Position Paper for the Asia-Pacific Regional Process of the 7th World Water Forum

Theme: Climate Change/ Water Related Disasters/ Resilience/ Mountain Water Security

Focus: Strategic Flood Risk Management

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Problem Statement

The Asia-Pacific region faces more water-related disasters than any other region in the world.

Disaster risks will continue to increase in many countries of the Asia-Pacific region as more vulnerable people and assets are exposed to weather extremes. (SREX report/Asia 2012)

Climate change and variability are expected to create more hotspots in the region.
Situation Analysis - 1: Water-related hazard and resilience indicators, by country

Within the Asia-Pacific region, South Asia and the Pacific sub-regions face the highest risk for water-related disasters and have the lowest resilience (AWDO 2013):

Water-Related Hazard Relative to Resilience

Note: Bubble size is proportional to per capita gross domestic product ($ per person).
Focus on Flood Risk Management

• Risk assessment
• Information and data sharing
• Early warning systems
Specific issues to be addressed - 2

Issues raised in the Imperatives Called by High-Level Expert Panel on Water and Disasters of UNSG’s Advisory Board to Give Life and Immediacy to the Hyogo Framework

• Flood risk assessments: “create comprehensive flood risk assessments”

• Data sharing: “We call on national governments to declare hydro-climatic data as “public good” to be shared at all levels (regional, national and local)”

• Early warning systems: Prioritize systems to forecast, inform, alert and evacuate; early warning systems must reach people.

• Strategic framework: Incorporate disaster risk reduction and climate change adaptation as integral to development planning
Recommendation of the APWF session at the 6th World Water Forum

- A right mix of structural and non-structural measures should be adopted for flood risk management in the HKH region.

- An ecosystem approach to disaster risk reduction should be considered, within the context of an integrated approach to flood risk management.

- Local knowledge should be considered along with scientific knowledge for flood forecasting and early warning.

- There is a need to explicitly recognize information systems in the integrated approach to flood risk management, thereby developing disaster management plans based on information and communication technologies for early warning.

- There is a need for a framework for cooperation on regional flood data and information, because of the shared river basins and consequent externalities in the HKH region.
Key Elements of Integrated Flood Management

• Managing the water cycle as a whole
• Integrating land and water management
• Adopting a best mix of strategies
• Ensuring a participatory approach
• Adopting integrated hazard management approaches
Missing Element in the Integrated Flood Management Approach

- There is a need to recognize information systems explicitly in the integrated approach to flood risk management.

- In the case of the Hindu Kush Himalayan region, the development of information systems needs a coordinated effort because of the trans-boundary nature of its river systems.

There is a need to develop a regional strategic flood risk management framework, with a focus on emerging technologies and strengthened regional information systems for enhanced community resilience and adaptation.
The overall method used to solve the issues - 5

The Information Systems Perspective

- The key to flood risk management problem lies in better systems for information management and dissemination to the last mile

- Modern hydro-met stations to collect and store data

- Information and communications technology, both terrestrial and satellite communication systems, to transmit data in real-time

- Mechanisms for sending flood alerts up to the last mile

- Training, capacity building, and public awareness development
Implementation Strategies and Roadmap - 3

- Climate Change Studies
- Flash Flood Risk Assessment Studies
- Regional Flood Information System Initiative/Flood Outlook Initiative
- Community Based Early Warning Systems Initiative
- Basin Level Flood Risk Management Guidelines Preparation/Adaptation and Resilience Building Initiative
Water Towers of Asia
Preliminary findings of ICIMOD Climate Change Studies

- Hydrological modeling for RCP 4.5 and 8.5 scenarios show that the glaciers in the 5 river basins—Indus, Ganges, Brahmaputra, Salween and Mekong are likely to reduce by 20 to 55% by 2050.

- Overall, river flows in 2041-2050 are likely to increase or remain unchanged compared with 1998-2007 for all four river basins, although there is a large spread in projections. This is mainly due to enhanced melting of glaciers and strengthening of precipitation.

- Increase in the flow is likely to be highly variable, indicating higher incidences of floods and drier periods. For example, in the Brahmaputra basin the water flow is likely to have more increase in the pre-monsoon months (-10% to 10%) compared with monsoon and post-monsoon (0 to 5%).

- The policy implications of these observations is that the governments have to be better prepared to deal with unexpected floods and drier period in spite of having more water flows on an aggregate basis.

ICIMOD’s partners are from Bangladesh, China, India, Nepal, The Netherlands, Pakistan

Timeline: Project to be completed in 2015
ICIMOD’s Flash Flood Risk Assessment Studies

- ICIMOD studies have identified 203 priority (potentially dangerous) glacial lakes out of 8,790 in Bhutan, China (Ganges sub-basins within China), India, Nepal and Pakistan (Indus sub-basin).

- ICIMOD has also conducted GLOF risk assessment studies using dam breach simulation models and HEC-RAS and HEC-GeoRAS models.

- ICIMOD has developed flash flood risk management resource manuals for structural and non-structural measures as well as the one for training the trainers.

- ICIMOD published last year eight case studies and synthesis on flash flood risk management in the HKH region, providing recommendations for flash flood risk management.

