

Water in the Himalayas – Friend and Foe

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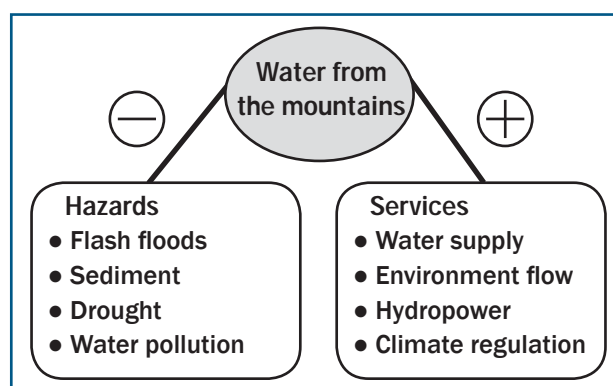


Kamal Banskota

Fishing community in the Chittagong Hill Tracts, Bangladesh

Water provides essential, life sustaining services to people and ecosystems. In the greater Himalayan region, more than 1.3 billion people are estimated to live in the water basins of nine of the world's largest rivers which originate in the Himalayas, the 'water tower' of Asia, and which are dependent on Himalayan waters.

These rivers are the Indus, Ganges, Brahmaputra, Irrawaddy, Salween, Mekong, Yangtze, Yellow, and Tarim (Table 1). In addition, the Amu Darya, which flows into the Aral Sea, originates in the western part of the greater Himalayan region. The water resources in these basins provide services for household purposes, ecosystems, food production, hydropower, inland navigation, and the production of various commodities. In essence, these rivers are the lifelines of the region and its people. However, there are threats to these resources. With its large population and ever increasing demand for water, South Asia is an area where water related stresses are rapidly emerging and, in some areas, may be reaching a crisis point. While water provides life-sustaining services, water also causes the hazards such as flash floods, riverine floods, debris flows, landslides, and droughts. ICIMOD strives to foster the co-management of both the services and hazards provided by water (Figure) in order to maximise the benefits and minimise the risks.



Water – friend and foe

A climate change awakening

The water resources of the Himalayas are sensitive to changes in climatic regimes, and the region's large (often vulnerable) population, which is dependent on these water resources, is at increasing risk. The year 2007 was a year of great awakening and increased awareness about our rapidly changing climate and the

Table 1: Principal rivers of the Himalayan region

River	River			River Basin			
	Length (km)	Mean discharge (m ³ /s)	Glacier melt in river flow (%)	Area (sq km)	Population (x1000)	Population density	Water per person (m ³ /year)
Indus	2,900	5,533	44.8	1,081,718	178,483	165	978
Ganges	2,507	18,691	9.1	1,016,124	407,466	401	1,447
Brahmaputra	2,948	19,824	12.3	651,335	118,543	182	5,274
Irrawaddy	2,170	13,565	small	413,710	32,683	79	13,089
Salween	2,800	1,494	8.8	271,914	5,982	22	7,876
Mekong	4,600	11,048	6.6	805,604	57,198	71	6,091
Yangtze	6,300	34,000	18.5	1,722,193	368,549	214	2,909
Yellow	5,464	1,365	1.3	944,970	147,415	156	292
Tarim	2,030	146	40.2	1,152,448	8,067	7	571
Total				8,060,016	1,324,800		

possible impact on society, particularly through changes in the water cycle and in natural hazards that might lead to disasters. Politicians and policy and decision makers, as well as the public at large, are becoming more aware of the increased challenges and threats that the HKH region is likely to face as a result of climate change. This has led to an increased interest in understanding how the expected changes in climate will impact on natural resources and society in the Himalayas, particularly on snow and ice and the downstream effects in the great river basins. Therefore, it is of paramount importance to carefully monitor and assess the environmental changes that affect water resources, their quantity, and quality. Politicians and researchers now realise that the Himalayan region is characterised by extremely poor coverage of environmental data; systems for the monitoring of hydrometeorology, snow, and glaciers are poorly developed and not undertaken in a coordinated manner. Yet, the number of people who depend on water resources derived from the Himalayas is very large. Such facts, in combination with strategic

planning, have been underpinning the development of a new strategy for ICIMOD and the decision to design a new strategic programme targeting 'Integrated Water and Hazard Management' (IWHM) (Table 2).

