

Chapter 4

Anticipating Flash Floods

People manage to anticipate flash floods by observing and interpreting warning signals in the local environment. They also manage to make basic emergency plans and to identify time thresholds for saving key belongings and for moving out and higher up, for instance. People also have knowledge of safe settlement areas and from whom to seek advice and support within the community.

Forecast and early warning signals for flash floods

“The people of Chitral have a smattering of knowledge about the movements of astronomical bodies like the sun, the moon, and the stars. The pace of the movements of these bodies, after long observation, provided visual guidance to them in their daily lives. [...] The sun’s journey [...] has also been marked in connection with the cultivation of different crops and other work. Experience enabled people to receive guidance even in the rainy season. In a mountainous country, the sun rises over the hills and the rays of the sun coming out earlier through notches in the cliffs have been closely observed and marks

made to record the advance of a season. [...] The scheduling of farm work according to these calculations is called ‘dehqan hisab’, ‘the peasants’ account. From these movements of astronomical bodies, predictions about whether the coming seasons will be dry or wet are also made.” (Akbar Khan Rahmat 1996, Rahmat is an eminent local poet)

“We saw black clouds, lightning, and huge thunderstorms above us in the mountains. Some dust was also starting to rise and we heard the noise of boulders falling and rolling down. [...] We understood that a big flood was coming and we ran away to safety.” (Islamuddin, Aziz Urahman, Gul Muhammad Jan, Rashidullah, Khan Zarin and Ghulam Jafar, Gurin village, Gurin Gole, Shishi koh valley, Lower Chitral)

“Forty years ago, a snow avalanche affected our village. Before the avalanche, a mountain goat went down to the village. This unusual apparition of wildlife gave us a signal that something was going to happen because mountain goats normally don’t come down to the villages.” (Islamuddin, Aziz Urahman, Gul Muhammad Jan, Rashidullah, Khan Zarin and Ghulam Jafar, Gurin village, Gurin Gole, Shishi koh valley, Lower Chitral)

“The whole valley started shaking like it does during an earthquake before the flood came.” (Islamuddin, Aziz Urahman, Gul Muhammad Jan, Rashidullah, Khan Zarin and Ghulam Jafar, Gurin village, Gurin Gole, Shishi koh valley, Lower Chitral)

“People know when it will rain. They look at the direction of the wind.” (Qazi Said Ahmad, Ashret village, Lower Chitral)

“We also knew that the flood was coming because of the typical smell.” (Old lady, Chenar village, Mastuj, Upper Chitral)

People can identify and monitor natural phenomena related to flash floods such as the colour of the clouds, intensity of rainfall, unusual sounds, and changes in water flow. As such, they have some level of hydrological and meteorological knowledge. Some people are able to identify the unusual movements and appearance of wildlife (ants, birds, rats and mice). Long observation of the sun, the moon, and the stars used to help people make decisions about farming activities (Rahmat 1996). Overall, few people die in flash floods because they have learned from experience to identify and interpret environmental warning signs and signals of flash floods. However property, agricultural fields and irrigation channels, are damaged often. (*“The danger from flash floods is not so much to life as it is to livelihoods”; “Protecting the land, more than life itself, is the big issue.”* Workshop participants, Chitral Town, November 2006) Today, this ability to observe and monitor environmental signals is weakening partly because the

number of men working outside the village is increasing (see Chapter 6, section on local early warning systems in 2006).

Time thresholds and emergency measures

“Since this event, when it rains heavily we know we have to get ready to run away with our luggage. Most of us have a bag prepared with clothes and shoes. We have already shifted all our important documents to safer places” (i.e., relatives’ places). (Abdullah Khan Shakir, Shainigar village, Drosh)

“Now every time it rains we move out of our houses!” (Imam of the village, Isfangol village, Upper Chitral)

“When it rains heavily we climb higher up because we know that a flood will occur.” (Elder, Panan Deh, Reshun Gole, Upper Chitral)

“If it is raining heavily at night we stay awake.” (Shapir Khan and Muhammad Yousaf, Panan Deh, Reshun, Upper Chitral)

“After that event, we began to sleep with our shoes on during the rainy season.” (Old lady, Chenar village, Mastuj, Upper Chitral)

Flash floods are very challenging because they occur, by definition, very rapidly and do not leave much time for

Herders of Chitral: The Lost Messengers?

preparedness. Use of the time between the observation of key environmental signals and the occurrence of floods is therefore crucial. Households adopt a few simple short-term strategies before the rainy season starts or during heavy rainfall such as saving administrative papers and other belongings with their relatives or with neighbours, moving physically to safer places especially at night, running higher up and staying awake or sleeping with shoes on, and having a 'go-bag' ready. **Although most of these simple strategies might seem like 'common sense' or 'universal knowledge', it is important to recognise that people have bounded rationality; that is, people's rationality is limited to their own information and beliefs.** For instance, a man interviewed described how his wife ran away from the house as a flash flood was coming but then, seeing many people on the street, decided to go back to get her veil. She was then trapped in the house, but did not die. Her husband likes to believe that the veil saved his wife from the flood; seeing her return to get it as a protection factor rather than a risk. This story illustrates the point that 'running away' when the water starts rising might not always be accepted as common sense depending on religious and cultural beliefs and practices for instance.

