# Science policy interaction for effective decision making

## *Experiences from the Hindu Kush Himalayan Region*

***Nand Kishor Agrawal, Coordinator***
***Himalayan Climate Adaptation Programme (HICAP)***

International Centre for Integrated Mountain Development

Kathmandu, Nepal

*NAP Expo, 8-9 August 2014*

ICIMOD 30

THREE DECADES
FOR MOUNTAINS AND PEOPLE

# The Hindu Kush Himalayan region

ICIMOD

# The HKH Region: “Water Tower of Asia”

ICIMOD

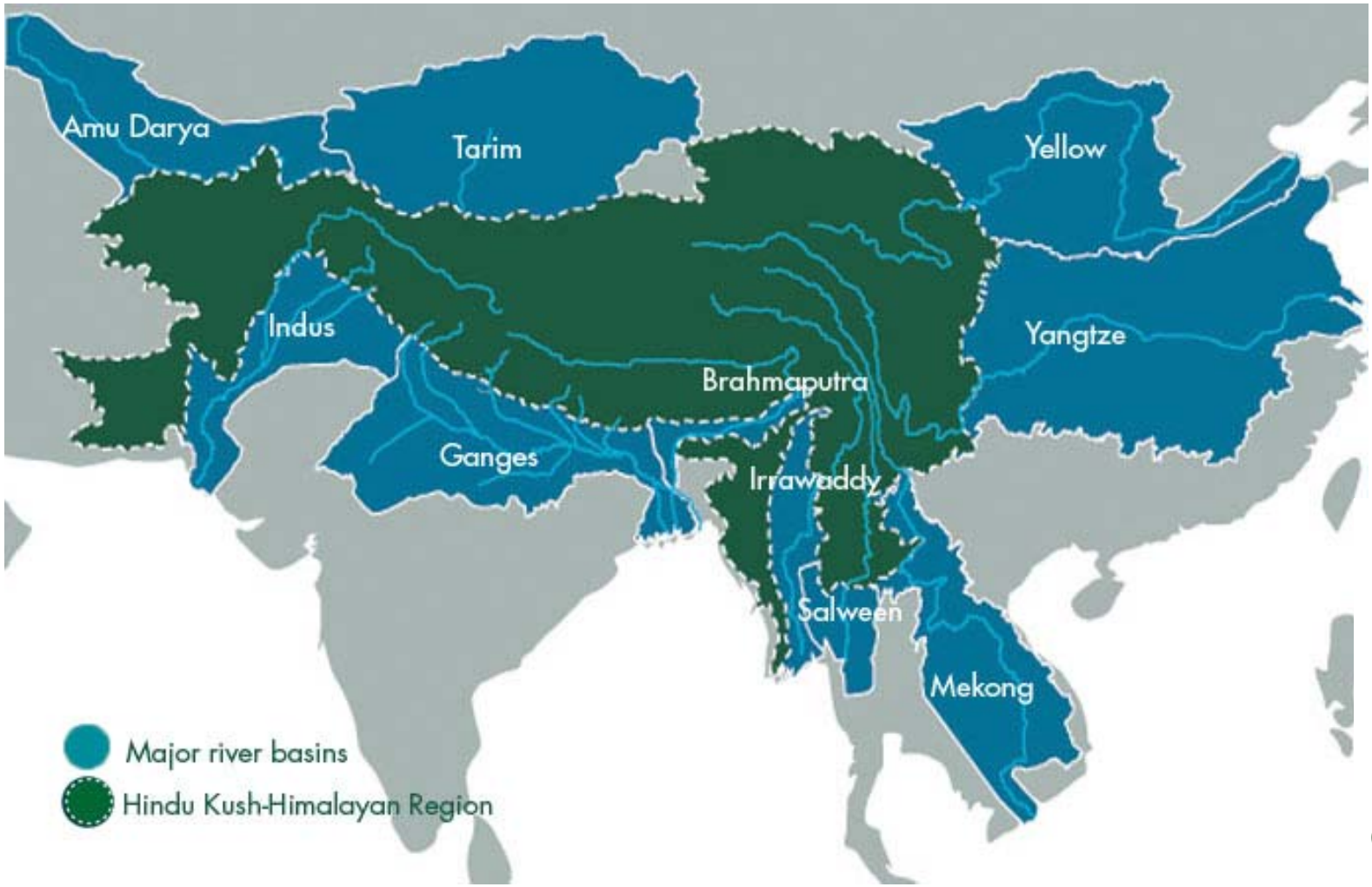
FOR MOUNTAINS AND PEOPLE

- has over **50,000** glaciers, representing about **30%** of the total glaciated mountain area of the world
- also known as the ‘**Water Tower**’ of Asia, the region is the source of **10 large Asian river systems**
- Vital source of water, food, energy, forests, biodiversity…

# Regional Intergovernmental Learning and Knowledge Centre

ICIMOD

FOR MOUNTAINS AND PEOPLE




Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan

**210 million people in the HKH**

**1.3 billion people downstream**

# Major Issues in the HKH Region

ICIMOD

FOR MOUNTAINS AND PEOPLE

1) Poverty in mountains more prevalent
2) Major drivers of change
   - climate change (mountains are hotspots)
   - land use/cover change
   - infrastructure development – hydropower dams
   - urbanization in mountains
   - globalization, access increased, ICT
   - Out-migration, faminization of NRM
3) Mountain specific policies lacking
4) Transboundary and common regional issues – like DRR
5) Differential capacities of institutions
6) Gaps in knowledge
   - consistent, comparable and representative data; long-term monitoring

