

Regional efforts on disaster risk reduction in the HKH region: challenges and opportunities

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Outline of presentation

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- About ICIMOD
- Distribution of disasters in the Himalayan region
- Recent flood disasters and lessons learnt
- Technologies for disaster risk reduction
 - End to end flood early warning system
 - HKH HYCOS initiative
 - Rapid response mapping
- ICIMOD's role in reducing disaster risks in the HKH region

Intergovernmental, knowledge,
learning and enabling centre

ICIMOD's Eco-region



Member Countries

- Afghanistan
- Bangladesh
- Bhutan
- China
- India
- Myanmar
- Nepal
- Pakistan

Mission

Enable sustainable and resilient mountain development for improved and equitable livelihoods through knowledge and regional cooperation.

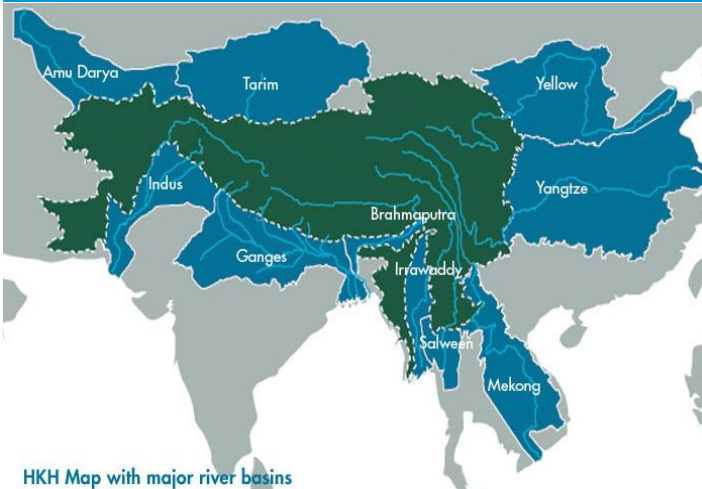
Vision

ICIMOD's Vision is that the men, women, and children of the Hindu Kush Himalayas enjoy improved wellbeing in a healthy mountain environment.

Himalayan region: Source of 10 major river systems – the “water tower” of Asia

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HKH Map with major river basins

Largest body of ice outside the Polar caps, the “Third Pole”

Himalayan glaciers are sources of freshwater reserves which provide headwaters for major river systems in Asia

Sustenance to about 1.3 billion people

Climate change impact in the mountains

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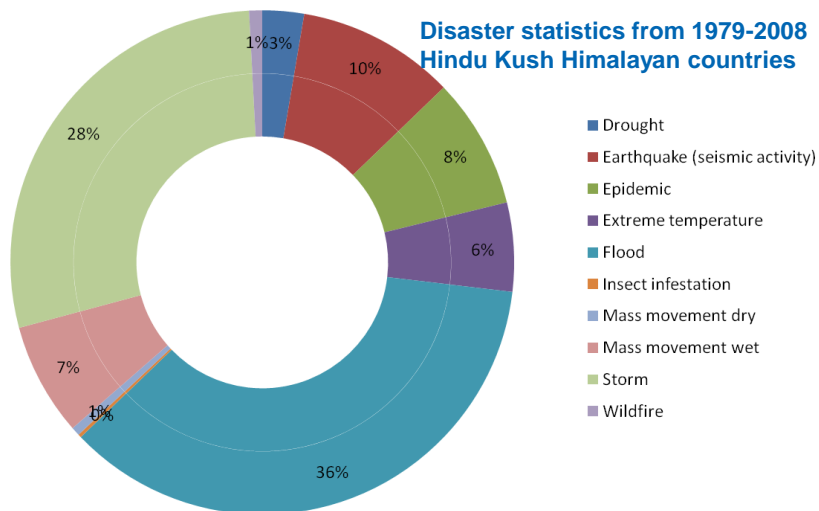
- Rate of warming is higher in the mountains than in the plains (Shrestha et al., 1999) and five times faster than warming globally (Lau et al., 2006)
- Glaciers and snow melt accelerated
- Increased risk of glacial lake outburst floods (GLOFs) due to increased volume of water in glacial lakes
- Changing water availability downstream particularly during the lean flow season
 - Hydropower sector
 - Water supply and irrigation
- Potential impacts on agriculture and ecosystems
- Increased occurrence of floods and droughts



