

Building Resilience to Water-Related Disasters in the Asia-Pacific Region

7th World Water Forum 2015

12–17 April 2015, Daegu and Gyeongbuk Republic of Korea



ICIMOD

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Strengthening Flash Flood Risk Management in the Hindu Kush Himalayas¹

The need for specific policies and better interfaces with local institutions

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Introduction

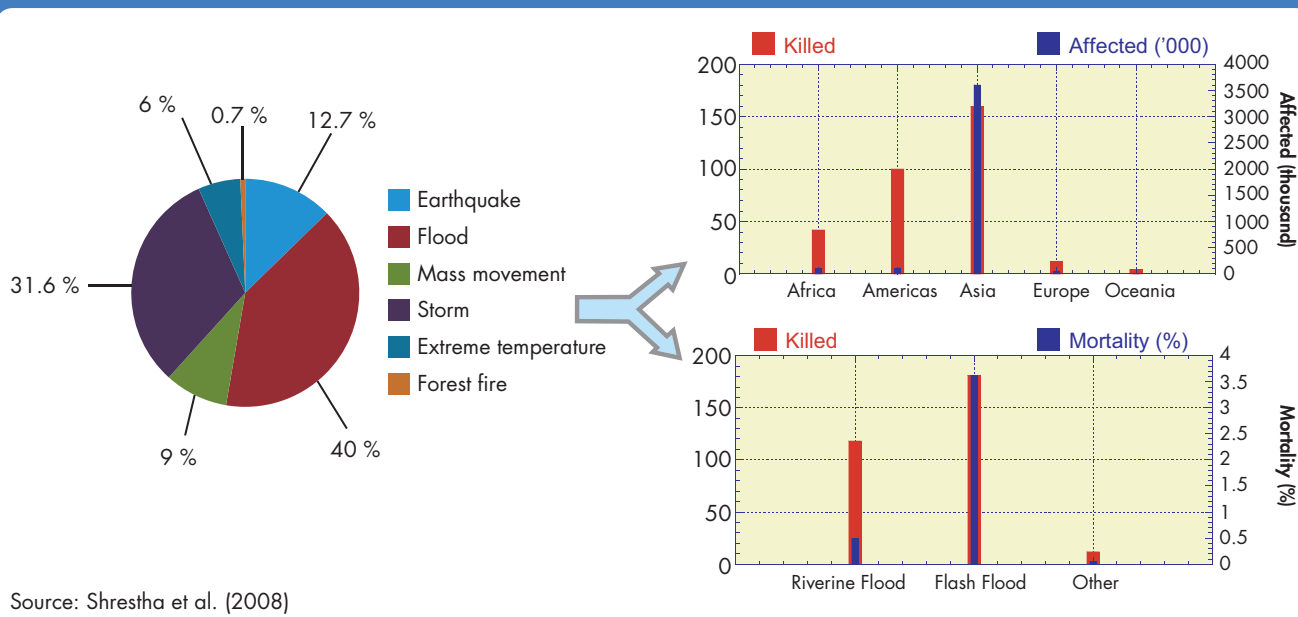
The Hindu Kush Himalayan (HKH) region faces more disasters than any other region in the world. Flash floods are among the most common form of disaster in the HKH and are particularly devastating due to their suddenness and the volume of water and debris they carry. Disaster risks are expected to increase in many countries of the region with climate and other changes as more vulnerable people and assets are exposed to weather extremes. Despite their immense impact on people and the socioeconomy of the region, there is a general lack of policies, strategies, and plans specifically dealing with flash floods in most of the countries of the HKH region. There is a need to develop appropriate policies and institutions to build resilience to flash floods so that communities face lower risks from such hazards. At the same time, local communities have been dealing with flash floods for generations and are adapting to change and managing the increased disaster risk, with and without support from national policies and institutions. There is a need to strengthen the supportive interface between national and local institutions (both formal and informal) working in flood risk management, climate change and disaster risk management. Such an interface could enable policy makers to capitalize on local knowledge and strategies to inform policy making on flash flood risk management to produce policies that are relevant and able to be implemented on the ground.