# Responding to the Challenges of Global Change

ICIMOD

FOR MOUNTAINS AND PEOPLE

Find opportunities

to

enhance resilience

and support

adaptation of

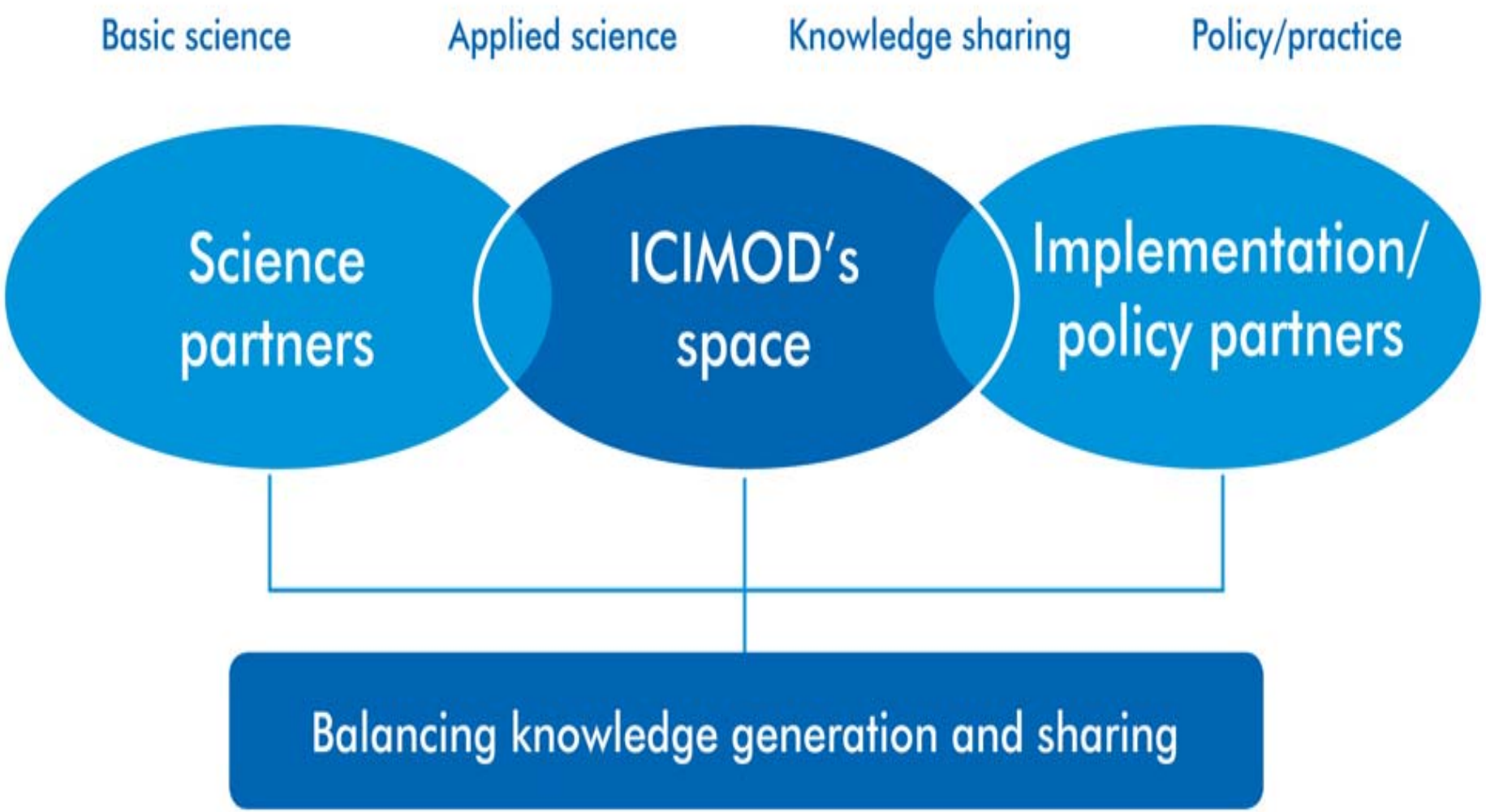
mountain

communities

# Linking Science-Policy-Practice

ICIMOD

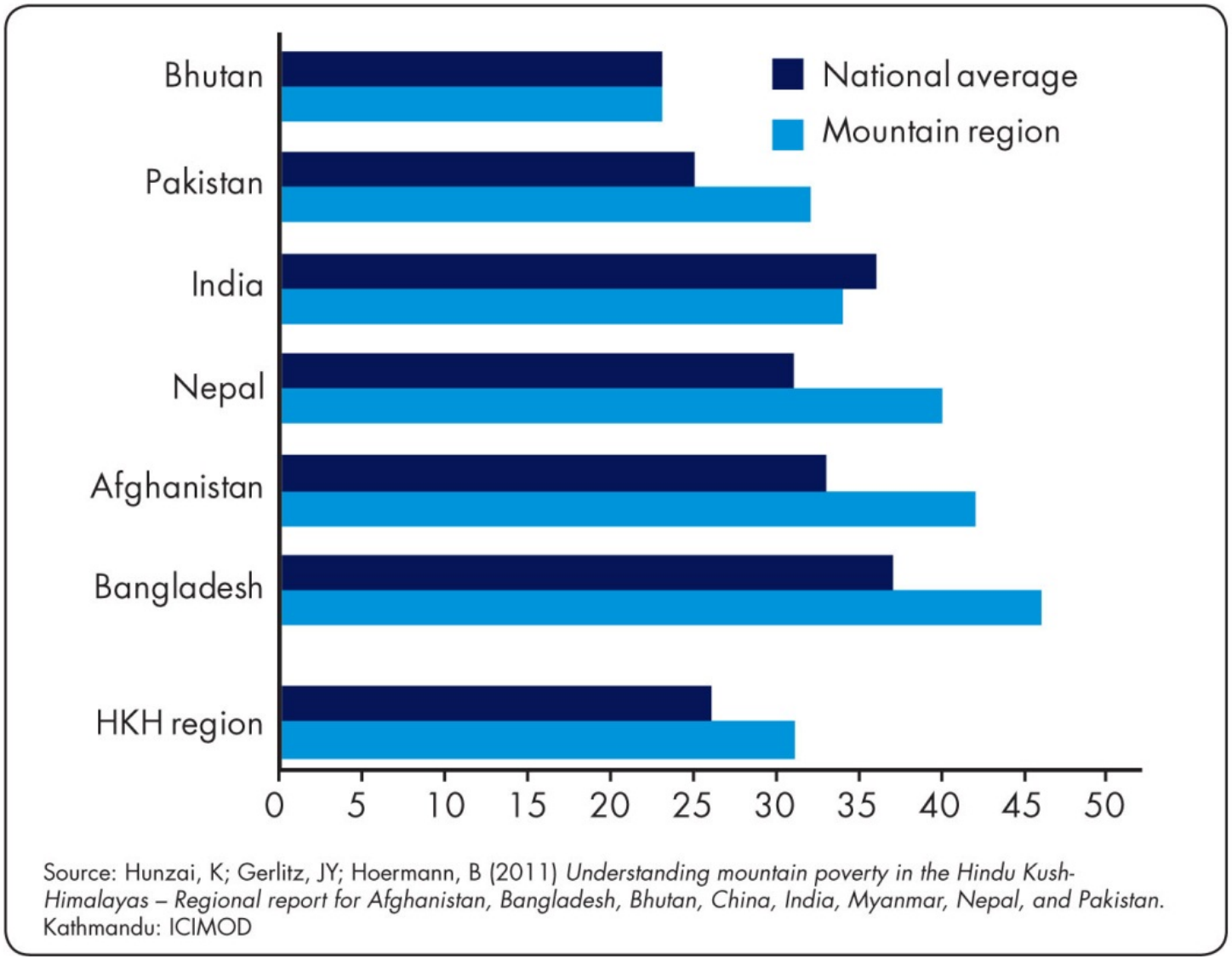
FOR MOUNTAINS AND PEOPLE