Hindu Kush Himalayan region is prone to disasters

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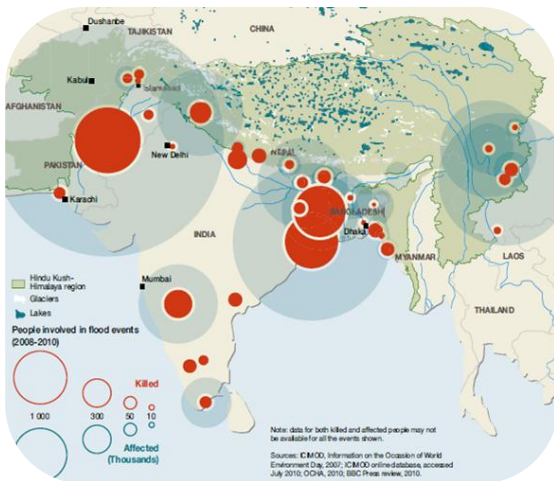


Source: EM-DAT - The OFDA/CRED International Disaster Database

One-third of these disasters are floods

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Often transboundary floods - shared vulnerability across national borders
 Huge loss of lives and livelihoods and immense human suffering undermines SD

Disproportionate impacts of disaster

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- Women, boys and girls are 14 times more likely than men to die during a disaster.
 - In 1991, Bangladesh cyclone: Of the 140,000 people who died, 90% were women.
 - More women than men died during the heat wave that affected Europe in 2003. In France most deaths were among elderly women.
 - Hurricane Katrina, USA: Most of the victims trapped in New Orleans were Afro-American women with their children.
 - In Sri Lanka and India, it was easier for men to survive during the tsunami because knowing how to swim and climb trees is mainly taught to boys.
- (Neumayer and Plümer , 2007)



Lessons learned from past disasters

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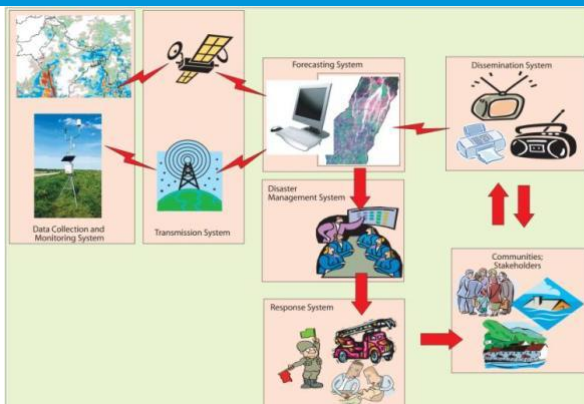
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- Data gaps
- Capacities vary across regions
- End-to-end information systems
- Proper infrastructure planning
- Opportunities for transboundary cooperation

Innovation in technologies for end to end flood early warning system

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EWS elements

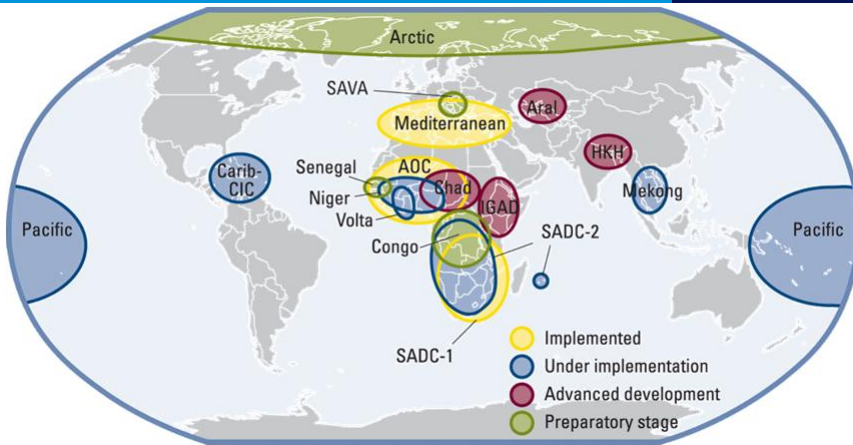
- Risk knowledge
- *Monitoring and warning*
- Dissemination and communication
- Response and recovery

- Advancement and innovation in technology : real-time data through sensors.
- Data transmission through CDMA, GPRS/GSM, and satellite iridium.
- Space based technology using earth observations are increasing the lead time, filling data gaps and risk mapping.

