

Chapter 5

Adapting to Flash Floods and Other Hazards

Strategies for adapting to flash floods in Chitral include various technical and non-structural measures. Technical strategies include the construction of food stores, terraces to reduce damage to houses from falling rocks,



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Figure 11: Wooden food store in the Kalash village of Jao Guru, Birir Valley, Lower Chitral

retaining walls for flood protection, and traditional earthquake-resistant structures. Non-structural strategies especially rely on strong family and social networks, the ability to spread the risk of natural hazards among different assets through spatial and economic diversification mechanisms, traditional natural resource management regulations, and the ability to learn from previous mistakes and community initiatives. When people are asked directly what they are doing to improve their preparedness against natural hazards, not many elements come to mind. Indeed, over time people tend to internalise their practices; and they become part of people's culture and day-to-day life. This is especially true for long-term adjustments. In fact most of the non-structural strategies have been established for people to cope with many kinds of stress and not only flood preparedness per se. Nevertheless, all adjustment mechanisms add to social and economic resilience.

Technical and structural strategies

Food stores, terraces, and retaining walls

"The flood took place on July 14th 2006 from 4 pm to 9 pm. [...] It destroyed all our fields but our houses were safe and so were our grain stores kept inside the houses. We can store up to two to three months of grain but the quantity depends on how much land each person has and on the time of the year. We also have houses in the pastures with food stores (butter especially) but the flood washed away three of those. It had



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Figure 12: Retaining walls along a stream in Birir village (Kalash) financed by an external organisation using local materials. Traditional flood-protection walls are made out of stone and wood. But nowadays, in many places, wood is becoming very expensive, or is even unavailable because of excessive deforestation.

never happened before!" (Narrated by Aziz Urahman, Gurin village, Gurin Gole, Shishi Koh valley, Lower Chitral)

"Through our work with communities here in Chitral we have seen cases in which people built terraces at the back of their housing plots to reduce damage from rock fall on their houses." (Syed Harir Shah, Programme Manager for Community-based Disaster Risk Reduction, Focus Humanitarian Assistance, Chitral)

"Before, the community used to construct protection walls but now it is too costly so we rely on the government." (Abdullah Khan Shakir, Drosh, Lower Chitral)

"In the old days there was no system of preparedness in place to ensure food supplies for the inhabitants during the 6-month winter period. The people themselves ensured they had enough essential commodities for the block period. Even today, local people, the business community, and the local government arrange essential commodities and wheat for six months in summer in preparation for winter, and the business community as well as the households stock their daily needs for a four to five month period to overcome the season's harshness. People still use indigenous wisdom to harvest seasonal crops according to the changing climatic situation, and they know how to protect their crops, plants, and livestock from the harsh weather conditions. A very famous saying is: "if you are not caring for yourself, who will care for you" (Thansoro key khiyal

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no arrow, ka ta khiyal koy).” (Syed Harir Shah, Programme Manager for Community-based Disaster Risk Reduction, Focus Humanitarian Assistance, Chitral)

Traditional earthquake-resistant houses

“If an earthquake starts, we always run into our houses!”
(Kalash elder, Krakal village, Bumburet Valley, Lower Chitral
– Kalash are an ethnic minority in Lower Chitral)

“There are many rich people here but they don’t build traditional houses.” (Reshun, Upper Chitral)



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Figure 13: Traditional Kalash houses, Krakal village, Bumburet Valley, Lower Chitral. The flat roof also serves as an outdoor living space.

Most Kalash elders have witnessed at least one or two major earthquakes and many small ones, but they are not too worried about them. Traditional houses in the Kalash valleys, and in Chitral and the North West Frontier Province (NWFP) in general, are earthquake resistant due to a sophisticated combination of wood, stones, and clay. A traditional house consists of a single room without windows (*baipash*) and a veranda. Five wooden pillars⁵ support a flat roof made of stone and mud layers. Due to the cold climate, a hole in the roof to let the smoke out of the central fireplace is the only opening bringing in light and air apart from the entrance. The walls are made of stone, mud, and clay with thick wooden logs (25 inches). The Kalash elder reports that only the cattle sheds and the walls along the roadside are damaged by big earthquakes because these structures do not have any wood. But nowadays, access to wood is becoming more and more difficult due to deforestation. A traditional house might require about 10 to 20 big trees. The poorest households cannot afford wood anymore and instead have to use more stones and clay. Most of the other houses are made of mud brick, because wood is expensive. Rich households do not always follow the traditional trends anymore either – for reasons other than financial ones, including the social status attached to modern buildings. The modern trends favour houses with separate rooms, larger openings/windows, and corrugated roofs. Certainly the new

