Managing Disasters, Sustaining Development in the Himalayas

David Molden at the Sustainable Mountain Development Summit, Kohima, 2013

It is easy to say that the Himalayas are prone to disasters. Every year, we have about 76 disasters, some 36,000 people were killed and over a million affected by disasters. About a third of these disasters are from floods.

There are two broad kinds of flooding:

- riverine floods, where the rivers swell up and overtop their banks
- flash floods which are caused up in the hills from rapid rainfall, from glacial lake outbursts, from cloudbursts.

Also quite common are landslide dam outburst floods. Lots of times landslides come down and block the river; the dam breaches and causes intense flooding.

The mountains, and the rivers coming from the mountains, typically cross national boundaries. Big riverine floods are very often transboundary floods. This is true especially of the big riverine floods, but also of many flash floods as well. About 10% of floods are transboundary in nature, but over 60% of people get displaced during these transboundary floods. Right now, there is a lack of exchange of real time data We have some bilateral agreements and some treaties, but we need more of those; there's a door open for much more regional cooperation in floods. The loss of life and damage really does not need to occur. It's not a matter of fate, its really how people manage the situation that can relieve the situation much better.

In 2000, there was a landslide that caused a block on the Yarlung Zangbo, the Brahmaputra river. When the dam got overtopped, there was a huge flood that came down. It caused extensive damage but no casualties in China. However, there were heavy casualties in India with 30 people dead, many more homeless, and millions of rupees worth of damage.

The happy news is the people did something about it. In 2002, there was a data sharing agreement between India and China. In 2004, a similar event happened when the Pareechu river in Tibet was blocked. Huge volumes of water came down, but the Chinese had communicated that to their Indian counterparts. When the dam broke out in 2005, there was great damage to property but there were no human casualties.

Another flood in recent years is the Koshi barrage. Rather than living with floods, in modern times we have decided that dykes are the way to go. If well maintained and managed, it's an effective measure. People get a sense that things are okay if we have those dykes. But if you don't really maintain and repair dykes then even with a moderate rise in water levels, we have huge floods. The message here is that better maintenance, better planning, perhaps even better ways of thinking through flooding really makes a difference.

From previous floods, we have learnt that we do have huge data gaps. We are missing those communication systems that could really help us out. We can do better at flood infrastructure and planning. There is a need for transboundary cooperation to deal with many of these flood events.

What are some of the solutions?

The first is to immediately fill some data gaps. When it comes to weather stations, at lower elevations, we have plenty of data stations. This decreases as we go higher. We don't have information about weather at high altitudes. We need to get weather stations up high. There are huge improvements in the technology for determining rainfall using satellites that can be made to make up for the lack of data stations. We still need the data stations to calibrate those.

One of the other movements that's happened across the globe are these regional flood information systems. There is one for the Himalayan Hindu Kush region ( HKH-HYCOS) that we can take better advantage of, where we can share information across borders. HYCOS is trying to set up an

end-to-end system where we can share data and get that data moving across borders 'at a rate faster than floods' as the motto says.

Often times, these high-end solutions don't help us for the really localised flash floods. For this, people can employ some almost homemade gadgets. One such example being used in Assam is of a device that simply detects the water level in a stream. When the water level goes up, it sends up a signal to an alarm or a telephone system.

This requires very strong interaction with communities. It requires that the communities are trained to use this type of system so that they don't have to wait for complicated systems that often rely on someone very far away. If we think of migration and of men moving out of villages, we have to be paying attention to women and making sure they are protected from floods. A mix of high-tech, low-tech, government systems as well as a community level approach is going to see us through.

There is a dramatic melting of glaciers and a resultant formation of glacier lakes. These lakes are putting people and the many hydropower stations at risk. We have to think how we are going to rethink these hydropower stations by taking into account the threats from these glacial lake outburst floods (GLOFs).

In 1985, there was a GLOF that came down, just bowled right through the valleys of Nepal, and totally wiped out a hydropower station. If you go back to the same place today, it is as if people forgot. You notice that people are building in those same valleys where GLOF happened two decades ago. People have built schools, right down on the river, because that's where the land is available. Planning where infrastructure is going to be put needs to be talked about.

It is possible to build these kind of end-to-end systems. I think that it is possible, and we need to link science with government and communities. We can do much better with our infrastructure planning and management. We have come a long way with transboundary information systems and really do much better with cooperation.

So the message is, there are floods and there are disasters. Let us make the next one, the next flooding event, something that is not so big a disaster by working together on this.