

# Water, The Essential Resource

As climate change affects the availability of water, the region's countries are asking for a better scientific understanding of floods and droughts that may become more frequent and damaging. The 2010 monsoon floods in Pakistan were unprecedented in their duration and impact. In this year, ICIMOD's focus was on the linkages between climate change and reducing the risk of water-induced disasters in transboundary river basins.

The integrated activities of ICIMOD have created a platform for dialogue between countries on information and data sharing for flood forecasting, disaster risk reduction, and satellite rainfall estimates for operational purposes. The work on disaster risk reduction concentrated on research, networking, and the production of dissemination materials, intended to inform policy and decision makers. This year, ICIMOD launched a 'Disaster Preparedness in the Himalayas' portal within the ICIMOD website in order to share knowledge on disaster risk reduction within the region. It also tested a community-based early warning system for flash floods in Assam, India.

ICIMOD completed a risk assessment methodology on glacial lake outburst floods (GLOF). The methodology is now being used by private hydropower developers in Nepal. As well, over two dozen professionals in the region were given training in the field of glacier mass balance studies.

Mountains present an opportunity to detect initial impacts of climatic change with observations of the cryosphere such as changes in the snowline, duration of snow cover, rate of glacier recession, increases in hazards such as ice and snow avalanches, formation and break-out of moraine-dammed lakes, and thawing of permafrost. ICIMOD's work to map glaciers is now in accordance with international protocols – GLIMS, GlobGlacier, and Moderate-resolution Imaging Spectroradiometer (MODIS).

The work on glaciers and glacial lake inventory in the Himalayas has led to partnerships with researchers

from academic institutes like the Swiss Federal Institute of Technology (ETH) Zurich, the Cold and Arid Regions Environmental and Engineering Research Institute (CAREERI) of the Chinese Academy of Sciences (CAS), and the US National Aeronautics and Space Administration (NASA). ICIMOD is working with ETH to

Flash flood in Nepal



build the capacity of Indus Basin partners in hydrological modelling of snow and glacier melt runoff and to develop models applicable to the study areas, and with NASA and United States Geological Survey (USGS) to develop and implement a prototype hydrological model that includes snow and glacier melt.

During 2010, ICIMOD strengthened its basin-wise approach and river basin information system (RBIS) especially in the Koshi and Indus river basins where we have been able to develop partnerships with stakeholders in some regional member countries and apply advanced space-based technology for satellite rainfall estimation for flood prediction. A concept has also been developed for a multidisciplinary transboundary Koshi Basin programme.

# Climate change and water availability in the Indus Basin

Participants at a workshop in July 2010 agreed to improve collaboration on scientific and technical research in the Indus river basin. The workshop 'Climate and environmental change impacts on the cryosphere of the Indus basin and its implications for future water scenarios' brought together more than 70 experts, scientists, government officials, and policy makers from 13 countries including Afghanistan, China, India, Nepal, and Pakistan, from the region, and Germany, the Netherlands, Switzerland, the UK, and the USA.

The Indus river basin covers approximately 1,100,000 sq.km in the Hindu Kush, Karakorum, and Himalayan mountains

of Afghanistan, China, India, and Pakistan. With one-third of the upper basin above 5000m, the area is heavily glaciated and meltwater from snow and glaciers contributes a significant amount of the annual average flow of the river.

One of the difficult questions for scientists is the conflicting behaviour of glaciers, some of which are retreating, and some advancing or even surging, within close proximity. The participants stressed the vertical and horizontal variations in environmental processes and lack of adequate monitoring systems to capture these.

Scientists, senior government officials from the Indus basin countries, and representatives from international agencies expressed interest in collaborating in the Indus Basin Programme. The immediate aim is to support ongoing research and detailed monitoring of snow, ice, and

water resources in the region through capacity building and establishment of appropriate systems. The programme will also provide a platform for sharing knowledge and state-of-the-art approaches and interventions.

The initiative will help provide information for knowledge-based decision-making and planning to ensure water availability for household consumption, food production, power generation, and other uses in the Indus basin.

**Dr Ghulam Rasul**, Chief Climatologist, Pakistan Meteorological Department, Islamabad, said:

*"Climate change is coming fast and negatively impacting on timely water availability in Pakistan. ICIMOD's support in building the capacities of national institutions and bringing together the Pakistani and Afghan institutions on one platform to study glacial melting and assess future water availability is highly commendable. This coordinating / facilitating role has been extremely useful for hydro-meteorological data generation and forecasting water availability. It will be appreciated, if ICIMOD continues its support to the HKH countries."*



## Flash floods in the Himalayas: Capacity building for risk management

*“Being a trainer, I have started utilising the skills learnt – from developing training modules and designing the lectures to incorporating exercises, field visits, and emphasising the importance of stakeholder involvement in DRR. All this so that trainees can utilise the skills learnt in their field of activity, appreciating the importance of an integrated approach, ”*

thus **Dr K J Anandha Kumar**, Associate Professor at the National Institute for Disaster Management (NIDM), India, after participating in a training course.

