

# International Conference on Mountain People Adapting to Change



Ministry of Science, Technology  
and Environment, Nepal



# About ICIMOD

The International Centre for Integrated Mountain Development (ICIMOD) is a regional knowledge development and learning centre serving the eight regional member countries of the Hindu Kush Himalayas (HKH) – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – based in Kathmandu, Nepal. Globalization and climate change have an increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people. ICIMOD aims to assist mountain people to understand these changes, adapt to them, and make the most of new opportunities, while addressing upstream and downstream issues. ICIMOD supports regional transboundary programmes through partnerships with regional partner institutions, facilitates the exchange of experiences, and serves as a regional knowledge hub. We strengthen networking among regional and global centres of excellence. Overall, we are working to develop economically- and environmentally-sound mountain ecosystems to improve the living standards of mountain populations and to sustain vital ecosystem services for the billions of people living downstream – now and in the future.



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The governments of Afghanistan, Australia, Austria, Bangladesh, Bhutan, China, India, Myanmar, Nepal, Norway, Pakistan, Switzerland, and the United Kingdom.

# International Conference on Mountain People Adapting to Change

9–12 November 2014, Kathmandu, Nepal

Prepared by

Anirudh Krishnan, Iris C P Leikanger, Jemima Diki Sherpa, Nand Kishor Agrawal, and Dhruvad Choudhury

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This document summarizes the proceedings of the conference based on the individual presentations and results of the panel discussions.

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## Comments from the conference

"I learned a lot about mountains, mountain people, and disasters. I am sure that my learning from the conference will inform the process of formulating Pakistan's national food security policy, and that the needs of mountain communities will be incorporated."

— **Malik Shakir Bashir Awan**, National Assembly of Pakistan

"I will leave no stone unturned to solve the problems faced by the mountain poor in Nepal. The knowledge ICIMOD has generated about glaciers, water availability, poverty, vulnerability, and migration will enrich the National Action Plan for Adaptation document for Nepal."

— **Bhartendu Mishra**, National Planning Commission of Nepal

"As the conference has made clear, those trying to find climate-related solutions for people should first learn about local cultures and local systems."

— **Jigmi Rinzin**, National Council of Bhutan

"Engagement in conferences and collaborative processes can expedite the placement of mountain voices in the global agenda. There is a need to set up a regional monitoring and data sharing platform." — **Jamie McGoldrick**, UN Resident Coordinator, Nepal

"The conference could serve as an entry point for mainstreaming mountain concerns into national plans, fostering collaborative partnerships, and integrating local and traditional knowledge into policy." — **Rojina Manandhar**, UNFCCC Secretariat

"After this conference, we need to carry a commitment back with us. Instead of making speeches, if we commit to action within whatever capacity we work, I am sure we can each make a difference." — **Babar Khan**, World Wide Fund for Nature, Pakistan

"In collaboration with youths, I will do a rapid survey and assessment with elected political representatives and administrators to gauge their understanding of climate change issues and adaptation. Hopefully this can lead to collective action at the sub-national level across the HKH region." — **Pushkin Phartiyal**, Central Himalayan Environment Association

"There are issues with grazing and rangelands in many provinces in Pakistan. I will take the learning points from this workshop to help nomadic communities and support them in the context of climate change." — **Faizul Bari**, Food and Agriculture Organization, Pakistan

### Tweets

**Satyarup Siddhanta** — @SatyarupS

Wonderful well organized #icimod conference..left me Inspired, Enriched & Committed!Thank you @icimod #adaptHKH #climatechange #empowerment

**Sumeet Keswani** — @SumeetKeswani

The #climatechange buck can't be passed anymore. #science & #policy have to work together to #adaptHKH & other zones. Glad to be a part.

Great to see @icimod's int'l conference on #adaptHKH end with commitments. #ideas baked over 4 days, time for #action.



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# Acronyms and Abbreviations

CGIAR	Consultative Group for International Agricultural Research
CHEA	Central Himalayan Environment Association
CICERO	Center for International Climate and Environmental Research - Oslo
CSIR 4PI	Council of Scientific and Industrial Research Fourth Paradigm Institute
FOCUS	Focus Humanitarian Assistance
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GRID	Global Resource Information Database
HICAP	Himalayan Climate Change Adaptation Programme
HKH	Hindu Kush Himalayas/Himalayan
ICIMOD	International Centre for Integrated Mountain Development
ICT	information and communications technology
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
IGSNRR	Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
NAP	national adaptation plan
RDS	Regional Database System
SAARC	South Asian Association for Regional Cooperation
SaciWATERS	South Asia Consortium for Interdisciplinary Water Resources Studies
TERI	The Energy and Resources Institute
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WWF	World Wide Fund for Nature

## Acknowledgements

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# Executive Summary

The 'International Conference on Mountain People Adapting to Change: Solutions beyond boundaries bridging science, policy, and practice' was held in Kathmandu, Nepal from 9 to 12 November 2014. The conference brought together over 300 policy makers, development practitioners, climate experts, researchers, and journalists working in the area of climate change and adaptation in the Hindu Kush Himalayas for a four-day conference on adaptation to change, particularly climate change.

The conference, which was organized by ICIMOD in partnership with Nepal's Ministry of Science, Technology, and Environment, primarily aimed to break down the boundaries between the science, policy, and practice of adaptation to climatic and other changes in the mountains of the HKH and downstream areas and to find holistic approaches to adaptation that go beyond political, sectoral, and national boundaries. It provided a platform for research and development institutions to share information and knowledge regarding climate change adaptation. It fostered a rich discussion between policy makers, researchers, and practitioners and provided further opportunities for engagement and the integration of efforts between various interest groups.

Participants engaged in discussions on a wide range of topics within the three thematic pillars of science, policy, and practice and their intersections. Sessions were devoted to consolidating global and regional knowledge and translating them into systematic policy and action; transboundary and transdisciplinary benefit and knowledge sharing; disaster risk reduction and preparedness; the vulnerability and resilience of communities and livelihoods; adapting global climate science and models to the HKH context; and emerging fields of climate research such as black carbon and its impacts on the cryosphere. The conference also addressed a number of crosscutting themes such as gender and power imbalances, knowledge management and dissemination, and enhanced communication between stakeholders. These themes were integrated into the discussions at several sessions as key concerns for adaptation science, assessing policies, and formulating action.

In addition to the sessions, young change makers were engaged in a poster presentation showcasing research, case studies, and pilot projects conducted across the region and a marketplace session was held to present innovative products and solutions for mountain communities adapting to change. ICIMOD also launched an open-access, web-based Regional Database System (RDS) to enhance knowledge and data sharing efforts. The conference was live streamed and efforts were made to engage the wider public through newspaper, television, and radio coverage, as well as through social media such as Twitter, Facebook, and LinkedIn.

Based on the discussions after panel and dialogue sessions, participants and speakers agreed that regionally produced scientific data, local knowledge, and experience from the HKH region continue to be poorly represented at the Intergovernmental Panel on Climate Change (IPCC) and other global forums. Participants emphasized the need for a unified mountain voice to represent the HKH at such forums. They also recognized the challenge of creating national adaptation plans that can act as policy links between global strategies, planning, and implementation at the national and local levels as well as the 'lived realities' of mountain communities.

Over the course of the 19 conference sessions, speakers, panellists, and participants agreed upon the importance of several interventions and made wide-ranging recommendations. The slow uptake of new scientific knowledge generated by researchers together with adaptation policy and action in the region were highlighted. Participants emphasized the urgent need to establish mechanisms and systems to integrate scientific knowledge, traditional knowledge, local adaptation methods, and local and national policy and action. In addition, several speakers identified the importance of a two-way flow of information and knowledge between scientific and local communities to ensure that local knowledge is incorporated into science and policy, while making scientific knowledge accessible to local communities.

The speakers highlighted the need to open up communication channels between different domains of climate science and to foster interdisciplinary and collaborative research. There was a call for scientists to move beyond viewing their work as isolated academic knowledge production and instead to understand and engage with the climate policy and action frameworks and to develop a deeper understanding of, and connection with, affected communities.

Policy-level attendees reiterated the importance of more precise science on the region and the simple presentation of scientific findings to ease the implementation of this knowledge through national and local policy. There was wide recognition of the importance of breaking down the boundaries between global and regional climate science. Many speakers emphasized the importance of building on existing global climate data and models, especially models specific to other mountain regions of the world, in an attempt to build regional knowledge. Participants also highlighted a number of areas in which scientific efforts can aid adaptation by informing policy and practical action, including more detailed studies of black carbon impacts; linking scientific information such as weather forecasting with needs-based technological solutions and infrastructure for disaster preparedness and management; and increasing interdisciplinary and participatory processes to integrate indigenous and local knowledge into academic and formal reporting.

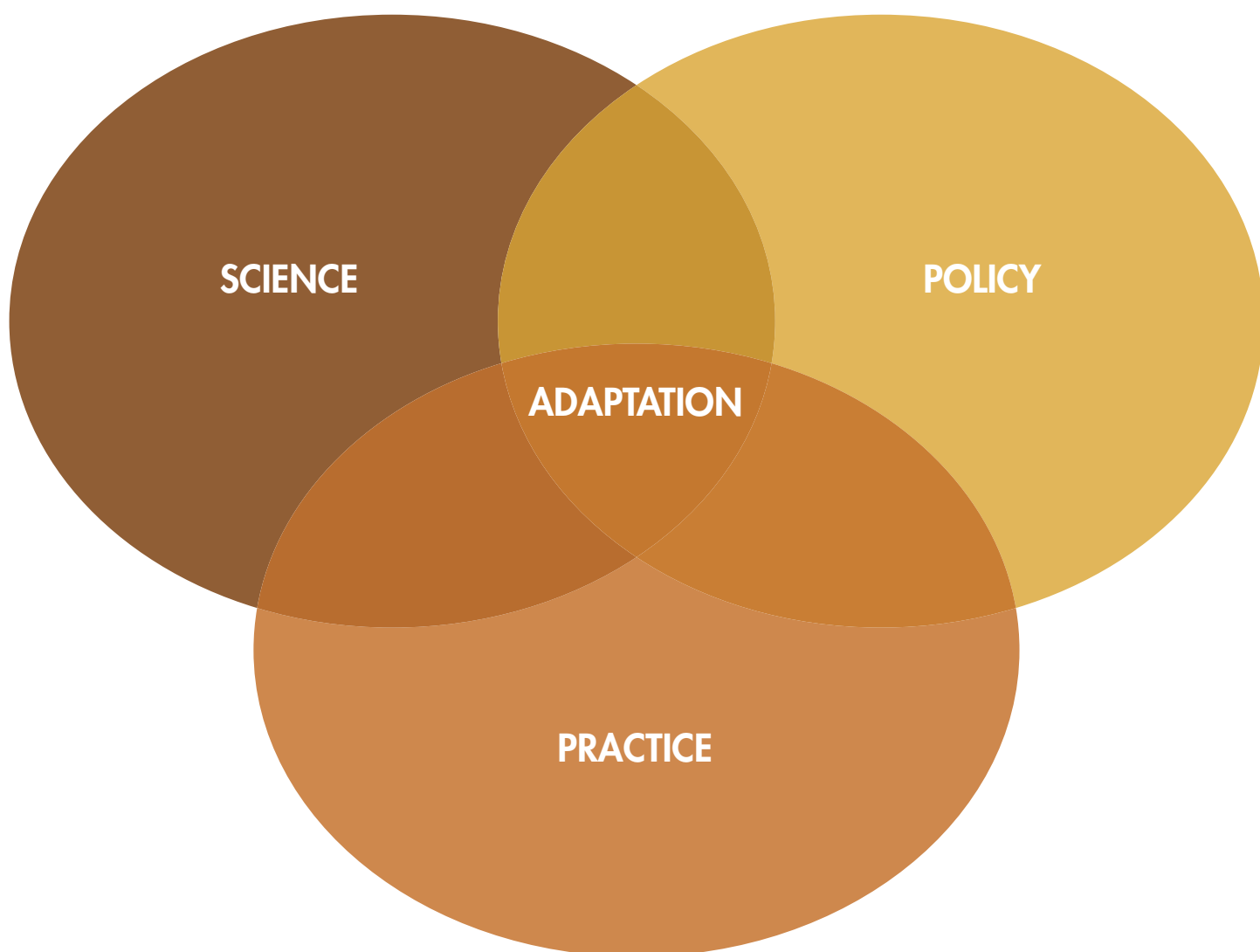
During the closing session, the panellists and participants made a commitment to action in their personal capacities. Policy makers, such as Bhartendu Mishra of the National Planning Commission of Nepal and Malik Shakir Bashir Awan of the National Assembly of Pakistan, committed to integrating the knowledge that they gained at the conference into national and subnational action plans in their countries. Other participants like Pushkin Phartiyal from the Central Himalayan Environment Association and Faizul Bari from the Food and Agriculture Organization pledged to take action in their research, advocacy, and implementation efforts.

ICIMOD made several key commitments including the promotion of good science; generation of new knowledge to fill regional data gaps; the organization and communication of that knowledge through existing and new initiatives such as the Regional Database System and the Himalayan Monitoring and Assessment Programme (HIMAP); implementation of ideas generated at the conference through capacity building, pilot testing, and scaling up at various ICIMOD field sites with local communities; supporting the process of developing and implementing national adaptation plans (NAPs) at regional, national, and local levels; promoting gender inclusiveness across programmes, as well as through the Women, Gender, Environment, and Mountains (WGEM) network and the Mountain Initiative for Climate Change Adaptation in Mountain Regions; acting as a platform to foster the regional cooperation needed to support sustainable adaptation in the Hindu Kush Himalayan region; and taking the mountain agenda to regional and global fora.

## Key recommendations for action

The conference participants came up with the following key recommendations for action:

- Generate a unified mountain voice through strong regional and global cooperation between communities, institutions, and non-governmental actors
- Engage in specific and targeted communication across local, national, regional, and global levels to highlight the importance and urgency of adaptation action in the world's mountains
- Promote institutional pluralism while carrying out global assessments, with more inputs from the HKH and other mountain regions
- Create and support mechanisms for collective reflection and learning among diverse stakeholders (particularly researchers, policy makers, practitioners, and communities)
- Improve institutional mechanisms to address the trade-offs between ecosystem preservation and development needs and provide adequate resources and funding
- Support local-level adaptation through technology, capacity building, and financial resources
- Ensure greater collaboration with the media and civil society to facilitate better communication of the science on adaptation and climate, and enhance the voices of local communities in policy formulation
- Integrate the wealth of traditional, indigenous knowledge and emerging local adaptation practices into local- and national-level adaptation plans
- Focus on locally relevant issues and communicate new and existing knowledge in simple language to facilitate informed policy making that is relevant to local communities
- Increase consultation with stakeholders across local and subnational levels, as well as across upstream and downstream communities, to enhance benefit sharing across communities and regions
- Enhance crossborder flows of knowledge to minimize adverse effects and enhance benefits to the entire region
- Integrate efforts to address power differentials across gender and social class by making efforts to address historic and contemporary limitations in the agency and decision-making power of women and other marginalized groups.



### SCIENCE

- Strong regional knowledge
- Regional climate scenarios
- Black carbon impacts on the cryosphere
- Disaster risk preparedness
- Flexible food production systems
- Community- and ecosystem-based adaptation
- Upstream-downstream linkages

### POLICY

- National adaptation plans
- Integration with global development strategies
- Insurance for climate-induced loss
- Transboundary resource management
- Lessons from other mountain regions
- Effective communication
- Putting mountains on the global agenda

### PRACTICE

- Integrating adaptation knowledge into development
- Large- and small-scale climate-smart strategies
- Indigenous, existing, and emerging adaptation practices
- Climate-resilient livelihoods and value chains

# Background

As the source of ten of Asia's major river systems, the Hindu Kush Himalayas provide water, ecosystem services, and livelihoods to more than 210 million people. The region is also a source of water for more than 1.3 billion people – almost a fifth of the world's population – living in downstream river basins. Climate change and other changes have already begun to impact on ecosystems and communities across the region, as well as those living downstream. Traditional adaptation techniques that have supported people in mountain areas for centuries are no longer able to keep up with the rapid pace of change.

To effectively support communities in adapting to change, solutions that look beyond political, sectoral, and national boundaries must be developed. This requires in-depth knowledge of both local conditions and broader global climate change trends. Although new reports such as the IPCC's 'Climate Change 2014: Impacts, Adaptation and Vulnerability' have provided fresh insight, there are still gaps in our knowledge about how climate change is affecting, and will continue to affect, the HKH region.

The International Conference on Mountain People Adapting to Change aimed to fill some of these knowledge gaps by bringing together over 200 experts and stakeholders from around the globe, including government representatives and high-level dignitaries from the HKH, to discuss the status of adaptation. The conference was jointly organized by ICIMOD and Nepal's Ministry of Science, Technology, and Environment under ICIMOD's Himalayan Climate Change Adaptation Programme. HICAP is a six-year research programme that was initiated in 2012, which is being implemented by ICIMOD in collaboration with the Center for International Climate and Environmental Research – Oslo and the Global Resource Information Database-Arendal. It is supported by the governments of Norway and Sweden.

The conference approached climate change adaptation in the HKH region from a holistic perspective, seen in the context of other change processes and in relation to changes in mountain areas around the globe. By drawing together the latest knowledge, policies, and practices on adaptation, the conference aimed to strengthen the interface between science, policy, and practice, and to improve communication for adaptation to change in the HKH region and downstream areas. It sought to find holistic approaches to adaptation that go beyond political, sectoral, and national boundaries.

# Conference Sessions

## Managing Change: The challenges of translating knowledge into adaptation policy and action in the mountains

### Key messages

- The HKH region provides livelihoods to more than 210 million people and water to more than 1.3 billion – almost a fifth of the global population. Given the vulnerability of mountains to climate change, there is an urgent need for coordinated action for adaptation.
- There needs to be greater transfer of scientific knowledge to policy makers to ensure the integration of climate issues into national planning processes and the adoption of current knowledge into national adaptation plans.
- At the regional level, intergovernmental panels should be set up to share knowledge and coordinate adaptation policy and action.