# Poverty in the Himalayan Region

ICIMOD

FOR MOUNTAINS AND PEOPLE



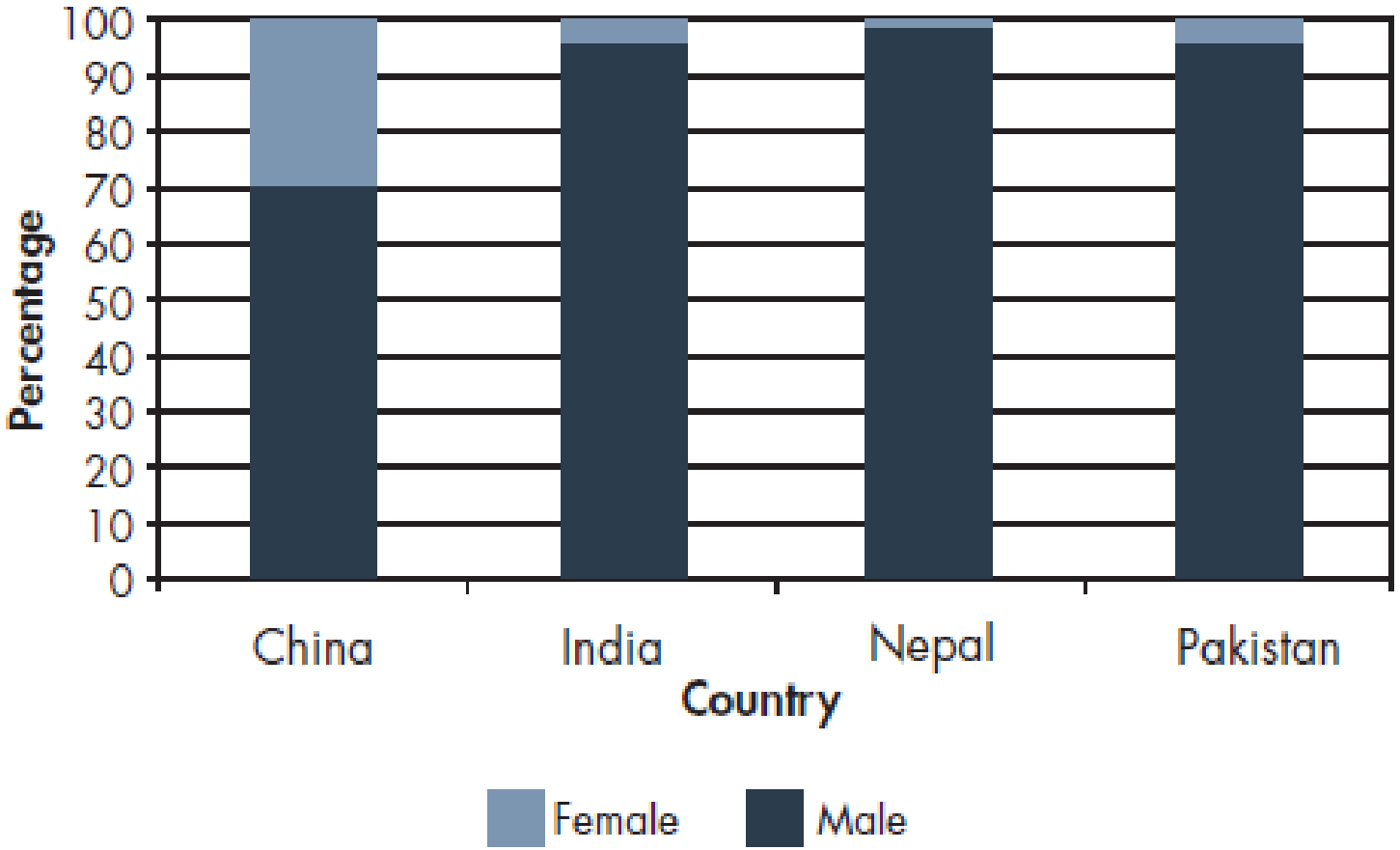

Source: Hunzai, K; Gerlitz, JY; Hoermann, B (2011) *Understanding mountain poverty in the Hindu Kush-Himalayas – Regional report for Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan.* Kathmandu: ICIMOD

