or are realised beyond the region, generating consequences for societies, economies, and ecosystems across Asia or the world at large. Climate events such as floods and droughts in the HKH, especially in countries that export major food commodities, could create market instabilities at the global level and negatively affect food security in import-dependent countries.

Examples: At only 1.5° Celsius of global warming, one-third of glacier mass in the HKH is predicted to disappear by the year 2100. In such a context, mega flood events could severely impact 1.65 billion people living in downstream areas of China, India and Pakistan¹². Losses and damages to the agricultural sectors of these countries, which are among the major exporters of many globally traded commodities, could create significant cascading climate risks. Evidence suggests that the slow-onset effects of climate change could threaten production of sugar cane (China, India, Pakistan), wheat (China), soy

(India) and maize (China), with all three countries featuring in the top 10 exporters of climate risk in the global rice sector¹³. Many low-income countries depend on rice exports from the HKH for their food security, meaning climate change impacts on rice farming in the region will reverberate around the world.

3. Exogenous cascading climate risks: These are risks that originate beyond the HKH (due to climate shocks and/or the slow-onset effects of climate change around the world) but are realised within the region, generating consequences for societies, economies, and ecosystems within the HKH. The HKH could face exogenous cascading climate risks, for example via international trade and finance flows.

Examples: Pakistan is significantly dependent on the import of palm oil from South Asian countries, including Indonesia, Malaysia, and Thailand¹⁴. Palm oil is Pakistan's largest food import item, with a 30% share in its agricultural imports as a consequence of increasing per capita consumption of edible oil. As climate events such as floods increasingly affect the production of palm oil in the main producer countries^{15, 16}, supply scarcity leads to price spikes in global markets¹⁷⁻¹⁹. Higher prices of imported palm oil and the inability to produce adequate quantities domestically could negatively affect communities and individuals in Pakistan in the form of food insecurity and increased costs of living.



Burning crop residues in Lumbini, Nepal.

The benefits of cooperation to manage risks and implement adaptation

Cascading climate impacts cross national borders and have knock-on effects not only for neighbouring countries, but also for remote localities. Adaptation to the risks they generate is best designed and implemented in a cooperative setting, bringing together state and non-state actors from multiple countries and governance levels. But what are the concrete benefits of cooperation on adaptation action to tackle these risks? What is the opportunity cost of not pursuing regional resilience in the HKH? And how can countries begin to weigh up these benefits against the costs of fragmented and uncoordinated efforts to address cascading climate risks?

Cost-benefit assessments of cross-country cooperation on adaptation versus local and domestic adaptation are still nascent. This is in part because adaptation to climate change has been traditionally defined as a local challenge, unlike climate change mitigation (i.e., the reduction of greenhouse gas emissions) which has long been recognised as requiring collective and multilateral efforts. It is also because of the specificity, complexity, and uncertainty associated with climate risk and adaptation data, which has hindered the uptake of economic tools to support climate change adaptation

assessments and inform adaptation efforts²⁰. Nevertheless, insights can be drawn from existing studies on the economics of cooperation on climate change mitigation to start to understand the benefits of cross-country cooperation on adaptation.

Such an approach is defensible given the similarity of “problem structures” that mitigation and adaptation to cascading climate risks present²¹. Both mitigation actions and adaptation measures to cascading climate risks aim at protecting public goods shared between multiple countries and communities – the atmosphere in the first case, and the economies, societies, and ecosystems of a geographical region, sector or system in the second. As with greenhouse gas emissions, cascading climate impacts cross borders and have spillover effects on multiple localities. When an individual country implements ambitious actions to abate greenhouse gas emissions, such actions have domestic benefits for that country (e.g. better air quality), but do not – in themselves – achieve the goal of keeping global warming to a certain degree. Similarly, domestic adaptation actions might reduce vulnerabilities to climate impacts at local or national scales, but do not, in themselves, achieve regional, global, or systemic resilience.

Studies on the costs and benefits of cross-country collaboration on climate change mitigation suggest that the benefits of cooperation outweigh the potential costs of establishing enabling mechanisms for collaboration and collective effort. Evidence shows that cooperation can significantly reduce the costs of climate action²², reduce inequities within and between countries (caused or amplified by environmental policies)²³, lower the transaction costs of knowledge and technology transfer²¹, and overcome national-level resource constraints which limit the scale of ambition and action by state and non-state actors²⁴. While local adaptation measures within national borders can improve a country’s adaptive capacity to manage climate risks, region-wide resilience cannot be attained by fragmented adaptation activities alone. Cooperation on adaptation is essential to achieve a resilient HKH region.