- ICIMOD is working with WMO and other partners to establish a South Asia regional flash flood guidance system.
Mitigation and Early Warning Systems (e.g. Tsho Rolpa Glacial Lake)
ICIMOD’s Regional Flood Information System Initiative

- An institutionalized cooperation among the four countries of Bangladesh, Bhutan, Nepal, and Pakistan in the field of hydrometeorology has been established, with China and India as observers.

- A regional flood information system has been established and is accessible from www.icimod.org/hycosrfis

- Real-time data at 15 minutes interval from more than 30 hydro meteorological stations upgraded across the four countries can be visualized in this website.

- Real-time data are also available from other hydro meteorological stations as well as those available from the Global telecommunication system (GTS).

- Regular consultation with the hydromet agencies in the HKH region has resulted in enhanced cooperation in flood risk reduction.
ICIMOD’s Flood Outlook Initiative:

- A regional flood outlook system is being developed to provide to the national hydro-meteorological agencies the products needed to support the development and refinement of national flood forecast and warning systems.

- The system integrates data from various sources including real-time data from national and regional websites, HKH HYCOS real-time data, satellite based snow and rainfall estimates, and meteorological forecasts with a web based user interface, for ease of use by regional and national operators.

- During the monsoon of 2014 the project plans to run the models in forecast mode to obtain feedback from regional and national agencies for further improvement of the system.

ICIMOD and its partners from Bangladesh and Nepal
ICIMOD’s Community Based Early Warning Systems Initiative

- A community based flood early warning system was piloted in Assam, India, which proved to be successful in saving life and property; installed 5 sets together with the local partner.

- A prototype system was tested in ICIMOD’s knowledge park before installing in the field and continuous research and development is being done to improvise the low cost technology.

- Training on participatory flood mapping and community-based monitoring was conducted for field facilitators followed by an envisioning training and field exercises to prepare flexible flood management plan.

- The District Disaster Management Authority (local Government) were involved from the initial stage for the future sustainability of the system.

- ICIMOD piloted wireless sensor network (WSN) based flash flood early warning system in Sunamganj District of Bangladesh, which may also help strengthening community based early warning system.
ICIMOD’s Basin Level Flood Risk Management Guidelines:

- To review flood risk management policies and practices of the three Koshi basin countries for identifying challenges and opportunities for regional cooperation (December 2015)

- To systematically document best practices for flood risk management in the Koshi basin for policy uptake (December 2015)

- To develop and test basin-wide analytic tools to support national flood forecasts in the Koshi basin countries (December 2015)

- To propose Koshi basin flood risk management regional cooperation framework (June 2016)

ICIMOD partners from China, India, and Nepal
ICIMOD’s Adaptation and Resilience Building Initiative

The aim is to upscale practices and policies, to analyze barriers and bridges for implementation of the adaptation pathways, and to develop the pathways. This initiative will support the National Adaptation Plan (NAP) process of countries in the HKH region

The specific activities will include:

- A systematic review of climate change impacts, and the preparation of case studies on socio-economic, governance and gender drivers and conditions leading to differential vulnerability
- A report on the impact of climate change on the timing, frequency and duration of critical moments for climate change adaptation for different sectors and locations
- A report discussing the barriers and opportunities for out-scaling and up-scaling critical adaptation options for different sectors

ICIMOD partners are from Bangladesh, India, Nepal, The Netherlands, and Pakistan

Preliminary results by March 2015; final results by 2018
Mountains occupy 24% of global land surface; home to 12% population; About 10% of world’s population directly depend on the mountains for their livelihoods; 40% indirectly depend on water, hydroelectricity, timber, biodiversity and niche products, mineral resources, recreation, and flood control.
Mountains and Water Security Initiative – 2: Water Towers of Asia
1.3 Billion People Downstream
What will happen to our water resources?
Mountains and Water Security Initiative – 3: Shrinking Glaciers

Glaciers shrinking

Glaciers growing
Mountains and Water Security Initiative – 4: Population density

Population Density in the 10 River Basins of Hindu Kush-Himalayan Region

Legend
- Cities
- River basin
- River
- high_region
- 0 - 4,000
- 4,001 - 8,000
- 8,001 - 12,000
- 12,001 - 16,000
- 16,001 - 20,000
- 20,001 - 24,000
- 24,001 - 30,000
- 30,001 - 50,000
- 50,001 - 1,005,420

Arabian Sea
Bay of Bengal
Indian Ocean
Mountains and Water Security Initiative – 5:
Water Scarcity In Spite of Abundance
ICIMOD’s Mountain Water Security Initiatives

Mountain springs

- Understanding socio-hydrology of springs in mid hills of Himalayas through case studies and primary research. 3-5 case studies in mid hills of Bangladesh, Nepal, and India
- Enhancing spring recharge through better understanding of recharge processes and then supporting interventions

Timeline: March 2014 - Feb 2016

Solar-powered Water Pumps

- Piloting solar pumps in selected parts of mountains and plains within HKH region. Documenting the impact of solar pumps on people’s livelihoods.
- Working in partnership with relevant agencies while installing the pumps.

Thank you