Flash floods are different by nature from riverine and other floods and are particularly devastating due to their suddenness and volume of water and debris. There is a need for specific policies on flash flood risk management, as well as cooperation between countries sharing river basins in the region as floods are not confined by political boundaries. Despite the lack of policies, local institutions are adapting and building resilience to flash flood risk. Supportive interfaces need to be strengthened between local and national institutions to support community adaptation and resilience.

Causes of flash floods in the HKH

- Intense rainfall events or cloudbursts
- Prolonged monsoon rainfall and monsoon depressions
- Rapid snow melt during spring
- Glacial lake outburst floods (GLOFs)
- Landslides and debris flows
- Landslide dam outburst floods (LDOFs)
- Failure of artificial structures such as embankments and hydropower dams
- Uncoordinated operation of hydraulic structures

¹ This paper has been adapted from Part 1 of Shrestha and Bajracharya (2013) *Case studies on flash flood risk management in the Himalayas: In support of specific flash flood policies*. Kathmandu: ICIMOD. It also draws on Pradhan, NS; Khadgi, V; Kaur, N (2014) 'Chapter 6: The role of policies and institutions in adaptation planning: Experiences from the Hindu Kush Himalayas.' In Ensor, J; Berger, R; Haq, S (2014) *Community-based Adaptation to Climate Change: Emerging Lessons*. Rugby, UK: Practical Action Publishing.



Source: Shrestha et al. (2008)

Figure 1: **Types of water-related disasters, distribution of water-related disasters by continents, and different types of floods (1900 – 2005)**

Flash floods in the HKH: Increasing incidence and devastating severity

The Hindu Kush Himalayas (HKH) provides water to 1.3 billion people – over 20 per cent of the world's population (Pradhan et al. 2012). Stretching 3,500 kilometres over eight countries, from Afghanistan in the west to Myanmar in the east, this mountain system is characterized by fragile bedrock, steep slopes, and a high rate of surface erosion making it prone to natural hazards. Floods are one of the most common forms of natural disaster in this region, and flash floods are particularly devastating. The mortality rate for flash floods is much higher than for other water-induced disasters. Global warming and climate change are expected to exacerbate the risk posed by floods, particularly flash floods (Shrestha and Bajracharya 2013). The HKH region is undergoing significant warming, which will accelerate glacier melt, increasing base river flows. This is likely to increase the incidence and severity of flash floods in the region (Pradhan et al. 2014, in Ensor 2014; Shrestha et al., 2008).

The HKH is one of the poorest regions in the world, containing about 40 per cent of the world's poor. The region is also the most densely populated in the world, with the population density as high as 180 persons per square kilometre in some places – and this population is growing at a rapid rate. High population density results in scarcity of natural resources such as land and water, forcing people to live in areas vulnerable to natural disasters. On top of the physical and environmental factors, these social and economic conditions exacerbate

the vulnerability of people in the region to different types of disaster including flash floods (Shrestha and Bajracharya 2013).

Lack of policies specific to flash flood risk management

Despite their destructive nature and immense impact on the socioeconomy of the region, flash floods have not received adequate attention from policy and decision makers. There is a general lack of policies, strategies, and plans specifically dealing with flash floods in the countries of the HKH region. Most of the existing policies relate to riverine floods or to disasters in general. Measures to reduce flash flood risk can be entirely different from those for general flood risk management, necessitating specific flash flood risk management policies. There are also a wide variety of institutional arrangements in place to deal with floods; however, none of these explicitly deal with flash floods. China has a relatively better policy and institutional framework for flash floods; however, all of the countries in the region are yet to recognize and address mountain hazards as a separate issue from both upstream and downstream disaster risk perspectives, particularly in relation to flash flood risk reduction (Shrestha and Bajracharya 2013).

To improve flash flood risk management in the HKH the countries of the region need to address flash floods as a separate issue in their policies and plans. This requires an improved understanding of the processes involved

and the measures needed to manage the problem – which requires investment in research at the national and regional level. As rivers and watersheds cross political boundaries, policies on flash flood risk management need to be developed from a river basin and regional perspective – as well as taking into account national considerations and realities on the ground (Shrestha and Bajracharya 2013).