Evidence from cases of cross-country collaboration on mitigation suggests that a region-wide push for addressing cascading climate risks adds credibility to voluntary pledges, national targets, and efforts for risk management (in light of the increased scrutiny and accountability associated with collective action) and reduces the risk of a loss of economic competitiveness associated with any country acting alone. In this context, a regional alliance has the potential to motivate member countries to build on national efforts, improve and strengthen implementation, transfer knowledge and best practices, and enhance ambition (thereby generating a ‘race to the top’). Evidence suggests that small regional coalitions such as ‘climate clubs’ can



(Photo: Nabin Baral/ICIMOD)

Different types of cooperation to address different types of cascading climate risk

Clearly, different forms of cooperation will be required to address different types of cascading climate risk, which will have a bearing on the feasibility, benefits, and costs of each case. While there is limited evidence-based literature to draw upon, conceptual research suggests that less complex cascading risks spreading across neighbouring countries are best addressed through targeted collaboration between those countries. Complex and systemic cascading risks, on the other hand, require broad transnational cooperation along the transmission pathways of those risks, involving cross-scale governance approaches and multilateral agreements³³.

We can hypothesise that regional cooperation to address intra-regional climate risks in the HKH can build upon the existing governance structures and instruments established by the eight member countries (see section 5), with lower 'barriers to entry' and resulting costs. Established ways of working can be harnessed to help navigate political implications and tensions, and existing intergovernmental institutions can provide the necessary capacity and coordination efforts.

Both endogenous and exogenous cascading climate risks clearly require forms of cooperation that extend beyond the region – requiring bilateral climate diplomacy and an enabling environment through multilateral support and action. Endogenous climate risks (those originating in the region but manifesting elsewhere) strengthen the business case for enhanced support to the HKH region to mitigate or manage the risks at their source. To effectively manage exogenous climate risks (those originating beyond the HKH, but which pose a grave threat to the peoples, ecosystems, and economies of the region), a strong and unified approach within the HKH region may facilitate the necessary cooperation with others – both through bilateral channels and multilateral processes (such as the adaptation negotiations under the UNFCCC).

achieve more than large-scale global initiatives in delivering climate action due to higher participation, engagement, and ambition^{25, 26}; however, given the global nature of cascading climate risk, such regional initiatives shouldn't come at the expense of international and multilateral efforts.

Similar to mitigation action, cooperation on adaptation can facilitate the exchange of knowledge, best practices, and technologies among different countries and actor groups. Information sharing and technology transfer are designed to help avoid duplication of effort, reduce

research and development costs, and accelerate the deployment of robust and cost-effective adaptation solutions^{27, 28}. While it may be hard to quantify the return on investments aimed at strengthening resilience to complex, compound, and cascading climate risks (given their complexity and uncertainty), several studies show that the costs of cascading climate risks are significant and, for some, even higher than risks emerging within national borders^{3, 29}. Given the scale of investment required to strengthen regional resilience in the HKH, developing public-private partnerships and leveraging private-sector capital for adaptation finance will be crucial. Stronger regional cooperation on adaptation, when facilitated by a stable and supportive policy environment, including regulations and incentives, has been shown to encourage such private-sector investment³⁰. Existing economic assessments of adaptation finance also suggest that cooperation on climate change adaptation bolsters adaptation finance and strengthens the transfer of funds from high-income to low-income regions, and from less vulnerable to more vulnerable countries³¹.

Given the evident necessity of cooperation on adaptation to manage cascading climate risks, it is the right time for countries of the HKH to begin to assess the costs of fragmented adaptation regimes versus the benefits of regional cooperation through an economic lens. Such assessments should be integrated in climate risk management frameworks from the outset. Nevertheless, the complexity of economic analysis needs to be balanced with its practical applicability to cascading climate risks given their scale, complexity, and level of uncertainty (which are fundamental challenges to any cost-benefit analysis)³². For example, in managing risks associated with a shared river basin between two countries, a qualitative screening assessment that ranks and prioritises adaptation options could be a useful and appropriate tool to aid decision-making processes. However, in a case of managing food security risks associated with a price spike in the global food market (driven by both climatic and non-climatic events), the costs and benefits of adaptation are likely to be significant and subject to a high degree of uncertainty. To ensure the analysis is robust, it is advisable to use multiple tools and approaches.

Finally, it is important to note that cost-benefit analyses are traditionally ambivalent to equity considerations. In other words, conducting economic assessments of climate adaptation options could potentially result in leaving the poorest and most disadvantaged behind while focusing efforts on building systemic resilience for the greatest number. Therefore, it is important that cost-benefit analyses of cooperation on adaptation assess the impacts of adaptation measures on different groups and examine the sensitivity of those measures to alternative assumptions and equitable outcomes.

Lessons learnt from existing regional cooperation mechanisms

For centuries, many countries in shared geographical regions have been engaging in political, economic, and institutional cooperation mechanisms to strengthen their common interests and foster synergies and collective action. Many environmental issues are now understood as best addressed through globally and regionally coordinated efforts. Global agreements on climate change (e.g. the Paris Agreement), environmental preservation (e.g. the Convention on Biological Diversity, and the United Nations Convention to Combat Desertification), and sustainable development (e.g. the 2030 agenda for sustainable development) encourage regional cooperation and urge countries to identify regional forums in which to engage and collaborate. While regional cooperation on climate change adaptation is not as common as in the case of other environmental issues, like climate change mitigation and air pollution, there are lessons to be learnt from early practices of initiating cooperation mechanisms on adaptation.