HKH HYCOS is a part of the Global WHYCOS framework

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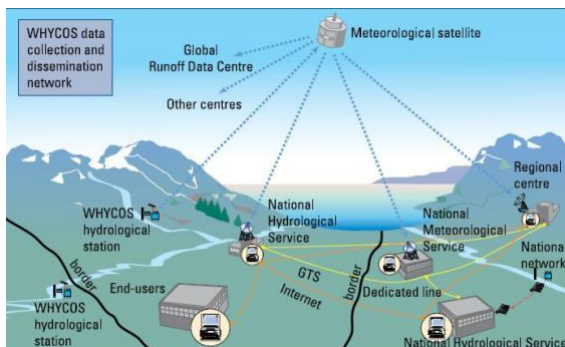
To improve the basic observation activities, strengthening the international cooperation and promoting free exchange of data in the field of hydrometeorology.

HKH-HYCOS: Setting up monitoring stations and establishment of real-time flood information systems

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‘Making Information Travel Faster Than Flood Waters’



Establishment of a Regional Flood Information System in the HKH-Region - Timely exchange of flood data and information through an accessible and user friendly platform



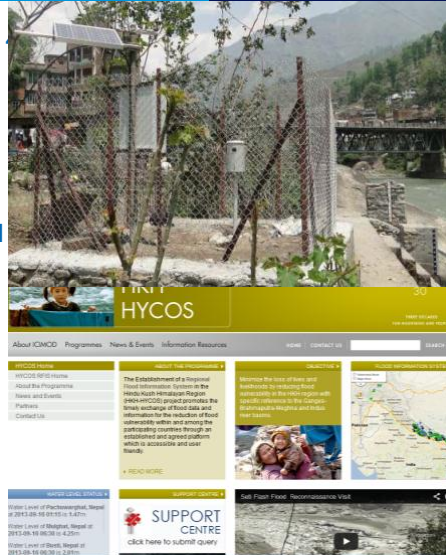
HYCOS is a vehicle for technology transfer, training, and capacity building

Regional flood information system: real-time data sharing

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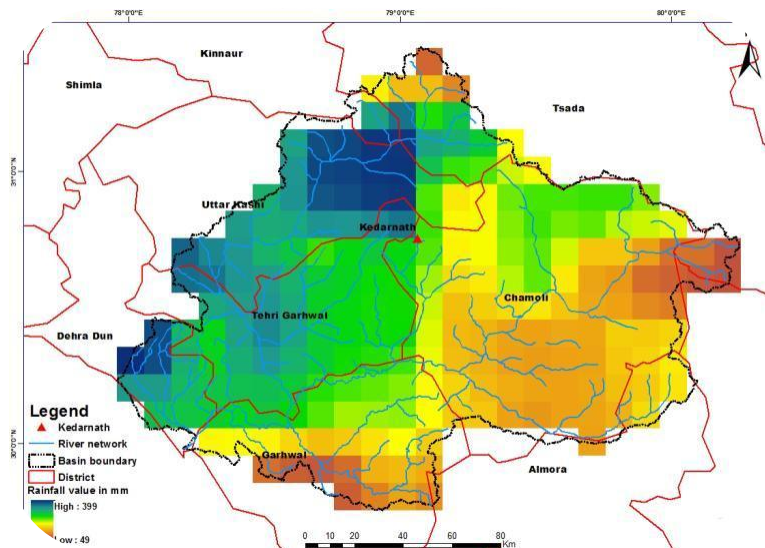
- Real time data sharing institutionalized in countries through upgrade of 38 hydrometeorological stations and enhanced capacity of partners in flood forecasting
- Utility of data through the development of value added products: for example regional flood outlooks and quality control procedures developed.
- Integration of various data sources:
 - Satellite rainfall estimates
 - Global telecommunication data
 - Real time data from partner countries