<b>Keynote speaker</b>	Krishna Chandra Paudel Ministry of Science, Technology and Environment, Nepal
<b>Panellists</b>	Malik SB Awan, National Assembly of Pakistan; Jigmi Rinzin, National Council of Bhutan; Naba Bikram Kishore Tripura, Ministry of Chittagong Hill Tracts Affairs, Bangladesh; Anil K Sinha, Bihar State Disaster Management Authority
<b>Session host</b>	Dhrupad Choudhury, ICIMOD
<b>Rapporteurs</b>	Gopilal Acharya and Ritu Meher Shrestha



Owing to their rich agricultural systems and biodiversity, mountains represent the future food security of a large number of communities. Therefore, it is crucial to achieve integration between science, policy, and practice and to engage HKH actors in global discussions and actions related to climate change. Mountain societies have a wealth of indigenous knowledge of their environments, which often enables them to flexibly develop local strategies to adapt to the changes that they are experiencing. While these strategies have generally been unable to evolve fast enough to keep up with the accelerating rate of climate change, there is a wealth of knowledge in these methods. At the same time, there is clearly a demand for scientific knowledge to keep up with the rapid pace of climatic change and support adaptation strategies.

Climate change is no longer solely the mandate of environmentalists or NGOs. It is now very much a part of the agendas of the private sector and governments. Therefore, integrating climate change and climate change adaptation into national agendas requires bringing together various stakeholders from diverse regions and from all levels, including global, regional, national, and subnational actors.

While greater attention has been paid to knowledge creation in the HKH region since the IPCC's Fourth Assessment Report (AR4) was published in 2007, there are still gaps in scientific knowledge regarding the extent and rate of climate change at regional and local levels. Parliamentarians in the region face increased demands to meet the needs of small landholders and farmers, and to address the challenges that climate change is posing to their livelihoods. Policy makers depend on reliable scientific information based on locally relevant data that captures the diversity of the region.

The mountain agenda, therefore, urgently needs to be integrated into the national agendas of governments and adaptation action plans articulated. Additionally, the role of each institution in implementing such plans must be clarified to achieve effective and meaningful coordination. Moreover, these processes should take place in close collaboration with local communities to utilize their traditional knowledge of the environment and integrate it into national action plans.

At the regional and global levels, sustainable development in mountain regions would benefit from an intergovernmental panel like the Arctic Council to address issues specific to the region. Thus, networking between the Hindu Kush Himalayan countries is key to translating scientific knowledge into adaptation policies for the mountains of the region.

**"Mountains suffer the most from climate change, conflicts, poverty, overexploitation of resources, and loss of biodiversity."**

— **Krishna Chandra Paudel**,  
Ministry of Science, Technology and Environment, Nepal

**"We must strengthen networking, not only within the Hindu Kush Himalayas, but across the globe."**

— **Jigmi Rinzin**,  
National Council of Bhutan

**"We may be data deficient, but we are not knowledge deficient."**

— **Anil K Sinha**  
Bihar State Disaster Management Authority



## Adding Knowledge and Evidence: Strengthening regional knowledge beyond IPCC assessment reports

### Key messages

- The rich knowledge and climate change adaptation strategies of local communities and regional scientists are rarely discussed in global fora or incorporated into the IPCC's reports.
- Despite advances in knowledge about climate change in the HKH region, the generation of new knowledge, especially on adaptation options, should continue to be a priority.
- Adaptation is a long-term, ongoing, and iterative process and, while global assessments can inform strategies, new comprehensive regional information should be incorporated as and when it emerges.

Given the widely acknowledged lack of knowledge regarding the effects of climate change on the HKH and mountain regions generally, knowledge creation is the first step. Several advances have been made in our understanding of climate change in the region since the IPCC's Fourth Assessment Report in 2007, but it is crucial that knowledge generation continue to be a priority.

**Keynote speaker** Dipak Gyawali  
Nepal Water Conservation Foundation

**Panellists** NH Ravindranath, Indian Institute of Science; Arun Bhakta Shrestha, ICIMOD; Anand Patwardhan, University of Maryland; Atiq Rahman, Bangladesh Centre for Advanced Studies

**Session chair** Nand Kishor Agrawal, ICIMOD

**Rapporteurs** Shradha Ghale and Ritu Meher Shrestha





The IPCC's reports assess global climate issues and provide a strong platform for science and advocacy at the global level. They are, however, incomplete in their inclusion and incorporation of regional data and local knowledge. The richness of the knowledge and climate change adaptation strategies of local communities rarely filter up to the regional and global levels, and the contribution of regional experts to IPCC reports is extremely limited. International cooperation and treaties need to be rethought, taking into account the voices of diverse groups of stakeholders.

Climate models outlined in the IPCC's Fifth Assessment Report, published in 2014, are more reliable than ever before. For the first time, the Fifth Assessment Report used words like severe, pervasive, irreversible, and abrupt to describe changes. Scientific evidence shows that these climate change impacts increase the vulnerability of mountain societies. Therefore, the first step towards adaptation to future climate change is reducing exposure to present climate change.

There is a lack of integration as many scientists do not consider implementation a part of their responsibilities, while implementing agencies generally consider science a separate realm.

There is a need to identify ways to connect scientific knowledge and implementation practices. Moreover, greater emphasis should be placed on learning from the mistakes that have had adverse effects on communities.

Generating new knowledge must come to the fore and processes of knowledge generation need to be critically evaluated for their relevance to local contexts. Although a lot can be learned from global assessments and climate models, there is a need for comprehensive regional analyses for targeted and locally relevant adaptation strategies. It is, therefore, important to develop region- and context-specific climate models based on comprehensive local data.

Adaptation is a long-term, ongoing, and iterative process, and it needs to incorporate new information and knowledge as and when it emerges. There is a dire need to develop solidarity across national borders and among scientific communities, international business corporations, NGOs, and other actors.

However, there are competing explanations for the causes of climate change. Bureaucratic organizations tend to see people as the main contributor, with ecosystems unable to keep up with rising demands. Classical market liberals see pricing as the problem, and champion policies that remove price controls and subsidies. Climate activists generally consider mankind's disregard for nature as the central issue. In the face of these multiple uncertainties, policy makers are unable to ascertain what contributes most to climate change and outline a set of priorities for action.

The path forward can be found by assessing historically successful and unsuccessful treaties and international agreements. Successfully identifying the contribution of various factors to the larger problem of climate change vulnerability requires due consultation and the inclusion of all voices. The answer lies in institutional pluralism based on hearing, and responding to, the voices of all stakeholders and ensuring that adaptation policy and action are strongly informed by the bottom-up transfer of knowledge and needs.

**"The IPCC is shackled by too much 'eagle-eye' science and too little 'toad's-eye' science."**

— **Dipak Gyawali**

Nepal Water Conservation Foundation

**"Science places too much emphasis on good practices, but the bad practices we have learned from are rarely documented."**

— **Atiq Rahman**

Bangladesh Centre for Advanced Studies

**"We can learn a lot from global assessments, but to adapt we need comprehensive regional analyses."**

— **Arun Bhakta Shrestha**

ICIMOD

# Moving from Climate Observations to Scientific Understanding in the HKH Context

## Questions of scale: Applying global and regional climate scenarios to HKH basins

### Key messages

- Researchers must focus on locally relevant issues, provide answers in simple language, and address timeframes relevant to policy makers and local communities.
- Local data and information should be integrated into climate models and efforts should be made to build local capacity to aid uptake by policy makers.
- Locally sensitive, integrated approaches to infrastructure and resource use must consider highly uncertain and high-impact drivers, while enhancing human wellbeing and ecosystem health in a manner that brings communities, decision makers, and researchers together to devise innovative solutions.

It is frequently argued that, in order to support policy makers in developing adaptation measures, more detailed information on the impacts of climate change is needed. However, developing high-resolution climate scenarios for the Indus, Ganges, and Brahmaputra river basins is a challenging task, and

<b>Chair</b>	Asit K Biswas, Third World Centre for Water Management
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<b>Panellists</b>	Liu Suxia, Institute of Geographic Sciences and Natural Resources Research (IGSNRR), Chinese Academy of Sciences; Christopher Scott, University of Arizona; Bob van Oort, CICERO; Robert Zomer, Centre for Mountain Ecosystem Studies
<b>Session host</b>	Philippus Wester, ICIMOD
<b>Rapporteurs</b>	Rashmi Kiran Shrestha



these scenarios will never be able to deliver the level of certainty requested by decision makers. High-altitude climates are particularly uncertain, and commonly-used climate datasets are grossly inaccurate at high altitudes. These data constraints make it difficult to develop accurate climate scenarios for the HKH region using either statistical or dynamic downscaling techniques. With these challenges in mind, researchers must address the question of how climate change risks and uncertainty should be communicated to different stakeholders so that the urgency to act is not lost.

A systematic approach to downscaling general circulation models to the local level requires improving the science of climate modelling while simultaneously providing simple options for decision makers based on available information. To improve the science of climate modelling, a number of changes can be made: improving the accuracy of general circulation models by scaling up regional information, quantifying the uncertainties inherent in modelling, and carrying out ensemble projections. Simple options can then be provided to decision makers by communicating 'what-if' scenarios and collecting detailed information about the needs of local communities.

Downscaled global and regional models may be used to project changes at the local level by superimposing projections of large-scale changes upon information from local climate stations and by ensuring that the information generated by downscaling is focused on locally-relevant issues. Through this process, information can be used to support local adaptation with a focus on flexibility and co-benefits, bringing all stakeholders together to discuss and share information and knowledge, as well as local risks and options, and involving the private sector in mainstreaming this process.

To accommodate the wide range of modelling results and their associated uncertainties, information can be made operational and applicable to a range of adaptation needs by clearly identifying which parts of the results are certain or uncertain. In this way, modelling information can provide relevant answers in simple language, integrate local data and information into local modelling, build local capacity, and translate results into information that is thematically relevant, both locally and nationally.

Based on this information, locally sensitive integrated approaches to infrastructure and resource use practices must consider highly uncertain and high-impact drivers while enhancing human wellbeing and ecosystem health in a manner that brings communities, researchers, and other decision makers together to devise innovative solutions. By quantifying uncertainty and providing detailed 'what-if' scenarios from downscaled data, researchers engaging in climate modelling can contribute to this goal.

In order to convince policy makers and local communities of the reality of climate change and the need for incremental and transformational adaptation, there is a need for researchers to develop targeted communication strategies and platforms to create awareness about climate change, its drivers, and its impacts. Engaging communities, particularly the younger generation, in information gathering and awareness building around climate change offers the potential to integrate the inherent uncertainties in science into policy. In doing so, climate data can be made more intelligible to stakeholders, science results can be spread to communities, and researchers can ensure that modelling and research are based on local realities.



**“Climate change and climate impacts are local.”**

— Bob van Oort, CICERO

**“It is key to focus on those uncertainties that will have a greater impact.”**

— Christopher Scott  
University of Arizona



## Emerging concerns: Black carbon and the cryosphere

### Key messages

- Black carbon emissions contribute significantly to the melting of glaciers in the HKH region. This affects not only local livelihoods but also water resources over much larger areas.
- Reduction of black carbon emissions could slow down glacial melt and climate warming in the HKH region in the near term as well as reduce one of the major health hazards in South Asia, thereby facilitating effective adaptation to climate change.
- The remaining scientific uncertainties concerning the role of black carbon in the Himalayas have to be resolved, but they should not pose barrier to taking action to reduce emissions of black carbon. The health benefits of reducing black carbon emissions are so significant that it warrants taking immediate and stringent action.

The vast majority of HKH glaciers are shrinking rapidly, except in the Karakoram Range, where some are stable and even advancing. Black carbon is contributing significantly to the melting of glaciers, affecting local livelihoods and water resources over large areas. Particulate black carbon, with a particle size below 2.5 microns (PM<sub>2.5</sub>), strongly exacerbates regional warming by settling on snow and ice, darkening the surface, and thereby increasing the absorption of solar radiation. It also heats the air while being suspended or transported by the wind. Scientists generally agree that both of these processes contribute to the melting of glaciers.

Scientific knowledge about the impact of climate change in the Himalayas has improved since the IPCC's Fourth Assessment Report, but knowledge gaps remain regarding the extent to which black carbon

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<b>Keynote speaker</b>	Tobias Bolch, University of Zurich
<b>Panellists</b>	Arnico Panday, ICIMOD; Cong Zhiyuan, Institute of Tibetan Plateau Research, Chinese Academy of Sciences; Maria Shahgedanova, University of Reading
<b>Session host</b>	Arun Bhakta Shrestha, ICIMOD
<b>Rapporteurs</b>	Linda Maharjan

**“We need to quantify the relationship between black carbon emissions, deposition, and changes in snow and glacier melt and runoff using regional models.”**

**— Maria Shahgedanova**  
University of Reading







contributes to melting and the direct linkages between black carbon emissions and impacts. More detailed in situ and remote sensing studies are needed to understand these processes.

The most significant sources of black carbon emissions in the region are the burning of biomass (open burning and cooking stoves), diesel vehicles, and industrial burning of coal. Understanding the relative impact of different sources of black carbon on air pollution and climate change is a key concern.

There is a strong potential for slowing down the melting of glaciers in the HKH by reducing black carbon emissions. Additionally, there is an equally significant co-benefit in terms of reducing the number of premature deaths and adverse health impacts, such as respiratory diseases, from particulate pollution. The health impacts of black carbon and PM2.5 have been well established by the World Health Organization. This knowledge makes the reduction of black carbon emissions important, especially as reductions in black carbon also reduce PM2.5.

Even with uncertainties in the scientific understanding of glacial dynamics and black carbon impacts on glacial melt, it is potentially beneficial to reduce emissions of black carbon as soon and as vigorously as possible. Improvements from reduced black carbon emissions in terms of climate change could be observed within a couple of decades and contribute to facilitating adaptation to climate change in many areas in the region. The major sources of black carbon affecting the HKH are within the region, which means that those who reduce emissions will also reap the benefits in terms of improved health and the slowing of glacial melt and mountain climate change.

“What is really important for a scientist is to talk to people and know about their needs and perceptions to refine our goals. Existing mitigation technologies should be transferred to local people.”

— Tobias Bolch  
University of Zurich



## Predicting uncertainties: The challenges of disaster risk management

### Key messages

- The link between disaster risk reduction science and practice must be strengthened by combining data with knowledge of local conditions and translating them into 'actionable information'.
- A range of robust and appropriate communication technologies and strategies tailored to varied conditions and capabilities are needed.
- Policy makers must create response plans that work in an integrated way from the local to transnational and regional levels and reduce risk by making disaster risk reduction central to development projects.

#### Chair

Vinod K Gaur  
Council of Scientific and Industrial  
Research Fourth Paradigm Institute

#### Keynote speaker

Anil K Sinha, Bihar State Disaster  
Management Authority

#### Panellists

Anand K Sharma, India Meteorological  
Department; Mandira Shrestha, ICIMOD;  
Mats Eriksson, Stockholm International  
Water Institute; Salmanuddin Shah, Focus  
Humanitarian Assistance

#### Session hosts

MSR Murthy and Neera Shrestha-  
Pradhan, ICIMOD

#### Rapporteurs

Deo Raj Gurung

As the risk of extreme climate events grows, sustainable adaptation and resilience in mountain communities require creative and multilayered responses and solutions. Scientific prediction methods work hand in hand with strong policy, local-level practical response mechanisms, and risk minimization measures. The gaps in our scientific understanding of disasters and associated uncertainties, communication gaps between scientists and the wider community, and failure to integrate local knowledge into disaster planning have resulted in available data not being turned into actionable information. These are major challenges that must be overcome for better disaster preparedness and risk reduction in the HKH region.





Current disaster management systems must be strengthened by engaging with communities to create feedback mechanisms through which ground realities and local knowledge are communicated to the scientists who devise solutions. Such inputs will streamline and improve systems each time they are tested, making the prediction of risk effects and response planning more effective. Two-way flows of information, where ground realities are relayed to scientists and policy makers and scientific information is communicated effectively with communities, are key to dynamic and effective disaster management planning and risk reduction.

Scientific and technical communities must also make an effort to shift their paradigm from solely generating scientific information to the practical communication of data, for example, by emphasizing the importance of improving impact weather forecasting, which informs practical action by focusing on short-term predictions of nature's most adverse climatic conditions. At the policy level, disaster management plans need to be detailed at various levels of action. This should involve creating plans at three or more levels – district, provincial, and national – and should ensure that these plans work hand in hand.

Early warning systems for the early detection of adverse events and frequent dissemination of information to local communities should be institutionalized. To ensure last mile connectivity, emphasis should be placed on public awareness and the capacity building of communities to effectively respond to a calamity. Particular efforts should be made to prepare the poorest sections of society for disasters, as they are often the worst hit.

It is also important to use appropriate needs-based technologies for disaster scenarios while keeping local realities in mind. For instance, in disaster conditions or in areas with limited electrical access, a simple weather communication system that can be operated using hand- or solar-powered technology is preferable to ones that are more complex and less robust.

It is crucial to tailor the method of communication to the type of information being conveyed. For real-time communication during a flood, for instance, mobile phone alerts can be extremely effective. On the other hand, seasonal information such as updates on an ongoing drought may be better conveyed via television. Multidecadal information, such as climate change trends, needs to be conveyed in greater depth in formats such as yearly reports disseminated through appropriate channels.

Preparedness is particularly important given the positive trade-offs in terms of the cost of risk reduction and preparedness compared to the high cost of recovery and rehabilitation in the absence of such measures. Government and other policy makers must enact disaster management plans that function on a number of levels. National plans need to be well integrated into various community, district, and provincial levels of administration, and early warning systems need to be institutionalized. It is also important to collaborate on a regional level, as extreme climate events are often transboundary in nature and, therefore, real-time data sharing across national boundaries can be beneficial. Hydrometeorological data are often not shared openly and efficiently, impeding early warning efforts. Strong emphasis on creating end-to-end, people-centric early warning systems that follow the United Nations Office for Disaster Risk Reduction framework and that cover risk assessment, monitoring, warning, dissemination, and response is crucial.

While both warning and response systems are crucial, policy makers must also focus on actively reducing risk by mainstreaming disaster risk reduction practices and requirements into development planning and policy. Infrastructure and other planning must be undertaken keeping potential disasters in mind and prioritizing risk reduction.

“There is a need for a paradigm shift from ‘weather forecasting’ to ‘impact weather forecasting’ with a focus on actionable information.”

— Anand Kumar Sharma  
India Meteorological Department

“Preparedness for the worst case scenario is the best way forward.”

— Anil K Sinha  
Bihar State Disaster Management Authority

“Communication gaps are often the weakest link in the early warning workflow.”

— Mats Eriksson  
Stockholm International Water Institute

## Bridging Local and Global Knowledge to Improve Livelihoods in Changing Landscapes

### Sustaining the mountains: Ensuring food security through flexible production systems

#### Key messages

- Mountain food security has different requirements from food security in the plains because climatic and socioeconomic changes affect mountains more severely in terms of raw climatic indicators as well as vulnerability.
- By promoting flexible farming systems with a wide range of options, policy makers and institutions can contribute to mountain food and livelihood security by strengthening local food systems and improving the resilience of farming households against income shocks.
- By identifying and capitalizing on new opportunities in the mountains, mountain livelihoods can be diversified beyond agriculture through tourism, handicrafts, remittances, and small enterprises.

