

## Regional Cooperation for Flood Disaster Mitigation in South Asia

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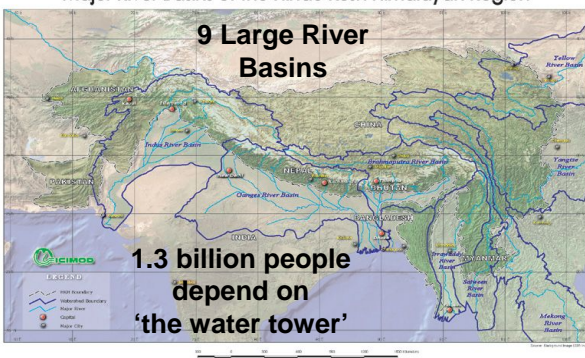
- ▶ International non-political organisation with a regional mandate
- ▶ 8 member countries:  
Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, Pakistan
- ▶ Mountain learning and knowledge centre - bridging research and policy



### Major River Basins of the Hindu Kush Himalayan Region

#### 9 Large River Basins

1.3 billion people  
depend on  
'the water tower'



## WATER IS LIFE! ...and death!!

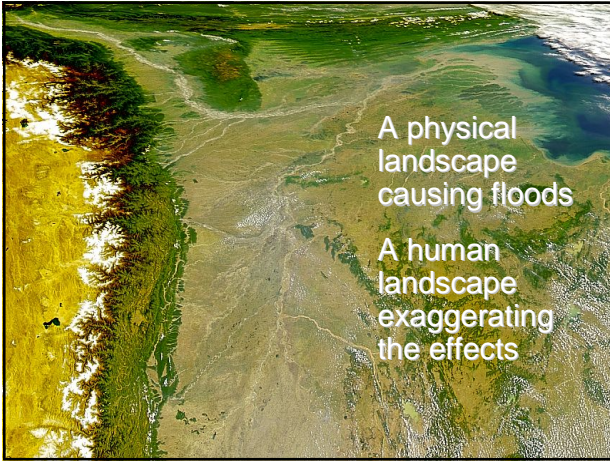
### Services

- Water supply
- Environment flow
- Hydropower
- Climate regulation

### Hazards

- Floods/Flash floods
- Sediment
- Drought
- Water pollution





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## Water: a key resource

River	Area sq km	Mean discharge (m <sup>3</sup> /s)	% of Glacier melt in river flow	Population x1000	Population density	Water per person m <sup>3</sup> /year
Indus	1,081,718	5533	44.8	178,483	165	830
Ganges	1,016,124	18691	9.1	407,466	401	-2500
Brahma	651,335	19824	12.3	118,543	182	-2500
Irrawaddy	413,710	13565	unknown	33,097	80	18,614
Salween	271,914	1494	8.8	5,982	22	23,796
Mekong	805,604	11048	6.6	57,198	71	8934
Yangtze	1,722,193	34000	18.5	368,549	214	2265
Yellow	944,970	1365	1.3	147,415	156	361
Tarim	1,152,448		40.2	8,067	7	754
Total				1,324,800		

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## Himalayan Glaciers Retreat rapidly

Figure 2: Rapid retreat of greater Himalayan glaciers in comparison to the global average (Dyurgerov and Meier 2005)

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## Changes in Runoff over Time: Seasonal and long term

(from Jansson, Stockholm University)

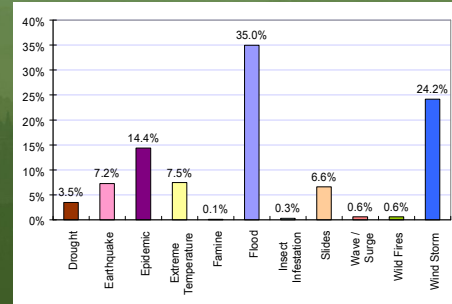
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## Floods in South Asia 2007

- ▶ More than 3700 dead – Nepal, India and Bangladesh
- ▶ Affected 60 million
- ▶ Economic loss > US \$1 billion



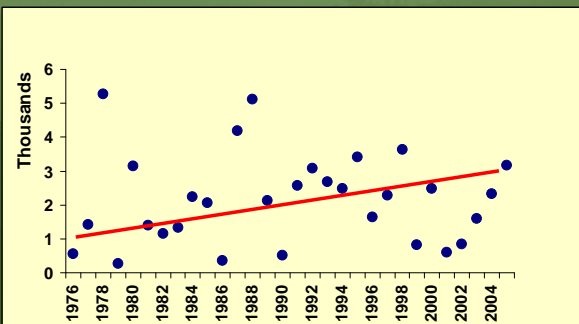
## Disasters in South Asia (1975-2005)