⁵ The five wooden pillars are found in most traditional Chitrali houses and have a special meaning in the Ismaili religion. Each pillar symbolises a prophet: Mohammed, Ali, Fatima, Asan, and Hussain. (Group discussion, Brep resettlement area, Upper Chitral)

style provides a healthier environment because it has better ventilation than the traditional style and the materials used are less prone to fire, but the structure is not as energy efficient and earthquake resistant as the traditional structure. The decreasing use of traditional houses is also related to the lack of labour due to the increasing number of men seeking jobs outside their villages. Building traditional houses is extremely labour intensive and requires specific skills. Overall the changes in house construction raise an interesting point



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Figure 14: Kalash girl in front of a traditional Kalash house, Bumburet Valley, Lower Chitral. Traditional houses are stronger because they are made out of a sophisticated combination of wood, stones, and clay. But nowadays, access to wood is becoming more and more difficult due to deforestation – especially for the poorest households who cannot afford to buy it.

of controversy regarding the roots of the problem and how to tackle it. Some people perceive traditional (wooden) houses as not being ‘environmentally friendly’ because they take a lot of wood to construct. Others perceive that the forest policy is not adequate and does not allow people to manage the forests in a sustainable manner – this is discussed below in the section on ‘natural resource management’.

Non-structural strategies

Social capital

“We help each other. We are people descended from one ancestor here. We are one people. It’s natural to help each other.” (Qazi Said Ahmad, village leader, Ashret village, Chitral)

“The villagers from higher up used to warn us and we used to spend nights outside in this other village. The people of this village used to help us to save our belongings. They help us a lot!” (Aged woman, Chenar village, Mastuj, Upper Chitral)

“Now we are building a new house here [on the fringe of the last debris flow]. We don’t have any other options. We are not going to the resettlement area because our relatives live here and we still have a small plot of land. Whether or not the resettlement area is safer from floods, our relatives are here so it is more convenient for us to live close to them. We can’t leave this place because it is our family land. No one can leave their ancestral land!” (Woman, Brep, Upper Chitral)

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“We lost seven fields in the last major flood in 1978. Even if I could I would not leave this place because I am attached to this land and I am comfortable in my own area. It is more important to live with my relatives than to live in a safer place.” (Women, Chenar village, Mastuj, Upper Chitral)

Relatives and neighbours provide social and psychological insurance before, during, and after floods. Some women also go back to their parents’ homes during the flood season. Households have strong family/lineage/clan ties and social support networks or systems which help reduce their sense of helplessness. However, this sense of solidarity in the face of threat may weaken as men are starting to work outside the villages to earn cash, therefore increasing individualism. Moreover, a strong sense of place and family ties sometimes contributes to underestimation or disregard of the possibility of future hazards. Despite knowing about the danger, some people affected by floods still prefer to resettle in the same vulnerable area to maintain, and still benefit from, family support.

Diversification strategies

“Everybody in the village has land in the pastures and some household members (both men and women) go there for two to three months during the summer.” (Elder, Panan Deh, Reshun Gole, Upper Chitral)

“It is safer to keep the livestock up in the pastures during the rainy season.” (Women’s group discussion, Chenar village, Upper Chitral)

“All our livestock (goats, sheep, and cows) are taken up to the pastures, but there are also risks higher up.” (Elder, Panan Deh, Reshun Gole, Upper Chitral)