<b>Chair</b>	Naba Bikram Kishore Tripura, Ministry of Chittagong Hill Tracts Affairs, Bangladesh
<b>Keynote speaker</b>	Tor Halfdan Aase, CICERO
<b>Panellists</b>	Golam Rasul, ICIMOD; Nina Holmelin, CICERO; Feng Yan, Asian International Rivers Center, Yunnan University; Chendo Norbu, Ministry of Agriculture and Forests, Bhutan
<b>Session host</b>	Abid Hussain, ICIMOD
<b>Rapporteurs</b>	Lipy Adhikari and Omaid Seddiqi

Climatic and socioeconomic factors affect mountain ecosystems more severely than those in plains. In the mountains, both conventional and commercial agriculture are vulnerable to climate change impacts such as low productivity, the degradation of natural resources, frequent floods, and prolonged droughts. Socioeconomic factors affecting mountain ecosystems include inaccessibility, demand uncertainty, increased outmigration, and population pressure. Mountain food security also differs from food security in the plains because mountain livelihoods are largely dependent on





natural resources, livestock, and niche products. Some of the key concerns for mountain food security are the supply of inputs, diversity of crops, and farmers' physical access to markets.

Despite recent economic development in the HKH region, food security remains the fundamental challenge as intensive agriculture is often not possible in mountain regions. Vulnerability in the mountains is high primarily due to two reasons: mountain agriculture is rainfed and suffers greatly from climate change and the mountains are disconnected from the plains, and, therefore, left with limited or no access to markets in the event of a natural disaster.

Flexible production systems are of crucial importance to achieving food security in the mountains. Mountain farmers need to adopt flexible farming systems with a diverse range of products such as cash crops, livestock, agroforestry products, honey, and poultry. Such systems will strengthen local food systems and improve the resilience of farming households to climate change. For example, if crop production gets affected by floods or price shocks, livestock and forest products can help maintain income. Flexible production systems may contribute significantly to the overall sustainability of mountain food production and the security of livelihoods.

There is a need to identify and capitalize on new opportunities in the mountains, such as the production of vegetables, nuts, fruits, livestock, honey, and medicinal plants. Non-agricultural opportunities, such as the productive use of remittances, promotion of handicrafts and tourism, and small enterprises also play an important role in diversifying mountain livelihoods. When identifying the opportunities in a specific geographical area, that area's agroecological potential and accessibility to markets should be taken into account. Where markets are easily accessible, the specialization of some agricultural products may also be promoted.

Effective policy measures can play a key role in encouraging flexible farming practices and increasing the opportunities of farming households. Policies should focus on flexibility; providing institutional services, better irrigation and water management, adequate roads, improved market opportunities, and greater investment in agriculture; as well as strengthening local food production.

Government institutions can be instrumental in achieving greater food security. Lessons from China since the 1980s suggest that local-level food security policies need to be supported by an emphasis on effective natural resource management, grain and livestock production, and infrastructure development. Institutions should identify key challenges in the mountains and provide both financial and institutional support. In the HKH region, governments should support income generating activities such as the production of cash crops, medicinal products, and mushrooms.

Despite the climatic, topographical, and socioeconomic challenges, there is a need to identify opportunities in the mountains to reshape local production systems so that they may flexibly react and adapt to changes without harming local diversity and ecosystems. It is important to maintain a balance between flexibility and productivity in mountain production systems to achieve sustainable food security. It is also important to identify ways to strengthen policy and institutional support to improve flexibility in production systems with enhanced participation of women and to diversify livelihoods through non-agricultural activities conducive to increasing income. Location-specific diversification of agricultural and non-agricultural activities may be promoted, keeping in mind the agroecological potential and market access in the mountains.

**"Diversity in agriculture reduces the impact of climate change."**

— Chendo Norbu

Ministry of Agriculture and Forests, Bhutan

**"The range of farmers' production choices must be extended to increase the scope of flexible adaptation."**

— Tor Halfdan Aase

CICERO

## A fine balance: Connecting community and ecosystem-based adaptation

### Key messages

- Humans, the environment, vegetation, and other biota interact closely to form an ecosystem. Climate and other forms of change have an impact on the balance of these interactions, and all measures for adaptation must take this balance into account.
- Ecosystem-based and community-based adaptation are complementary approaches.
- Just as humans and ecosystems are closely interlinked and interdependent, community-based and ecosystem-based adaptation must be integrated to enhance the resilience and sustainability of ecosystems and communities.
- Healthy communities rely on healthy, balanced ecosystems; unbalanced ecosystems increase the vulnerability of communities.

<b>Chair</b>	VK Bahuguna, Government of Tripura, India
<b>Keynote speaker</b>	Xu Jianchu, Kunming Institute of Botany, Chinese Academy of Sciences
<b>Panellists</b>	Rajendra P Agarwalla, government of Assam, India; Babar Khan, WWF Pakistan; Luis Waldmüller, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ); Wu Ning, ICIMOD
<b>Session host</b>	Laxmi D Bhatta, ICIMOD
<b>Rapporteurs</b>	Anju Pandit and Deepa Basnet



Resource constraints are often key concerns in the mountains. The social, economic, and ecological systems of mountains are being affected by climatic and other changes. Disproportionately high poverty in the region, food insecurity, dependence on natural resources, and limited income opportunities exacerbate the vulnerability of mountain societies.

Two increasingly popular approaches in adaptation to climate change are community-based adaptation and ecosystem-based adaptation. The former places communities at the centre of adaptation and addresses the dependency of households on the availability of resources and the demand for their products. The latter emphasizes the conservation and management of ecosystem services and, thereby, the supply of services.

There is a great deal of synergy and complementarity between both approaches to adaptation. Well-managed and sustainably-maintained natural resources play a cost-effective role in adaptation techniques and are, therefore, important elements of successful ecosystem-based adaptation. Community-based adaptation is built on collective action between all stakeholders, keeping the community at the centre to increase resilience.

These approaches need to be harmonized to directly benefit livelihoods and reduce vulnerability.

It is important to identify and harness the synergies between ecosystem-based adaptation and community-based adaptation. Activities such as ecosystem restoration and reduction in fertilizer use can aid in synchronizing the two approaches.

Mountain ecosystems are crucial providers of biodiversity and food security, and they play an important role in disaster mitigation. Therefore, there is a dire need to achieve a balance between the conservation of ecosystem services and the development needs of communities through an amalgamated approach.

In addition to climate change, the mounting pressure on these ecosystems is exacerbated by socioeconomic changes, including changing lifestyles and consumption patterns, which have led to the greater use of common resources. It is, therefore, important to assess the carrying capacity of these ecosystems and their channels of negative feedback in response to human interference.

Both ecosystem-based and community-based adaptation have long-term sustainable development as their overall objective. Keeping this in mind, the solution may be to incorporate the two approaches as part of an overall adaptation strategy to climate change. In formulating such strategies, it is important to analyse various climate change scenarios, undertake vulnerability assessments at both community and ecosystem levels, consult stakeholders, conduct monitoring and evaluation of impacts, and prepare adequate cost-benefit analyses of different adaptation options. There is also a need to meticulously compare the costs and benefits of community-based adaptation, ecosystem-based adaptation, and integrated approaches, and ensure that such analyses are used to design appropriate actions.

“Ecosystem-based adaptation and community-based adaptation are complementary approaches that must be harmonized in practical implementation.”

— Rajendra P Agarwalla  
Government of Assam

“Economically sound communities support healthy ecosystems, while highly fragile ecosystems lead to vulnerable communities and vice versa.”

— Babar Khan  
WWF Pakistan

“The key concern for adaptation is balancing ecosystem carrying capacity with community demand.”

— VK Bahuguna  
Government of Tripura, India



## Vulnerability and resilience: Integrating science with community responses to change

### Key messages

- The indigenous and local knowledge of communities is an important resource in developing adaptation strategies because of the familiarity of communities with ground realities, local environmental contexts, and existing resilience strategies.
- Institutional mechanisms need to be revised to facilitate the formulation of better adaptation strategies to support vulnerable communities.
- The resilience of vulnerable communities to change can be strengthened by linking bottom-up community knowledge to top-down formal research, as well as engaging in quantitative and qualitative approaches for developing effective adaptation strategies.

<b>Chair</b>	Sara Ahmad, International Development Research Centre
<b>Keynote speaker</b>	Ganesh Thapa, International Fund for Agricultural Development (IFAD)
<b>Panellists</b>	A Nambi Appadurai, Water Resources Institute; Su Yufang, Kunming Institute of Botany, Chinese Academy of Sciences; Anamika Barua, South Asia Consortium for Interdisciplinary Water Resources Studies; Fabrizio Bresciani, IFAD
<b>Session hosts</b>	Chanda Gurung Goodrich and Anjal Prakash
<b>Rapporteurs</b>	Devjit Roy Chowdhury and Sumit Dugar

Accounts from the HKH region show that farmers have already learned to adapt to climate change and are more resilient than before. Unfortunately, many resilience-building strategies that they have adopted have not been documented. In this context, the linkages between scientists and communities needs to improve. To assess the risks associated with climate change and bridge gaps between climatologists and social scientists, interdisciplinary research and the effective communication of research findings and adaptation strategies through the use of information technology are crucial. Qualitative and quantitative data should be combined in assessing vulnerability.





While top-down science is useful for mitigation, it is not as helpful in developing adaptation strategies. Therefore, bottom-up community knowledge and top-down research need to be combined to gain a better understanding of vulnerability and resilience.

Understanding vulnerability and resilience is important for policy and decision making, but the two concepts need to be demystified by embedding them within the same context. The concepts as well as actions building on these concepts need to be firmly grounded in local realities. Effective adaptation strategies require a long-term commitment to improving trust through meaningful stakeholder participation. Monitoring and evaluation procedures also need to be designed with inputs from local communities, and priority should be given to integrating their knowledge and experience into strategies.

Another approach to achieving this end is through building participatory approaches with farming communities. Extension services need to take into account the issues relevant to communities and tailor interventions to their particular needs. It is essential that information be made available at the local level, and that coping mechanisms be developed on a case-by-case basis as community and individual needs vary with livelihood, gender, and geography.

There are many existing examples of science helping to reduce vulnerability, such as agrometeorological advisories, but it is important that scientific findings and new technologies be sensitized to ground realities. It is necessary to periodically assess the usefulness of scientific information and how this information is used to enhance capacities. Understanding local networks and communication interfaces should be a priority to ensure that knowledge is properly disseminated. For this, it is necessary to identify the appropriate interfaces to share scientific research in simplified language and to incorporate knowledge from applied sciences.

Another key issue is the need for financial engineering, in which science can play a role. To enable communities to manage climate change, we need to give farmers access to financial services and develop reinsuring mechanisms in collaboration with governments.

**“There is a significant problem in translating research into action.”**

—Ganesh Thapa, IFAD

**“Understanding social responses and the social construction of knowledge is very important, but capturing all elements is difficult.”**

— A Nambi Appadurai  
Water Resources Institute



## Consolidating Knowledge: Adaptation science for holistic perspectives in upstream and downstream contexts

### Key messages

- Mountain people and downstream communities are closely connected, and changes in upstream areas can have tangible impacts on downstream areas. Science, policy, and practice aimed at improving the resilience of upstream or downstream communities must take these linkages into account.
- To ensure that adaptation science coheres with the needs of local communities, holistic policy perspectives and sufficient stakeholder consultation are required at the local and sub-national levels so that outcomes benefit both upstream and downstream communities.
- New knowledge in adaptation science, as well as policy and action to improve the resilience of communities, should be marked by a shared understanding of the priorities and challenges faced by local communities.

#### Chair

Roland Steurer, GIZ

#### Panellists

Asit K Biswas, Third World Centre for Water Management; Svante Bodin, International Cryosphere Climate Initiative; Vinod K Gaur, CSIR 4PI; VK Bahuguna, Government of Tripura, India; Ganesh Thapa, IFAD; Golam Rasul, ICIMOD

#### Session host

Rajan Kotru, ICIMOD

#### Rapporteurs

Suman Bisht and Yi Shaoliang

Upstream and downstream contexts are often viewed separately when it comes to policy making due to national and administrative boundaries and differences in terrain and environments. Changes in these regions are generally considered as separate and unique to either upstream or downstream areas in the domains of climate and adaptation science, as well as in policy making. However, these areas are closely linked by political, geographical,



and social factors. Changes that primarily affect either area can have significant spill-over effects on the other, and their dependencies are not mutually exclusive.

Climate and other changes in upstream regions have a direct impact on water availability across ecosystem interfaces and livelihoods in downstream regions such as river basins and plains. In addition, adverse changes in mountain regions can increase migration outflows, placing stress on downstream urban areas. Similarly, policy and action to improve livelihoods in downstream communities or at a national level can have potentially large spill-over effects on upstream areas and their people, particularly in the case of hydropower projects, which often inundate valuable agricultural land and displace upstream communities. Additionally, the dearth of global and regional knowledge and research on food security in the mountains has resulted in a bias towards national agricultural planning based on crop varieties and irrigation methods that are more suitable for downstream areas, such as plains, compromising the ability of mountain societies to benefit from national food security and adaptation plans.

Science, policy, and practice aimed at understanding and improving the adaptation capacity of mountain societies should, therefore, take into account the potential effects of these policies on downstream regions. Similarly, action aimed at downstream communities should take into account the potential adverse effects on upstream communities. Adaptation science has been unable to formulate a convergent and harmonized response to the needs of upstream and downstream communities. Researchers need to learn from local knowledge on issues such as food security and harness local inputs and traditions, for example, through documented cases of local Himalayan seed varieties that are more effective in countering variable climate conditions. To achieve this, a bottom-up approach can be useful in integrating adaptation science with the needs of local communities. This should involve the documentation of agrobiodiversity and traditional knowledge on conservation and crop varieties as well as stakeholder consultations. Stakeholder engagement processes may also need to take place at a higher level in order to ensure that the outcomes of consultations are acceptable to both upstream and downstream communities.

In generating new adaptation knowledge, as well as in formulating policy and action to improve resilience, it is necessary to bring in different perspectives from a diverse group of stakeholders. While promoting research on adaptation, action should be planned along with communities according to their priorities and should take into account their short- and long-term needs. It is often possible to carry out data collection based on research, monitoring, or modelling and, thereby, generate knowledge that is marked by a shared understanding and communicated back to local communities using simple language. Actionable communication should also be adapted to the scale, sector, and type of stakeholders and institutions involved.

A holistic perspective on inclusive and integrative policy and action must extend across local, national, and regional boundaries, as well as divisions between academic disciplines, and should empower institutions at all levels to effectively integrate their policy and implementation processes. Local institutions need to be supported to implement standard protocols for decision making as well as the application of such decisions to enhance their service delivery. Meanwhile, these institutions need to be gender-sensitive and equitable, and they must have constructive policy support from national-level institutions. In this context, ongoing reform processes such as decentralization, deconcentration, and devolution are steps towards empowering local institutions to take larger ownership of the actions and decisions made on the ground. This is likely to lead to sustainability and enhanced scope for future innovations.

**“We need a two-way flow of information and communication.”**

— Roland Steurer, GIZ

**“Holistic perspectives are those that take into account scientific and local knowledge across fields, disciplines, cultures, and institutions. They are inclusive of marginalized people and have a clear focus on gender.”**

— Ganesh Thapa, IFAD

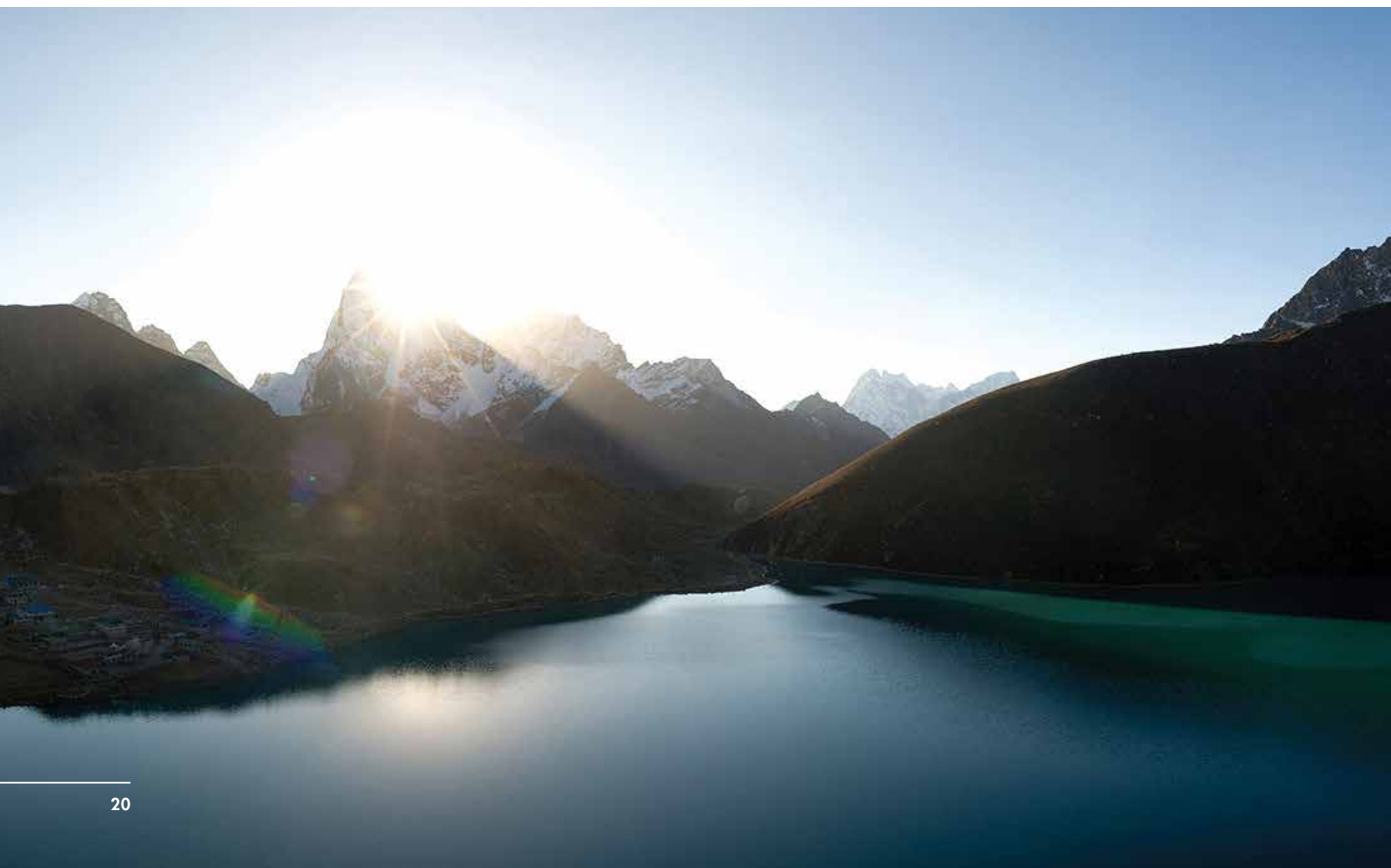
## Enhancing Compatibility: Connecting national adaptation plans with global strategies

### Key messages

- Sound science, effective policy, adequate finance, good governance, and robust implementation are key prerequisites for good coordination between the different tiers of government.
- The focus on coordinating strategies across global, national, and sub-national levels should be in line with the speed of implementation, scale of adaptation projects, and scope of comprehensive adaptation action.
- As transboundary impacts of change can be large, cross-border flows of knowledge are important in order to enhance the benefits to the entire region.