Safe places for building houses

"We take two things into account when we build our houses. We don't build houses in the way of floods and in places where stones may fall down." (Elder, Krakal village, Kalash Valley, Chitral)

Part 3 – The Case Study

"In the Parsan Valley, people used to have strict rules to prevent the location of settlements in hazardous places. They were not allowed to build settlements close to the river. But now, with the increase in population, people are living closer to the river bed due to lack of land." (Syed Harir Shah, Programme Manager in Community-based Disaster Risk Reduction, Focus Humanitarian Assistance, Chitral)

"Twenty years ago a major flood washed away all the houses in the village. At that time, our houses were located in a vulnerable place because no water was available higher up. After that major flood, access to water improved and we rebuilt our houses higher up on the mountain slope in safer places. This year the flood did not destroy any houses." (Islamuddin, Aziz Urahman, Gul Muhammad Jan, Rashidullah, Khan Zarin and Ghulam Jafar, Gurin village, Shishi koh Valley, Lower Chitral)

"The whole area is flood prone, but it is very costly to buy land somewhere else." (Shainigar village, Drosh, Lower Chitral)

"I don't feel safe here. A flood event might happen again but what can we do? We don't have another place to live." (Lady, Chenar village, Chitral)

"Our homes never get washed away!" (Qazi Said Ahmad, Ashret village, Lower Chitral)

"Houses are built in the wrong places!" (Workshop participant)



Figure 9: The physical geography of Chitral District does not, in general, provide many safe places to live. The mountain slopes often consist of steep, barren land unsuitable for settlement. The river plains are exposed to recurrent floods making them equally unsuitable for settlement. The only land left is on the numerous alluvial fans occurring at the mouths of stream gorges, or valleys, descending from the high mountains. Often, living on these alluvial fans is connected with a high level of risk, since they are exposed to recurrent flash floods and debris flows. In fact, alluvial fans are formed from such events. Hence, people are often in a situation in which they have to find the least vulnerable spot within the alluvial fans. In general, such places are at the sides or at the very edges of the fan.

The first step towards disaster preparedness in mountain regions is for people to locate their houses in safe places, away from debris flows, flash floods, and snow avalanches. Settlement options safe from floods are few. In many places, the river channel takes up the whole valley. Most of the time, irrigation channels have to be built to make the land suitable for settlement, and this involves additional costs that have to be borne by the locals. In most cases, people can only try to minimise risks by choosing the less hazardous places whenever possible. Some houses are built on relatively ancient alluvial fans that have been progressively cut off by a major stream coming from the mountains. In such cases, settlements may be safer than on more recent alluvial fans because a deep channel is formed by progressive stream erosion. Other settlements are built in clusters and slightly high up on excavated mountain slopes (but still relatively close to the river beds for water access) not only to be safe from floods but also to save the suitable land for agriculture. However, many new, dispersed settlements are also located on active (and therefore very risky) alluvial fans due to lack of available land and population pressure. Houses located at the bottom and on the sides of alluvial fans are safer than those located on the top and in the centre as the chance of floods and the velocity of water/debris flows are reduced.

Generally, the location of houses depends on a combination of factors: including environmental (avoiding areas prone to



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Figure 10: Buildings located on top of an alluvial fan, Upper Chitral

flash floods and choosing areas with access to drinking and irrigation water; equally, lack of water often forces people to build their houses close to the river bed), socioeconomic (e.g., land fragmentation because of division among the sons, getting land from relatives, willingness to live close to relatives and on one's father's land), demographic (e.g., increase of population), institutional (e.g., customary rules, no memory of previous floods), political (e.g., land regulation and building codes – or lack of!), and historical (e.g., land requisition). Interviews reveal, for instance, that in certain places the location of houses has improved over time because water has

been made available in safer areas and people have learned from previous experience of a flood (e.g., Gurin village, Shishi koh Valley). Elsewhere households newly affected by floods and with prior experience of them are rebuilding their houses in the same area or very close to the damaged area because of lack of assets/options and because of people's desire to remain close to their relatives – and this trend is common in the region (e.g., Chenar village, Mastuj area).

An apparent contradiction transpires from the last two quotations in terms of whether or not houses are built in safe places. This apparent contradiction reflects the current changes that are happening in the district. *“We have lost the local knowledge. Houses are now being built in vulnerable places”*, comments Professor Faizi of Chitral College. Some settlements, including newly-constructed public schools, are even located at the hydrographic apex of active alluvial fans, the most vulnerable area. The district currently lacks statistical data and analysis to validate field observations and community perceptions on this topic properly. Different forces are also interacting at the same time, and this makes the situation quite complex. On the one hand, the increasing population means that access to safe places is decreasing. On the other, access to drinking and irrigation water has also probably increased, especially following interventions by non-government organisations in the 80s. New land has been cleared for new houses and people have been able to settle down in new places (maybe safer than

previously?)³. Schools are built by the government but the land is generally donated by the local communities so the worst land is often provided because of the pressure on land and lack of suitable areas for cultivation and settlement. Members of local on-government organisations are convinced that *“communities need to be made aware of natural hazards again”*.

