



MINISTRY FOR FOREIGN
AFFAIRS OF FINLAND

ICIMOD

FOR MOUNTAINS AND PEOPLE

Establishment of a Regional Flood Information System

Making flood information
travel faster than flood water

Flooding Takes a Heavy Toll

The Indus, Ganges, Brahmaputra, and Meghna rivers originate in the Hindu Kush-Himalayas (HKH) and support the lives and livelihoods of over 700 million people living in their basins. A significant percentage of them are exposed to recurring riverine flood disasters, mainly during the monsoon season. These floods result in enormous costs in terms of people killed or displaced, infrastructure damaged, and economic output lost.

Some of the worst floods in living memory have occurred in South Asia in the past decade, undoing decades of development progress, hampering economic growth, and exacerbating poverty in flood-affected areas. The Pakistan floods of 2010, for instance, killed about 2,000 people and affected 20 million. A breach of the Koshi embankment in Nepal in 2008 displaced more than 70,000 people in Nepal and over 4 million in neighbouring India. Every year, flood waters inundate a large swathe of India and a quarter of Bangladesh, displacing millions of people, with total damage estimated at billions of dollars.

The overall vulnerability of those living in and around the river basins is exacerbated by trends such as increased migration of the poor to flood-prone lowlands; growth of dense settlements along the river banks, fueled in large part by urbanisation and industrialisation; and effects of climate change, particularly increased frequency and intensity of monsoon precipitation.

Why a Regional Flood Information System is Needed

It is widely recognised that floods in the Indus, Ganges, Brahmaputra, and Meghna basins cannot be totally controlled; therefore, the limited resources are better directed towards reducing flood vulnerability and mitigating flood impact through improved flood management. This calls for meaningful regional cooperation of the countries sharing the basins, namely Bangladesh, Bhutan, China, Nepal, India, and Pakistan. The bilateral river treaties and data sharing arrangements that are currently in force among these countries, although necessary, are not sufficient to avert flood catastrophes of transboundary scale.

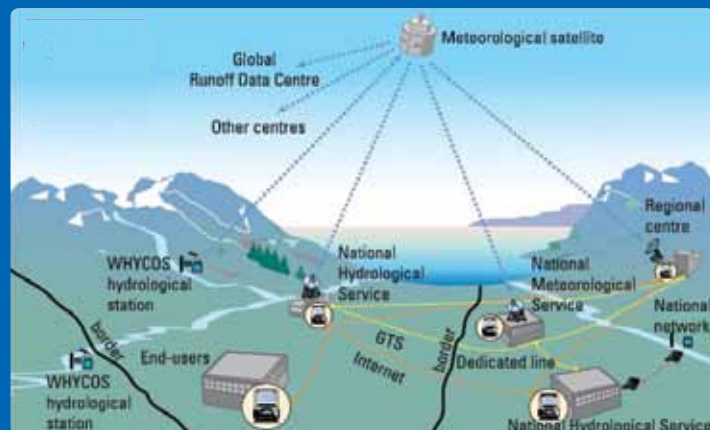
Therefore, on both humanitarian and development grounds, ICIMOD's regional member countries considered it timely to adopt a regional approach – for example, a mechanism for multilateral exchange of flood data and information – to alert people living in flood-prone areas with sufficient lead times to evacuate. This, in a nutshell, is the rationale behind the creation of the HKH Hydrological Cycle Observation System (HKH-HYCOS).

HKH Hydrological Cycle Observation System – HKH-HYCOS

ICIMOD, the World Meteorological Organization (WMO), and partner countries developed the HKH-HYCOS project to enhance regional cooperation in hydrometeorological data collection and sharing for flood forecasting to support disaster prevention and flood management at the regional level. The project is establishing a regional flood information system (RFIS) to facilitate transboundary exchange of real- and near-real-time data, best practices, and know-how in support of flood management. It also seeks to build the technical capacity of the national hydrological and meteorological services of partner countries. The overall objective is to minimise loss of human lives and property damage through timely exchange of flood data and information between and among partner countries.

The project was initiated in May 2001 with the financial support of the United States Department of State (Regional Environmental Office for South Asia) and the United States Agency for International Development (USAID) Office for Foreign Disaster Assistance (OFDA), based on the proven concept of WMO's World Hydrological Cycle Observing System (WHYCOS). Initial planning involved technical experts and government representatives from partner countries, to ensure that the project addressed common concerns shared by all partners. The current phase, which started in December 2009, is supported by the Ministry of Foreign Affairs, Government of Finland.