As climate change and its impacts become increasingly apparent, exacerbating the vulnerabilities of poor, disadvantaged, and marginalized communities, national and international agencies are stepping up their efforts to address the challenges. The UNFCCC has initiated action to support nations, with focus on the least developed countries, to prepare national adaptation plans (NAPs). Complementing the UNFCCC initiative, the UNDP and the United Nations Environment Programme (UNEP) have launched the NAP global support programme. Despite these efforts, action on the issue is unsatisfactory and is not progressing at a

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<b>Keynote speaker</b>	Atiq Rahman, Bangladesh Centre for Advanced Studies
<b>Panellists</b>	Rojina Manandhar, United Nations Framework Convention on Climate Change (UNFCCC) Secretariat; Arabinda Mishra, The Energy and Resources Institute; Vijaya Singh, United Nations Development Programme Nepal; Batu Krishna Uprety, UNFCCC-least developed countries expert group
<b>Session host</b>	Dhrupad Choudhury, ICIMOD
<b>Rapporteurs</b>	Rucha Ghate and Neera Shrestha-Pradhan





sufficiently urgent pace. Although many countries have initiated action, the affected communities remain vulnerable and adaptation does not seem to be integrated into national development plans. In particular, the integration of issues related to gender equality remains a big concern.

The United Nations has offered many opportunities through its various programmes to address climate change adaptation, but these efforts need to trickle down to communities. One of the main challenges is to ensure that these efforts are helping communities build their capacities to adapt. However, different agencies face various challenges at the international, national, and sub-national scales. As a result, global and national strategies and programmes need to be synchronized with governments and local institutions to make NAPs and their integration with national development programmes more effective. It is also essential to integrate mountain adaptation concerns into the global discourse and align them with the post-2015 sustainable development goals.

Scientific knowledge needs to be bridged with people's knowledge through communication and should be taken to stakeholders. The key prerequisites for good coordination between different tiers of government include good science, effective policy, adequate finance, good governance, and robust implementation. Climate change is a global phenomenon with severe localized impacts on communities, particularly mountain people. However, it has also brought new opportunities for mountain people, and these opportunities should be capitalized on. There is a need to integrate local knowledge and practices with scientific knowledge to bridge existing gaps between local practices, national plans, and global efforts. Adaptation practices need to be included in national plans to ensure a wider range of options for farmers to generate adequate income for better livelihoods. The funds allocated for climate change should reach the most vulnerable communities to support them effectively in adaptation practices.

It is important to engage institutions and transfer ownership to regional centres and networks by providing a platform to implement activities. Community-level adaptation practices should be integrated with national-level processes and budgetary provisions should be made for this. Not only must the immediate needs of the people be addressed, but efforts should also be made towards building the capacity of local and regional institutions as well as improving socio-political and ecological systems.

Adaptation is particularly important for vulnerable people, so NAPs should aid local adaptation practices. There is a need to analyse how climate change affects different sectors of the economy and society and to what extent these sectors are informed about existing adaptation strategies and emerging opportunities. Synergies among various sectors are required to establish a set of appropriate practices and adaptation processes to improve the resilience of people, institutions, and systems.

Technology, capacity, and resources are three major pillars of adaptation. It is necessary to enable institutions to extend synergies from the global to the regional level. It is also important to develop the concept of adaptation as a regional public good and to build the capacity of regional institutions to empower them in order to engage with policy makers and politicians more directly, focusing on the speed of implementation, scale of adaptation projects, and scope of comprehensive adaptation action.

**"No country can have standalone strategies and plans."**

— Zafar Hasan Reza  
Pakistan Agricultural Research Council

**"Process defines content; hence, the focus should be on the speed of implementation, scale of adaptation projects, and scope of comprehensive adaptation action."**

— Arabinda Mishra, TERI

**"Climate change is a global phenomenon with severe localized impacts on communities, particularly in the mountains."**

— Atiq Rahman  
Bangladesh Centre for Advanced Studies

## Engaging Actors from the Periphery of Adaptation Policy Discussions

### Insurance and risk mitigation strategies: Ensuring recovery after climate-induced loss

#### Key messages

- Financial tools such as insurance and remittances have the potential to improve the resilience of vulnerable communities in post-disaster scenarios.
- Innovative and efficient insurance schemes that tie premiums to the level of risk can also work as a mitigation and adaptation strategy by encouraging consumers to adopt behaviours that reduce their risk exposure.
- Good scientific data and modelling are essential to enhance the positive outcomes of insurance as they can aid insurance companies in calculating risks and pay outs, often resulting in reduced premiums.
- The active role of governments is essential to promoting insurance among poor communities.

<b>Chair</b>	Mohammad Rafiqul Islam, Bangladesh Planning Commission
<b>Panellists</b>	Anamika Barua, SaciWATERS; Giovanna Gioli, University of Hamburg; SVRK Prabhakar, Institute for Global Environmental Strategies; Eddy Moors, Alterra Wageningen UR; Judy Oglethorpe, WWF Nepal
<b>Session host</b>	Nand Kishor Agrawal, ICIMOD
<b>Rapporteurs</b>	Soumyadeep Banerjee and Deepa Basnet



Insurance and other financial mechanisms are often overlooked in discussions of adaptation to change, but they have the potential to act as significant components of long-term adaptation strategies. In the wake of climate-induced loss, attention often turns exclusively to government- or aid-based relief efforts. However, insurance and other forms of financing such as remittances and saving schemes can also improve the resilience of vulnerable communities to the effects of change and may even prove more efficient in the immediate aftermaths of disasters. It is, therefore, crucial that policies to promote financial adaptation practices are backed by good scientific information and that they centrally address climate adaptation and resilience.

As both the scale and frequency of climate-related disasters increase, the question of how insurance systems can provide security to vulnerable communities while remaining financially and commercially viable becomes increasingly complex. However, insurance not only has the potential to help with recovery and resilience to the effects of climate change, it may even work indirectly as a mitigation and adaptation strategy. For instance, if insurance is made mandatory and the cost of coverage is tied to the level of risk,

consumers are likely to adopt behaviours that reduce those risks. Additionally, insurance plans that reward planning with higher indemnities for long-term policy holders may also encourage farmers to invest in better management practices.

However, for insurance to be beneficial to farmers, insurance companies, and the relevant governments, the system must be designed such that it benefits all stakeholders, results in overall positive development, reduces disaster risk, and enhances adaptation to climate change. A poorly designed system can have a negative effect on these outcomes. For instance, in many developing countries insurance is not mandatory and, where it is present, agricultural insurance is subsidized. These subsidies pose an economic burden on the governments and have the potential to create an environment in which farmers do not assess risks seriously, promoting more high-risk behaviour. Therefore, a well thought out plan of initial government support to encourage poor farmers to get insurance is essential.

For insurance to be part of the portfolio of disaster responses, there must be a focus on making insurance policies both innovative and efficient. A major issue in post-disaster scenarios is delayed insurance payments, which hinders policyholders' ability to recover. Payments must be made as quickly and efficiently as possible. Insufficient coverage of hazards and high basis risk are also problematic. Appropriate and innovative policy and contract design must be the focus; multiperil and location-specific approaches, and the mandatory combination of risk-mitigation and risk-diversifying instruments can reduce basis risk and lessen losses.

It is also important to assess ways in which insurance can ensure long-term recovery. For instance, analysing how payouts are made and how they are spent or reinvested is crucial, as well as finding ways to encourage long-term risk reduction during the recovery process. Additional inventive approaches, such as making female household members the beneficiaries of policies or schemes that link savings to insurance coverage, can assist in attaining development goals such as gender equity and improved household indicators of health and education. These types of approaches ensure that insurance acts as a recovery or mitigation measure and that it actively enables adaptation to climate and other changes.

Ensuring good scientific data and modelling are essential to strengthening the positive outcomes of insurance. Insurance coverage is based on the historical incidence of an event, which is used to calculate the probability of reoccurrence. Therefore, accurate, long-term data collection and analysis can significantly aid insurance companies in calculating risk and payout thresholds, often reducing premiums. Scientific input can also help policyholders to assess and minimise risk, for instance, by providing farmers with weather forecasting and advice on planting timeframes, seed selection, fertilizers, and optimal farming methods. In developing nations, good scientific information linked with innovative policy can provide the basis for a holistic, practical approach to insurance, risk management, and livelihood development.

Insurance is only one financial tool that can be used in coping with the effects of climate-induced loss. Other solutions range from large-scale tools such as India's kisan credit card scheme, which removes bureaucratic hurdles for farmers needing credit, to individual tools, such as remittances from family members to help in post-disaster recovery.

**“People need to be able to access more than one method to build their resilience to climate-related loss.”**

— **Judy Oglethorpe**  
WWF Nepal

**“Remittances compensate for weak credit and insurance markets, and they stimulate local economies through the multiplier effect.”**

— **Giovanna Gioli**  
University of Hamburg

## Transboundary river basins: Management and benefit sharing as adaptation mechanisms

### Key messages

- Transboundary resource management needs to be firmly rooted in national development plans as well as existing regional fora for cooperation.
- Building trust, respect, and common ground between different stakeholders is key to successful transboundary cooperation.
- Economic integration and private sector involvement can strengthen actions grounded in consensus and commitment.

Adapting water management to climate change in the transboundary river basins of the Hindu Kush Himalayas requires prudent sharing of the benefits that arise from water use between the major production sectors of agriculture, energy, and industry. The focus of this benefit sharing should be on enhancing energy security and building resilience to water-related disasters. Given the challenges of river water allocation during the last decades, it is important to seek innovative solutions to promote benefit sharing in transboundary river basins. It is also important to design water management programmes such that they are catalysts for action by decision makers and that they promote economic development and the wellbeing of local people. At the same time, it is important to recognize and harness the complementarities between resilience building and disaster risk reduction as methods to reduce overall vulnerability among the inhabitants of these river basins.

The economic integration of the HKH region and the downstream river basins would provide an effective environment for benefit sharing. Economic integration and private sector involvement can strengthen actions

<b>Chair</b>	Anil Sinha, Bihar State Disaster Management Authority
<b>Keynote speaker</b>	Asit K Biswas, Third World Centre for Water Management
<b>Panellists</b>	Mats Eriksson, Stockholm International Water Institute; Ramesh Vaidya, ICIMOD; Sandhya Rao, Integrated Natural Resources Management (INRM) Consultants; Gyanendra Lal Pradhan, Hydro Solutions
<b>Session host</b>	Shahriar Wahid, ICIMOD
<b>Rapporteurs</b>	Santosh Nepal







grounded in consensus and commitment. While such a strategy would have a central focus on water as a natural resource around which regional economic exchange takes place, the approach extends beyond water and could encourage balanced trade and investment across various sectors. The hydroelectric power generated could be a natural starting point from which to promote regional economic integration.

There are many effective examples of transboundary river management, and the cooperation between India and Bhutan for hydropower development stands as a good one. However, building trust, understanding, and respect and finding common ground among stakeholders is critical for successful cooperation, as is political commitment for sharing resources.

Building transboundary cooperation requires mutual trust, which can be a basis for identifying common benefits or threats in a basin. Regional transboundary water management strategies, therefore, need to be anchored to national development plans to ensure strong foundations. Attending to energy security in the river basins and developing a consensus-based framework for disaster risk reduction offer ample avenues for water cooperation in the river basins.

Private sector involvement can be instrumental in speeding up the development of hydropower in the region. By negotiating separately with policy makers and communities in upstream areas, where power is developed, and in downstream areas, where it is marketed, the private sector can often expedite the development of necessary infrastructure and institutional arrangements.

Climate change poses threats to water resources and this has significant adverse consequences for transboundary water management. Continuous dialogue with stakeholders, including policy makers and local communities, is crucial to achieve wide-ranging support for water management projects and related disaster risk reduction processes. To tackle these problems, it is important to build capacity at various levels.

**“Water should be seen as a connector of societies, rather than as a sector.”**

**— Mats Eriksson**

Stockholm International Water Institute

**“Transboundary water management in South Asia requires out-of-the-box thinking by realizing the unique geopolitical situation of the region.”**

**— Anil K Sinha**

Bihar State Disaster Management Authority

## From mountain to mountain: Lessons for the HKH from other regions

### Key messages

- There are many lessons to be learned and shared between mountain regions and communities to improve climate change adaptation and encourage the spread of good practices and useful knowledge.
- It is important to promote practice-sharing on climate change adaptation across borders and between mountain communities and regions. Several existing international institutions, bodies, and meetings can play a role in facilitating practice-sharing.
- Communication needs to be specific and targeted to different contexts and frames of understanding, whether at the level of local communities, local officials, policy makers, or global actors. In addition, sub-national cooperation between regional and local government agencies, as well as between government and non-government actors, is crucial to adaptation across mountain regions.

Mountain communities have a wealth of knowledge and strategies accumulated over generations on how to cope with living in remote, harsh environments and how to adapt to climate variability. Regional adaptation strategies need to recognize this and build on local knowledge, including the local knowledge of mountain communities

#### Chair

Basanta Shrestha, ICIMOD

#### Panellists

Yuri Badenkov, Russian Academy of Science; Lawrence Hislop, GRID-Arendal; Janine Kuriger, Swiss Agency for Development and Cooperation; Manfred Seebauer, GIZ; Saskia Werners, Wageningen University

#### Session host

Erling Valdemar Holmgren, ICIMOD

#### Rapporteurs

Naina Shakya and Marjorie van Strien





from other regions. When mountain ecosystems are managed sustainably they can provide essential regulating services that act as buffers against climate change and natural disasters.

There is a strong need for better coordination to foster transboundary cooperation and partnerships for climate change adaptation. Multilateral institutions, non-governmental actors, and inter-governmental agencies – such as the Mountain Partnership, UNEP's climate coordination activities programme, the Global Adaptation Network, and the International Institute for Environment and Development's community-based adaptation conferences – can play central roles in building bridges across institutions and countries, and applying lessons learned from other regions.

It is of central importance to facilitate exchange at the sub-national level between regional and local government agencies in order for climate coordination activities to be properly formulated and ultimately absorbed at the local level. At the same time, it is also critical to foster links and partnerships between governmental and non-governmental actors. Public-private partnerships can often help in achieving development goals using private sector efficiency in the provision of essential services.

Mountain institutions in different areas of the world have a lot of pertinent information, data, and experience to share with each other in many areas of science, policy, and practice. In particular, the Carpathian Convention – an agreement between seven states to protect, maintain, and sustainably manage forests in the Carpathian mountains – can be used as a model for cooperation between the HKH states.

Poor communication and coordination poses bigger challenges in fostering regional cooperation and partnerships for climate change adaptation in the HKH region. In addition, there seems to be an increasing disconnect between the global, national, and local levels in terms of knowledge sharing. This disconnect must be addressed in order to share good climate change adaptation practices from around the world.

Climate change adaptation also needs specific communication mechanisms tailored to local contexts and frames of understanding, such as crafting positive environmental narratives using legendary or mythological figures to convey important messages to local communities. This also applies to raising awareness among political authorities and local administration officers concerning policy development. Another way to raise awareness could be to recognize local-level success stories in climate change adaptation by adopting them into national policy instruments in order to connect local and global levels and climate change adaptation.

“There is a strong need for exchange at the subnational, regional, and local levels for adaptation knowledge to be absorbed at the local level.”

— Janine Kuriger

Swiss Agency for Development and Cooperation

“It is critical to foster links and partnerships between governmental and non-governmental actors.”

— Manfred Seebauer, GIZ



## Connecting the Dots: Translating science to policy through effective communication

### Key messages

- Better communication of science to communities and policy makers can be achieved by including them in research at the outset to identify their needs and priorities, tailoring information specifically for different audiences, and improving scientists' understanding of the policy-making process and local action so that scientists are better able to create targeted information using simple language.
- It is important to examine when a lack of understanding and communication becomes a key barrier to the integration of scientific information into policy and practice.

Translating climate and adaptation science into good policy at various levels requires a system of effective communication to ensure the uptake of scientific knowledge by policy makers and to improve the understanding of climate issues. It is, therefore, important to identify ways to simplify scientific messages and build bridges between science, policy, and the general public. Additionally, in designing effective communication strategies, it is advantageous to look at examples from other regions or sectors and to identify what made them successful.

It is relevant to question whether a lack of communication is the underlying issue preventing a wider uptake of scientific knowledge by policy makers. In many cases, the key messages of climate science are already available to policy makers in easy-to-understand language. Political leaders also have greater access to local communities than scientists and are better positioned to understand their ground realities. Even when there is broad support for a particular action, large multinational corporations can hinder action because it may threaten their deeply entrenched interests. Therefore, climate change also involves questions about ethics and values that go beyond science. This is where the arts and humanities can play a role. It is necessary to examine how science can be used by, and made understandable for, policy makers and communities, and how scientists can ensure that their work is useful for these groups.

<b>Moderator</b>	Anne Solgaard, GRID-Arendal
<b>Keynote speaker</b>	Ashok Gurung, India China Institute
<b>Panellists</b>	Kunda Dixit, Himal Media; Batu Krishna Uprety, UNFCCC-least developed countries expert group; Mona Laczó, BBC Media Action; Trude Rauken, CICERO; Rucha Ghate, ICIMOD
<b>Session host</b>	Anja Møller Rasmussen, ICIMOD
<b>Rapporteurs</b>	Abid Hussain and Shradha Ghale





There are several reasons why climate science is not always compatible with politics and the media. Climate change is uncertain, but politicians and the media dislike uncertainty; they want definite answers. The impact of climate change is long-term, but politicians and the media typically think in terms of short-term consequences. Climate change demands large-scale global actions, but politicians and journalists have to operate within local or national parameters.

