Regional Cooperation for Flood Disaster Mitigation

in the Hindu Kush-Himalayan Region

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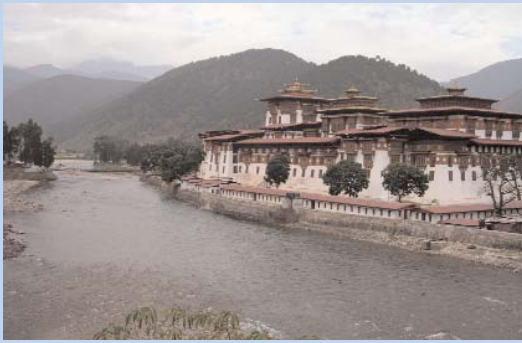
Flood Facts

- In Bangladesh, 20% of the landmass is flooded every year. The 1998 flood covered more than two-thirds of the country, affecting over 30 million people. Over a thousand people died, 38% of rice crops and 27% of vegetable crops were destroyed, and 600,000 animals were killed. Nearly 500,000 homes were lost, along with 15,000 kilometres of road, and 14,000 schools.
- Floods cross national boundaries. A flash flood caused by breaching of a landslide dam across the Yigong River in Tibet Autonomous Region, China, in the year 2000, left 30 people dead in Arunchal Pradesh, India, with another 100 reported missing and over 50,000 rendered homeless. The flood also washed away more than 20 bridges and caused an estimated $22.9 million in damage. A heavy downpour in Nepal in 2001 flooded and washed away more than 40 villages in Bihar, India, affecting more than 2.5 million people. Floods and landslides in Nepal in 2002 caused 427 deaths and an estimated $2.7 million in damage. In Bihar, India, more than 396,000 houses were damaged and 810,000 hectares of crops was destroyed.
- The damage of floods is increasing. In 2004, South Asia had its worst monsoon flooding in 15 years and the worst post-monsoon flood of the decade, affecting Northeast India and Bangladesh. In Hunan, China, 783 houses collapsed, 12,000 houses were damaged, and 74,000 hectares of crops were destroyed; in Bangladesh nearly 900 people died and 30 million were marooned; in Nepal 100,000 people were displaced and landslides cut off Kathmandu from the rest of Nepal.
- By mid-August 2006, floods in China had affected 120 million people leaving 1,231 people dead, more than 8.67 million ha of cropland and 0.65 million houses damaged – a direct loss of some US$12 billion.

Floods in Asia



Asia accounts for nearly half of all flood disasters in the world. During the last 20 years floods have claimed more than 300,000 lives, and caused an estimated damage to the Asian economy of more than US$200 billion. Flooding poses severe constraints on socioeconomic development and puts pressure on agricultural and industrial production. Infrastructure in the region is also at risk. Poor countries are always hit the hardest with economic losses often amounting to beyond 10% of GDP.

The great rivers of Asia have their source in the Hindu Kush-Himalayas (HKH) and the Tibetan Plateau. They supply water to nearly 500 million people in the adjacent plains and downstream river basins vital for socioeconomic development, irrigation, hydropower generation, fisheries, and inland navigation, as well as for the maintenance of wetlands and biodiversity. But these rivers are also the source of floods. As elsewhere, the poor are the most vulnerable, the most affected, and have the least capacity to recover. The impact of floods must be decreased in order to reduce poverty, save lives, and take advantage of the rivers' benefits.

Rivers know no borders

Rivers are not confined by political boundaries; all the major Asian rivers including the Indus, Ganges, and Brahmaputra pass through several countries between their source and the sea. Downpours in the mountains can lead to catastrophic floods downstream. Release of pressure to save property and lives in one country can lead to outpouring of water and floods in another. The flood problem cannot be solved on a national scale alone.

Managing Water and Floods through Regional Cooperation

The rivers of the greater Himalayan region provide both important services as well as life-threatening hazards. In order to achieve a sustainable development, the management of resources and risks must go hand in hand. An integrated flood management approach within the framework of Integrated Water Resources Management (IWRM) should be adopted, with a view to maximise the efficient use of flood plains and minimise the loss of life and livelihoods. Regional river basins are integrated systems the management of which require regional solutions.

While floods cannot be prevented, an integrated cross-sectoral approach to flood management is essential to prevent flood-related disasters while retaining the floods' positive effects. Structural measures like dikes and embankments play a significant role in flood mitigation and hazard reduction. Land use planning and building codes are important non-structural measures. But the most effective way of reducing losses is to provide people with sufficient advance warning to be able to take other preparedness and response measures. Timely and accurate flood information based on real-time hydrometerological observations across boundaries is essential to achieve this.