“People now have grain from the warehouses and go to work in the cities. They also cut trees in the mountains and sell wood to the market for 100 Pakistani rupees per kilogramme. It is difficult because we have less and less wood available and work is not easy to get outside. So we are still very dependent on our agricultural land. We will start to cultivate this land [that had just been damaged by the flood] again as soon as possible.” (Islamuddin, Aziz Urahman, Gul Muhammad Jan, Rashidullah, Kahn Zarin, Ghulam Jafar, Gurin village, Shishi Koh Valley, Lower Chitral)

“No one leaves the village permanently. It is only seasonal migration.” (Qazi Said Ahmad, village leader, Ashret village, Chitral)

“Due to lack of management, the cultivated area in Chitral could not be increased in either quantity or quality. For example, the rotation of crops was abandoned and the one-crop system was forced upon the farmers and thus the traditional cultivation

system of growing maize, barley, millet, and pulses was abandoned. As a result an amount of 60 million is annually spent on food subsidies for the district from the national exchequer". (NWFP and IUCN-Pakistan 1999)

Pastures, agricultural land, and houses – three (gendered) habited worlds wherein herders/nomads, men, and women are at the heart of a complex agropastoral system, a combination of irrigated cultivation and animal husbandry. Livelihood diversification has been a key coping mechanism for facing the harsh environmental conditions (including physical isolation and natural hazards) and economic hardship. Chitral remains closed to the rest of Pakistan for about six months of the year during the winter because of snow, which can be several metres' deep (and temperatures can reach minus 15 degrees Celsius). Certain strategies spread the risks of flash floods among people's physical and economic assets, allowing the system to maintain a level of flexibility and to bounce back in the face of change in general (and natural hazards in particular). Long-term strategies include vertical transhumance and economic diversification, but also the separation of houses from animal sheds, and landholdings dispersed over a wide area. All four aspects may contribute towards disaster preparedness in certain contexts and indirectly only: apart from transhumance, they are not common practices in the region.

Transhumance can be described as a resource optimisation strategy between the lowland and the pastures (vertical spatial

diversification) allowing people to take advantage of the ecological niches, depending on seasonal climatic changes by moving livestock between different grazing lands (using the fast-growing and nutritious higher altitude plants, while the sites at lower elevation rest or are used for cropping and vice versa). However, generally, this resource optimisation strategy also increases some risks. In the transfer of livestock, the herds and flocks and herders are at risk from avalanches, storms, blizzards, landslides, and so on – more so than they would have been had they stayed put. In fact, blizzards in late spring and early fall have probably caused more deaths and damage to transhumance flocks and livestock than any other natural hazard (Personal conversation, Dr. James Gardner). This means that transhumance might be a useful strategy for spreading the risk of possible death of livestock in flash floods but on an ad hoc basis only.

In some areas, the animal sheds are located away from the houses (horizontal spatial diversification). Indirectly this can contribute to spreading the risk of physical damage from flash floods over a geographical area. However, the practice is very context-specific and varies from place to place depending, for instance, on political/religious, economic (labour efficiency), institutional (access to user rights), and climatic factors and illustrating the complexity of the system. For instance, in some places, it is a new trend influenced by religious, political factors. The religious leader of the Ismaili Muslims recommended to its followers, mainly located in Upper Chitral, that they separate



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Figure 15: Young herder bringing a flock of goats to the pastures, Chitral District

their sheds from their houses for hygienic purposes. In Lower Chitral, separating sheds from houses is not new, but reasons for doing so vary. In some cases, houses are built on slopes, whereas sheds are built close to the fields so that manure from the sheds can easily be transported to them. In the case of congested villages, specific routes are assigned to each villager for his cattle. A villager with no user rights is compelled to build his shed outside of the village. Finally, due to the harsh climatic conditions during winter, some people may want to build their sheds close to their houses to be able to watch their calves, especially at night. (Personal communication, Farid Ahmad)

A third strategy for spreading risks is to rely on dispersed landholdings. If a flood damages one field, the landowner can still fall back on other fields located somewhere else. However, many people do not have dispersed landholdings. In most cases, only the richest people have dispersed landholdings. In other cases, dispersed landholdings may also depend on people's/family's past relationships with the former rulers. Again, the ability to rely on dispersed landholdings as a risk-spreading strategy against natural hazards is quite context-specific.