It is a good idea to involve policy makers at the outset of the process of knowledge creation and scientific study and to specifically identify all relevant policy makers and institutions. Being cognizant of the concerns or queries of policy makers at the outset will further fine tune the direction, content, and language of a scientific message.

It is vital to use language that is understandable to the people on the ground. Talking about real problems faced by people is more likely to convince them of the need or urgency of a measure than dense scientific messages. While abstract science may not be easily understood, people comprehend messages quickly if they are linked to local systems and pertinent issues such as food, water, resources, and livelihoods. Different groups of people also need different kinds of information. Paying attention to these differences and bringing the communication needs of ordinary people to the forefront of the climate change conversation is a simple solution to connect people with science.

It is also important to enhance the media's capacity to communicate climate science to the public and policy makers. Journalists should not only understand the relevant scientific terminology but also the policy formulation process. They also need to be given sufficient training to understand the local socio-political systems so they are able to produce media outputs that are more critical and pertinent to local communities.

It is necessary to understand local values and the structure of power and politics in framing communication tools to convey scientific knowledge to policy makers. A simple, understandable, and evidence-based scientific message is more attractive to both local communities and the media and more useful in prompting action. Science – particularly climate science – may be difficult for communities and policy makers to understand and to match with their local needs and political interests. For scientists to influence policy making, they need to understand the policy formulation process and identify the key policy institutions and persons who may better understand the scientific message to be articulated in policy formulation. The role of civil society is also important to bridge this gap. Likewise, the collaboration of the media with scientists, communities, and policy makers can better harness the synergies between these groups and can contribute to effectively bridging the gap between science and policy.

“The question is really about power and politics.”

— Ashok Gurung, India China Institute

“We need to differentiate between scientific knowledge that is geared towards bringing policy change and that which is not directly related to policy change.”

— Rucha Ghate, ICIMOD

“There is a need to think about who controls the production of knowledge, and who is using it.”

— Trude Rauken, CICERO



## In Practice: Integrating adaptation knowledge into development

### Key messages

- Adaptation and development planning should be seen as interdependent rather than isolated processes. It is crucial to integrate the adaptation process with development planning, particularly in vulnerable mountain regions, and to translate national level strategies and policies for local governments and communities.
- The major bottlenecks are the low to no participation of communities, lack of ownership of governments, excessive focus on meeting immediate development needs, and weak coordination between sub-national and national governments.
- To integrate climate change adaptation into development planning, there is a need to build the capacity of local people and ensure local participation, strengthen databases, improve institutional mechanisms to address the trade-off between ecosystem and development needs, and ensure resources and funding.

<b>Chair</b>	Jigmi Rinzin, National Council of Bhutan
<b>Keynote speaker</b>	Hari K Upadhyaya, Centre for Environmental and Agricultural Policy Research, Extension and Development
<b>Panellists</b>	Maurizio Busatti, International Organization for Migration; Muhammad H Popalzai, Ministry of National Food Security and Research, Pakistan; Bernard Cantin, IDRC; Sunil Tankha, International Institute of Social Studies
<b>Session host</b>	Dhrupad Choudhury, ICIMOD
<b>Rapporteurs</b>	Neera Shrestha-Pradhan and Abid Hussain

The integration of adaptation approaches into national and sub-national development planning processes remains highly inadequate and is a critical challenge in the large-scale implementation of these approaches. In order to address this challenge, efforts must be made to draw from the experiences of different countries in the HKH region and to study their ongoing efforts to integrate adaptation processes into development planning.



Mountain ecosystems are rapidly changing and widening the range of challenges faced by mountain people. This creates an urgent need to integrate climate change adaptation into development planning and further into development policy. While it is difficult, it is not impossible to integrate climate change adaptation into development planning. There are a number of best practice cases that have the scope to be scaled up and easily internalized by the people. The major challenges are the low participation of communities, low level of ownership of governments, excessive focus on meeting immediate development needs at the cost of long-term needs, and weak coordination between subnational and national governments.

Currently, adaptation and development planning are carried out in an isolated way, which leads to disjointedness between plans at different levels and of different types, such as national adaptation programmes of action and local adaptation plans of action. There is a dire need to integrate the adaptation process with development planning, particularly in vulnerable mountain regions, and to translate national-level strategies and policies for local government and communities. It is also important to have people-centric approaches and the involvement of all stakeholders in adaptation planning. Particularly in developing agriculture and food security policies, national governments should involve many different stakeholders, including federal and/or provincial governments, non-governmental actors, inter-governmental organizations, and local communities in the policy formulation process.

One of the major challenges is that of timescale: climate science talks about the long-term future, whereas decision makers and politicians need information about the short term. Climate change adaptation is a question of effective risk management and the informed pricing of risk, and climate change risks should be considered among other risks in risk management and planning. Therefore, we need to look beyond trade-offs to maximise benefit sharing.

There is also a need to divert available funds to the most appropriate institutions. In South Asia, some institutions are overfunded, whereas critical institutions are still underfunded. This presents an opportunity to achieve positive adaptation outcomes by strategically channelling funds to the right organizations. Moreover, a significant share of available funds must reach the local level where adaptation actions are implemented.

“Besides climate change, we must think about all global drivers of change, such as migration, market, policy framework, natural changes, and human conflict.”

— Hari K Upadhyaya  
CEAPRED

“Critical institutions are still underfunded.”

— Sunil Tankha  
International Institute of Social Studies

“The question is really about power. We need to use language in a way that makes sense to both local people and policy makers.”

— Bernard Cantin,  
International Development Research Centre

“Is it politicians who are responsible for not integrating adaptation into development planning, or is it scientific reports that do not really convey their message, or technocrats and executives who cannot translate the language of the reports into action?”

— Jigmi Rinzin  
National Council of Bhutan



## Applying Lessons from Science and Policy to Local Contexts

### Climate-smart strategies: Large- and small-scale innovations and services for a changing climate

#### Key messages

- Bottom-up social innovation must find support in national and regional policies and programmes.
- Top-down technological solutions must reflect the needs of various communities, particularly women.
- Addressing issues of power and gender inequality in accessing resources and knowledge is critical to avoiding capture of technology and resources by elite groups.
- Effective strategies must be implemented as part of a larger package of adaptation strategies, rather than as isolated interventions, and may include financial instruments such as crop insurance, scientific inputs such as weather advisories, and information and communications technologies (ICT) such as SMS services.

<b>Chair</b>	Yang Yongping, Kunming Institute of Botany, Chinese Academy of Sciences
<b>Keynote speaker</b>	Pramod K Aggarwal, Consultative Group for International Agricultural Research (CGIAR)
<b>Panellists</b>	Raminder Singh, Reuters Market Lite; Partha J Das, Aaranyak; MSR Murthy, ICIMOD; Suocheng Dong, IGSNRR
<b>Session host</b>	Suman Bisht, ICIMOD
<b>Rapporteurs</b>	Pooja Pathak

While top-down approaches are more visible at regional and national levels, bottom-up and socially innovative approaches are effective at the community level. For climate-smart strategies to be successful, it is important to effectively integrate the two approaches.

When integrating these two approaches, it is crucial that diverse examples of successful climate-smart strategies are studied and adapted to suit the context of the HKH region. Several innovative strategies have already successfully merged technological innovations with community participation. Many such examples involve crop insurance, weather-based agricultural advisories, early warning systems for floods, flood-resistant crops, and the use of ICT to link farmers with markets.

Crop insurance is an effective strategy for improving the management of climatic risks, as it can reduce income variability and, thereby, the vulnerability of mountain societies. Especially on a large scale, it can ensure the sustainability of low insurance premiums. Such initiatives can focus on engaging farmers to design their insurance packages, as well as to measure, report, and verify the losses with the use of ICT. However, crop insurance must be implemented as part of a larger package of water management and other adaptation strategies rather than as an isolated intervention.

Another strategy is the provision of weather-based agriculture advisories. It is important to contextualize such advisory notices given by scientists to the local level. Such advisories should involve a two-way communication process that allows farmers to ask relevant questions and scientists to respond to them. Community-based approaches such as climate-smart villages can be useful in



overall risk management, adaptation, and mitigation. Technological innovations must be in line with local development plans and must meet the needs of local institutions for these approaches to be meaningful.

It is also important to study the potential effectiveness of scaling out successful strategies. Key to this process is the ability to identify the right technology for a particular community and climate situation, with a clear impact pathway that includes identifying partners, the capacity building of all key actors, and the use of appropriate business models to scale out institutional mechanisms that support potential public-private partnerships.

ICT strategies can involve simple, innovative tools such as customized SMS services that provide information on weather, the availability of seeds, market locations for the sale of agricultural produce, market prices, optimal seasonal crops, and other relevant information. Such messages conveyed in a local language can foster direct market linkages and remove the need for middlemen in the sale of produce. ICT tools can also be instrumental in empowering women and giving them information related to poultry and dairy farming, or other information relevant to their roles in the production process. In communities where large differences in decision-making power and resource-controlling agency is skewed towards males or other groups, special attention should be paid to avoid the capture of resources and technology by elites.

Overall, a successful climate-smart strategy ensures value addition and gender equity in terms of access to markets and income, provides a service that improves wellbeing, involves environmentally-friendly technology, puts in place a clear framework for institutional action, and builds the capacity of local communities. Mechanisms should be designed to encourage the wide participation of local communities. The technology involved in the strategy should be easy to use, reliable, and economically viable. Local institutions must be involved in assessing and improving the monitoring systems. Finally, instruments should be created to provide financial, technical, and policy support from the government to ensure the sustainability of this process.

**“Scaling out should not be left to the government. It must include public-private partnerships.”**

— Pramod K Aggarwal  
CGIAR

**“There are six key ingredients in an effective climate-smart strategy: value, equity, service, technology, institution and mechanism, and capacity building.”**

— Dong Suocheng  
IGSNRR





## Adaptation in action: Indigenous, existing, and emerging practices for managing livelihoods

### Key messages

- There is a wealth of knowledge in the traditional and emerging indigenous practices of local communities on adapting to the effects of climate change. This knowledge needs to be incorporated into local- and national-level adaptation and development plans.
- The bidirectional flow of knowledge between climate scientists and local communities, with a focus on communicating this knowledge to policy makers, is necessary to create a sustainable adaptation strategy that is sensitive to local communities and promotes development and equity for marginalized groups.

Mountain regions are unique in several ways. Their fragile biophysical conditions, remoteness, isolation, and marginalization make communities in these regions more vulnerable to environmental degradation and climate risks, which constrains adaptive capacities. However, various mountain communities in the HKH region and in other areas have wide-ranging indigenous practices for managing and maintaining livelihoods in the face of climate risks. Of these practices, some are longstanding while others are just emerging. It is essential to assimilate this knowledge from the local level to the national level.

<b>Chair</b>	Eklabya Sharma, ICIMOD
<b>Keynote speaker</b>	Bernard Cantin, IDRC
<b>Panellists</b>	Pushkin Phartiyal, Central Himalayan Environment Association; Veronika Utz, GIZ Pakistan; Madhav Karki, International Union for Conservation of Nature; San Win, University of Forestry, Myanmar
<b>Session host</b>	Soumyadeep Banerjee, ICIMOD
<b>Rapporteurs</b>	Devjit Roy Chowdhury and Deepa Basnet



At the same time, wider global changes including globalization, liberalization, urbanization, increased connectivity and mobility, and changes in land use bring new challenges that are often not addressed by traditional adaptation strategies. There is a need for scientists studying these challenges and policy makers implementing strategies to increase awareness among mountain communities in order to improve their capacity to adapt to such changes. There is an urgent need for the bidirectional flow of knowledge and practices between local communities and scientists, with a focus on communicating the results to policy makers so that they can be implemented through national- and regional-level adaptation and development plans.

“Resources are scarce in mountain regions, and maladaptation needs to be avoided.”

— Pushkin Phartiyal  
CHEA

Mountain societies and institutions often struggle to understand the change processes and their differential impacts on various groups of people. The difficulty in comprehending and acting upon these processes stems primarily from the lack of two-way flows of information. For instance, in the HKH region, socioeconomic realities such as climate-induced outmigration are not often identified by research institutions, resulting in strategies that are ineffective. For example, having large proportions of female inhabitants in regions with high male outmigration may make some strategies inappropriate or unfeasible.

**“Good indigenous practices should be supported by policies and institutions.”**

**— Eklabya Sharma**  
ICIMOD

Across the HKH region, people, policy makers, and research institutions should work together to devise gender-sensitive strategies for adaptation to change. In situations where the retreat of glaciers causes changes in water availability, institutions should bring specialists to train local communities regarding water use and micro-irrigation. They should facilitate a community-led initiative to decide on water rights and distribution methods.

Given that climate change is uncertain, there are still existing knowledge gaps. Mitigation is done on a global scale, but adaptation is done locally. Without the involvement of communities, it is impossible to achieve sustainable solutions to the problems caused by climate change. Frameworks such as GIZ's 'vulnerability sourcebook' can be useful in designing strategies that involve adequate local representation in the decision-making process. Moreover, qualitative knowledge should be combined with data to evaluate the effectiveness of such strategies.

Efforts need to be made to recover lost indigenous knowledge regarding adaptation practices. A way of achieving this may be to establish knowledge platforms or institutions with the participation of local communities and a focus on providing proportional representation for marginalized groups and establishing balanced power relations. It is also essential that development practitioners understand and communicate with local communities through such institutions before formulating any local- or national-level policies.





## Adding value: Promoting climate-resilient livelihoods and value chains

### Key messages

- It is essential to implement strategies for the long-term improvement of mountain livelihoods and, thereby, help communities become more resilient to the effects of climate change.
- There is a great untapped potential for the production of niche crops and materials as well as other economic activities, such as tourism, that can take advantage of the unique microclimates of the mountains.
- Scientists must play an active role in diversifying livelihood options and addressing adaptive capacities by documenting traditional production and local knowledge, outlining existing economic linkages, and engaging in action research of innovative crops and techniques.

<b>Chair</b>	TS Papola, Institute for Studies in Industrial Development
<b>Keynote speaker</b>	Suraj Vaidhya, South Asian Association for Regional Cooperation (Chamber of Commerce and Industry)
<b>Panellists</b>	Anu J Shrestha, ICIMOD; Pankaj P Raturi, Dabur Nepal; Kallur S Murali, IDRC; Pradip Maharjan, Federation of Nepalese Chambers of Commerce and Industry
<b>Session host</b>	Marjorie van Strien, ICIMOD
<b>Rapporteurs</b>	Lipy Adhikari

Mountain communities in the Hindu Kush Himalayas generally have subsistence lifestyles that have come under pressure in recent years because of factors like poverty, globalization, unregulated development, population dynamics, and market integration, which have challenged the sustainability of local livelihoods and ecosystems. This situation is now further complicated by climate-related threats to the natural resources on which a majority of

mountain livelihoods depend. It is essential to develop and implement strategies for long-term livelihood improvement that will simultaneously help communities become more resilient to the effects of climate change. Without this, climate change, along with the other drivers of change, may result in a devastating loss of traditional settlements, knowledge, and diversity in the HKH region as well as an additional strain on resources in urban areas. The challenge of strengthening livelihoods in the mountains is, therefore, of central concern. Policy makers must work in collaboration with local communities, researchers, national and international business communities, and development practitioners to meet this challenge.

Despite the high levels of poverty in the HKH region, there is a significant untapped potential for the production of niche crops and materials as well as economic activities such as tourism that take advantage of unique mountain microclimates and landscapes. The sale of rare and high-value aromatic plants, medicinal plants, and spices as well as newly-introduced crops like coffee and oats may supplement traditional subsistence crops and other conventional economic activities in these areas. However, issues around how cultivation and harvesting techniques can be improved to meet





commercial standards, how producers can be linked to markets, and how to ensure that benefits are equitably distributed among producers remain unresolved. Additionally, more attention should be paid to building the climate resilience of products, services, and value chains and enhancing the adaptive capacities of mountain communities.

Scientists can play a pivotal role in diversifying livelihood options by documenting traditional production and local knowledge, outlining existing economic linkages and structures, employing action research to test innovative crops and techniques, and building climate resilience in value chains. Sharing the outcomes of this documentation and research widely with local communities, policy makers, and the private sector will aid in informed decision making and long-term planning. Government policies and programmes are needed to connect local producers to information about new technologies and market demand at the national and global levels. Policies that enable a better link between the private sector and these producers are also key.

However, questions regarding scale, nature of ownership, and benefit sharing in production in the context of mountain economies are yet to be addressed. While small, tight-knit communities sharing limited natural resources may benefit the most from cooperative models, there is some doubt that these models might not be able to consistently attract and maintain the investment and production needed to incorporate businesses into national or global supply-demand chains. However, privatized alternatives run the risk of unequal benefit sharing at the local level or even profits becoming concentrated outside of these communities. Therefore, it is essential to build capacity and work with business models that will create vibrant local economies, diversify mountain communities' sources of livelihood, and encourage people to continue living in the mountains while feeling connected to, and benefiting from, the wider economy and the world.

“Mountain value chains should be flexible enough to allow the economic improvement of all actors.”

— Kallur S Murali, IDRC

“The biggest problem is that mountain people are the most affected by climate change, despite being the least involved in the process.”

— TS Papola  
Institute for Studies in Industrial Development



## Getting Mountains on the Global Agenda: Mapping the way forward

### Key messages

- There is a need for a unified mountain voice on the global stage, which can be achieved by establishing strong regional and global cooperation between communities, institutions, and non-governmental actors.
- Collective reflection and learning and the incorporation of science and local knowledge are essential to ensuring that mountain issues are considered in the global processes to address climate change.
- It is vital to engage in communication at local, national, regional, and global levels to highlight the importance and urgency of adaptation action in the world's mountains.

The focus for the future must be on using regional and global cooperation to generate a unified mountain voice that is sensitive to, and inclusive of, local needs. This unified approach will form the basis for making sure that mountain issues are included as key considerations in upcoming processes to determine global actions for climate change adaptation, including those of the UNFCCC, the new IPCC assessment reports, and the Convention on Biological Diversity. There must be a push to promote institutional pluralism while carrying out global assessments and to include more input from the HKH region in these processes.