Need to improve interfaces between local and national institutions for better flash flood risk management

Until specific policies on flash flood risk management emerge in the countries of the HKH, attention needs to be focused on how existing generic policies for floods, climate change adaptation, and disaster risk reduction are being implemented by national and local institutions and, most importantly, the interface between these institutions. Is this interface supportive or unsupportive? Local communities and institutions on the ground have been adapting to flash floods for generations (Pradhan et al. 2012) and have accumulated a wealth of knowledge that could be used to inform policy change for better flash flood risk management. Local knowledge and local institutions are important because flash floods often occur in isolated remote areas where external support cannot immediately reach (Shrestha et al. 2008). Policy change in flash flood risk management driven from the local level would naturally be more cognisant of local realities and would capitalize on local knowledge – while at the same time building a supportive interface between local and national institutions working in this field.

A recent study on ‘Community Based Adaptation to Climate Change’ found that policies and institutions in the HKH are not always supportive of local practices (Chapter 6 by Pradhan et al. 2014, in Ensor 2014). This study calls for “well researched government decisions that take account of local practices and considers drivers of change” (Ibid., p 95). The study points out that both national and local institutions have a vital role to play in adaptation to change, but that there are “frequent disconnects between national and local plans and institutional options for strengthening adaptive capacity” (Pradhan et al. 2014, in Ensor 2014, p 96). There is a need to enhance the institutional interfaces, which means improving the horizontal and vertical interfaces between formal and informal (community-based) institutions functioning on various scales towards improving adaptation outcomes for communities (Pradhan et al. 2014, in Ensor 2014).

Policy and institutional framework in China

“Existing policy [in China] ensures the consideration of flash flood hazards during construction planning. China also has a mechanism to allocate funds for flash flood prevention. [...] China has short-term (by 2010) and long-term (by 2020) plans for flash flood management. The short-term plan, which focuses on non-structural measures such as monitoring, telecommunication, forecasting and warning, and combines them with structural ones, is being set up as a preliminary measure in key regions. The long-term plan is a comprehensive flash flood hazard prevention and reduction system combining non-structural and structural measures and will be implemented in all flash flood prone areas.” (Shrestha and Bajracharya 2013, p 6)

In terms of infrastructure, China has established Flash Flood Hazard Prevention Teams, which are led by the State Flood Control and Drought Relief Headquarters. These teams contain representatives from the Ministry of Water Resources, Ministry of Land and Resources, China Weather Bureau, Ministry of Construction, and the State Environmental Protection Administration of China.

Supportive interfaces can drive meaningful policy change drawing on the expertise of local communities in dealing with flash floods and adapting to change. For example, in Assam, India, flood mitigation infrastructure is managed by formal state institutions, with little community input. Embankments are used as the primary flood risk mitigation measure – although it has long been acknowledged that a combination of structural and non-structural measures would be more effective. Although initially effective in providing protection from flash floods, embankments need to be maintained and lose their effectiveness over time. Furthermore, dependence on embankments can weaken traditional community adaptation strategies and promote a ‘false’ sense of security among communities living in the flood plains. This can ultimately increase the vulnerability of communities. The situation in Assam demonstrates an unsupportive interface between the formal public sector and informal non-public sector institutions, which operate completely separately from each other with no sharing of learning or adaptation approaches. This disconnect between top-down strategies and local needs and knowledge can often end in disaster – e.g.,

when the embankments are breached inundating communities with devastating flood waters leading to loss of life and property (Pradhan et al. 2014, in Ensor 2014). A more supportive interface between the formal state institutions mandated to deal with flood mitigation in Assam and the informal community organizations has the potential to produce more effective flood mitigation measures by, for example, combining structural measures (e.g., embankments) with non-structural measures (e.g., community-based early warning systems). Although already functioning without a supportive interface with national institutions, the community-based early warning system installed on the Jiadhal River in Assam could benefit from improved technology and collaboration between upstream and downstream communities and state governments (as the river crosses two states) (Ibid., p 24).