At present, there is no region-wide flood information system in place that covers entire transboundary river basins. Successful examples of the bilateral exchange of flood data and information demonstrate the technical feasibility and the high potential for disaster reduction based on basin-wide cooperation in the region.

Regional Cooperation in Flood Disaster Mitigation

The International Centre for Integrated Mountain Development (ICIMOD) and the World Meteorological Organization (WMO) have together initiated a project to promote **regional cooperation in flood disaster mitigation.** The plan involves

- Establishing a regional flood information system for the HKH region
- Regional sharing of information to provide warning to potentially affected areas and to save lives
- Regional sharing of technologies, resources, and scientific knowledge to better provide each country with adequate ways and means of collecting and disseminating data and information
- Capacity building of the national collaborating institutions

The overall project goal is reduction in flood vulnerability in the HKH region with specific reference to the Ganges-Brahmaputra-Meghna (GBM) and Indus river basins

The strategic objective is to provide the operational concepts and tools for improving integrated river basin management, specifically by managing floods and thus contributing to minimising the loss of lives and property, reducing poverty, and accelerating economic development in shared river basins affected by recurring floods.

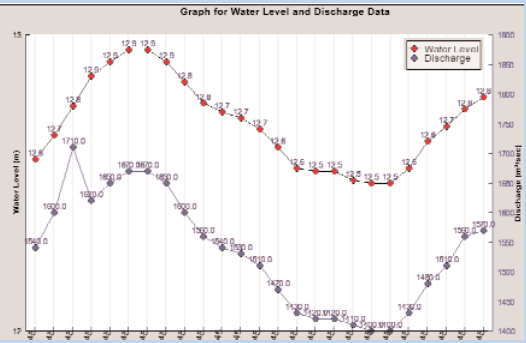
The specific objectives are 1) planning and implementation of an efficient and operational regional flood forecasting information system based on real-time data and information; 2) provision of relevant data and information products for disaster preparedness and reduction plans and activities by and among participating countries.

The project is planned in **three phases.** The preparatory phase is complete; Phase 2 comprises implementation of pilot projects in participating countries and is looking for donor support; Phase 3 is full-fledged regional implementation.

Project Development

This project originated from the Second Steering Committee Meeting of HKH-FRIEND (Flow Regime From International Experimental Network Data, part of UNESCO's International Hydrological Programme) held in April 2000 at ICIMOD, Kathmandu.

A series of meetings were held between 2001 and 2005, attended by high level government representatives, directors of national hydrological and meteorological services, technical experts from the region, and representatives of international organisations, in which a framework was developed and agreed for a system for the exchange of information and data to support flood forecasting in the HKH region and associated downstream areas (see box). A consultative panel was established with high level technical and government representatives from the participating countries to provide advice and guidance for the development of the project. WMO's World Hydrological Cycle Observing System (WHYCOS) was chosen as the basic framework for the information system, forming HKH-HYCOS.



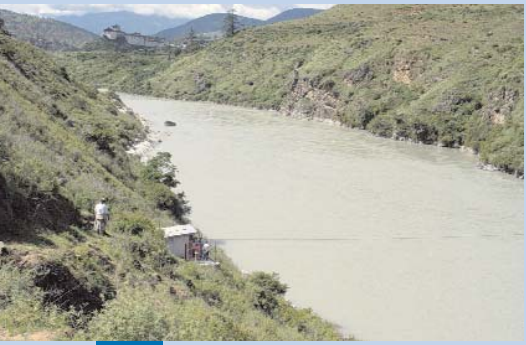
The preparatory phase of the project culminated in a demonstration and testing phase which was successfully conducted from June to September 2005. Partners shared near real-time data from selected hydrometeorological stations from 10 June 2005 onwards. Most partners shared data through the web interface available on the project website, while options were also available for submitting data through FTP and email.