There is a need to create and support mechanisms that enable collective reflection and learning among diverse stakeholders, including researchers, policy makers, practitioners, and local communities. Poor communication between these stakeholders is a key weakness, and strengthening this communication will be essential to the successful adaptation to a number of changes in the Hindu Kush Himalayas, including the significant challenges faced due to climate change. Improved communication will result in coordinated action to achieve common development goals.

<b>Facilitator</b>	David Molden, ICIMOD
<b>Keynote speaker</b>	Ganesh Thapa, IFAD
<b>Panellists</b>	Bhartendu Mishra, National Planning Commission, Nepal; Malik Shakir Bashir Awan, National Assembly of Pakistan; Jigmi Rinzin, National Council of Bhutan; Rojina Manandhar, UNFCCC Secretariat; Jamie McGoldrick, UN Nepal; Yang Yongping, Kunming Institute of Botany, Chinese Academy of Sciences; David Molden, ICIMOD
<b>Session host</b>	Dhrupad Choudhury, ICIMOD
<b>Rapporteurs</b>	Suman Bisht, Shradha Ghale, and Tashi Dorji



“Communicating mountain knowledge and concerns is important. We must engage local, scientific, as well as indigenous knowledge holders while making adaptation plans.”

— Rojina Manandhar  
UNFCCC Secretariat

It will be beneficial to establish organizations and institutions with a primary focus on sharing knowledge and assisting in the integration of scientific knowledge into the policy formulation process. Existing organizations can set up dedicated teams to perform this function and engage with the media and civil society to facilitate the spreading of knowledge.

At the local level, in addition to improved communication, support must be provided in the form of better technology, capacity building, and provision of financial resources to plan and enact adaptation measures. In the face of disasters, governments are often unprepared for evaluating the severity of the situation, managing the effects, and providing humanitarian aid and assistance. In this context, intergovernmental or non-governmental organizations can play a key role in providing technical assistance to authorities.

**“Engagement in conferences and collaborative processes can expedite the placement of mountain voices on the global agenda. There is a need to set up regional monitoring and data sharing platforms.”**

**— Jamie McGoldrick**  
UN Nepal



# Launch of the Regional Database System

At the conference, Kjell Tormod Pettersen, the Norwegian ambassador to Nepal, launched ICIMOD's Regional Database System (RDS). Access to timely and high-quality data is essential to understanding the challenges facing mountain ecosystems and their people, enabling independent research and scientific enquiries, catalysing the development of knowledge products and innovations that improve the wellbeing and livelihoods of mountain communities, and empowering critical and urgent decision making in times of humanitarian crisis. The RDS is a central data repository for different thematic areas on the HKH region. This open-access web-based portal (<http://rds.icimod.org>) allows users to browse, search through, and download all of ICIMOD's published datasets and provides tools for creating custom maps and graphs. "By promoting data sharing, ICIMOD's Regional Database System will improve research, support policy, and provide benefits to the people and environments of the Hindu Kush Himalayan region", said Pettersen. The data sharing policy governing the use of data from the RDS is aligned with the philosophy of access to high-quality scientific information and knowledge. The RDS can be accessed through the portal upon registration and acceptance of the data use policy.

## Poster Presentation and Marketplace Session

### Poster Presentation

One of the main goals of the conference was the participation and contribution of young researchers in the theme of climate change adaptation. In order to encourage young individuals to showcase their ongoing or recent work, an open call was made for the submission of posters on the conference theme. The contest attracted submissions from 88 young change makers from nine countries, with the largest number of submissions coming from India, Pakistan, Nepal, and Bangladesh. Three submissions were received from outside the region (from Iran, the United States, and Germany).

During the conference, 20 selected participants presented their posters on a wide array of topics within the overarching theme of climate change adaptation. The topics covered all conference objectives, including community-based and ecosystem-based adaptation, vulnerability and livelihoods, water management, food security, climate-smart





agricultural technologies, disaster management, gender-focused strategies, disaster modelling and mapping, cryosphere and black carbon, and improved communication strategies. The poster session was popular among conference participants, attracting the curiosity of several experts and high-level policy leaders.

Five winners were selected by a panel of four including ICIMOD's Rucha Ghate, Muhammad Ismail, and Deo Raj Gurung as well as science journalist TV Padma. The winners were chosen on the basis of their innovativeness, presentation, and sound methodology. Many presenters made rigorous use of case studies to make policy recommendations. The topics of the winning posters ranged from technology-based strategies to water availability and demand scenarios, food security, disaster management, and gender issues in adaptation. Some of the winners were also interviewed by the media reporters shortly after the award session. The five winning posters were:

- 'Naturally-available resources can be an alternative solution to mitigate climate-induced water crises' by Nazmun Naher Mita (Bangladesh): The merits of rainwater harvesting systems in the Chittagong Hill Tracts of Bangladesh were illustrated.
- 'Taking a different path: Women migrants, climate change, and adaptation' by Ou Xiaou (China): This poster explored power relations in migration decisions within households as well as choices of adaptation strategies, with a special focus on the relative power of women.
- 'Assessment of rainwater harvesting potential in Murree Hills using remote sensing and GIS' by Aneeqa Azeem (Pakistan): The total rainwater harvesting potential of the region was estimated at almost 114 million litres per day, and additional studies estimated that the system costs only 11% of what it costs to transport water by tankers.
- 'Responses of *Andrographis paniculata* to salinity for stress tolerance' by Sujata Bhattacharya (India): Increase in soil salinity is a major stress in agriculture today, but the medicinal plant *Andrographis paniculata* is capable of controlling the level of cellular reactive oxygen species and can be grown successfully under conditions of saline stress.
- 'Hazard assessment of glacial lake outburst floods and potential of ICTs for coping' by Dilli Bhattacharai (Nepal): This poster assessed the potential impacts of glacial lake outburst floods and the role of ICTs in coping with them.







## Marketplace session

Alongside the poster session, the conference also featured an event entitled ‘Innovative Solutions’, which was a marketplace-styled session consisting of stalls set up by not-for-profit organizations, NGOs, and social enterprises. Twenty-two organizations from six countries, including Helvetas, WWF, BBC Media Action, and International Development Enterprises, set up booths showcasing their projects and solutions to enhance the resilience of communities to climate change. Many of the organizations demonstrated their products and solutions with functioning models and prototypes, posters, displays, audio-visual exhibitions, and interactive activities.

Among the cutting-edge solutions showcased were programmes involving ICT training to improve the quality of agricultural research; effective ways for the media to aid in adaptation; and projects to combat declining soil fertility and productivity, establish community-based flood early warning systems, increase knowledge flows between communities and scientists, implement better watershed management and irrigation methods, encourage greater gender inclusion, improve food security, and provide alternative livelihood options. The projects were implemented in areas across the HKH region, including the Pamir, Karakoram, trans-Himalayan region, Khyber-Pakhtunkhwa, Ladakh, and the Gandaki river basin.





## Visit to Godavari Knowledge Park

The conference started off with an optional visit to the ICIMOD Knowledge Park at Godavari. Spread over 30 hectares of land given to ICIMOD by the government of Nepal in the early 1990s, the park is a knowledge incubator and testing ground for new technologies and practices for sustainable land use and natural resource management in the hills of the HKH region. Conference participants were taken on a guided tour of the park, starting with a visit to the information centre where visitors learned about ICIMOD's regional programmes and thematic areas. Participants then visited exhibits and experimental facilities demonstrating renewable energy technologies, water management, vegetation management, soil management, income generation activities, biodiversity conservation, and ecotourism. They were also introduced to the research and support facilities for replication and scaling up of tried and tested solutions. Visitors were taken on a short walk through the park's deciduous and evergreen broadleaved forests, where they witnessed a great variety of floral species, butterflies, and birds.



# Engaging Media

## Press Coverage

To encourage the media to report on the Mountain People Adapting to Change conference, the organizers engaged the Nepal Forum for Environmental Journalists as an official media partner. The forum, a non-governmental organization promoting environmental journalism in Nepal, aided the exchange of knowledge and helped to transmit the message and outcomes of the conference to its target audience through daily video spots, radio talks, interviews, and news bulletins. The media partnership provided full-scale coverage and publicity leading up to and during the conference, including this conference teaser video: [j.mp/adapthkh\\_intro](http://j.mp/adapthkh_intro). The forum also monitored media coverage in local dailies and produced daily summaries of the conference, which were disseminated widely to media persons.

In total, 20 journalists from seven regional member countries participated as full-time conference reporters, attending sessions, press briefings, and a final press conference (Afghanistan – 3, Bangladesh – 2, Bhutan – 3, India – 3, Myanmar – 1, Pakistan – 1, and Nepal – 7). They reported on various aspects of the conference, quoting notable speakers and panellists in addition to reporting on the conference outcomes.

In addition, multiple press briefings and a press conference were organized prior to, during, and after the conference. A panel including ICIMOD and the Ministry of Science, Technology and Environment, Nepal, addressed a press conference organized on 12 November, marking the end of the conference. The panel addressed a group of 25 journalists on the outcomes of the conference and directions for future research and conferences, and also answered several questions from the media. A press release entitled 'Experts come together to find climate change adaptation solutions beyond boundaries in the Hindu Kush Himalayas' ([www.icimod.org/?q=15589](http://www.icimod.org/?q=15589)), outlining the main conclusions of the conference, was circulated among all media contacts.

A number of newspapers, television channels, and radio stations ran articles and other items related to the conference. The majority of these were produced in English, but some were in regional languages such as Nepali, Dzongkha, and Bangla. Overall, there were 44 print articles on the conference in mainstream regional newspapers, 16 mentions in radio bulletins, and five radio programmes, as well as wide regional television coverage. All media stories are available at <http://www.icimod.org/?q=15516>.





## Social Media

Conference participants, speakers, organizers, partner organizations, funding partners, and viewers from around the world shared comments on the conference via major social media platforms including Twitter, Facebook, and LinkedIn, with many joining the conference stream using the conference hashtag #adaptHKH. CICERO, GRID-Arendal, the International Organization for Migration, Royal Norwegian Embassy in Kathmandu, and others tweeted and retweeted quotes from the panellists throughout the course of the conference.

A dedicated digital outreach team ensured that a steady stream of conference-related content was made available online. A live video stream from the conference, photographs from the sessions on Flickr, and daily briefs on ICIMOD's website were shared across major social media outlets, providing a steady engagement online. A silo of digital content was steadily built and made available through the conference website.

Anandeeta Gurung, a young digital media volunteer, aided the digital outreach team and blogged about her impressions from the conference daily. Her insights provided a fresh perspective. Journalist TV Padma tweeted: "We may be data-deficient, but we are not knowledge-deficient... we have a wealth of traditional knowledge." And panellist SVRK Prabhakar tweeted: "We need to move away from narrow financial sense of risk insurance to a broad based approach to suit to developing countries." The following post was accessed by 4060 accounts on Facebook alone: "Five young change makers were felicitated at the closing plenary, #adaptHKH Voices of the Future winners: Nazmun Mita, Ou Xiaoou, Anita Azeem, Sujata Bhattacharya, and Dilli Bhattarai" (#livestream j.mp/10UCQza, <https://www.facebook.com/icimod/posts/801463773226280>).

Approximately 1250 tweets were posted in total with the '#adapthkh' hashtag. The collaborative social media efforts produced an estimated reach of almost 11,000 accounts, forming an estimated 58,000 impressions, according to TwitterReach reports. Facebook likes and shares as well as LinkedIn interactions also contributed significantly to the visibility of the conference.

## Live Streaming

The live streaming of the entire conference was provided via Youtube for people from all over the world to benefit from the high-level policy panel discussions, interactive panels, and dialogue sessions on various climate change adaptation issues in the mountains. Over the course of the conference, the live stream was watched 2892 times, with more than 1600 views on the final day. Some viewers expressed their admiration and their wish to have been present at the conference. The recorded streams are available to the public on Youtube or via the conference website at [www.icimod.org/?q=13540](http://www.icimod.org/?q=13540).



# Commitments for Future Action

During the closing session, panellists and participants made various commitments to take action in their personal capacities. Some policy makers committed to integrating the knowledge gained at the conference into national and subnational action plans in their countries. Bhartendu Mishra of the National Planning Commission of Nepal pledged to use the conference outcomes to enrich Nepal's national action plan for adaptation, and Malik Shakir Bashir Awan of the National Assembly of Pakistan committed to pay particular attention to mountain issues in formulating Pakistan's food security policy. Several participants also pledged to take action in their own research, advocacy, and implementation efforts. For instance, Pushkin Phartiyal of CHEA committed to conducting assessments to gauge administrators' understanding of adaptation issues. Faizul Bari of the Food and Agriculture Organization pledged support for nomadic communities in Pakistan within the context of climate change.

On behalf of ICIMOD, David Molden made some key commitments: to promote good science; generate new knowledge to fill regional data gaps; organize and communicate that knowledge through existing and new initiatives such as the Regional Database System and the Himalayan Monitoring and Assessment Programme; put the ideas generated at the conference into action through capacity building, pilot testing, and scaling up the activities at various ICIMOD field sites with local communities; support the process of developing and implementing national adaptation plans at regional, national, and local levels; promote gender inclusiveness across programmes, as well as through the Women, Gender, Environment, and Mountains network and the Mountain Initiative for Climate Change Adaptation in Mountain Regions; act as a platform to foster the regional cooperation needed to support sustainable adaptation in the Hindu Kush Himalayan region; and take the mountain agenda to regional and global fora.

## Key recommendations for action

The conference participants came up with the following key recommendations for action:

- Generate a unified mountain voice through strong regional and global cooperation between communities, institutions, and non-governmental actors
- Engage in specific and targeted communication across local, national, regional, and global levels to highlight the importance and urgency of adaptation action in the world's mountains
- Promote institutional pluralism while carrying out global assessments, with more inputs from the HKH and other mountain regions
- Create and support mechanisms for collective reflection and learning among diverse stakeholders (particularly researchers, policy makers, practitioners, and communities)
- Improve institutional mechanisms to address the trade-offs between ecosystem preservation and development needs and provide adequate resources and funding
- Support local-level adaptation through technology, capacity building, and financial resources
- Ensure greater collaboration with the media and civil society to facilitate better communication of the science on adaptation and climate as well as to enhance the voices of local communities in policy formulation
- Integrate the wealth of traditional indigenous knowledge and emerging local adaptation practices into local- and national-level adaptation plans
- Focus on locally relevant issues and communicate new and existing knowledge in simple language to facilitate informed policy making that is relevant to local communities
- Increase consultation with stakeholders across local and subnational levels, and across upstream and downstream communities, to enhance benefit sharing across communities and regions
- Enhance crossborder flows of knowledge to minimize adverse effects and to enhance the benefits to the entire region
- Integrate efforts to address power differentials across gender and social class by making efforts to address historic and contemporary limitations in the agency and decision-making power of women and other marginalized groups

# Annexes

## Annex 1: List of Speakers

In alphabetical order by first name

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**Anne Solgaard**  
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**Arnico Panday**  
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**Arun Bhakta Shrestha**  
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**Ashok Gurung**  
India China Institute

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Third World Centre for Water Management

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Bangladesh Centre for Advanced Studies

**Babar Khan**  
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**Batu Krishna Uprety**  
UNFCCC – Least Developed Country Expert Group

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National Planning Commission, Nepal

**Bob van Oort**  
CICERO

**Chendo Norbu**  
Ministry of Agriculture and Forests, Bhutan

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Institute of Tibetan Plateau Research, Chinese Academy of Sciences

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**Dipak Gyawali**  
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**Fabrizio Bresciani**, IFAD

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**Ganesh Thapa**  
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**Giovanna Gioli**  
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**Golam Rasul**  
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**Gyanendra Lal Pradhan** (Hydro Solutions)

**Hari K Upadhyaya**  
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**Jamie McGoldrick**  
UN, Nepal

**Janine Kuriger**  
Swiss Agency for Development and Cooperation

**Jigmi Rinzin**  
National Council of Bhutan

**Judy Oglethorpe**  
WWF Nepal

**Kallur S Murali**  
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**Krishna Chandra Paudel**  
Ministry of Science, Technology, and Environment (Nepal)

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**Lawrence Hislop**  
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**Luis Waldmüller**  
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**Madhav Karki**  
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**Malik Shakir Bashir Awan**  
National Assembly of Pakistan

**Mandira Shrestha**  
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**Maurizio Busatti**  
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Ministry of National Food Security and Research, Pakistan

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Indian Institute of Science

**Naba Bikram Kishore Tripura**  
Ministry of Chittagong Hill Tracts Affairs, Bangladesh

**Nina Holmelin**  
CICERO

**Pankaj Prasad Raturi**  
Dabur Nepal

**Partha J Das**  
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**Pradip Maharjan**  
Federation of Nepalese Chambers of Commerce and Industry

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Government of Assam, India

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ICIMOD

**Raminder Singh**  
Reuters Market Lite

**Robert Zomer**  
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## Annex 3: Conference Daily Briefs

# Mountain People Adapting to Change

**Solutions Beyond Boundaries Bridging  
Science, Policy, and Practice**

9 – 12 November, Kathmandu, Nepal

**Daily Conference Brief**

**9 November 2014**

**ICIMOD**

FOR MOUNTAINS AND PEOPLE



Ministry of Science, Technology, and  
Environment, Nepal



## **Dr Govind Raj Pokharel inaugurates International Conference on Adaptation**

Inaugurating the international conference on 'Mountain People Adapting to Change: Solutions beyond Boundaries Bridging Science, Policy, and Practice', Chief Guest Dr Govind Raj Pokharel, Vice Chair of Nepal's National Planning Commission, said that addressing the challenges arising from climate change is extremely critical for mountains.

Dr Govind Raj Pokharel emphasized that the countries of the Hindu Kush Himalayas must share experiences and knowledge and seek to integrate adaptation into development plans in order to enhance the adaptive capacity of the mountain people.

Citing the Government of Nepal's goal to reduce absolute poverty from the current rate of 23%, the Chief Guest said doing so would be a major challenge if the country doesn't address disasters induced by climate change and other factors.

"Nepal will be losing a significant part of its GDP due to flood, glacial lake outburst flood, and landslides that damage infrastructures and properties, and cost human lives," he said, adding that Nepal's target of graduating from the group of the Least Developed Countries and becoming a middle-

income country by 2030 will be seriously challenged by the adverse impacts of climate change.

Dr Govind Raj Pokharel said taking the private sector onboard the adaptation discourse for continued investments in the mountains is crucial. Climate change and related issues are often seen as areas for environmentalists, governments, and NGOs to deal with, he said. However, roping in the private sector to mobilize investment, insurance, and finance is important.

The Chief Guest, who is also the member of the ICIMOD Board of Governors, said that by organizing such an international event ICIMOD already fulfilled two important institutional mandates, that of sharing knowledge and enhancing regional cooperation.