The Alps region has a long history of regional cooperation to manage environmental issues, with three inclusive governance instruments in place. **The Alpine Convention**, the world's first regional cooperation agreement covering a transnational mountainous region, was signed by eight Alpine countries² and the EU. It aims to promote sustainable development and protect the Alps, through transnational cooperation involving national, regional, and local actors. It currently convenes member countries, observers, and thematic working groups to address cross-border and cross-sectoral aspects of adaptation through guidelines, workshops, and experimentation projects³⁴. Parties to the Alpine Convention are obliged to cooperate in the fields of research and regional monitoring, as well as on legal, scientific, economic, and technical matters. However, the Convention acts do not specify cooperation instruments and implementation pathways to pursue the objectives recommended by them.

The EU Strategy for the Alpine region (EUSALP) is the second in the trio of governance instruments. It constitutes a regional strategy and an integrated framework by the European Council to address common challenges faced by the Alpine region. The framework promotes and enhances cross-border cooperation in the Alpine region between state and non-state actors and sets out common goals and coherent funding strategies as a condition for success in their implementation³⁵. In addition, the Interreg Alpine Space Program – a European transnational cooperation programme for the Alpine region – provides a

framework to facilitate cooperation among economic, social, and environmental players in seven Alpine countries, and between various institutional levels³⁶.

The recommendations of the EUSALP and Interreg Alpine Space Program are not mandatory for member countries in the region. They set out goals and objectives, but do not dictate management structures and/or governance mechanisms to achieve those objectives and leave implementation to lower levels of decision-making. At the local level, preferred tools are limited to the drafting of plans or projects to address the impacts of climate change through adaptation solutions. However, these plans do not often consider cross-border and cross-sectoral adaptation options. Moreover, a monitoring system, a set of incentives, and a penalty system are lacking, which causes suboptimal adoption of recommendations and inability to track progress. In addition, these mechanisms lack a certain level of inclusivity, with limited consultation involving lower levels of government, associations, or groups of citizens³⁴.

The Arctic Council is an intergovernmental forum promoting cooperation in the Arctic. It facilitates coordination and interaction among the eight member countries³³ that have territories within the Arctic, Indigenous people, and other Arctic inhabitants on issues of sustainable development, environmental protection, and climate action. The Council was established in 1996, initially to understand environmental challenges and preserve the Arctic environment while promoting sustainable development³⁷. The Council also addresses issues of climate adaptation and resilience and has evolved to establish institutional and governmental mechanisms for sharing knowledge and scientific findings.

The Arctic Council regularly produces environmental, ecological, and social assessments of the Arctic region. However, it does not provide any funding for science and policy programmes. All projects and initiatives connected to the Council are sponsored by the member states and sometimes receive support from external grants. The Council does not implement or enforce its guidelines or recommendations, and leaves that responsibility to individual states or international bodies³⁸.

Moreover, the Arctic Council's recommendations and guidelines are not legally binding: it does not have the legal status to develop legislation or enforce decisions and policies under international law. However, the Council contributes to law-making processes of the Arctic region by providing a forum for coordination and negotiation of three legally-binding agreements³⁹. These agreements mandate the Arctic states and communities to cooperate on aeronautical and maritime search and rescue, marine oil pollution preparedness and response, and scientific research on the Arctic.

² Austria, France, Germany, Italy, Liechtenstein, Monaco, Slovenia, Switzerland.

³ Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and United States.

The Arctic Council is known to be a successful and inclusive regional cooperation mechanism to coordinate environmental action between governments and communities in the Arctic region. However, challenges remain as divergent political interests negatively affect the Council's inclusivity and coordination capacity⁴⁰. While Indigenous communities have an important role in decision-making processes in the Arctic Council, maintaining cooperation among the Arctic states, observer countries, and Indigenous people and local communities is an important challenge to regional governance of the Arctic⁴¹.

The Baltic Sea region is another example of regional cooperation on environmental action. The Baltic Sea coast is shared among eight countries within the European Union⁴⁴ and Russia. There are three cooperation mechanisms in place to coordinate national policies and measures for the management of the Baltic Sea eutrophication⁴⁵ problem. The Baltic Sea Region Strategy (BSRS) consists of a framework that coordinates EU projects addressing the state of the Baltic Sea, thereby facilitating regional cooperation among the member countries (excluding Russia). While the BSRS action plan sets out goals and objectives for the region, with water quality and eutrophication at its core, it is non-binding. Similarly, the Helsinki Convention (under the secretariat of the Helsinki Commission – HELCOM) defines targets for reducing eutrophication in the Baltic Sea but does not include any mandatory measures for the member countries. The third regional framework – the EU's Water Framework Directive (WFD) – is a central piece of legislation for the management of the Baltic Sea, calling for the achievement of a Good Ecological Status (GES)⁴⁶ in the whole basin.