# Gendered migration in the Himalayas

## Distribution of labour migrants by gender

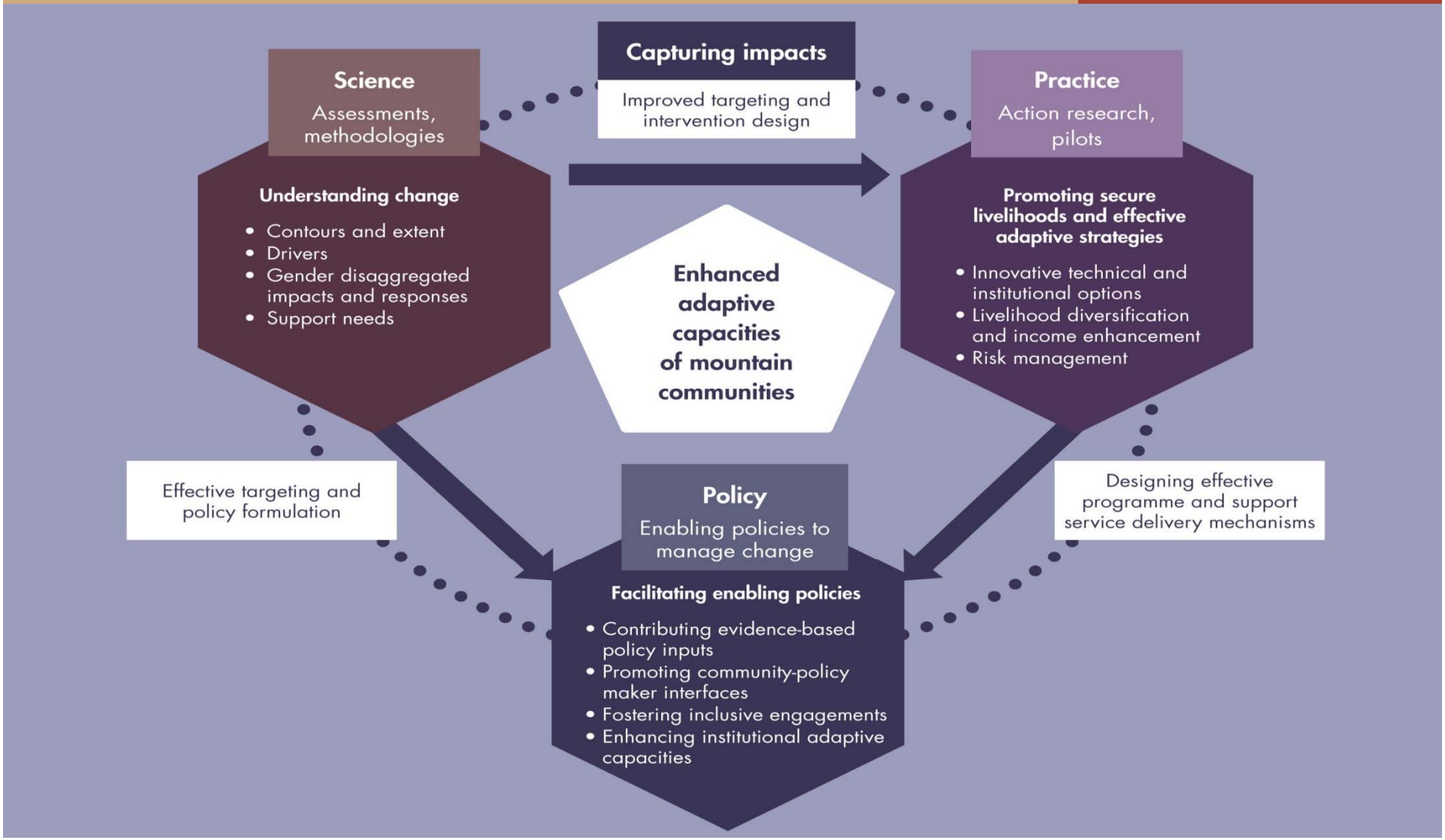
ICIMOD

FOR MOUNTAINS AND PEOPLE



# Adaptation to Change Regional Programme

ICIMOD
30
THREE DECADES
FOR MOUNTAINS AND PEOPLE



# Action Initiatives

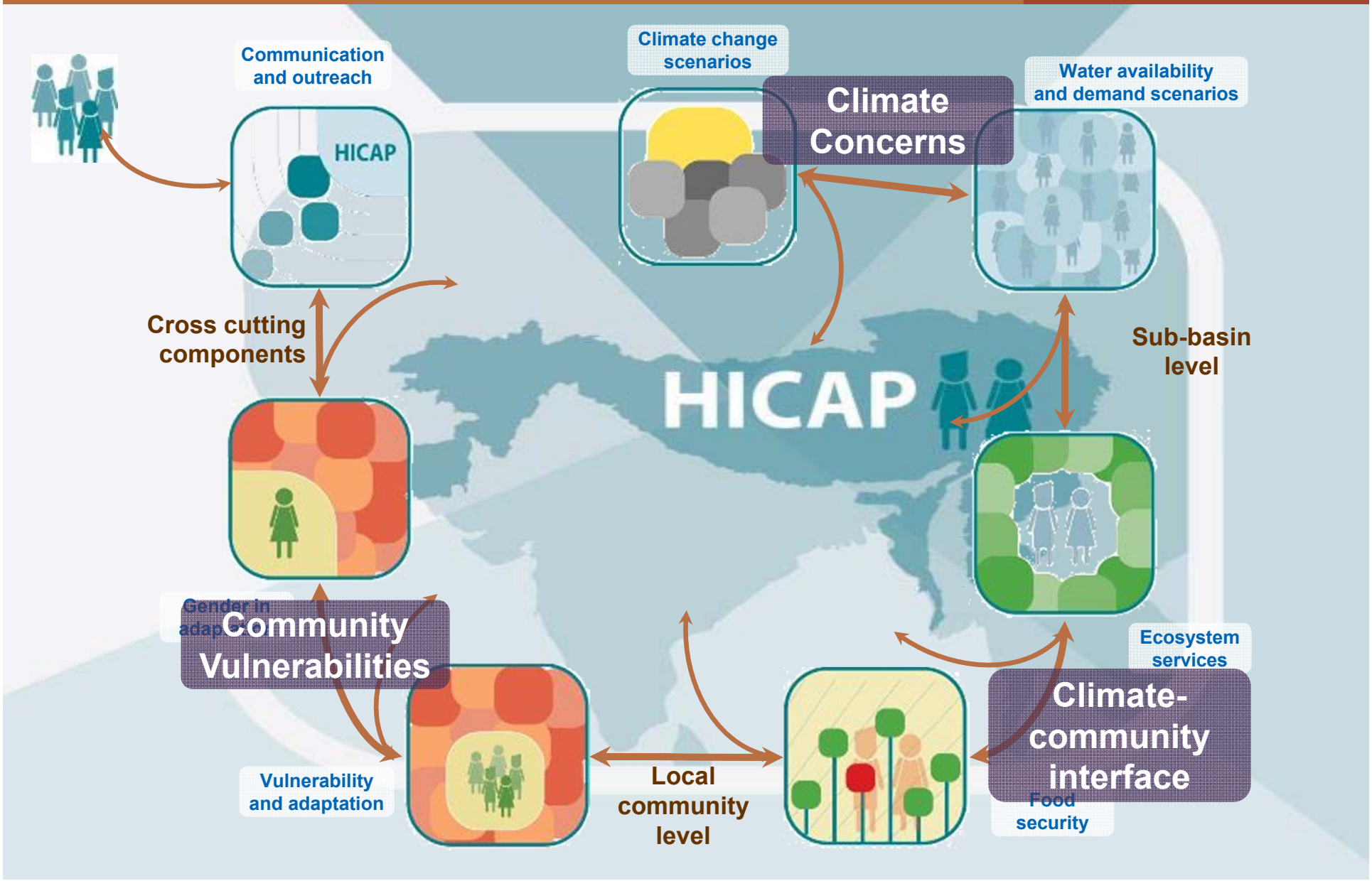


| Himalayan Climate Change Adaptation Programme (HICAP) | Improving Livelihoods and Enhancing Resilience of the Rural Poor in the HKH (*Adapt*Himal) | Support to Rural Livelihoods and Climate Change Adaptation in the Himalayas (Himalica) |
|---|---|---|
| •Downscaled climate models<br>• Water demand & availability<br>• Impacts on ecosystems, food security<br>• Vulnerability analysis & gender-disaggregated impacts<br>• Adaptation strategies<br><br>*Indus, Ganges, Upper and Eastern Brahmaputra, Upper Mekong-Salween basins*<br><br>**China, India, Nepal &Pakistan** | •Assess the impacts of socio-economic and environmental changes<br>•Identify appropriate adaptation mechanisms<br>•Pilot test and validate livelihood options for mountain poor<br>• Capacity enhancement & policy engagement through knowledge management<br>**Bangladesh, India, Myanmar and Nepal** | •Enhanced policy adaptation capabilities<br>• Development & management of knowledge products on adaptation<br>• Collaborative action research on livelihoods & adaptation<br>• Pilot activities on livelihoods<br>• Institutional capacity building<br><br>**Bangladesh, Bhutan, Nepal, Myanmar, (India)** |