WHYCOS data collection and dissemination network

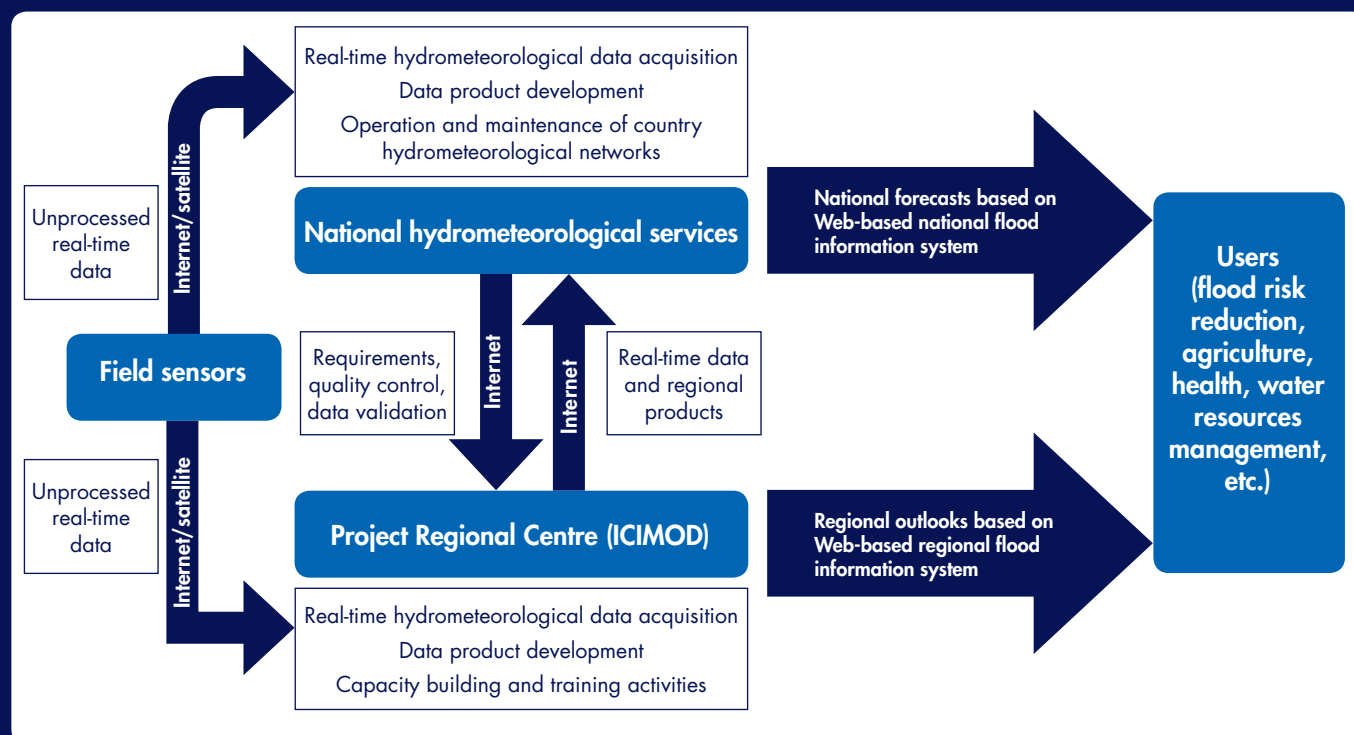


Regional Flood Information System (RFIS): Data Acquisition, Transmission, and Capacity Building

The wide variation in capacities of partner countries with regard to flood forecasting and management offers a tremendous opportunity for bilateral and regional technical cooperation. The project initially includes about 28 hydrometeorological stations, most of which require upgrading, selected in consultation with partner countries. When the RFIS is fully operational, real- or near-real-time river level, rainfall, and related data from these selected hydrometeorological stations will be measured using instruments meeting international standards produced by Ott Hydromet, Vaisala, Hydro Services Private



HYCOS information flow



Limited, and Stevens. The data will be transmitted through direct telemetry (GSM/CDMA or satellite) to the national hydrometeorological services of partner countries. It will be delivered simultaneously to the regional server at ICIMOD for development of regional flood outlooks. About 216 Global Telecommunications System (GTS) stations under the auspices of WMO in the HKH will also contribute synoptic data to the RFIS. It is envisaged that more and more hydrometeorological stations will be added to the HKH-HYCOS network over time in order to improve both the accuracy and lead times of flood forecasts.

RFIS will essentially comprise effective data and information transmission and reception capabilities, adequate national and regional databases and data

management systems, and the requisite technical expertise. The regional and national flood information systems are visualised as Web-based systems. It is planned that satellite rainfall estimation products, derived hydrology flow products from other global data-sharing networks, and Sentinel Asia satellite products will be integrated into the RFIS.

Field technicians will be trained in operation and maintenance. Training and regional exposure visits are also envisaged for administrators and national database managers in partner countries. Training will be jointly coordinated by ICIMOD and WMO. Training sessions, as well as awareness-raising drives in local communities, will address the social dimensions of flood disaster preparedness, including gender aspects.

HKH-HYCOS Project Components

Component	Expected outcome
1. Framework for cooperation	Strengthened framework for cooperation on sharing of regional flood data and information among partner countries
2. Regional flood information network	Establishment of a flood observation network in selected basins in partner countries
3. Flood information systems	Establishment of regional and national flood information systems to share real-time data and information and increase lead time
4. Training and public awareness	Enhanced technical capacity of partners on flood forecasting and communication to end users
5. Planning and full-scale regional project	Fully integrated regional project planned and agreed among partner countries



Implementation Arrangement

As the implementing and coordinating agency, ICIMOD hosts the Project Management Unit and coordinates with the partners to implement the project according to WMO's WHYCOS guidelines. As the apex body of the project, the Regional Steering Committee, comprising representatives of national partners, ICIMOD, WMO, and the Government of Finland, ensures coherence among project policy, strategy, and implementation; approves revisions to the project document, work plan, and budget; and advises on future direction and financing.

ICIMOD, WMO, and the partner countries will strive to upscale the project by expanding the network of real-time hydrometeorological stations and the use of data for development of flood outlooks and flood forecasting products to contribute to saving lives and livelihoods in the HKH.



HKH-HYCOS Partners

Implementing and coordinating agency	ICIMOD
Technical/scientific support agency	World Meteorological Organisation (WMO)
Partner countries	Bangladesh: Bangladesh Meteorological Department (BMD); Bangladesh Water Development Board (BWDB) Bhutan: Department of Hydro-Met Services (DHMS) China: China Meteorological Administration (CMA); Bureau of Hydrology (BoH) Observer Nepal: Department of Hydrology and Meteorology (DHM) India: Central Water Commission (CWC) Observer; Indian Meteorological Department (IMD) Observer Pakistan: Pakistan Meteorological Department (PMD); Water and Power Development Authority (WAPDA)
Private sector partner	Real Time Solutions (RTS) Pvt Ltd

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