However, despite three regional frameworks and agreements for the management of the Baltic Sea, studies indicate that member countries do not have strong motivations to cooperate on climate adaptation planning⁴²⁻⁴⁴. Political tensions in collaborating with Russia and the lack of mandatory measures are cited as challenges to the efficacy of such mechanisms. But an additional barrier to cooperation on adaptation through the existing frameworks is that climate impacts are featured only implicitly and peripherally⁴⁵. In the absence of an explicit and focused agreement to govern adaptation cooperation, countries show little interest in addressing cascading climate risks through the existing conventions. Even when coordinated and agreed adaptation measures are implemented, they tend to result from the unintentional interplay of BSRS, WFD, and HELCOM²¹.

Regional cooperation and integration initiatives are also not new to the HKH region. **The South Asian Association for Regional Cooperation (SAARC)** was established in 1985 by eight member states⁴⁷ to collaborate on issues associated with the environment, natural disasters, agriculture, rural development, human resource development, and tourism. However, despite being in existence for more than three decades, fragile governance structures, geopolitics, misperceptions, and tensions between neighbouring countries have hindered cooperation in the SAARC region^{46,47}. Conflicts of interest between member countries and internal security issues have decreased participation and engagement in SAARC and given rise to alternative regional initiatives⁴⁸.

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is another example of a regional cooperation mechanism in the HKH. It was established in 1997 by seven countries lying in the coastal and adjacent areas of the Bay of Bengal⁴⁸. BIMSTEC facilitates cooperation among member countries in several areas, including the environment, climate change, agriculture and fisheries, trade, technology, energy, and public health. In a summit held in 2018, the BIMSTEC members agreed on concrete steps to be taken towards closer cooperation in disaster management and conservation of mountain ecosystems and expressed serious concerns regarding climate change^{49,50}. While the management of environmental issues is a shared objective of SAARC and BIMSTEC, these initiatives do not explicitly focus their efforts on climate change adaptation and region-wide resilience building.

Many other regional and sub-regional cooperation structures exist within the HKH. The Bangladesh, China, India, Myanmar – Economic Corridor (BCIM – EC) focuses on establishing principles, modalities, and frameworks for cooperation on trade, poverty alleviation, and sustainable development, among other issues⁵¹. The Bangladesh, Bhutan, India, Nepal (BBIN) sub-regional initiative aims to improve economic cooperation and better integration in the global economy⁵². The South Asia Wildlife Enforcement Network (SAWEN) supports wildlife law enforcement to combat wildlife crime through communication, coordination, and capacity building⁵³. The Terai Arc Landscape (TAL) programme is a joint effort on conservation of wildlife corridors and migration pathways between India and Nepal, connecting 13 protected areas in the landscape^{54 and 55}.

There is further work to do to map these and other initiatives, understand their structures and mandates, and distil lessons and best practices.

⁴ Sweden, Denmark, Germany, Poland, Lithuania, Estonia, Latvia, and Finland.

⁵ A process involving the nutrient enrichment of the environment, increasing plant and algae growth, and leading to harmful algal blooms, dead zones, and fish kills (<https://oceanservice.noaa.gov/facts/eutrophication.html>).

⁶ Good Ecological Status (GES) is the European Water Framework Directive (WFD) default objective for all water bodies that can be achieved by improving the standard quality of various biological, physicochemical, and hydromorphological parameters.

⁷ Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.

⁸ Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand.

Regional cooperation on adaptation in the HKH in practice

A regional cooperation mechanism in the HKH region is essential for cross-scale adaptation and region-wide resilience to cascading climate risks. But what would an HKH cooperation mechanism on adaptation look like? What are the main areas this cooperation framework should build or strengthen? Drawing lessons from cooperation on climate change mitigation and existing examples of cooperation on environmental issues with links to adaptation (from both within and beyond the region), we propose four key areas as the essential pillars of a regional cooperation mechanism on adaptation in the HKH region. These include: (1) research, information sharing, and knowledge exchange; (2) cross-scale governance capacity and policy support; (3) climate diplomacy, negotiations, and coalition building; and (4) capacity strengthening, implementation, and finance.

1. Research, information sharing, and knowledge exchange

The shared and transboundary nature of climate risk is increasingly recognised, calling for collective responsibility to address it. However, there is still an urgent need for more applied research and accessible datasets to identify key risks (and potential opportunities) for the HKH region, assess how these risks will unfold and endanger the region in future, and develop effective

and robust policy solutions that build long-term resilience. Drawing lessons from previous practices, sharing information, and developing joint research projects on cascading climate risks, especially intra-regional cascading climate risks, is the first step in building the necessary knowledge base for cooperation on adaptation in the HKH.