Major Meetings and Consultations and what they have achieved

First High Level Consultative Meeting 'Developing a Framework for Regional Cooperation in Flood Forecasting and Information Exchange in the Hindu Kush-Himalayan Region', May 2001, Kathmandu, Nepal	• Consensus on regional cooperation in flood disaster mitigation • Identification of country nodes • Framework for development of flood information system agreed
First Consultative Panel Meeting 'Making Information Travel Faster Than Flood Waters', May 2002, Kathmandu, Nepal	• Concept note drafted and approved • Action plan developed • Website www.southasianfloods.org established
Second High Level Consultative Meeting on 'Establishment of a Regional Flood Information System' March 2003, Kathmandu, Nepal	• Twelve state-of-the art technical papers presented • National consultation meetings planned • Further partner institutions included • Draft project document discussed and revision agreed • Resolution on the development of the project endorsed
National Consultations: Bhutan, July 2003; China, Sept. 2003; Bangladesh, Oct. 2003; Pakistan, Feb. 2004; Nepal, March 2004	• Needs and priorities identified and assessed • Pilot basins nominated
Technical Meeting on Country and Regional Telecommunication Strategies, Data Management, and Dissemination of Regional Flood Information, Nov./Dec. 2004, Kathmandu, Nepal	• Plan for Demonstration and Testing Phase finalised: June-September 2005 • Draft test plan document prepared • Minor upgrades agreed for selected stations
High Level (Secretary) Meeting May 2005, Bhutan	• Project document endorsed and recommended to donors for funding • Agreement on conducting 'Demonstration and Testing' phase June to September 2005

Major Activities and Achievements of the First Phase

- Concept paper on the establishment of a regional flood information system prepared and endorsed
- Short, medium, and long-term action plans developed for the further development of the project
- South Asian Floods website for sharing flood data and information launched <www.southasianfloods.icimod.org>
- National stakeholders' commitments received through national consultations held in five member countries
- Member country needs and priorities identified and capacities enhanced in flood forecasting and management
- Technical meeting held for finalising a regional telecommunication strategy
- Basins and hydrometeorological stations selected for pilot studies



- Upgrading of selected stations in partner countries with equipment and instruments
- Successful demonstration of feasibility and will of member countries to share near real-time hydrometeorological data in a test phase
- A platform for regional dialogue formed
- Strengthened bilateral cooperation
- Strengthened regional cooperation in flood disaster mitigation
- Project document prepared and recommended for submission to donors for funding Phase 2

The Road Ahead

The road ahead is mapped out in the plan for Phase II, "Detailed Planning and Pilot Project Implementation" of the Project. The project's second phase directly builds on Phase I to establish a regional flood information system. River level/flow, rainfall and related information will be observed at specific sites and transmitted in near real-time using agreed and reliable means of telecommunication to the National Hydrological and Meteorological Services to be used for flood forecasting and information purposes. The successful implementation of the Phase II Project will establish a fully functional data information dissemination system for floods within selected pilot basins within the Ganges-Brahmaputra-Meghna and Indus River Basins. Setting up these systems will achieve a considerable extension of the lead-time for flood warning in the pilot basins.

Outlook

As trust and confidence develops amongst the participating countries we will be able to move from sharing of historical hydrological data – already practised with some success in the region – to **sharing of real-time data**, which is critical for flood prediction to save lives and property. Regional collaboration on this issue could form the basis for attracting both donor and private sector investments in hydromet services and water resource development, as it has in other WHYCOS-established regions. This project can be an important means for fostering regional environmental cooperation and has great potential to create collaborative breakthroughs.

Who are Involved?

Initiators and coordinators

- International Centre for Integrated Mountain Development
- World Meteorological Organization

Participating countries and collaborating institutions

- **Bangladesh:** Bangladesh Water Development Board, Bangladesh Meteorological Department
- **Bhutan:** Department of Energy; Department of Geology and Mines
- **China:** China Meteorological Administration; Bureau of Hydrology
- **India:** Central Water Commission; India Meteorological Department (observer)
- **Nepal:** Department of Hydrology and Meteorology
- **Pakistan:** Pakistan Meteorological Department; Federal Flood Commission
- **Myanmar** and **Afghanistan,** observing partners

International partners

- United States Geological Survey (USGS)
- United States National Oceanic and Atmospheric Administration (NOAA)
- United Nations Educational, Scientific and Cultural Organization (UNESCO)

Phase I donors

- United States Agency for International Development, Office for US Foreign Disaster Assistance (USAID/OFDA)
- United States Department of State, Regional Environment Office for South Asia