## “We must develop transformative knowledge”

Can we dare to cross boundaries - between disciplines, between policy and practice, and between countries - to develop transformative knowledge?

This was the question Dr David Molden, Director General of the International Centre for Integrated Mountain Development (ICIMOD), posed to more than 250 participants at the opening of the international conference on ‘Mountain People Adapting to Change: Solutions beyond Boundaries Bridging Science, Policy, and Practice’ in Kathmandu, Nepal.

Dr David Molden said it is time to move beyond the description of the problem to find solutions that would bring about positive and transformative change. He pointed out that mountain people are experiencing change at an unprecedented rate, and the fragile mountain ecosystems, already experiencing significant poverty rates, are highly vulnerable to climate change. This is further compounded by air pollution, floods and droughts, and a range of socio-economic transformations including globalization, market forces, and urbanization.

“However, change brings opportunities,” he said, adding “it is through knowledge, ideas, innovation, partnerships, and sharing that we make a difference.”

ICIMOD’s Director General pointed out the concern raised by the authors of the International Panel for Climate Change (IPCC) AR5 that the HKH region is data deficient. However, these knowledge gaps were being filled and people from the region are generating the good science to move forward.

“It is important to bring the message of the mountains to the global community,” he stated, adding that the results of the Conference would feed into various global processes like the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties and the Sustainable Development Goals.

Dr David Molden emphasized that the Conference should address the issue of how to move science-based evidence into policy, and how this knowledge could be made more useful for action. Outlining a four-tier process, he said the first step would be to develop new understandings and ideas that can help in the process of adapting to change.

“Second, we must find ways to ensure that knowledge products are effectively used in policy and practice; third, this event (the Conference) will help to enhance networks and communities of practice,” he stated. “And finally, the messages we develop here will also be the ones we can take to the global community.”

## Broader coalition emphasized

Welcoming an unprecedented gathering of political leaders, scientists, policymakers, grassroots workers, practitioners, and journalists, the co-organizer of the international conference on ‘Mountain People Adapting to Change’, Dr Krishna Chandra Paudel, Secretary of Ministry of Science, Technology, and Environment (MOSTE), Government of Nepal, said the outcome of the event must contribute to the global climate change agenda.

Dr Krishna Chandra Paudel emphasized that climate change does not recognize political boundaries, and therefore, the knowledge and experiences shared by countries in the HKH region as well as countries from outside the region would be extremely crucial for developing newer understanding, partnerships, and broader regional cooperation to develop and implement adaptation plans.

**“Mountains suffer the most from climate change, conflicts, poverty, over-exploitation of resources, and loss of biodiversity”**

The Secretary encouraged ICIMOD to support its regional member states in the National Adaptation Plan (NAP) process by sharing knowledge and piloting climate change adaptation activities at the community level. “ICIMOD and MOSTE have been partnering for a long time, and this partnership for strategic cooperation for promoting the mountain agenda will continue in areas of mutual interest,” he said.

Dr Krishna Chandra Paudel urged the Conference participants to deliberate on all the important aspects of adaptation issues in the mountains and contribute to the common goal of putting mountain agenda in the global discourse. He also hoped the

outcomes of the Conference would contribute to the climate change agenda of the upcoming summit of the South Asian Association for Regional Cooperation in Kathmandu.



# Knowledge must result in action

The first high level leadership panel of the ongoing international conference on 'Mountain People Adapting to Change' stressed on the need for knowledge to result into concrete policies and actions in the mountains.

The panel, moderated by Director General Dr David Molden of ICIMOD, agreed there is clearly a demand for increased knowledge and science to plug the gap, and mechanisms for science to enter policies still need to be enhanced.

"Data and information are required to update adaptation action plans, and we will require scientific knowledge for this. If data is inadequate, then the policies will be inadequate," said a member of Bhutan's Upper House, Jigmi Rinzin.

Clarifying the roles of institutions for coordination at the national and sub-national levels, moving from sectoral to integrative and holistic thinking, and strengthening the capacities of institutions right down to the district level were



**"Success in the HKH region depends on unprecedented levels of international cooperation"**  
**Christiana Figueres, UNFCCC**



**"Mountains matter for everybody. For mountain countries, adaptation is our lifeline"**  
**Krishna Chandra Paudel, Nepal**



**"Empowerment means providing the tools for local people to participate actively in their development. Opportunities lie in developing high-value mountain products and value chains"**  
**Malik Shakhir Bashir Awan, Pakistan**



noted as some steps that needed to be taken. If adaptation policies are to respond effectively to the local conditions, the science also needs to be tailored to specific local contexts within the region.

The panel stressed that while governments can help facilitate change, the crucial drivers for adaptation need to be the local communities themselves. Development needs to be people-centered, and local voices must be heard. Generating a strong, unified mountain voice through regional and international cooperation without losing sight of the local needs was also emphasized.

Networking among regional member countries and beyond is key for sharing and up-scaling best practices. Further, reviving the Mountain Initiative and the possible development of a Himalayan Council were also noted as promising vehicles for creating that unified and strong voice.

**"In Bangladesh the mountain agenda must be reflected in the national agenda"**  
**N B Kishore Tripura, Bangladesh**



**"We must strengthen networking not just within the Hindu Kush Himalayas but across the globe"**  
**Jigmi Rinzin, Bhutan**



**"We may be data deficient, but we are not knowledge deficient"**  
**Anil K Sinha, India**



# Mountains deserve more global attention

Outlining the adaptation issues in the Hindu Kush Himalayas at the international conference on 'Mountain People Adapting to Change: Solutions Beyond Boundaries Bridging Science, Policy and Practice', Director Programme Operations of ICIMOD, Dr Eklabya Sharma, said as much as mountains are hotspots of biodiversity they are also the hotspots of change.



**“Mountain-specific policies are required to address the issues and tackle the challenges”**

He pointed out that mountains around the world provide 40% of global goods and services, and closer to home, the HKH is a treasure house of natural endowment and cultural heritage with four

of the 34 global biodiversity hotspots. The ice reserves of the HKH could irrigate all of Asia for three years, and South Asia for five to six years. The region has rich agro-biodiversity, and is a melting pot of cultural heritage, ethnic diversity, and sacredness with more than 1,000 living languages.

“And yet, mountains haven’t received enough attention both in global agendas and investments,” said Dr Eklabya Sharma. “It is through Conferences like these we must seek to draw the attention of the global community on the issues of Sustainable Mountain Development and Adaptation to Change.”

Mountain poverty, compensation for ecosystem services, and the need for increased investment for sustainable development are some major issues that need urgent attention in the HKH region. The major drivers of change were climate change, land use and land cover change, infrastructure development, globalization and urbanization, and out-migration.

The other major challenge facing the region, according to Dr Eklabya Sharma, was the knowledge gap and data deficit, also pointed out by the International Panel for Climate Change (IPCC) reports. To address this, ICIMOD has started some regional

initiatives like the river basin and transboundary landscape management approaches. ICIMOD has also embarked on a programme called ‘Hindu Kush Himalayan Monitoring and Assessment Programme’, a kind of mini-IPCC assessment with the regional focus targeting policymakers.

He added that both ecosystem- and community-based adaptations are important, and National Adaptation Plans should be targeted for linking and converging these approaches for successful adaptation strategies.



Nand Kishor Agrawal, Conference Convenor and Programme Coordinator (HICAP Initiative), ICIMOD, delivers vote of thanks

Participants enjoying themselves in ICIMOD’s Knowledge Park at Godavari



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# Mountain People Adapting to Change

**Solutions Beyond Boundaries Bridging  
Science, Policy, and Practice**

9 – 12 November, Kathmandu, Nepal

**Daily Conference Brief**

**10 November 2014**



**ICIMOD**

FOR MOUNTAINS AND PEOPLE



Ministry of Science, Technology, and  
Environment, Nepal

## Moving from eagle-eye to toad-eye climate research

The two recent reports of the International Panel for Climate Change (IPCC) were at the heart of discussions at the morning plenary of the ongoing international conference on 'Mountain People Adapting to Change: Solutions Beyond Boundaries Bridging Science, Policy and Practice' in Kathmandu, Nepal.

The Plenary session 'Adding Knowledge and Evidence: Strengthening Regional Knowledge Beyond IPCC Assessment Reports' started with the Chair, Kristin Halvorsen, posing two major questions: What new gains have been developed after IPCC AR4? And how effectively is it linked with the region?

The keynote speaker, Dr Dipak Gyawali, gave some thought-provoking remarks examining the process of the IPCC. He said that local level knowledge does not filter up to the IPCC reports. "The IPCC is shackled by too much eagle-eye science and too little toad's-eye science," he noted, adding there was a need to rethink how international cooperation is being carried out. He also raised the question of institutional pluralism while carrying out global assessments.

There was a broad consensus amongst the panelists that knowledge from the HKH region, and representation by the region's scientists in the IPCC process, remains low, although some gains have been made in the period between the two assessment reports. Major data gaps still exist, including on precipitation distribution, the disconnect between regional analyses and local observations, and the future frequency and magnitude of extreme events.

*Contd. page 2*



## New milestone in data access and sharing

The International Centre for Integrated Mountain Development (ICIMOD) launched the Regional Database System (RDS) that is expected to enhance research related to the Hindu Kush Himalayas.

Developed by the Regional Database Initiative under ICIMOD's Mountain Environment Regional Information System, the RDS portal (available at <http://rds.icimod.org>) is a central data repository for different thematic areas in the HKH region. It is an open access web-based portal.

Speaking at the launch, the Norwegian Ambassador to Nepal, His Excellency Kjell Tormod Pettersen, said the database system is an important achievement for ICIMOD. "I am sure this will be a huge development which will contribute to the wellbeing of mountains and communities in the HKH region," he said.

The data in the RDS are primarily contributed by ICIMOD's initiatives under various regional programmes.





"Linkages of sources and impacts of black carbon across the whole geographical region of the Hindu Kush Himalayas are of great importance," said ICIMOD's Programme Coordinator for Atmosphere Initiative, Dr Arnico Panday.

**Social Media:**  /icimod  @icimod  /icimod

Participants emphasized that development should protect people from disasters and not be the cause of disasters. Therefore, planned and robust infrastructure, weather systems, secure food-water-health systems, raising public awareness, and strengthening local institutions and governance system were identified as some of the more critical areas that needed urgent attention.

At the same time, there was consensus that the IPCC process is not designed to cover all information and knowledge. Research is also available that may not have made into the reports. There was also a recognition that there was no one-size-fits-all formula, especially within such a complex region.

Dr Anand Patwardhan of University of Maryland noted that the narrative about adaptation has evolved over time in the IPCC, but more work needed to be done to link adaptation research and practice. "Scientists think implementation is not their business, and implementing agencies think of science as a separate realm," he said. "We urgently need ways to connect scientific knowledge and practice on the ground."



## Call for a fine balance

Ecosystem-based and community-based adaptation complement each other in adapting to climate-related and other changes. This was the consensus the panel on 'A Fine Balance: Connecting Community and Ecosystem-based Adaptation' arrived at after an hour-long deliberation on the topic.

The keynote speaker, Dr Xu Jianchu of Kunming Institute of Botany, China, said any approach to climate change adaptation must take into account the inter-relations and interactions between people and environment.

Participants discussed the importance of mountain ecosystems and they said the importance of ecosystem restoration for community resilience cannot be understated.

Dr Babar Khan of WWF-Pakistan made a call for the need to strike a healthy balance between conserving

## Clear and relevant messages crucial

Focusing on locally relevant issues, providing answers in a simple language, and making matters relevant to policymakers and local communities could go a long way in communicating complex science and uncertainties regarding climate change scenarios to decision makers in an effective way.

**“Achieving an understanding by policymakers of the inherent uncertainties and their potential impact on policy making are crucial”**

**Christopher Scott, University of Arizona**

This was the consensus reached at the Dialogue Cafe 'Questions of Scale: Applying Global and Regional Climate Scenarios to HKH Basins'. The panel said this could be done by integrating local data and information into local modelling and building capacities at the grassroots.

Professor Liu Suxia of Institute of Geographic Sciences and Natural Resources Research, China, highlighted the need for downscaling of models in order to assess the impact at the local level, whilst emphasizing the need to validate the model outputs and responses where necessary.



need of ecosystem services and the development needs of communities. “An economically stronger community supports healthy ecosystem, while highly fragile ecosystems lead to vulnerable communities,” he said.

ICIMOD’s Ecosystem Services Theme Leader Dr Wu Ning reiterated the importance of engaging local people for the success of the ecosystem-based adaptation process. He said ecosystem-based adaptation requires collective action from all stakeholders.

## Bridging scientific and Indigenous knowledge for adaptation

The session on “Vulnerability and Resilience: Integrating Science with Marginalized Groups’ Response to Change” explored the linkages between climate science and vulnerability of communities.

The Panel Chair, Dr Sara Ahmad of IDRC, emphasized the value of inter-disciplinary research to decipher the risks of climate change, and the need for communicating research to bridge the gap between climatologists and social scientists. Participatory processes are also needed for the coproduction of indigenous and scientific knowledge when it comes to vulnerability and resilience.

Information technology and practical offline tools are needed for communities to learn more about vulnerability and resilience. Discussion among participants focused on integrating climate change into the Disaster Risk Reduction national plans; adopting institutional approaches for knowledge mobilization; involving local communities and their knowledge in vulnerability assessments; and identifying appropriate interfaces to share scientific research in simplified language with those most at risk.

# Inclusive ground-based approach recommended

A number of recommendations were put forward at the second plenary session 'Consolidating Knowledge: Adaptation Science for Holistic Perspectives in Upstream and Downstream Contexts'.

The Session Chair, Roland F. Steurer of GIZ-Nepal, said achieving a holistic perspective for bringing science, policy, and practice together requires coordination between multiple stakeholders. Relevant issues need bridging by integrating upstream-downstream linkages that go beyond geographic boundaries and administrative, political, and social aspects of adaptation science.

"All adaptation strategies should add value to local economies and bring inclusive benefits, which in turn leads to local empowerment, enhancing ownership and sustainability," noted Roland F. Steurer.

**"There has been some criticism about the research on vulnerability and resilience being output-oriented and less process- or decision-oriented"** **Dr Ganesh Thapa, Visiting Scientist, ICIMOD**

The session agreed that mitigation is the best form of adaptation. It was also noted that ecosystem and community-based adaptation do not exclude each other. However, there has to be a right balance between short-term priorities of people and the long-term ecosystem needs.

The need to promote bottom-up vulnerability and resilience assessment approaches, and enhance food security by increasing the range of choices and risk minimization strategies available to farmers in the mountains were also stressed. Further, information technology has made it possible to use innovations in communities.



## Larger choice equals greater flexibility for farmers

The session on 'Sustaining the Mountains: Ensuring food Security Through Flexible Production Systems' revealed that mountain food security differs from food security in plains because mountain livelihoods are largely dependent on natural resources, livestock, and niche farm products. Moreover, mountains are more vulnerable to climate change impacts.

There is a need to identify opportunities in mountains to reshape local production systems so that they may flexibly react and adapt to changes without deteriorating local diversity and ecosystems. It is important to maintain a balance between flexibility and productivity to achieve sustainable food security, and to identify ways to strengthen policy and institutional support in order to diversify livelihoods through non-agricultural activities.

The session concluded with a key message: "Increase the scope of flexible adaptation by extending the range of farmer's production choices."

### Tweets of the day

**Kunda Dixit** @kundadixit

First the bad news. Himalayan glaciers retreating. Good news: Not fastest retreat in planet so fresh water lack won't be as bad. #adaptHKH

**om asha rai** @omastharai

#IPCC report shows data deficit in mountains, but we are already bridging that gap, says @icimod DG Dr David Molden #adaptHKH

**The Joy Luck Club** @zappylily

Its high time social scientists & climate scientists come out of their comfort zone and work with each other." says Anamika Barua #adaptHKH

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ICIMOD

FOR MOUNTAINS AND PEOPLE



Ministry of Science, Technology, and  
Environment, Nepal

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## Adaptation strategies must be comprehensive

The core message of the plenary session on 'Enhancing Compatibility: Connecting National Adaptation Plans with Global Strategies' was that adaptation plans must aim to integrate strategies that take global knowledge to local level.

Addressing key questions around global programmes that supported adaptation efforts, session Chair Zafar Hasan Reza, Member of Pakistan Agriculture Research Council, said National Adaptation Plans (NAPs) should have linkages with global strategies and sub-national plans, and should be integrated with the realities of local communities.

Dr DhruPAD Choudhury, ICIMOD Regional Programme Manager, took note of the opportunities the UN system has offered through its various programmes to address climate change adaptation. However, the efforts must trickle down to communities, and one of the challenges in doing so is to ensure these efforts are helping communities to build their capacities to adapt.

Delivering the keynote address, Dr Atiq Rahaman of Bangladesh Centre for Advanced Studies said good communication must bridge scientific knowledge and people's inherent knowledge. Calling for a good coordination between different tiers of government, he highlighted good science, effective policy, adequate finance, good governance, and robust implementation as the most important aspects of climate change adaptation.

Rojina Manandhar of United Nations Framework Convention on Climate Change (UNFCCC) talked about



the need to engage institutions and transfer ownership to regional centers and networks.

UNDP Nepal's Vijay Singh said community level

processes should be integrated with the national level, and this must be reflected in the budgetary provisions.

Dr Batu Krishna Uprety, an Expert Member of the Climate Change Council, asked the participants to reflect on two important questions: How are the sectors affected by climate change informed about climate change and adaptation? How can climate change adaptation be integrated into development planning?

Dr Arabinda Mishra of TERI University said the focus should be on speed of implementation, scale of adaptation projects, and scope of comprehensive adaptation action.

**“No country can have  
stand-alone strategies  
and plans” Zafar Hasan  
Reza, Pakistan**





## Communication and coordination: twin blocks for partnership

Poor communication and coordination poses some of the bigger challenges in fostering regional cooperation and partnerships for climate change adaptation in the Hindu Kush Himalayan (HKH) region. This was the broad consensus reached at the dialogue café 'From Mountain to Mountain: Lessons for the HKH from Other Regions'.

In a lively discussion, participants pointed out the increasing disconnect between global, national, and local level. They said this disconnect must be addressed in order to share good climate change adaptation practices from around the world.



Keynote Speaker Yuri Badenkov of the Russian Academy of Science emphasized the need for better coordination to foster transboundary cooperation and partnerships for climate

**“Taking the mountain agenda to international forums remains a challenge”** Basanta Shrestha, ICIMOD



change adaptation. He pointed out the important role institutions like the International Centre for Integrated Mountain Development (ICIMOD) can play in building bridges across institutions and countries.