The HKH Call to Action, initiated by the International Centre for Integrated Mountain Development (ICIMOD) and endorsed by its eight regional member countries, places regional cooperation at all levels as one of its six urgent actions. This roadmap recognises data and information sharing, and science and knowledge cooperation, as essential steps towards a sustainable and resilient HKH region⁵⁶. In the Ministerial Declaration on the HKH Call to Action, the eight HKH countries agreed to organise a task force, with high-level representation, to determine whether it would be feasible to create a regional institution framework in line with the roadmap⁵⁷. An HKH cooperation mechanism could build upon these foundations by producing environmental, ecological, and social assessments of the region to better understand cascading climate risks and adaptive capacities, including commissioning empirical case studies of the risks that are deemed most significant. Such assessments are an important step towards understanding the benefits of cooperation and costs of fragmented adaptation action and ultimately building a shared vision for a resilient HKH region. Such research should be complemented by constructive and knowledge-based dialogue between member countries.



Paddy plants lacking irrigation in Gaur Municipality, Rautahat District, Nepal.

(Photo: Jitendra Raj Bajracharya/ICIMOD)

2. Cross-scale governance capacity and policy support

Lessons drawn from existing examples of regional cooperation frameworks indicate that a lack of governance instruments and coherent policy processes is a key challenge to operationalising cooperation. In the absence of such instruments, the uptake of information and knowledge in adaptation policy-making and planning is also curtailed. Collaborative efforts to update National Adaptation Plans (NAPs) to account for cascading climate risks and cross-scale solutions, as well as integrating them into other relevant policy domains (such as trade, foreign policy, and finance) will be key to building regional resilience.

Such efforts are particularly important given that an adaptation action that might be effective in managing a climate impact in one country could exacerbate risks and negative consequences in another (within the region and/or beyond). Coordinated policy processes and cross-scale governance instruments are necessary to ensure that local and national adaptation actions build region-wide resilience, rather than undermine it by redistributing risks to neighbouring countries.

An HKH cooperation mechanism could start by establishing informal governance instruments (e.g., for the sharing of NAPs within the region) and providing policymakers with technical support on cascading climate risk management. Whether such a mechanism could evolve towards legally binding targets and mandatory actions, to amplify accountability and concerted commitment at different governance levels (from local to national), would require step-by-step assessment. Building ministerial-level institutional mechanisms like the Alpine Convention and the Arctic Council would require significant political will; demonstrating the benefits to be gained from cross-scale cooperation and transboundary adaptation at both national and regional scales would contribute to building support for such an endeavour.

3. Climate diplomacy, negotiations, and coalition building

Managing cascading climate risks, especially those transmitting to and from the region (i.e. endogenous and exogenous cascading climate risks), calls for multilateral negotiation and climate diplomacy with countries beyond the HKH. A regional cooperation mechanism could strengthen the unified voice of all member countries and the region as a whole in multilateral processes such as the UNFCCC (e.g., under the global goal on adaptation negotiations) and strengthen the management of cascading climate risks globally. Elevating adaptation in climate diplomacy and enhancing efforts in coalition building with countries that share cascading climate risks would be important outcomes of a cooperation mechanism in the HKH.

Through enhanced climate diplomacy on adaptation, an HKH cooperation mechanism could strengthen the call on countries 'exporting' climate risks to the region (i.e. those countries where exogenous cascading climate risks originate), to support more effective adaptation actions at their source. It could also provide the international community with concrete needs and actions for increased financial and technical assistance to the HKH to manage risks that spread from the region to places beyond (endogenous cascading climate risks). This should serve to generate higher-level political commitment for collaborative action in the region – one of the biggest hurdles in fostering cooperation. An HKH cooperation mechanism could also provide practical spaces to navigate the political tensions and trade-offs inherent in managing risks of a transboundary nature within the region.

4. Capacity strengthening, implementation, and finance

Challenges associated with implementation and insufficient funding are among the most important barriers to achieving adaptation goals and building long-term resilience. Many of the existing regional frameworks for managing environmental issues set out common goals and objectives but do not advise on necessary institutional structures, operational arrangements, and technical instruments to achieve those objectives, leaving implementation to national and local levels of decision-making. While cooperation to establish high-level goals and commitments is valuable in itself, fragmented and uncoordinated implementation hampers the achievement of those goals and potentially amplifies inequalities within and between countries.

A key function of an HKH cooperation mechanism could entail translating high-level recommendations and adaptation targets into roadmaps for implementing effective adaptation responses at different scales. While obtaining legislative authority to enforce such actions is challenging and time consuming, an HKH cooperation mechanism would ideally hold a certain level of legitimacy to advise and guide state and non-state actors in member countries on the implementation of adaptation to cascading climate risks, including piloting the design of transboundary adaptation programmes. In addition to supporting members to secure grants and international adaptation funds for such programmes, the cooperation mechanism could also support the generation of funding for adaptation implementation from within the region.