# HICAP: Putting Adaptation in Motion

ICIMOD

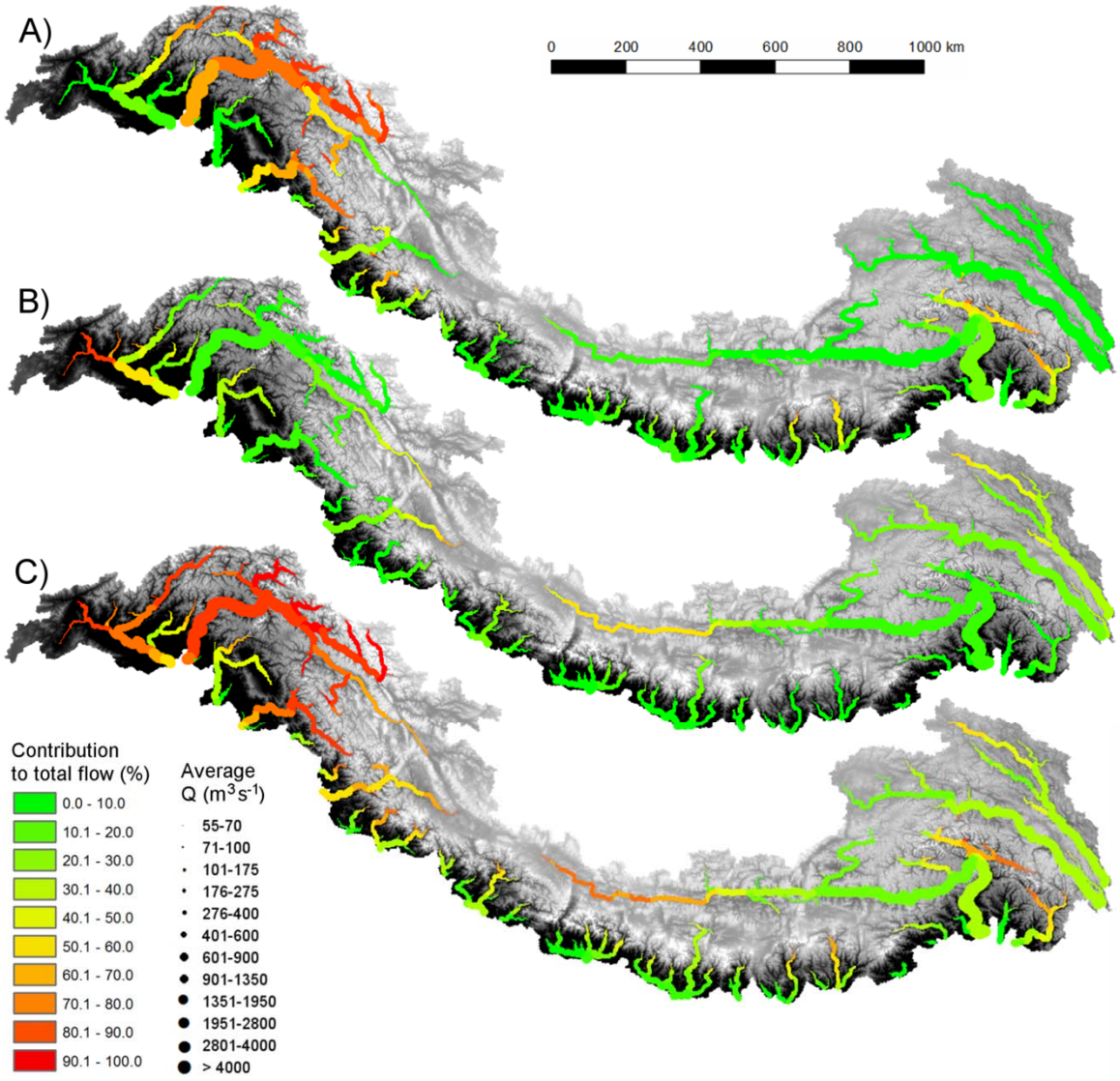


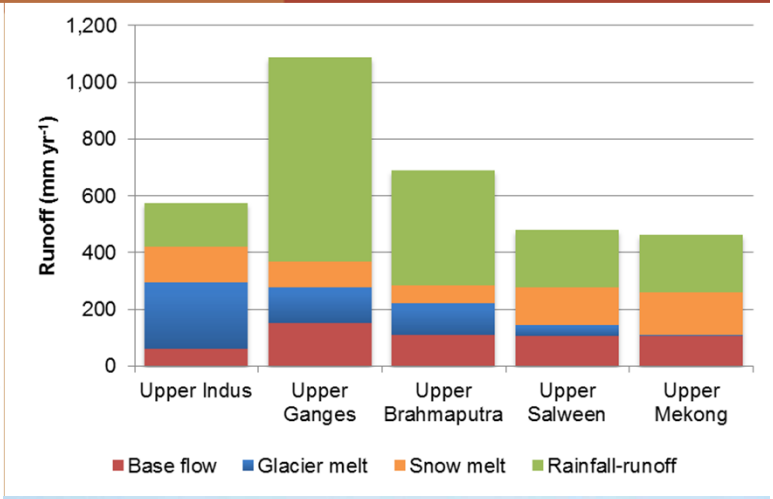


# *Understanding Change: Climate, water availability scenarios*

ICIMOD 30 THREE DECADES FOR MOUNTAINS AND PEOPLE

- Glaciers contributes to stream flow more in western side



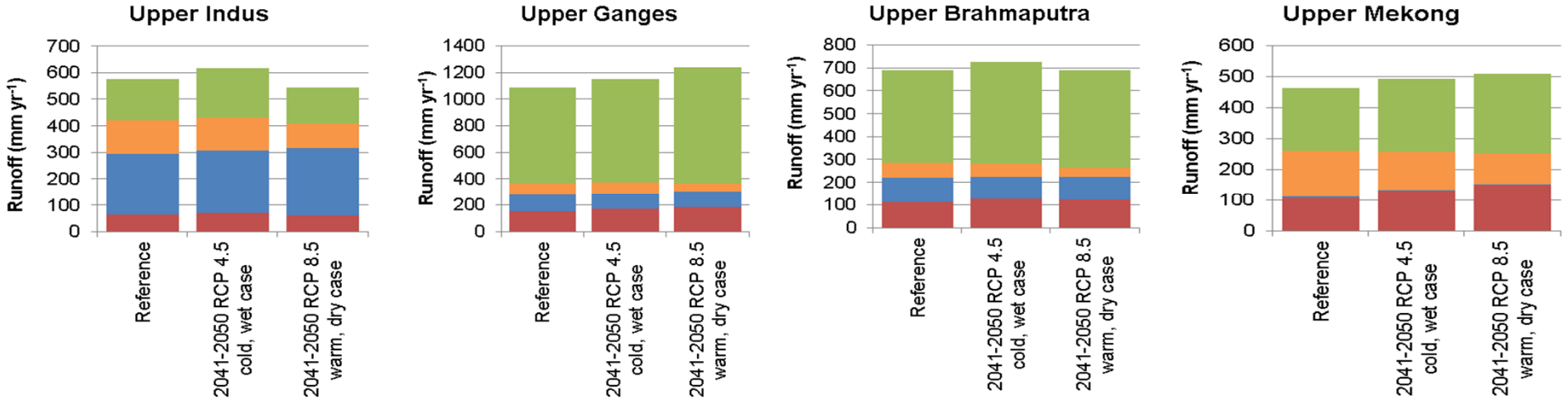




# *Understanding Change:* Future Stream Flow Scenarios



- Glaciers likely to reduce by 20-55% by 2050
- Overall stream flow likely to increase or remain unchanged in 2041-50 (e.g. ~1% to 27% in upper Ganges)
- High variability in stream flows: more water in pre-monsoon months