Use of satellite rainfall estimates: 16 June in and around Kedarnath

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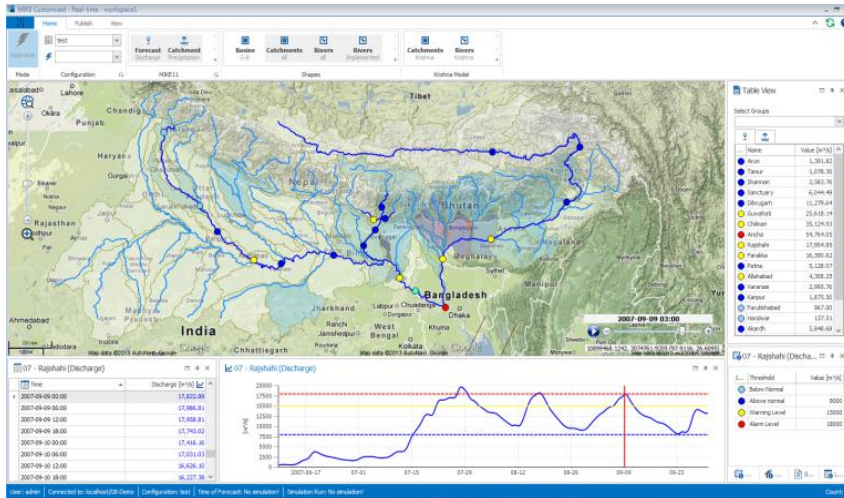
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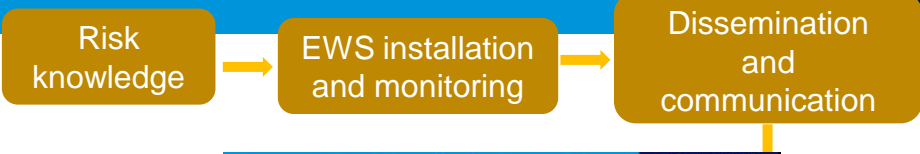
Flood outlook products provide early warning for timely preparedness



- Pilot model set up for Ganges Brahmaputra basins using Mike 11



CB-FEWS: Approach/Framework (Pilot in Jadhah and Singora Rivers, Assam)



The composite image consists of two parts. On the left, a photograph shows a community meeting taking place outdoors under a tree. A group of people, including men and women, are seated on chairs and are engaged in a discussion. On the right, there is an organizational chart titled 'Response capability'. The chart lists several individuals and their contact information:

- Pradip Barman (Contact No:.....)
- Arun Kutumo (Contact No: 9508268614)
- Water Management Authority - Dhemaji (Room: Contact No: 03753 224635, H (DPO-DM), Mobil no: 9577550399)
- Tengapur Jibon Gogoi (Contact No: 9954504605)
- Ghuguha Saniram Gogoi (Contact No: 9864927494)
- Gorubondha Tosil Bora (Contact No: 9508082694)

Source: Neera Pradhan, ICIMOD

SERVIR Himalaya

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SERVIR is a regional visualization and monitoring system that integrates earth observation information, such as satellite imagery and forecast models, together with in situ data and other knowledge for improved and timely decision-making.

Purpose: To improve environmental decision-making in the Hindu Kush-Himalaya (HKH) region through dissemination and analysis of earth observation information.

ICIMOD's state-of-the-art satellite data receiving facilities

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MODIS receiving facility



MODIS images are used for national and regional level mapping including rapid response mapping after a flood event.



Visit <http://geoportal.icimod.org/realtime/modis.aspx#> to visualize MODIS image.

Rapid response mapping

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Koshi flood, 2008

Damage Assessment of Seti River Flash Flood of 5 May 2012
Between Jamberi and Tase of Kaski District, Nepal

Flood Inundation map [SUPARCO GRID-4] for the SINDH Province, Pakistan

Seti flash flood, 2012

Pakistan flood, 2010

Implementation using Sentinel Asia System (SAS) and International Charters

Forest fire information dissemination

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Forest Fire Detection and Monitoring in Nepal
April 6, 2013

Total fire counts: 111	
Baitadi	2
Bajura	6
Chitwan	10
Dang	6
Dhading	3
Dolakha	1
Dhanu	1
Gorkha	2
Jhapa	1
Kailashaur	3
Katmandu	2
Makhuwari	1
Makhuwari	10
Morang	2
Nuwakothi	17
Palpa	3
Rasuwa	1
Sindhuli	3
Siraha	1
Sitkhouchha	1
Sitkhouchha	1
Sitkhouchha	2
Tanahu	6
Udayapur	4

Fire Statistics:
Total counts: 27

District	Count
Bharang	1
Barke	4
Chitwan	1
Dang	5
Dhading	3
Morang	3
Nuwakothi	2
Rasuwa	1