Capacity strengthening and mobilisation will be important prerequisites towards these outcomes. A lack of capacity to develop bankable proposals for adaptation programmes prevents the HKH region and individual member countries from acquiring sufficient support from multilateral funders such as the Adaptation

Fund and the Green Climate Fund. A key function of the HKH cooperation mechanism could be to lead capacity building and mobilisation efforts to develop bankable proposals on adaptation to cascading climate risks. Possible activities also include organising training programmes for national adaptation planners, as well as policymakers in other domains such as trade, finance, and agriculture, on cascading climate risks and suitable policy responses, and identifying technology transfers required.

Conclusion

As global heating accelerates, cascading climate impacts that both originate from and present risks to the HKH region are becoming an urgent policy priority, deserving of global attention. Aligned with the efforts of other regional organisations (including the European Union⁵⁸ and the African Union⁵⁹), the eight countries of the HKH are recognising the gains in resilience that can be achieved from coordinated and strong regional action. Extending these efforts to the domain of adaptation could not be more timely. A regional cooperation mechanism on adaptation to cascading climate risks has the potential to take practical measures of benefit to all member countries and to elevate the voice of the HKH on the global stage – where cascading climate risks are sure to be a defining agenda item of the negotiations on adaptation in the years to come.

References

1. Benzie, M., Carter, T. R., Carlsen, H. & Taylor, R. (2019). Cross-border climate change impacts: implications for the European Union. *Regional Environmental Change* 19, 763–776.
2. Carter, T. R. et al. (2021). A conceptual framework for cross-border impacts of climate change. *Global Environmental Change* 69, 102307.
3. Hedlund, J., Fick, S., Carlsen, H. & Benzie, M. (2018). Quantifying transnational climate impact exposure: new perspectives on the global distribution of climate risk. *Global Environmental Change* 52, 75–85.
4. Talebian, S. et al. (2023). A conceptual framework for responding to cross-border climate change impacts. doi:10.5281/zenodo.7817615.
5. Schweizer, P.-J. (2021). Systemic risks – concepts and challenges for risk governance. *J. Risk Res.* 24, 78–93.
6. Browne, K. et al. Multilateral Adaptation Finance for Systemic Resilience. (2022). SEI Policy Brief. SEI, Stockholm. doi:10.51414/sei2022.047.
7. Cook, K. L., Andermann, C., Gimbert, F., Adhikari, B. R. & Hovius, N. (2018). Glacial lake outburst floods as drivers of fluvial erosion in the Himalaya. *Science* 362, 53–57.
8. Mal, S., Allen, S. K., Frey, H., Huggel, C. & Dimri, A. P. Sectorwise (2021). Assessment of Glacial Lake Outburst Flood Danger in the Indian Himalayan Region. *Mountain Research and Development* 41, R1–R12.
9. Richardson, S. D. & Reynolds, J. M. (2000). An overview of glacial hazards in the Himalayas. *Quaternary International* 65, 31–47.
10. Shrestha, R. K., Ahlers, R., Bakker, M. & Gupta, J. (2010). Institutional Dysfunction and Challenges in Flood Control: A Case Study of the Kosi Flood 2008. *Economic and Political Weekly*. 45, 45–53.
11. Sattar, A., Haritashya, U. K., Kargel, J. S. & Karki, A. (2022). Transition of a small Himalayan glacier lake outburst flood to a giant transborder flood and debris flow. *Scientific Reports* 12, 12421.
12. Wester, P., Mishra, A., Mukherji, A. & Shrestha, A. B. (2019). The Hindu Kush Himalaya assessment: mountains, climate change, sustainability and people.
13. Adams, K.M., Benzie, M., Croft, S. and Sadowski, S. (2021). Climate change, trade, and global food security: A global assessment of transboundary climate risks in agricultural commodity flows. SEI report. Stockholm Environment Institute, Stockholm. <http://doi.org/10.51414/sei2021.009>
14. OECD. Palm oil in India. (2021). [oecd.world. https://oec.world/en/profile/bilateral-product/palm-oil/reporter/ind](https://oec.world/en/profile/bilateral-product/palm-oil/reporter/ind).
15. CPOPC. (2021). Palm Oil Supply and Demand Outlook 2022. <https://www.cpopc.org/market-trends/world-palm-oil-outlook-2020/>.