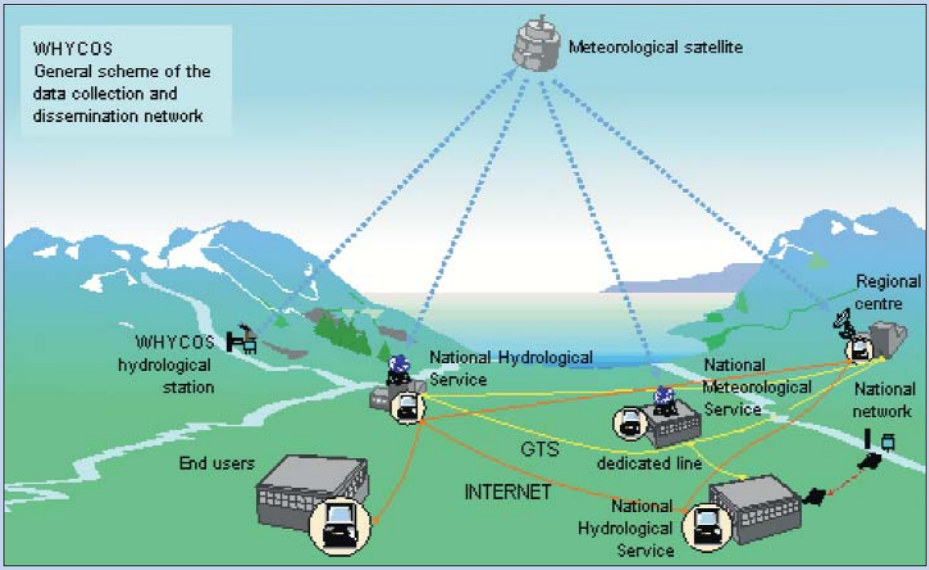
With additional support from

- Danish International Development Assistance (DANIDA)

New partners

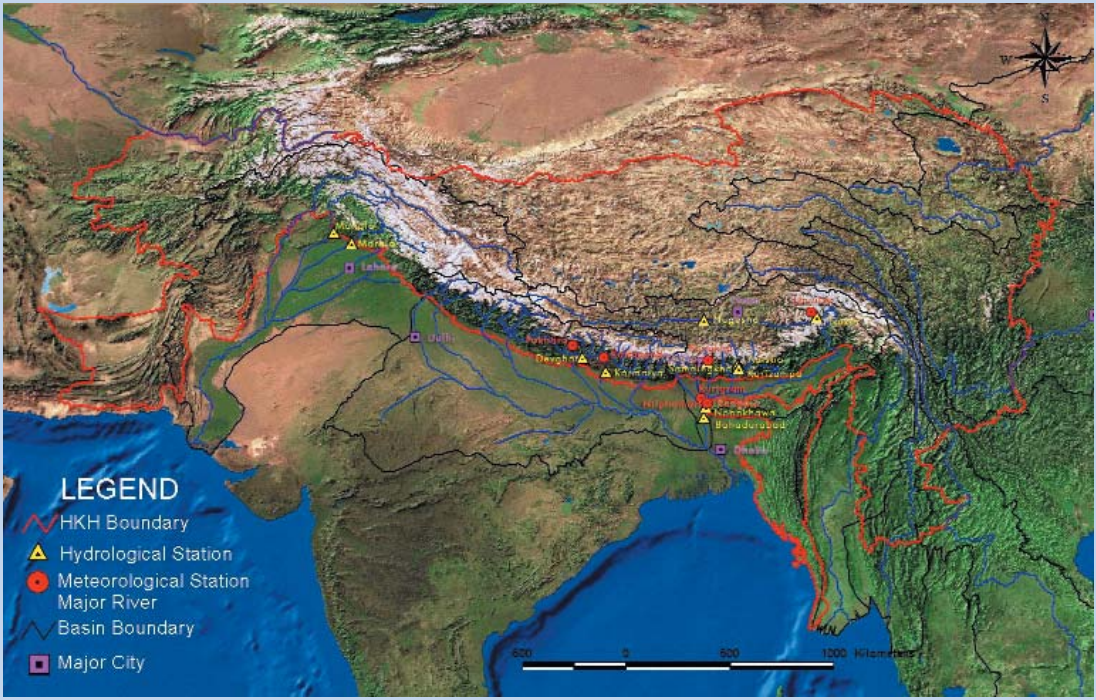
As the project develops, we are confident that other groups in the region who can provide and/or use hydrological and meteorological data, and are interested in developing disaster avoidance and response systems using the data, will become involved.

If you are interested in this kind of cooperation, please contact the project coordinator (see back page).



The Project Website – www.southasianfloods.icimod.org

The South Asian Floods website is still at the pilot stage, providing a small amount of information about the project, the region, and floods. Once the project is fully implemented, the website will be the platform for sharing real-time flood data information and will provide the means to channel relevant information, and to enable national offices at policy-making levels to prepare plans and implement early warning systems in a coordinated fashion. It is designed to influence the process and results of flood preparedness in the region by encouraging intergovernmental decision-making.



Regional Flood Information System in the HKH Region: Stations selected for the pilot phase

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