Chapter 3

Observing and Experiencing Flash Floods

Local knowledge on disaster preparedness in the Chitral District of Pakistan includes aspects related to people's observation and experience of flash floods, anticipation of floods, adjustment strategies, and communication strategies.

The people of Chitral have knowledge about the history and nature of flash floods in their own locality based on daily observation of their local surroundings, close ties to their environment for survival, and an accumulated understanding of their environment through generations. They have learned to interpret their landscape and the physical indicators of past flash floods. They can also describe and explain how their own vulnerability to floods has changed over time.

Nature and history of flash floods in Chitral

Cloud and glacier outbursts

"It was 4 pm on July 14th 2006 when the flood started. It was not raining here in the village. It was only raining higher up in the mountains. [...] The flood blocked the river for 10 minutes and it became a big lake and destroyed a water mill. The flood continued until 9 pm. Some big stones are still stuck inside the valley." (Narrated by Islamuddin, Aziz Urahman, Gul Muhammad Jan, Rashidullah, Khan Zarin and Ghulam Jafar, Gurin village, Gurin Gole, Shishi Koh valley, Lower Chitral)

"We were ready to take our goats up to the higher pastures when eight days of discontinuous heavy rain fell from June 30th till July 9th 1978. We shifted our animals and family members during that period to a nearby village. On July 7th, the river started to build up in the main course and to spill over. Some houses were destroyed. On July 9th even more houses were destroyed. The main flow came during the night of July 9th". (Chenar village, North of Mastuj, Upper Chitral)

"The water slowly started to flow continuously over the stream channel on June 14th 2005. [...] On July 9th at 9 pm the water started to cover the land and people had to run away from their houses. In the village, people wondered how it had happened because it was not raining before the flood. But people in

the high pasture had seen a huge hole/cave formed in the soil beneath the glacier from which the water came." (Group discussion, Resettlement area close to Brep, Upper Chitral)

Spring snow melt

"It was a very nice and sunny day around June/July in the high mountain. I was herding some goats. The weather was very hot. I was staying close to a stream and I started to see the flow growing more and more. No glacier or lake is up there. I was too high to give any signal that a flood was coming." (Narrated by Zerbali Khan, an old herder, Harchin, Upper Chitral)

The deep narrow valleys and glaciated mountain ranges of Chitral District were surely the most efficient ramparts against invaders. But today the associated dynamic geomorphological and climatic processes are probably the major enemies for the growing population. Shrubs mostly with very few trees grow in this arid and steep landscape. Barely 3.5% of the Chitral area is suitable for farming (Khattak 1999). Cultivation is almost entirely limited to active alluvial fans which are transformed into oases when people construct irrigation channels. These rainfed, irrigated lands are very fertile because of the constant deposition of eroded sediment. Farmers grow cereals, fruit trees, and some vegetables mainly for subsistence purposes, using buffaloes to plough the land. However, the oases are often temporary. Any intense and prolonged rainfall, especially during the months from June to August, induces debris flow and flash floods, and these often destroy the little agricultural land there is.

Local communities have a lot of experience of where floods occur and which areas are flood prone (experiential knowledge). Local stories highlight the different types of flash floods in the region. Some flash floods are triggered by cloud outbursts; others by glacial outburst or the snow melting in spring. Flash floods in Chitral have become part of people's lives: *"When the rainy season comes, people are mentally prepared."* (Workshop participant, Chitral Town, October 2006); *"it's a continuous process"* (Qazi Said Ahmad, Ashret village), and

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Figure 4: Irrigated land (left) with clear demarcation of the vegetation due to the irrigation channels (centre left), and non-irrigated land (right) in Morilasht region, Upper Chitral.

Arun B. Shrestha

Figure 5: A glacially derived debris flow destroyed 106 houses and large areas of agricultural land in July 2006 in Brep, Upper Chitral.

whatever happens *"life goes on"* (Munawar Khan, Baradam village). Informants have very good memories of the events they have witnessed. Often, they can recall spontaneously the precise date and time when a flood occurred. Stories show that there are important differences in the time taken for a flood to accumulate; varying from a few days to a few hours. In Brep, for instance, a very dry area located in the northern part of the district, the story of the last flood indicates how a slow glacial lake outburst release took about three weeks. Local stories show how local knowledge provides insight into previous water levels, change in water levels, types of flash flood and triggering factors in the locality, location of previous floods, and impacts of previous floods on livelihoods and property.

Julie Dekens

Figure 6: Destruction of cultivable land by a flash flood in Gurin village, Shishi Koh Valley, Lower Chitral, in July 2006.