16. Raghu, A. (2021). Palm Oil Declines After Four Days of Gains With Floods in Focus. *Bloomberg.com*. <https://www.bloomberg.com/news/articles/2021-12-27/palm-oil-declines-after-four-days-of-gains-with-floods-in-focus>.
17. Trading Economics. (2022). Palm Oil – 2023 Data – 1980–2022 Historical – 2024 Forecast – Price – Quote – Chart. *Trading Economics*. <https://tradingeconomics.com/commodity/palm-oil>.
18. Oktarina, S. D., Nurkhoiry, R. & Pradiko, I. (2021). The effect of climate change to palm oil price dynamics: a supply and demand model. *IOP Conference Series: Earth and Environmental Science* 782, 32–62.
19. Sarkar, Md. S. K., Begum, R. A. & Pereira, J. J. (2020). Impacts of climate change on oil palm production in Malaysia. *Environmental Science and Pollution Research* 27, 9760–9770.
20. Li, J., Mullan, M. & Helgeson, J. (2014). Improving the practice of economic analysis of climate change adaptation. *Journal of Benefit-Cost Analysis* 5, 445–467.
21. Roggero, M., Kähler, L. & Hagen, A. (2019). Strategic cooperation for transnational adaptation: lessons from the economics of climate change mitigation. *International Environmental Agreements: Politics, Law and Economics* 19, 395–410.
22. Thube, S. D., Delzeit, R. & Henning, C. H. C. A. (2022). Economic gains from global cooperation in fulfilling climate pledges. *Energy Policy* 160, 112673.
23. Tol, R. S. J. (2001). Equitable cost-benefit analysis of climate change policies. *Ecological Economics* 36, 71–85.
24. Anbumozhi, V. (2015). Low Carbon Green Growth in Asia: What is the Scope for Regional Cooperation. *ERIA Discussion Paper Series*.
25. Hagen, A. & Eisenack, K. (2019). Climate clubs versus single coalitions: the ambition of international environmental agreements. *Climate Change Economics* 10, 1950011.
26. Osmani, D. & Tol, R. S. J. (2010). The Case of two Self-Enforcing International Agreements for Environmental Protection with Asymmetric Countries. *Computational Economics* 36, 93–119.
27. Bibas, R., Méjean, A. & Hamdi-Cherif, M. (2015). Energy efficiency policies and the timing of action: An assessment of climate mitigation costs. *Technological Forecasting and Social Change* 90, 137–152.
28. Giordano, R., Pilli-Sihvola, K., Pluchinotta, I., Matarrese, R. & Perrels, A. (2020). Urban adaptation to climate change: Climate services for supporting collaborative planning. *Climate Services* 17, 100100.
29. Schenker, O. (2013). Exchanging Goods and Damages: The Role of Trade on the Distribution of Climate Change Costs. *Environmental and Resource Economics* 54, 261–282.
30. Buso, M. & Stenger, A. (2018). Public-private partnerships as a policy response to climate change. *Energy Policy* 119, 487–494.
31. de Bruin, K. C., Dellink, R. & Tol, R. S. J. (2010). International Cooperation on Climate Change Adaptation from an Economic Perspective. doi: [10.2139/ssrn.1625746](https://doi.org/10.2139/ssrn.1625746).
32. Lempert, R. J. Robust Decision Making (RDM). (2019). in *Decision Making under Deep Uncertainty* (eds. Marchau, V. A. W. J., Walker, W. E., Bloemen, P. J. T. M. & Popper, S. W.) Springer International Publishing. doi:10.1007/978-3-030-05252-2_2.
33. Bulkeley, H. et al. (2014). Transnational climate change governance. Cambridge University Press. doi: 10.1017/CBO9781107706033.
34. Cattivelli, V. (2021). Climate Adaptation Strategies and Associated Governance Structures in Mountain Areas. The Case of the Alpine Regions. *Sustainability* 13, 2810.
35. EUSALP-Strategy for the Alpine Region, several years. (Accessed 2021). EUSALP-Strategy for the Alpine Region <https://www.alpine-region.eu/>.
36. Interreg Program. (2015). The Alpine area for Alpine Space Program-Interreg, several years. Brussels: Belgium.
37. Bloom, E. T. (1999). Establishment of the Arctic council. *American Journal of International Law* 93, 712–722.
38. The Arctic Council. (Accessed 2021) Arctic Council <https://arctic-council.org/about/>.
39. Loukacheva, N. (2020). The Arctic Council and “Law-Making”. *Northern Review* 109–135. doi:10.22584/nr50.2020.005.
40. Cornwall, W. (2023). ‘We are cut off.’ Tensions with Russia are hobbling Arctic research. *Science*. <https://www.science.org/content/article/we-are-cut-tensions-russia-are-hobbling-arctic-research>.
41. Wheeler, H. et al. (2020). The need for transformative changes in the use of Indigenous knowledge along with science for environmental decision-making in the Arctic. *People and Nature* 2, 544–556. doi: [10.1002/pan3.10131](https://doi.org/10.1002/pan3.10131).