Critical actors and skills

Religious leaders and elders

“Local religious leaders and other pious people used to predict disasters and in many places it was true.” (Group discussion, workshop on local knowledge, Chitral Town, October 2006)

“In ancient times, we used to get advice on where to build new houses from two or three elders in the village, but now we make decisions at the household level.” (Elder, Panan Deh, Reshun Gole, Upper Chitral)

“In the past the ladies were the custodians of local knowledge. The women used to memorise all the traditional things because they were stuck at home and because they were also the direct target of natural hazards. They had to be at the forefront of natural hazards because they were sometimes on

³ According to Prof. Faizi, Chitral College, the Methar system (the last ruling dynasty of Chitral as an independent state until 1892, Ali and Khawaja 2004) was more efficient than the current one, for example it had a better way of constructing water channels.

their own and they had to find ways to cope with the hazards. Aged women are key informants for local knowledge related to natural disasters. In the case of weather forecasts old men are more knowledgeable than the women because they are the ones responsible for crop management and harvests.” (Professor Faizi, Chitral College)

“My grandpapa was well aware about the harvesting season, crop protection, water management, the forthcoming season’s severity, philosophy of working together, risk reduction in day-to-day affairs, importance of reforestation, and use of watershed etc. He knew how to make meteorological and hydrological forecasts, for instance, regarding pests. Solar observation, astrological beliefs, and observations of previous seasons and the application of traditional wisdom were among the traditional knowledge he used to inform the family and the villagers how to plan their next year’s harvest.” (Syed Harir Shah, Programme Manager for Community-based Disaster Risk Reduction, Focus Humanitarian Assistance, Chitral)

Key leaders, artisans, other social actors and skills

“The ladies were not ready to leave their houses but the head of the village at the time – a forester, whose grandfather had witnessed the previous flood – convinced us to leave.” (Women’s group discussion, Chenar village, Mastuj, Upper Chitral)

“Not everybody can make and use a ‘booq’.⁴ You need the right size and shape of horns and you need to know how to whistle.” (Durdana Khan, an old retired herder, Harchin village)

“Nobody in the village, knows how to build a traditional house like this one, but there are one or two local carpenters from Reshun who know.” (Elder, Panan Deh, Reshun Gole, Upper Chitral)

“Men know stories of floods that happened in nearby villages because they travel more than women. But women travel now a little bit more than before.” (Women’s group discussion, Chenar village, Mastuj, Upper Chitral)

“In the traditional society of Chitral, youngsters were given training in different skills. Chitrali handicrafts of wool, clay, iron, wood, and skin were the main source of subsistence. The education policy that replaced the old system has no direction. It produces people with certificates and degrees that serve no purpose. The result is that our society has produced unemployed youth instead of skilled people. New generations in the families of traditional craftsmen/women are giving up their ancestral professions without being able to adopt better ones.” (NWFP and IUCN-Pakistan 1999)

⁴ A horn made out of a yak or local goat horns used by herders as a communication tool and sometimes to give signals about imminent danger.

Different people in the same community have different types of knowledge. People's status within the community also gives their knowledge different values and meaning. Some people are more knowledgeable about natural hazards than others because of their profession, their age, their status, their family history, their skills, and/or specific gifts etc. Some people, because of their specific skills and ability to 'read' the landscape, the sky, and other elements of the environment

are trusted by the community and their advice is followed. This means that people manage to anticipate floods because of their trust in local advice and predictions (e.g., elders, local religious leaders, and other pious people). However, changes in the education system and the fact that the decision-making process is now based mostly at the individual and household levels result in the weakening of traditional knowledge and skills.

Box 2: Did you ask? Anticipating flash floods

Early warning signals – How can local people manage to anticipate and identify environmental warning signals of flash floods? What do people observe, hear, and sense before a flash flood happens? Do people have traditional/ local weather forecast systems? How do people know that it is time to leave their house?

Time thresholds and emergency measures – When do people know that it is time to leave their houses and move on to higher ground? What should they take with them?

Escape routes and safe house locations – How are communities and households preparing for a flood that is

about to happen? Where will people go? Why are people building houses in vulnerable places? Is it because of a lack of knowledge and/or a lack of options? What main obstacles are people facing in trying to build their houses in safe places?

Critical actors and skills – Who is doing what within the community? Who holds or owns the relevant knowledge about floods? Who has specific skills that can directly or indirectly contribute to improved disaster preparedness? How can these skills be nurtured?