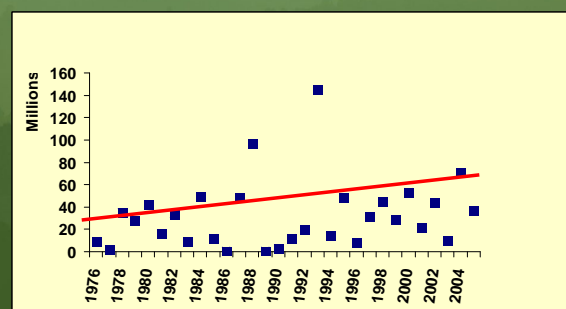
Source: OFDA/Cred Database

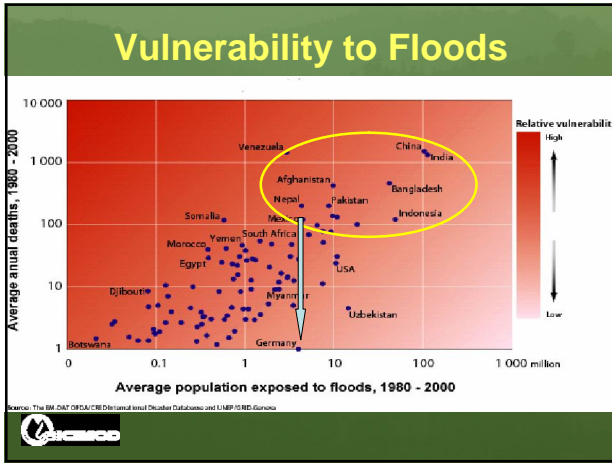


## Dead in floods in South Asia 1976-2005



## Affected from floods in South Asia 1976-2005



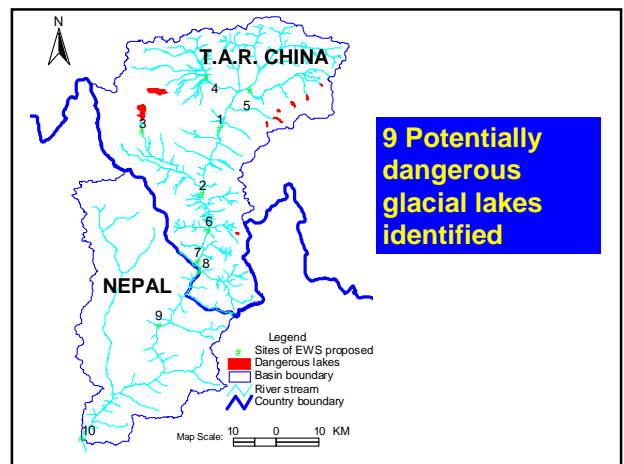


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## Flash Floods in Himalaya

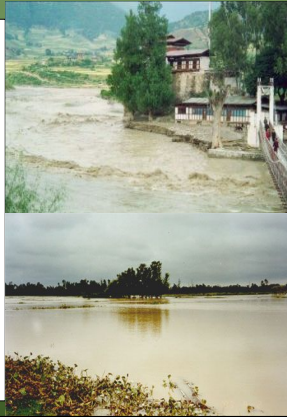
► Different type of Flash Floods:

- Extreme Rainfall Events
- Landslide Dam
- GLOF (Glacial Lake Outburst Floods)



### Key Issues:

- ▶ Transboundary rivers
- ▶ Lack of exchange of data, especially across national boundaries
- ▶ Not adequate lead time for flood warnings
- ▶ Diversity of technical, scientific and institutional know-how
- ▶ Some bilateral agreements exist
- ▶ Regional mechanism

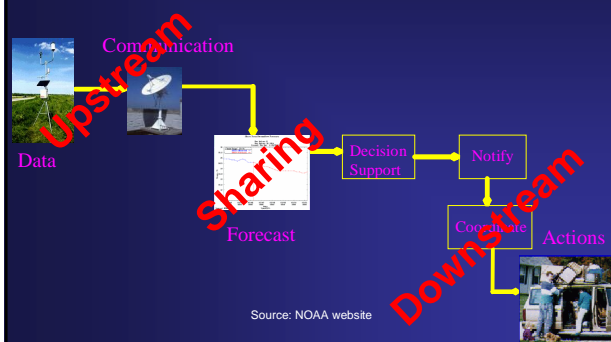


### Delhi Declaration, 8 Nov. 2007:

“Encourage development of *transboundary* multihazard *end-to-end early warning systems* as a priority under the existing sub-regional cooperation frameworks...”