Adaptation Without Borders is a global partnership working to strengthen systemic resilience to the cross-border impacts of climate change. We identify and assess transboundary climate risks, appraise the options to better manage those risks and support policymakers, planners and the private sector to develop climate-resilient and inclusive solutions. We catalyse new alliances and forms of cooperation on adaptation that pave the way towards a more sustainable and resilient world.

adaptationwithoutborders.org



ICIMOD



42. Elmgren, R., Blenckner, T. & Andersson, A. (2015). Baltic Sea management: Successes and failures. *Ambio* 44, 335–344.
43. Hassler, B. (2017). Transnational environmental collective action facing implementation constraints—the case of nutrient leakage in the Baltic Sea Action Plan. *Journal of Environmental Policy & Planning* 19, 408–422.
44. Karlsson, M., Gilek, M. & Lundberg, C. (2016). Eutrophication and the ecosystem approach to management: a case study of Baltic Sea environmental governance. *Environmental Governance of the Baltic Sea* 21–44.
45. Elliott, M. et al. (2015). Force majeure: will climate change affect our ability to attain Good Environmental Status for marine biodiversity? *Marine Pollution Bulletin* 95, 7–27.
46. Bishwakarma, J. K. & Hu, Z. (2022). Problems and prospects for the South Asian Association for Regional Cooperation (SAARC). *Politics & Policy* 50, 154–179.
47. Mukherjee, K. (2014). The South Asian Association for Regional Cooperation: Problems and prospects. *Progress in Development Studies* 14, 373–381.
48. Xavier, C. (2020). China in India's neighborhood. *Routledge Handbook. China–India Relationship*.
49. BIMSTEC Secretariat. (Accessed 2018). BIMSTEC Overview. <https://bimstec.org/?page=overview>.
50. Fourth BIMSTEC Summit Declaration. (Accessed 2018). <https://mofa.gov.np/wp-content/uploads/2018/08/Fourth-BIMSTEC-Summit-Declaration-final.pdf>.
51. Jinbo, W. (2022). The Bangladesh–China–India–Myanmar Economic Corridor. in *The Routledge Handbook of the Belt and Road*. Routledge.
52. Pal, P. (2016). Intra-BBIN trade: Opportunities and challenges. ORF Issue Brief. The Asia Foundation.
53. SAWEN Secretariat. (Accessed 2023) South Asia Wildlife Enforcement Network. South Asia Wildlife Enforcement Network. https://www.wfnepal.org/our_working_areas/tal2/
54. Terai Arc Landscape. (Accessed 2023). [wfnepal.org/our_working_areas/tal2/](https://www.wfnepal.org/our_working_areas/tal2/).
55. Chanchani, P. et al. (2014). Tigers of the Transboundary Terai Arc Landscape: Status, distribution and movement in the Terai of India and Nepal. National Tiger Conservation Authority, Governments of India and Nepal. NTNCDNPWC 3.
56. ICIMOD. (2020). The HKH Call to Action to sustain mountain environments and improve livelihoods in the Hindu Kush Himalaya. <https://lib.icimod.org/record/34934>. doi:10.53055/ICIMOD.1.
57. ICIMOD. (2020). Ministerial Declaration on the HKH Call to Action. International Centre for Integrated Mountain Development (ICIMOD). Available from: https://www.icimod.org/wp-content/uploads/2020/11/20201015_Declaration_-_Signed_MinisterialMountainSummit_ICIMOD.pdf
58. European Commission. (2021). EU strategy on adaptation to climate change. <https://climate.ec.europa.eu/eu-action/adaptation-climate-change/eu-adaptation-strategy>.
59. African Union. (2022). African Union Climate Change and Resilient Development Strategy and Action Plan (2022–2032). https://au.int/sites/default/files/documents/41959-doc-CC_Strategy_and_Action_Plan_2022-2032_08_02_23_Single_Print_Ready.pdf.

Authors: Sara Talebian (SEI), Deepshikha Sharma (ICIMOD), Katy Harris (SEI), Pradyumna J. B. Rana (ICIMOD).

Editor: Gillian Summers (ICIMOD), Shanuj VC

Designer: Punam Pradhan (ICIMOD)

First published by ICIMOD in August 2023 on behalf of the Adaptation Without Borders partnership. Adaptation Without Borders is directed and managed by three founding members – IDDRI, ODI and SEI – and supported by the contributions of a growing number of partners. The views presented in this brief are those of the authors and do not necessarily represent the views of the Adaptation Without Borders partnership or any of its funders, members, partners, advisors or ambassadors. Readers are encouraged to quote or reproduce material from this publication (in whole or in part and in any form) for educational or non-profit purposes without special permission from the copyright holders, provided acknowledgement of the source is made. No use of this publication may be made for resale or other commercial purposes without the written permission of the copyright holders.

© ICIMOD, August 2023.

For further information, contact:

Katy Harris, Director of Adaptation Without Borders, katy.harris@sei.org.

Suggested citation: Talebian, S., Sharma, D., Harris, K., and P. Rana (2023). Enhancing cooperation to address cascading climate risks in the Hindu Kush Himalaya. Adaptation Without Borders Discussion Brief.

This brief has been produced with the financial assistance of the European Union. Its contents are the sole responsibility of Adaptation Without Borders and can under no circumstances be regarded as reflecting the position of the European Union.