People rely on different sources of income (economic diversification). Most rely on subsistence agriculture, livestock, selling wood and getting jobs outside the village. Today, although more people than before are diversifying their livelihoods through remittances, the agropastoral system is still central to people's livelihoods because of the lack of job opportunities outside (one reason why people do not leave their villages permanently). In that sense, spatial and economic diversification mechanisms are often intertwined. Obviously not all diversification strategies are appropriate or sustainable. In Chitral, as in many other places in the Himalayas, the livelihood diversification process includes the sale of wood. This is because of the lack of jobs and leads to increased deforestation.

Natural resource management

Access to landownership

"We are not homeless. Everybody has a piece of land. We inherited our land from our ancestors." (Qazi Said Ahmad, village leader, Ashret village, Lower Chitral)

"One hundred and three households lost some land and 57 households lost everything due to the flood. Eighteen families are now living in the resettlement area [land provided by the government]. The others are living on their relatives' land. Now we don't want anything from the government. We only want the land that is around our houses and drinking water." (The land around the resettlement area is owned by the Government.) (Group discussion, Brep, Upper Chitral)

"Our land is more fertile now! Most of the damaged fields from the last 1978 flood are now cultivable and very fertile." (Aged women, Chenar village, Mastuj, Upper Chitral)

Community regulations on grazing and deforestation

"People here have too many goats! To stop the floods people need to stop the goats from grazing and to start forest regeneration. I have witnessed lots of changes in the forest cover over time and many timber mafias are working here. Rich people hire contractors to cut down trees for sale in Chitral. People are overgrazing their herds and cutting down trees because they do not have other means of livelihood. Unemployment and

lack of education are big problems." (Qazi Said Ahmad, village leader, Ashret village, Lower Chitral)

"The government destroyed the forest higher up and to hide the degradation they set the forest on fire. This is why we had this big flood recently." (Villagers, Lower Chitral)

"The community ban cutting down trees and pulling shrubs to reduce the floods. If we do cut trees and pull out shrubs we are fined. I know many people who have been fined. People report whenever they see somebody cutting down trees. Now we have to buy firewood from lower down in Chitral." (Dost Mohammed and Sardar Azam, village between Mastuj and Buni, Upper Chitral)

"In Garumsheshma [local place] the community imposed a ban on cutting down trees at a specific time of the year." (Syed Harir Shah, Programme Manager in Community-based Disaster Risk Reduction, Focus Humanitarian Assistance, Chitral)

"In order to prevent furrows (small gullies) being formed, communities used to ban the practice of dragging wood down the slopes. Gullies may aggravate flash floods in case of extreme rainfall events. This type of ban reduced the impact of floods but had a big impact on people's livelihoods because they were left with no alternatives. Now this practice is being revived in some places due to deforestation problems." (Aziz Ali, District Manager, IUCN-Pakistan Chitral Unit)



Arun B. Shrestha

Figure 16: Tracks caused by dragging wood on denuded hills around Chitral town. Traditional forest resource management included a verbal code of conduct ('dastoor') laying down various principles such as bans on cutting wood in a certain locality or bans on a number of undesirable activities on a particular rangeland for a particular period. One such activity is the practice of dragging logs down the hillsides after they have been cut in high altitude forests. This practice has been banned in order to reduce soil erosion as a result of gullying along the tracks formed by the dragged logs. (NWFP and IUCN-Pakistan 1999)

Most people in Chitral District own land. This is very important as agriculture is still their most important means of subsistence, as very few jobs are to be found outside. Communities used to have strong rules to secure the sustainable use of pastures and forests. Nowadays, these informal community rules allowing for

the sustainable use of the forests have eroded because of the nationalisation of forest resources in 1975, but some of them are also now being revived in certain areas. (NWFP and IUCN-Pakistan 1999)

Other attitudes towards flash floods

Learning from previous mistakes

"We have learned now that we should build our houses on slopes. Our houses should have fewer rooms. Our valuables should be stored in safe places. Our money should be in government banks. Now we are thinking of building a common store for grain, and animal sheds in safer places." (Group discussion, resettlement area, Brep, Upper Chitral)