Layer: Active Fire
Confidence:
● < 50%
● 50% - 75%
● > 75%

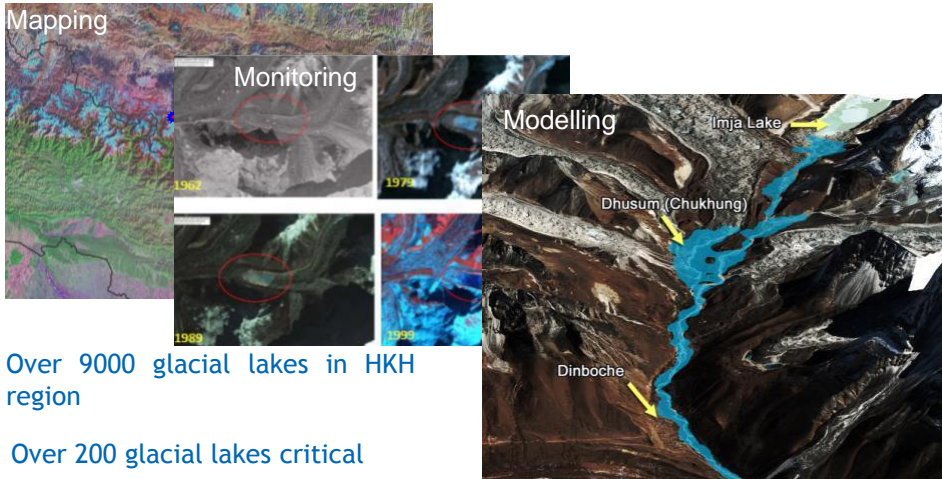
Legend: District Boundary

SERVIR @HIMALAYA
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SMS Email Tweet Web application PDF fire map

Mapping and monitoring of glacial lakes

GLOF: Glacial lake outburst flood

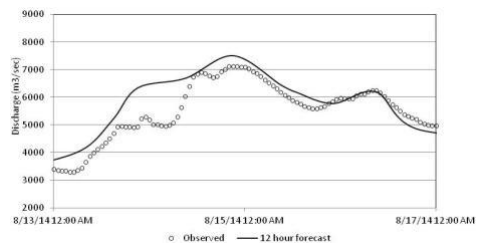


Over 9000 glacial lakes in HKH region

Over 200 glacial lakes critical

What are the key challenges in predicting disaster events and what should we do to address these challenges?

- Regional cooperation in sharing data and information and use of EO to increase leadtime and accuracy of forecasts and to bridge data gaps
- Strengthened institutional mechanisms and governance structures for coordination and communication of the warnings
- Warnings should be available, accessible, understandable and actionable for timely response to minimize the adverse impacts of disasters.



Opportunities for cooperation

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- Better understanding and analysis of the extreme events
- Opportunity for regional cooperation and collaboration in data sharing and timely warning
- Joint capacity building and trainings and strengthening institutional capacities
- Mutual learning, knowledge sharing and dissemination through regional platforms for enhanced disaster resilience
- Promoting partnerships and international collaboration in disaster risk reduction.

ICIMOD's commitment & role in reducing disaster risk in the HKH region

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ICIMOD is committed

- To promote and apply new and high end technologies for the dynamic assessment of water- and climate-related hazards,
- To develop real-time regional information systems, to strengthen community resilience and adaptation strategies,
- To assist and inform policy making, and to provide a platform for regional cooperation towards comprehensive disaster risk reduction.



From vulnerability to resilience and risk reduction: ICIMOD approach

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Community Level:

- Working on Disaster Risk Reduction with direct / indirect support to highly vulnerable up-stream & down stream communities.
- These community level initiatives provide examples of good practice in order to build evidence to influence appropriate Development and Disaster Management Policies.

National & Regional Level Stakeholders:

- Influence government policies, programs and practices of HKH nations for reducing vulnerability and increasing resilience of mountain communities.

International Stakeholders:

- International stakeholders are seen as powerful influencers for national level policies and programs.
- HFA & MDGs in particular guide DRR & Development policies in the countries.
- Our DRR programs not only align with HFA & MDGs, we are also part of regional and international learning forums on implementation of these guidelines.
- In addition we work with and influence international donors, donor countries and various UN entities to increase their investment and use their clout to influence HKH national governments government's for policy commitments for mountain hazard risk reduction

Thank you

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