- *Governments need to be prepared for unexpected floods and drier rivers in spite of more water flows on an aggregate basis*
- *ICIMOD plans a 'Water and Climate Atlas' for HKH by mid 2015*
- *Contribute to NAP process*

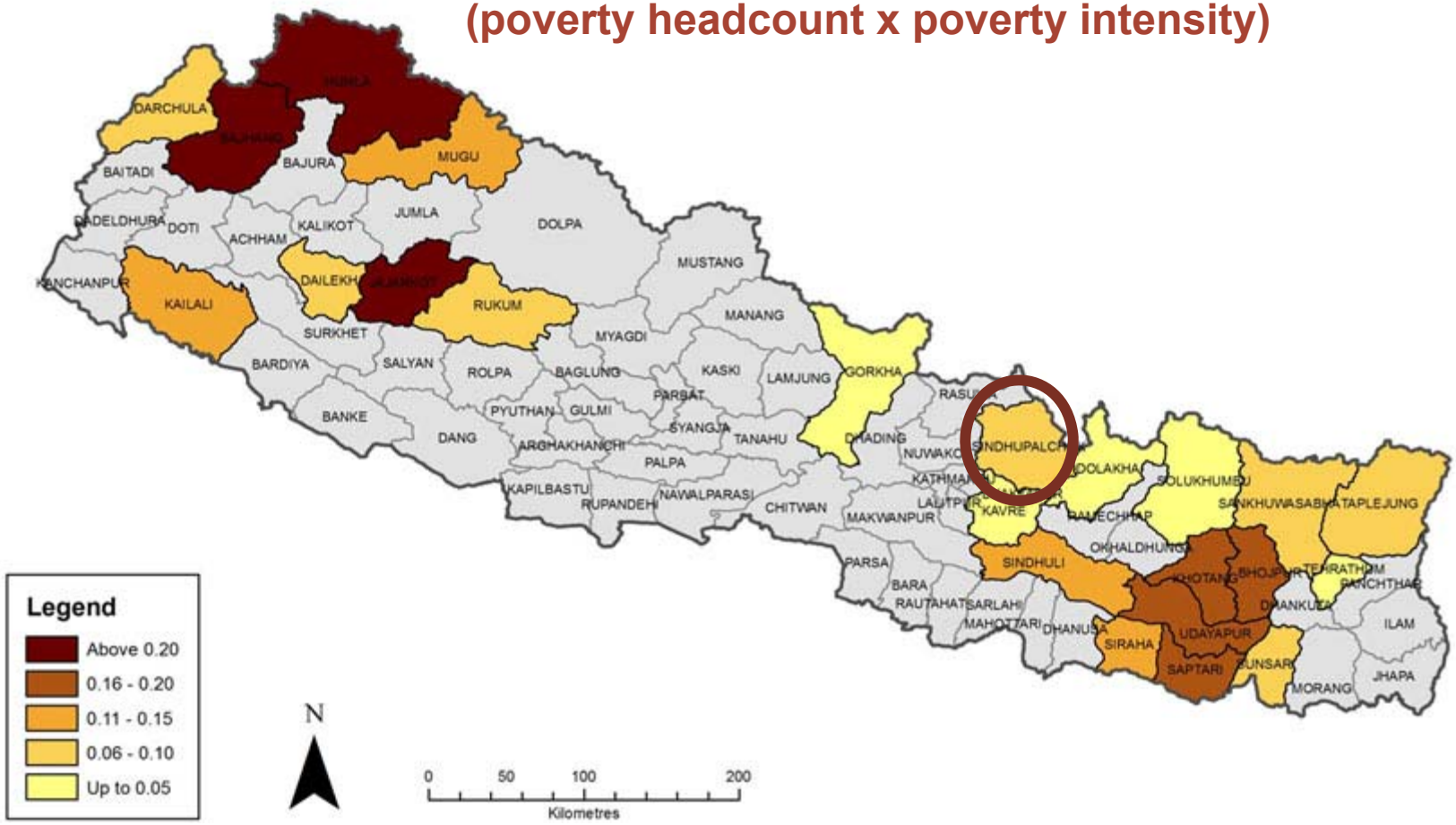


# Understanding Change: Poverty and Vulnerability Assessments (PVA)

ICIMOD 30
THREE DECADES
FOR MOUNTAINS AND PEOPLE

**PVA Surveys in 16,000 households**

**Mountain-specific Multi-dimensional Poverty Measures (poverty headcount x poverty intensity)**



# Understanding Food Security: Placed-based and PVA research

ICIMOD 30

- Mountain farming systems are being restructured due to outmigration of men, fewer young people in farming, and climatic changes.
- In the flood plains of Assam, floods are not always a bad news!


*Example: Subsidised food contributes only 8% of food requirements in PVA districts*

*Policy implication: Strengthen agriculture, diversify income*

| River sub-basins | Self-produced | Bought from store | Food subsidies/ aid | Other |
|---|---|---|---|---|
| Eastern Brahmaputra (7 districts) | 34 | 51 | 9 | 5 |
| Koshi (6 districts) | 54 | 44 | <1 | 2 |
| Upper Indus (3 districts) | 30 | 60 | 5 | 5 |
| **Average** | **41** | **51** | **5** | **3** |

# Gender in Adaptation

ICIMOD
30
THREE DECADES
FOR MOUNTAINS AND PEOPLE

## Understanding Vulnerability: gendered impacts of Change

- Decrease in water availability – domestic & agriculture – more difficult for women
- Outmigration of men – more responsibility of agriculture on women – lack of access to technology and credit

## Resilience: Adaptation challenges and best practices

- Women friendly agriculture approaches (e.g. technologies)
- Remittances allow women headed households to hire agriculture labourers

## Enhancing Adaptive Capacity: Action research and pilots

- Enhancing women's adaptive capacity - Nepal
- Developing resilience of women from migrant HH in Assam, India

# Knowledge to Pilots to Policy to Practice: Multi-dimensional Approach

ICIMOD 30

## a) Knowledge: Produce High Quality Science

Publications in international peer review journals (2013-14):

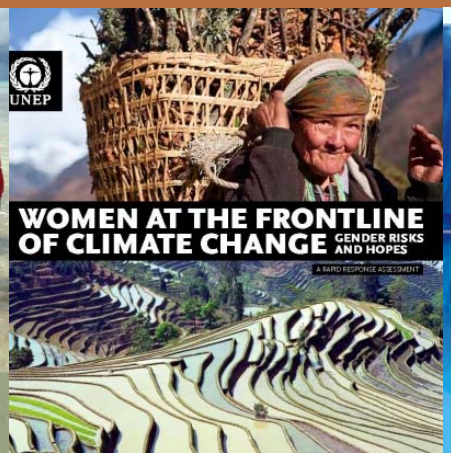
- 8 published; references made in IPCC and other documents