"Some villagers are now completely indebted. This man for instance bought a house on loan, did all the repairs, and had just rented it out for a few days when the flood came and washed it away. The people who have not had anything damaged by the flood don't come together. Now we are thinking of a village or social organisation to which everybody could contribute in case of a crisis (saving money)." (Shainigar village, Drosh, Lower Chitral)

Community initiatives and attitudes towards external help

"Now we are also writing letters to the government requesting it to build embankments. Writing these letters is what we are

doing to prepare ourselves because we are expecting floods every year.” (Abdullah Khan Shakir, Shainigar village, Drosh)
“Before, people were solely dependent on their own resources. But now their mindset is different. People are becoming dependent on the government.” (Prof. Faizi, Chitral College)

“We managed to arrange four million Pakistani rupees from the Aga Khan Rural Support Programme to construct retention walls against recurrent floods, but the local mullahs (religious and political leaders) prevented us from having any kind of arrangement with Aga Khan Rural Support Programme. We received threats that we were engaging in anti-Pakistani actions and we fear that whenever we make a request for action we may be arrested.” (Villagers group discussion, Lower Chitral)

Other general attitudes towards flash floods reveal that some people manage to learn from previous mistakes and have

started to organise themselves at the community level; for instance, to request external help from the government and non-government organisations. Some attitudes seem to indicate an increasing dependence on external help. The last quote illustrates how political and religious factors can come into play in influencing people’s vulnerability to floods. The villagers’ complaint reveals that local political and religious powers can inhibit community initiatives and institutional cross-scale linkages. This example also reveals how religious beliefs, and in this case the division between the Ismaili Muslims in Lower Chitral and the Sunni Muslims in Upper Chitral, can influence local practices in disaster preparedness. The Ismaili Muslims believe that the Aga Khan, the founder of the Aga Khan Foundation, is their religious leader. Therefore, some religious/political Sunni Muslim leaders refuse any intervention from the Aga Khan Rural Support Programme, which is linked to the Aga Khan Foundation as a way of denying or opposing the Ismaili Muslims.

Box 3: Did you ask? Strategies of adaptation to natural hazards

Technical and structural strategies – Food storage: how are communities and households preparing for the rainy season? Do they have specific food storage techniques? When do they start storing food? Where? What kind of food? For how many days or months can they rely on the food store? **Terraces and retaining walls:** what are people doing at the community level to control the stream?

Traditional earthquake-resistant houses: what can be learned from traditional housing structures? What are the elements that make traditional buildings more earthquake resistant than new ones? What are the elements that reduce the sustainability of such buildings (e.g., very labour intensive)? How can traditional structures be made more sustainable? Which households are building traditional houses and which ones are not? Why are those households not building traditional houses anymore? How do external forces, including natural resource policies, have an impact on local knowledge and practices? How are current (forest and land) policies influencing local practices? How can changes in the policies support or prevent people from adopting earthquake-safe practices?

Social capital – What are people's relationships with their relatives and their neighbours like? What does a households' social network look like? Where are their relatives located? What networks are people embedded in (e.g., family, social, professional, political) and how can the villagers best use them for disaster preparedness?

Diversification strategies and natural resources management – How do communities and households try to spread the impacts of flash floods among their resources (physical, economic, social)? Do they have landholdings in different locations? Do they have different livelihood activities? Do they also rely on cash-income activities? What background and mindset do people have regarding business? Do they have micro-finance arrangements and entrepreneurial attitudes or backgrounds? Do land ownership disputes arise from loss of land due to flash floods? What are the local adjustment strategies? Are they equitable?

Other attitudes towards flash floods – What are people's attitudes towards flash floods? What are the indicators that people have learned from previous flood events? How does the context (e.g., historical, sociocultural [age, gender, class, caste, physical ability, and ethnicity] and religious background influence local knowledge about and practices in disaster preparedness? For example, in this case study, do Sunni Muslims have different knowledge about and practices in disaster preparedness than Ismaili Muslims? Do people who have been settled for a very long period of time (e.g., the Kalash) have different knowledge about and practices in disaster preparedness than people who have not been living in the region for so long? How does the Islamic belief system influence, promote, and/or hinder local knowledge and practices on disaster preparedness?