Research suggests that institutions in developing countries, such as the countries of the HKH, are unlikely to be able to cope efficiently and equitably with climate change (Kates 2000, cited in Tompkins and Adger 2003), because most climate policy decisions are made at the national level with little input from those affected by such policies on the ground. To deal with climate and other change, and to support communities in their adaption to such change, it is important to develop policies that support effective institutional interfaces (Pradhan et al. 2014, in Ensor 2014). For this, more research is needed on how policies in the countries of the HKH create (or impede) supportive interfaces between institutions operating at the national and local levels (both government and private).

An example of a policy that created a positive interface between the national (government) and local (community/non-public) level is that of Policy Decision 10 in China, which recommended the establishment of water user associations to manage rural water infrastructure. In line with this policy, the Baoshan Municipal Water Bureau created 520 water user associations covering 142,449 households and 13,281 hectares of irrigated land. Each county issued implementation guidelines to support the new associations and regulate the supply of water and irrigation. Policy Decision 10 was able to create a supportive interface between the policy at the national level and the associations implementing the policy at the local level (Pradhan et al. 2014, in Ensor 2014). Although this example relates to managing too little water (droughts), lessons can be drawn for flash flood risk management. In fact, of all the countries in the HKH, China is the only one with specific policies for flash flood risk management.

Conclusion and recommendations

It is clear that the countries of the HKH region need specific policies on flash flood risk management as the current policies focus on disaster risk management generally or riverine floods, which are very different to flash floods in terms of their causation and impact. China is the only country in the region with a specific flash flood policy and an advanced institutional setup for total flash flood disaster management, which other countries could learn from.

Despite the lack of specific policies, communities in the HKH have been dealing with flash flood risk management and adaptation for generations and have a vast knowledge base that can be used to inform policies for flash flood risk management. However, to enable the knowledge to filter up from the local level to the national level we need supportive interfaces in place between national and local level/formal and informal institutions working in flood risk management, climate change adaptation and disaster risk management.

Accordingly, the following recommendations are made for policy makers and researchers in the HKH:

Recommendation 1: Formulate specific flash flood policies.

The countries of the HKH should formulate specific policies addressing flash floods as a separate issue. Lessons can be drawn from China in this regard as China has experience in formulating and implementing policies specifically relating to flash flood risk management.

Recommendation 2: Formulate policies from a regional perspective.

As rivers and watersheds in the HKH cross political boundaries, policies on flash flood risk management need to be developed from a river basin perspective, which is often transboundary and even regional – as well as taking into account national considerations and realities on the ground.

The vision for supportive interfaces between national and local institutions (formal and informal) working in flash flood risk management (and disaster risk management) can be pursued, despite the fact that specific policies for flash flood risk management are not in place in most countries of the HKH. And, in fact, such supportive interfaces can drive meaningful policy change drawing on the expertise of local communities in dealing with flash floods and adapting to change. Accordingly, the following additional recommendations are made.

Recommendation 3: Improve the institutional interface between local and national/formal and informal organizations working in flash flood risk management.

Local communities have been dealing with flash floods for generations and yet their local knowledge is seldom valued or used by policy makers when formulating and implementing policies for flash flood risk management. There is a need to enhance the institutional interfaces between national and local/formal and informal (community-based) organizations working in flash flood risk management, which means improving the horizontal and vertical interfaces of such institutions functioning on various scales towards improving adaptation outcomes for communities.

Recommendation 4: Carry out research on supportive and non-supportive interfaces between organizations working in flood risk management, climate change, and disaster risk management.

To improve the interface between organizations work in flash flood risk management, more research is needed on how the policies in the countries of the HKH create (or impede) supportive interfaces between institutions operating at the national and local levels (both government and private).

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Preparations for the Asia-Pacific Regional Process of the 7th World Water Forum were partially funded by the National Committee for the Forum through Korea Water Resources Corporation (K-water) and the Asia-Pacific Water Forum.

ICIMOD gratefully acknowledges the support of its core donors: the Governments of Afghanistan, Australia, Austria, Bangladesh, Bhutan, China, India, Myanmar, Nepal, Norway, Pakistan, Switzerland, and the United Kingdom.