  *(e.g. **Chapter 14 of IPCC's AR5**: refers to ICIMOD's migration and adaptation work.*

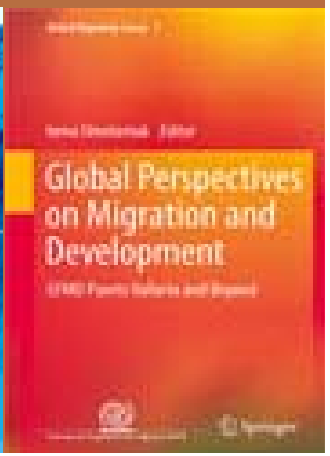
- 13 submitted;

- Other publications for awareness, policy advocacy:
  - 7 published; 6 submitted
  - 20 at different stages of drafting









# Adaptation Responses!



**Knowledge is not yet perfect,**
**evolving and improving**

**But**

**we cannot, and don't need to**
**wait until knowledge is perfect!**

# b) Pilots: Replicable, Government owned

## Livelihood Diversification Options – *High Value Products and Value chains*

ICIMOD 30
THREE DECADES FOR MOUNTAINS AND PEOPLE

Income enhancement and diversification through Value Chain approaches:

- On-farm and non-farm opportunities
- Market linkages
- Access to commodity pricing
- Support services
- Extension and technical services

# b) Pilots- Building capacities to manage risks: Flood Preparedness - Early Warning Systems



5 Community-based Flood Early Warning Systems installed in Assam, India; simple systems (USD 700-800); serving 42 villages,

Signals sent by one of the systems saved assets worth USD 3,300 in 2013

Communication downstream – communities, DRR system
Complimented with Flexible Planning for enhancing adaptation to flood-related hazard management

## Early warning can minimize the devastation of flash flood

*By Monoj Gogoi*

DHEMAJI, Oct 3: The frequency and intensity of flash flood is rapidly and noticeably increasing year by year in the eastern parts of Assam and Arunachal Pradesh, particularly in the Lakhimpur and Dhemaji districts of Assam and Lohit, Lower Subansiri and Anjaw districts of Arunachal Pradesh.

Many people believe that the root cause of this rapid increase in flash flood in these regions may be attributed mainly to erratic rainfall in the upper catchment areas due to climate change or climate variability.

The flash flood is different than the normal monsoon flood as it carries huge amount of water loaded with debris and sediment to the plains affecting people, livestock, crops land etc. The energetic flash flood is difficult to deal with and more hazardous than a typical monsoon flood because of its suddenness without giving much indication before. The north bank tributaries of the Brahmaputra are flashier and more prone to the flash flood for high gradients.

River researchers believe that the devastation of such flood could be minimized by effective flood forecast and early warning system. Dr. Partha J Das, a river researcher and a renowned environmentalist told this correspondent that in this context it was very important to monitor weather system, especially in synoptic situation that cause heavy rainfall in the upper catchment in Arunachal Pradesh hills as well as the geomorphological conditions in upper catchment. Based on such information forecast and warning of flash flood could be provided.

He also suggested that with high resolution digital satellite real time data, it was highly possible to monitor the weather system and rainfall events and catchment condition even in inaccessible hilly terrains.

Criticizing the present approach of the government to flood management he told it was reactive in nature. To deal with, possibilities of such events should be disseminated from upstream to the potentially affected people in the downstream in the form of flood forecast and warning, especially for the north bank tributaries of Assam. While some amount of qualitative flood forecast was provided by the Central Water Commission (CWC) for the Brahmaputra, there was hardly any forecast or warning for its tributaries, he added.

It may be mentioned that a community based flood early warning system has been introduced experimentally in some of these rivers, particularly in the Jiadhal river in Dhemaji by Aaranyak, a Guwahati based biodiversity conservation NGO in collaboration with Kathmandu based ICIMOD over last few years. This system comprises of a simple flood gauge and a related instrument that produces a siren as water level rises in the river. And this flood warning is disseminated from the upstream to downstream through a community network using mobile phone. 'This system of providing flood warning has become popular and useful to the community', Jarman Doley, a flood affected by the Jiadhal told.

Harish Pegu, a flood control activist from Dhemaji told 'It is very essential that government should promote such efforts and take up such effort on a larger scale in all the rivers of the eastern Himalayan region.'

# c) Proactive Policy Engagement



- Sharing in national, regional and global events
- Active engagement in global processes:
  - IPCC Reports;
  - UNFCCC: National Adaptation Plans (NAP) for LDCs;
- Direct engagements with stakeholders at, particularly governments at every level (district, province and national).

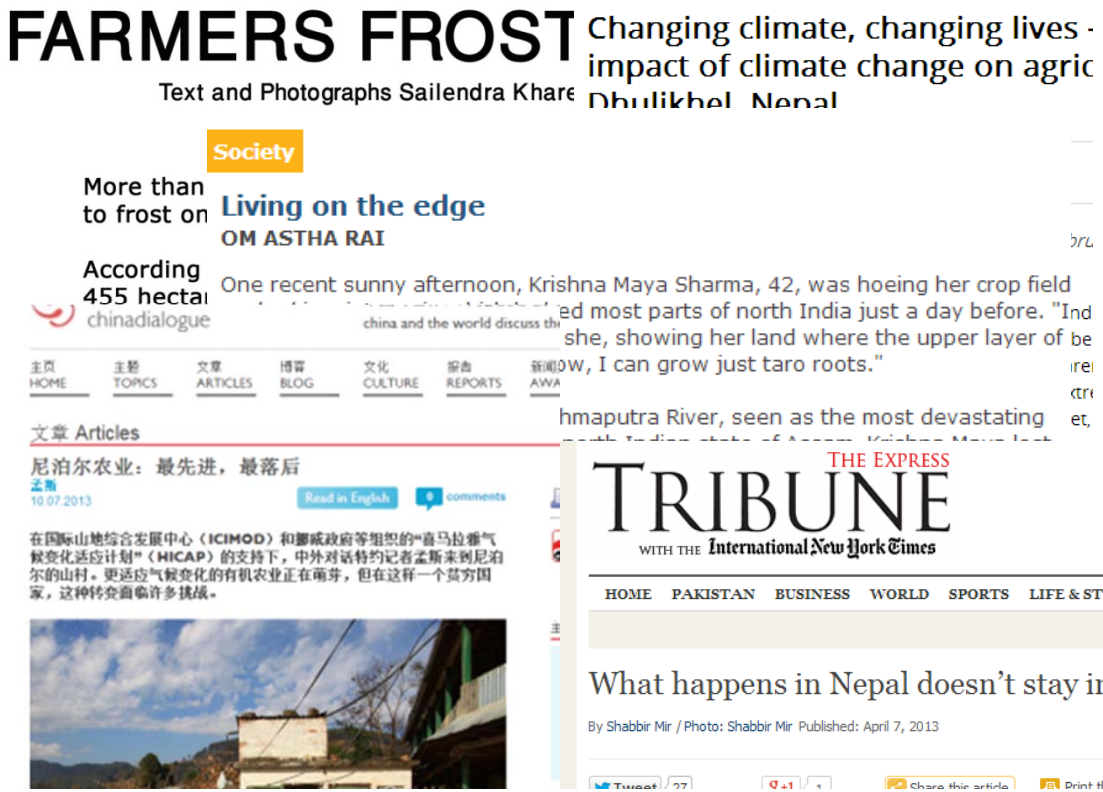
*Examples:*

- *Engagement of District Disaster Management Authority in Early warning systems*
- *Climate-Smart Villages pilots jointly with District Officers*
- *National Ministry proposing 'Adaptation knowledge forum'*