### Flood Mitigation needs End-to-End Forecast Process



### The way forward:

- ▶ 1) Improved *observation* network
- ▶ 2) Improved *information* sharing
- ▶ 3) Training and public awareness
- ▶ 4) An institutional framework for cooperation
- ▶ = 4 pillars of the HKH-HYCOS project



## The Hindu Kush – Himalayan Hydrological Cycle Observing System (HKH – HYCOS)

### Establishment of a Regional Flood Information System in the Hindu Kush- Himalaya

- ▶ **Objective:** to facilitate regional cooperation among the countries in the HKH region for the timely exchange of flood data and information
- ▶ Bangladesh, Bhutan, China, India, Nepal, Pakistan
- ▶ **“Making information travel faster than the floods”**



## Three phases of the project:

- ▶ Phase 1:  
Feasibility study and infrastructure testing (completed)
- ▶ Phase 2:  
Detailed planning and pilot project implementation (financial partners sought)
- ▶ Phase 3:  
Full-scale region wide flood information system



South Asian Floods (SAF)  
Regional Cooperation for Flood Information Exchange  
in the Hindu Kush-Himalayan Region

FLOOD INFORMATION SYSTEM

Home | Flood Information System | About Demonstration Phase | Reports | Network Diagram | Bookmark this page

You are here: Home / Flood Information System

Welcome to the Demonstration and Test Phase!

DEMONSTRATION PHASE OVERVIEW  
Welcome to the SAF web page for sharing hydro-meteorological data from selected stations of 3 countries. Bangladesh, Bhutan, China, Nepal and Pakistan are sharing data through the flood information system. India is participating as an observer. Please [click here](#) to download the user guide for the Flood Information System.

LINKS TO COUNTRY REPORTS

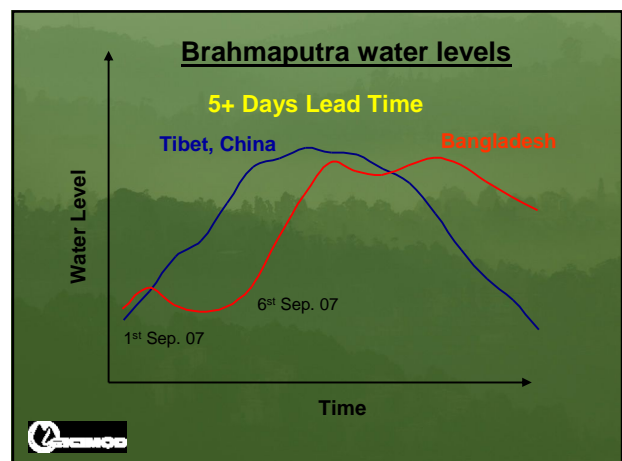
- Bangladesh
- Bhutan
- China
- India
- Nepal
- Pakistan

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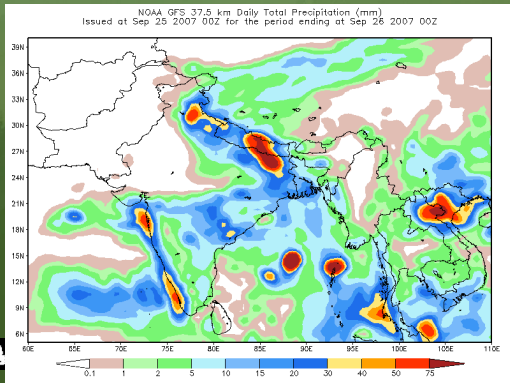
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## Data: Satellite Rainfall Estimation



## Summary

- ▶ An institutional framework for cooperation is crucial – ICIMOD provides one
- ▶ Political commitment is necessary – e.g. for sharing of data
- ▶ Building of trust and conflict prevention are bonus effects
- ▶ Natural Disaster Management as part of Natural Resources Management
- ▶ Projects = Processes



Thank you!

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