With partner institutions and support from USAID/OFDA, ICIMOD is working to increase the capacity in the region for managing the risk from flash floods. A regional knowledge-sharing workshop conducted in February 2010 suggested that the concept of ‘control’ has to be changed to ‘manage’. Risk awareness and the capacity to cope need to be raised in all countries of the region. Disaster preparedness is more effective than relief. Sustainable management of risk reduction of flash floods means strengthening the capacity of local people and mainstreaming disaster risk reduction (DRR) activities into development work.

In 2010, ICIMOD developed a draft Training of Trainers (ToT) manual on flash flood risk management based on two previous resource manuals and tested it at a ToT workshop organised jointly with the World Meteorological Organization (WMO) in October/November 2010 in Kathmandu. The revised manual is now being prepared for publication so that stakeholders across the region can benefit.

**Dr K J Anandha Kumar** continued:

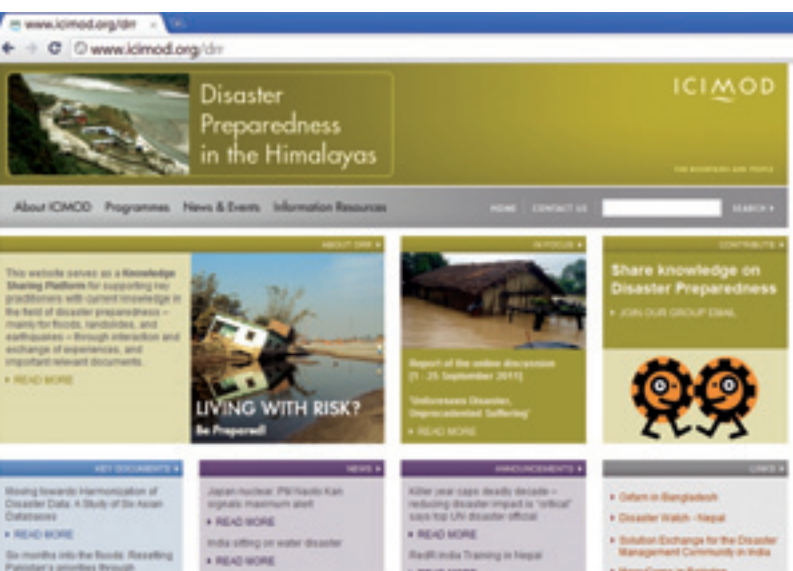
*“The ICIMOD workshop was a meticulously designed, well conducted, and nicely managed event, which provided a platform for learning and exchange of views on the topic. The venue allowed round the clock interaction with participants from different countries, on various relevant issues and perspectives. The well-planned field visit to various structures and social hazard mapping involving the participants provided an excellent opportunity to appreciate the ultimate importance of the integrated approach to flood management. ”*



## On the DRR website...

**Chet Bahadur Tamang**, Program Officer - Disaster Risk Reduction and Humanitarian Programme, Oxfam-GB Nepal, in Kathmandu, Nepal offers these comments on the DRR website.

*"It's good to have this type of forum to discuss various issues on disaster management. This is one of the efficient ways of getting possible solutions for a problem in a short time from experts of various sectors."*



*It's a good platform to bring the technical experts and field practitioners together. It can help in bringing the technology to be used for the benefit of the most vulnerable people. Many studies are made on disaster risk reduction but less has been used for the benefit of vulnerable people. This platform can help to disseminate those knowledge banks. In addition, it is equally helpful to share the outcome of use of certain technology and share the success or failure. Good luck for its continuation."*

## Testing early warning systems

As part of the flash floods programme, four early warning systems were installed on an experimental basis. The local communities found the systems to be very useful during the flood season of 2010. This is the first time that such equipment was set-up in this river basin [Assam] to deliver an early warning of impending waves of flash floods.

The instruments successfully provided timely warnings about rising water levels on three occasions. As a result, the villagers were able to move their livestock and other important belongings to safe locations and avoid serious damage to life and property. The equipment is simple and easy to install and maintain, and set up under community ownership and care.

*"People have received the system with enthusiasm. They are looking forward to using it again in the coming flood season with a stronger network of stakeholders for more efficient dissemination of the warning from upstream to downstream areas,"* says **Partha J Das**, Team Leader, Assam Flash Flood Project, Aaranyak, Assam, India.









Gandruk village with a view of Annapurna south, Nepal