# d. Hands on Media Engagement

ICIMOD 30

- Communicate complex science in simple language
- Journalists training and grant programmes
- 34 print, radio and video stories; 35 news items





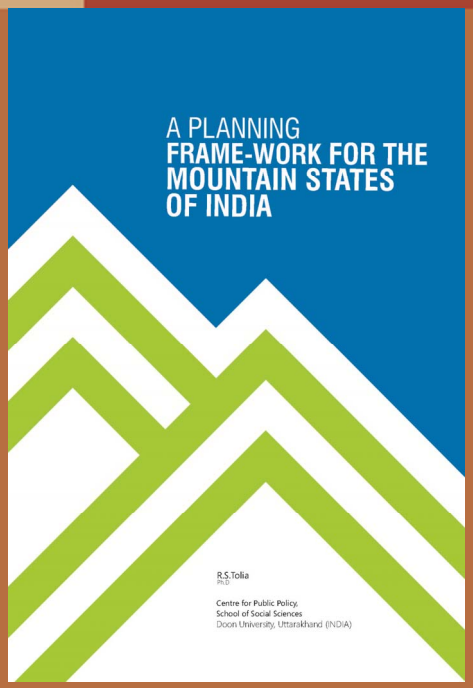

# *Towards Outcomes: Contributions to evidence based policy making and programme designing*

ICIMOD 30
THREE DECADES
FOR MOUNTAINS AND PEOPLE

- Working Group on *Mountain Ecosystems and Challenges faced by Hilly Areas*, set up for first time by the Planning Commission, Government of India for preparation of the Approach Paper for XII Five Year Plan

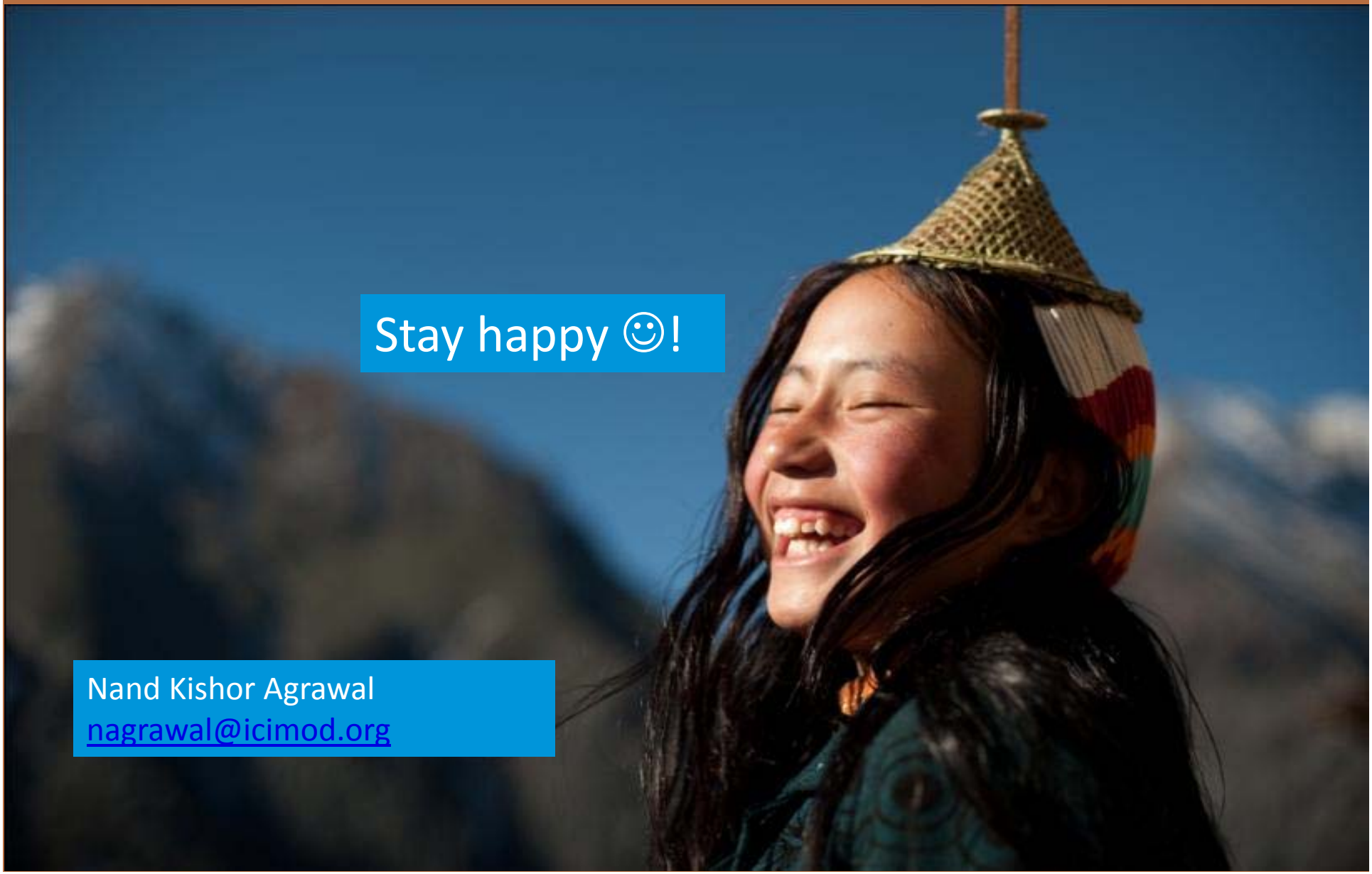
- *National Ministry proposing 'Adaptation knowledge forum'*

- IFAD's Country Operational Strategy (COSOP) for Nepal
  - Targeting
  - Programme development
    - Adaptation for Smallholder Agriculture in Nepal (ASHA)
    - Harnessing Migration for Rural Microenterprise Development



# Thank you for your Attention !






Nand Kishor Agrawal
nagrawal@icimod.org