Interpreting the landscape

"In 1961, my father decided to build a house in the village. One of the village elders came to him and suggested to him not to build a house on that particular site. The suggestion was based on the argument that the site had lots of river bed rocks ('shotar bokhtu') because the Begusht River used to flow there back in 1905. The old saying is that: 'water never forgets its path' (ogh than zhagho no rakhchur). But my father did not pay attention to the elder's suggestion. He built a house and so did many other people. In July 1978, the stream flooded and took away all the houses with it." (Amir Hazar, Izh village, Lotkoh Valley, Garachashma, Chitral District)

"The ruler took our land in Buni [local town, Upper Chitral] *and gave us this land. When we moved here, the villagers of Chenar told my husband about the flood that had occurred in the village 100 years ago. Big rocks were deposited. In 1978, the stream took a new path. The whole village was destroyed but nobody died."* (Chenar Village, Mastuj, Upper Chitral)

Not only do past hazards leave psychological traces in people's memories, often also they leave traces on the physical landscape. As such, the landscape becomes a precious source of information of what happened in the past; a physical repository of past events. Some people understand environmental signs of past flash floods in the landscape and can interpret these signs from their knowledge and previous experience of flash floods. Large rocks are a major indicator of past flash floods. Some people can recognise the location of past water stream/floods by interpreting the shape, location, and nature of slopes, rocks, geology, and morphology.

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Figure 7: Man sitting on rocks deposited by a flash flood on the road from Chitral towards the Lawari Pass, Lower Chitral. Notice the wooden log also deposited by the flood (centre).

Life histories

Forgotten experiences

"We didn't know the flood was coming because it was our first experience!" But one man remembers: "*Such a flood happened during our grandparents' time but we never expected such an event."* (Group discussion, Brep, Upper Chitral)

"After that major flood in 1978 we began to run out of our houses as soon as it was raining but now we have stopped doing that." (Chenar village, Upper Chitral)

Most people have scant knowledge of floods they learn about second hand, especially if they happened before they were born, if oral tradition is weak, and if knowledge is not transmitted frequently enough. Stories demonstrate how, in some cases, prior flash floods have been forgotten because flash floods of great magnitude do not occur frequently enough in one place (i.e., more than once in a generation) for villagers to remember them (from one generation to another) and for

this to influence their decision-making regarding settlement. This shows how frequency of flash floods influences people's capacity to remember hazards and how transmitted knowledge is probably more 'porous' than experiential knowledge.

Evolution of vulnerabilities to flash floods

"Initially our village was located below the glacier because people had access to drinking water there. Then the British built water channels on the other side of the river and people started to occupy this area as well. Since then, most people have built houses on both sides of the river; and this is a great advantage because in winter people living close to the glacier who suffer from water shortages are able to shift temporarily to the other side. However, a few families only have land on one side of the river, the most vulnerable to landslides and flash floods, because the former local ruler of Chitral took some of their land. So today those people are more vulnerable." (Dost Mohammed and Sardar Azam, village between Mastuj and Buni)

"Some people here have land on both sides of the river! Our great-grandfathers dug irrigation channels in what is called today 'Oshul Deh' and divided the land among them. It used to be an advantage because in case a flash flood happened we could easily seek refuge on the other side of the river.

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Figure 8: Woman living in a resettlement area after the flash flood which destroyed 106 houses in the original village in Brep in July 2006

Nowadays, the land is being more and more divided among our relatives. We can still fall back on our relatives but it is not our own house anymore." (Panan Deh and Osheel Deh, Reshun, Upper Chitral)

A combination of external factors (acting simultaneously, or not, and influencing and re-enforcing each other) often influences people's vulnerability to flash floods. For instance, some stories illustrate how environmental, demographic, and historical/ political factors have played a major role in changing people's vulnerability to flash floods. Land scarcity and water access

often compel people to stay close to the streams and glaciers (environmental factors). With the growing population, land fragmentation reduces people's options and their flexibility to choose safe locations and to resettle during the rainy season (demographic factors). In some cases, people used to live in safe places but the local rulers confiscated their land.[2] They were resettled in a vulnerable place and/or they simply lost part of the land upon which they used to fall back during the rainy season (historical and political factors). Stories about land resettlement during the times of former local rulers, or currently following construction of infrastructure (e.g., hydropower stations), are common in the region. Life stories can provide useful information about local perceptions about floods and changes in people's physical and social vulnerability to floods. This information can help to identify vulnerable groups and individuals that might otherwise be 'invisible'.

[2] Land confiscation happened for various reasons (inefficiency of services at the household level, intrigues with the neighbours, politics, intrigues with the court, religious factors) – Prof. Faizi, Chitral College

Box 1: Did you ask? Observation and experience of flash floods

History of floods – What do people know about the history of floods in their locality – e.g., when and where did the last flood occur? What was the water level of the last flood? How many people died? What damage was caused by the flood? How do people understand and interpret the situation or the landscape using their knowledge and/or previous experience of floods?

Nature of floods – What do people know about the nature of floods in their locality – e.g., onset, origin, velocity, types of rain, etc?

Interpreting the landscape – How do people understand and interpret the situation and the landscape from their knowledge and/or previous experience of flash floods?

Evolution of physical and social vulnerabilities – What is people's understanding of their own vulnerability (e.g., in pre-disaster situations) and of the factors that influence it? Are they living in a more vulnerable house now than before? Why? What happened? Do people have different priorities than they had before and how does this influence their vulnerability to natural hazards? To what extent are people able to identify the problems and to what extent are they able to solve them on their own initiative? How does disaster change, increase, and/or create new vulnerable groups (i.e., emerging vulnerability or vulnerable groups)? What other natural hazards and stresses do the community face and how does this influence local knowledge on disaster preparedness?