Participants agreed that responsibilities for the implementation of adaptation plans need to be shared among various stakeholders at different levels. However, for this to happen, the capacities of those involved have to be built.

Talking about partnership between government and non-government actors, Manfred Seebauer of GIZ-Nepal gave an example from India where the government partnered with an NGO in sustainable land management and climate change protection methods.

The participants pointed out that climate change adaptation also needs specific communication mechanisms, such as using mythological figures to convey important messages. They also said policy development is about finding allies.

## Winners of the poster competition

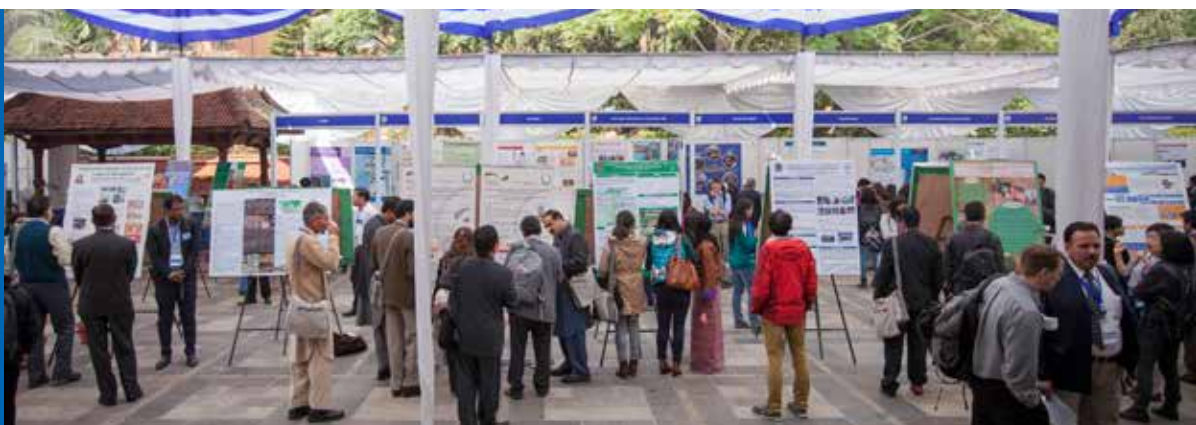
Nazmun Naher Mita,  
Bangladesh

Ou Xiaou, China

Anneqa Azeem, Pakistan

Sujata Bhattacharya, India

Dilli Bhattarai, Nepal



# Improve access to insurance for the poor

Recognizing insurance as a useful tool for post-disaster recovery and improving access to formal insurance mechanisms for the rural poor could reduce disaster risks considerably.

The panel on 'Insurance and Risk Mitigation Strategies: Ensuring Recovery after Climate-induced Loss' agreed that in spite of current and future adaptation and mitigation efforts, climate change will cause several long-term irreversible losses through slow and rapid onset of change. Hence, risk reduction and recovery measures must be explored.

Panellists provided examples of some insurance programmes from India, Indonesia, and Japan. However, they cautioned about several other constraining factors involved with insurance such as delayed payments, insufficient coverage, affordability of insurance schemes, lack of data for pricing the risk, and lack of public-private partnerships that is required to promote insurance services.

Dr SVRK Prabhakar, whose works have focused on climate change adaptation and disaster risk reduction, said people often forget insurance is a post disaster recovery tool because of the overwhelming focus on the relief activities.

## A matter of mutual trust

The interactive panel on 'Transboundary River Basins: Management and Benefit Sharing as an Adaptation Mechanism' called for out-of-the-box solutions to promote the sharing of benefits of transboundary river basin cooperation.

The panel noted that adapting water management to climate change concerns require prudent sharing of the benefits that arise from water use between the major production sectors of agriculture, energy, and industry in transboundary river basins of the Hindu Kush Himalayas (HKH).

In his keynote speech, Professor Asit K Biswas, a water expert, said it was very important to design water management programs as a catalyst for economic development and wellbeing of local people to inspire actions grounded on the commitment of decision-makers.

The panelists noted that building transboundary cooperation requires mutual trust, which can be a basis for identifying common values, or threats, in a basin. They said regional transboundary strategies must be anchored on national development plans.



“Insurance focuses on risk transfer rather than risk reduction”

Anamika Barua, SasiWater

The panel highlighted the need to broaden the definition of insurance, looking beyond formal insurance to non-traditional mechanisms for risk mitigation. Further, insurance does not prevent the loss of lives or assets.

Dr Giovanna Gioli of University of Hamburg pointed out that remittances constitute a self-insuring financial mechanism which is often ignored as an option by policymakers.

Participants also noted that insurance companies are not the only private sector actors that can contribute to risk mitigation, and that broader private sector engagement should be encouraged.

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“Attending to energy security in the river basins and developing consensus-based frameworks for disaster risk reduction offers ample avenues for water cooperation in river basins,” said Ramesh Anand Vaidya of ICIMOD, giving the examples of a recent power trade agreement between India and Nepal and the landslide-induced dam break in Sun Koshi River.

The cooperation between India and Bhutan in hydropower development was pointed out as an excellent example of transboundary cooperation. The interactive discussions highlighted the importance of trust building and finding common interest among stakeholders and political commitment for shared resources. Continuous dialogue between stakeholders, policymakers, and communities was also underscored.



## Is the message getting through?

The dialogue café on 'Connecting the Dots: Translating Science to Policy through Effective Communication' revealed that it is vital to understand local values and structures of power and politics in communicating science to policymakers.

The keynote speaker, Ashok Gurung, asked if communication is the real problem, since the key messages of climate science are available and not very hard to understand. "The real question is about power and politics," he said. "Climate change also involves questions of ethics and values that go beyond science. This is where the arts and humanities can play a role."

**"As a researcher once you put your findings out there, you lose control over how it's used. But you can control how you reach your results"** **Trude Rauken, Norway**

A simple, easy-to-understand, and evidence-based scientific message is more attractive for both media and the general public. Professionals need to understand both traditional and scientific statements. For scientists to

influence the policy making process, they must understand the policy formulation process.

The panelists also emphasized the role of civil society in bridging the gap between scientists and policymakers.

"Two and two become five when synergies between scientists, communities, and policymakers effectively bridge the gap between science and policy," said Dr Batu Krishna Upreti, an Expert Member of the Climate Change Council.

**"Everything about climate science goes against how politics and the media function"**  
**Kunda Dixit, Nepal**



### Key points from 'Connecting the Dots' dialogue:

- We need to think about who controls the production of knowledge;
- The history of power relationships (colonialism, imperialism) must be taken into account;
- There should be a balance between quantitative and qualitative research, and;
- Scientists need to have a better understanding of policy processes.

### Tweets of the day

**TV Padma @tvpadma** Everything about climate science and its communications goes against how local politicians and media function, says @kundadixit #adaptHKH

**bhrikuti rai @bbhrikuti** "need 2 reframe the debate from saving the planet to saving money

**om astha rai @omastharai**

Beauty of #adaptHKH conference. Has skeptics like Anand Sharma, too. Says #KedarnathFlood isn't due to #climatechange



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# Mountain People Adapting to Change

**Solutions Beyond Boundaries Bridging  
Science, Policy, and Practice**

9 –12 November, Kathmandu, Nepal

**Daily Conference Brief**

**12 November 2014**



**ICIMOD**

FOR MOUNTAINS AND PEOPLE



Ministry of Science, Technology, and  
Environment, Nepal

## Mountain voices must make it on global agenda

The international conference on 'Mountain People Adapting to Change: Solutions Beyond Boundaries Bridging Science, Policy, and Practice' ended on a high note with a leadership policy panel agreeing that more needed to be done if mountains were to make it on the global agenda.

Both panelists and the audience voiced their personal reflections, thoughts, and commitments to take forward the messages from the Conference to promote action on climate change adaptation in the region.

Dr Ganesh Thapa of International Fund for Agriculture Development provided an overall summary of the conference. Among others, he noted the need to generate a unified mountain voice through regional and global cooperation without losing sight of local needs, the need to promote institutional pluralism while carrying out global assessments (with more inputs from HKH region), and the need to create and support mechanisms for collective reflection and learning among diverse stakeholders.

The need to support local level adaptation through technology, capacity building, and financial resources, and the need for greater collaboration with media and civil society to facilitate better communication of science on adaptation was also highlighted by Dr Ganesh Thapa.

"Engagement in conferences and collaborative process can expedite placement of mountain voices on the global agenda. There is a need to set up regional monitoring



and data sharing platforms," pointed out the UN Resident Coordinator of Nepal, Jamie McGoldrick.

Not forgetting the voices of the young professionals, who will carry the work into the future, one of the five winners of the poster session, Dilli Bhattarai, said the conference encouraged the youth to keep working to fill the existing data gaps and find innovative solutions to climate change problems.

### ICIMOD commits to action

ICIMOD's Director General Dr David Molden who moderated the closing policy panel spelt out some of the ways in which the new knowledge from the Conference would be translated into action through ICIMOD's work and commitments. Among others, ICIMOD will:

- Put ideas into action through pilot testing;
- Take global and regional knowledge to the local level through its programmes and initiatives;
- Support NAP processes, regionally and locally;
- Promote good science and generate new knowledge to fill regional data gaps, through existing and new initiatives such as HIMAP (Himalayan Monitoring and Assessment Programme);
- Take the mountain agenda to regional and global forums;
- Promote gender inclusiveness, including through the Women, Gender, Environment (WGEM) and Mountain Initiative, and;
- Build capacities at the grassroots/local level.





## Diversifying livelihood options emphasized

The interactive session on 'Adding Value: Promoting Climate Resilient Livelihoods and Value Chains' identified a number of alternative livelihood options and suggested a shift in government policies.

The panelists said governments should act as catalysts and facilitators in promoting climate resilient livelihoods. They said engaging the private sector and developing niche tourism like eco- and village tourism offer opportunities for diversification.

Panelist Kallur K Murali of the Asia Regional Office, International Development Research Centre, pointed out that value chains should be reasonably flexible for economic improvement of all the actors involved in the system. "It is a key to equitable benefit sharing," he said.

Anu Joshi, ICIMOD Value Chain Development Specialist, suggested continuous tracking of business opportunities and capacity enhancement to improve people's livelihood options.



Pankaj Ratori of Dabur, a private company working on medicinal plants, said another noteworthy livelihood option is in the area of herbal farming, particularly aromatic plants, spices, and medicinal herbs.

The audience agreed that livelihood options must be diversified through diversification of products, and by focusing on niche and climate resilient mountain products. They said research, investment, and documentation are the key to livelihood options.

"If nothing works out, the last solution for mountain people will be permanent migration from their native place," said the session Chair, TS Papola of ISID.

## Adaptation strategies must be all-inclusive

A panel of development practitioners shared their experiences on the use of indigenous, existing, and emerging practices in managing livelihoods at the session 'Adaptation in Action'.

The panelists pointed out successful examples from Bolivia, India, Pakistan, Myanmar, and Nepal where knowledge from local communities was used in devising adaptive strategies. They said documenting indigenous practices and understanding communities were critical in designing adaptive strategies.

The session Chair, Dr Ekalabya Sharma of ICIMOD, said adaptation is possible despite the numerous challenges. He said community engagement in the design of risk evaluation is important to capture ground realities and reflect community expectations.

The panelists noted that agro-advisory services could make local communities strong, and adaptation at local level needs to respect common resources. "Resources are scarce in mountain regions and maladaptation needs to be avoided," said Dr Pushkin Phartiyal, Executive Director of the Central Himalayan Environment Association.

The panelists also stressed on raising awareness at institutional levels, and to take into consideration the



**"Good indigenous practices should be supported by policies and institutions"** Ekalabya Sharma, ICIMOD

changing social, economic, and demographic profiles while devising adaptation strategies. They said vulnerability frameworks should be tested on the ground by engaging communities, and local institutions must be strengthened.

The audience raised some pertinent points. They reminded that involving the marginalized groups in adaptive strategies is important. Among others, they recommended reclaiming lost local knowledge, building mechanisms to synergize bottom-up and top-down knowledge, devising gender-sensitive strategies for adaption, and ensuring the quality of indigenous knowledge.



## For innovation to work, integrate not isolate

In his opening remarks to the session on 'Climate Smart Strategies: Large and Small-scale Innovations and Services for Changing Climates', Professor Yang Yongping of Kunming Institute of Botany, China, pointed out that top-down approaches are more visible at the regional and national level whereas the bottom-up approaches are effective at the community level. However, in order for climate smart strategies to be successful, it is important to link the two.

Many examples of innovative strategies were given by the panelists, which successfully merge technological innovations with community participation. Some of these strategies included crop insurance, weather-based agro advisories, early warning system for floods, flood resistant crops, and the use of ICT for linking farmers with markets.

But these innovative strategies do not get rolled out in a vacuum. Certain conditions must be met for them to be successful. For example, for technological solutions to work, they must have bottom-up involvement of the community and must be linked with local development plans. They need also to integrate and not isolate, as marginalized groups are often isolated from modern technology.

In order for climate smart strategies to be successful, it is important that policymakers encourage local governments to address these challenges. Information communication technology using services such as mobile SMS was noted as playing an important role in empowering women as farmers.

The Regional Programme Leader of the CGIAR Research Programme on Climate Change, Dr Pramod K Aggrawal, pointed out that the key ingredients in the scaling out of strategies include clarity among scientists on the usefulness of the technological innovations and clarity on impact pathways.



“Scaling out should not be left to the government but must include public-private sector partnership”

**Pramod Kumar Aggrawal, India**

### Tweets of the day

**svrkprabhakar @svrkprabhakar**

Successful and helpful conference comes to close...over to action and communication! #adaptHKH

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#adaptHKH Day 2 on video by our media partner - NEFEJ <http://j.mp/1wi7zPr> archived #livefeed also available <http://j.mp/1xgCxb>

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Get an overview of the discourse from Day 1 <http://j.mp/1B5EChI> Video by NEFEJ, our media partner for #adaptHKH Conference.

**Sumeet Keswani @SumeetKeswani**

Great to see @icimod's int'l conference on #adaptHKH end with commitments. #ideas baked over 4 days, time for #action.

**TV Padma @tvpadma**

U cannot separate top-down & bottom-up climate-smart approaches. Both need to converge through innovation : @icimod MSR Murthy #adaptHKH

**ICIMOD @icimod**

Unless solutions for mountain people are developed, we would end with a permanent immigration out of the mountains - Dr TS Papola #adaptHKH

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@geologist\_ita Deliberations from the past three days are available as daily briefs <http://icimod.org/?q=15512> #adaptHKH



## Press Conference

# Thank you, ladies and gentlemen

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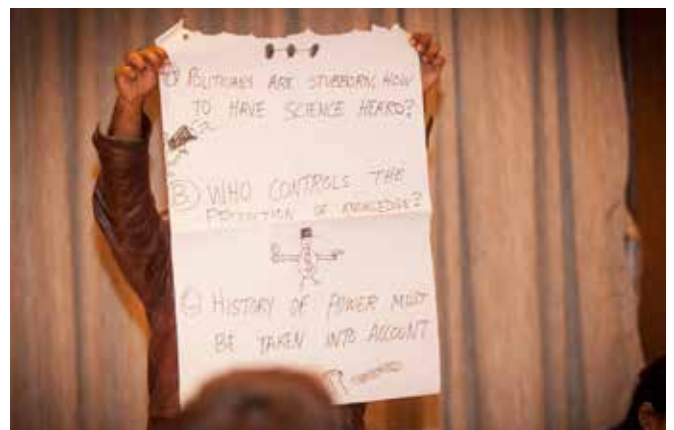
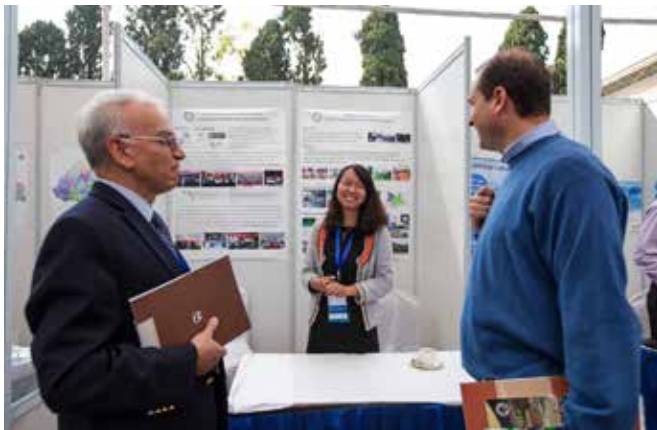
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Wu Ning  
Yi Shaoliang





# Glimpses...





# Difficult but not impossible

Improving livelihoods without compromising ecosystem services is a good step toward balancing development and adaptation. This was the message from the plenary on 'In Practice: Integrating Adaptation Knowledge into Development'.

The session Chair, Jigme Rinzin, Member of Parliament from Bhutan, opened the session with some thought-provoking questions: "Is it the politicians who do not want to integrate adaptation into development planning? Is it the difficult scientific reports that could not convey the messages? Or is it the bureaucracy that could not translate the language of the report into action?"

Dr Hari K Upadhyay of CEAPRED, a Nepalese NGO, noted that integrating climate change adaptation into development planning is difficult but not impossible. Some of the major bottlenecks he identified were low or no participation and ownership from governments and communities, and weak coordination among national and sub-national agencies.

The panelists noted the need to integrate climate change adaptation into development planning, the need to build capacity of local people, strengthen data bases, improve institutional mechanisms to address trade-off between ecosystem and development needs, and ensure resources and funding.

Dr Maurizio Busatti of the International Organization for Migration said the focus should shift from international migration to internal migration. He pointed out that there is a disjoint between multiannual plans and local plans, and disciplinary and funding gap. "National adaptation plans and local adaptation plans must be a joint process," he said.

Dr Muhammad Hashim Popalzai, Ministry of National Food Security and Research, Pakistan, said people-centric approaches and engagement of all the relevant stakeholders in adaptation planning is important.



**"Critical institutions are still under-funded"** Sunil Tankha, IISS, The Netherlands

Dr Bernard Cantin of International Development Research Centre, CARIAC, said that climate change risks should be considered among other risks in risk management and planning, and there is a need to be careful in using language in a way that make sense to both local people and policymakers. He also pointed out that one of the major challenges is that of scale. "While climate science talks of the long-term future, decision-makers and politicians look for short-term information," he said.

In his concluding remarks, the session Chair said that besides climate change, there is the need to think of all the global drivers of change like market forces, migration, policy frameworks, and natural changes.

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