Need for improved knowledge on ice and water

Under the IWHM programme, ICIMOD intends to respond to requests from its member countries to reduce the scientific knowledge gap in relation to what is happening to water resources in the HKH in the light of climate change and changes in society. In doing so, ICIMOD will encourage and facilitate the development of improved 'Monitoring and Assessment of Ice and Water Resources' to provide policy and decision makers, as well as the scientific community, with a better basis for strategic decisions on natural resources management. This improved monitoring and assessment system will have two strategic levels. The first will be monitoring at a regional level, where ICIMOD is well suited to take the lead using remote sensing techniques. Complementing

Table 2: Actions planned under Integrated Water and Hazard Management

Monitoring and Assessment of Ice and Water Resources

- Develop monitoring and assessment schemes for cryosphere and water resources at a regional scale
- Support strengthening of national capacities to monitor and assess cryosphere at national and field-level scales
- Assess functions and services provided by high altitude wetlands
- Establish a regional water-related database

Disaster Risk Reduction and Community Resilience

- Develop and deliver training courses in disaster risk reduction
- Share knowledge in disaster risk reduction
- Assess the impacts of climate change on ecosystems, natural hazards, and human health
- Assess the vulnerability of communities and build their resilience to multihazards

Strengthening Upstream-downstream Linkages for Benefit Sharing and Risk Reduction

- Facilitate regional cooperation for flood disaster mitigation
- Develop flash flood management, forecasting, and early warning systems
- Support integrated water resources management approaches and water governance
- Develop basin-wide scenarios on water availability and demand

this, monitoring systems for ice and water also need to be improved at a national level. This is the responsibility of the regional member countries, but ICIMOD may be instrumental in stimulating such a process and facilitating joint learning and methodology development.

Asia – suffering from natural disasters

Asia is the most disaster prone continent in the world, and ICIMOD's RMCs are infamous for being the most vulnerable countries in the world to natural hazards, particularly those induced by weather and climate, which often lead to disasters and thereby impede socioeconomic development and poverty reduction. ICIMOD has chosen to focus mainly on hazards and disasters related to adverse weather and climate conditions, such as high intense rainfall, regional floods, and flash floods. Water related hazards also include poor water quality, which, as a result of poor sanitation facilities, causes enormous harm to human health and well-being in the region, including thousands of deaths annually.

Disasters do not affect everyone equally. Women, children, the elderly, and the disabled are more vulnerable than others. Particular attention is needed to understand the differences and social inequities in society in order to support appropriate disaster preparedness and mitigation practices. In order to address the risks facing mountain communities and support their desire to better understand the nature of the hazards that might lead to disasters, ICIMOD has outlined a series of activities to be undertaken as part of 'Disaster Risk Reduction and Community Resilience'. Among these activities are the assessment of vulnerability of communities and building their resilience to multi-hazards; assessing the impact of climate change on ecosystems, natural hazards, and human health; delivery of training in disaster risk

reduction; and providing an active and vibrant platform for sharing knowledge and experiences within disaster risk reduction.

Better water management - towards benefit sharing and risk reduction

From a larger, regional, perspective, disasters are causing immense harm to society with tremendous suffering among those individuals who lose family members, livelihoods, and infrastructure. Climate-induced disasters are taking the heaviest toll. Looking at the regional member countries, riverine floods and flash floods account for more than 10,000 deaths annually, not to mention the number of people who lose their livelihoods and economic assets. As mentioned above, ICIMOD believes that hazards and benefits related to water need to be co-managed in order to maximise the benefits and minimise the risks; often reduction of one is met by an increase in the other. Good water governance is repeatedly pinpointed by the international community of water professionals as an activity to be fostered through the adoption of integrated water resources management (IWRM) processes. The IWRM principles encourage the management of water across different sectors, ideally with a holistic view of the need for water in society so that available resources can be distributed and allocated as efficiently as possible, while at the same time safeguarding the needs of society. Applying an IWRM process in a regional river basin presents additional challenges. The nine large river basins in the HKH straddle various cultural, political, and administrative boundaries, and the water flowing in the basins is used for multiple purposes including water supply, irrigation, hydropower, inland navigation, recreation, and spiritual uses, all of which demand a fair share of the precious resource. In its new strategy, ICIMOD intends to contribute to the 'Strengthening of Upstream-Downstream Linkages for Benefit Sharing and Risk Reduction'. Activities to this end include the facilitation of regional cooperation for flood disaster mitigation; the development of flash flood management, forecasting, and early warning systems; the support of IWRM approaches and good water governance; and the development of basin-wide scenarios on water availability and water demand.

Addressing challenges and opportunities in relation to water and hazards in the entire Himalayan region is a formidable task and, of course, ICIMOD has no intention of being the prime solution in this context. However, we believe by working together with national partners in the eight member countries, and by jointly identifying different roles and responsibilities among us, we can take small but important steps towards the achievement of ICIMOD's new vision of a 'mountain population of the greater Himalayas enjoying improved well-being in a sustainable global environment'.



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The human face of disaster: a man rebuilt his house in a disaster struck area in Northern Pakistan for lack of choice