

Chapter 3

Observing and Experiencing Floods

Local knowledge on disaster preparedness in the eastern Terai of Nepal includes aspects related to people's observation and experience of floods, anticipation of floods, technical adaptation strategies, non-technical adaptation strategies, and communication strategies.

Based on daily observation of their local surroundings, close ties to their environment for survival, and an accumulated understanding of their environment through generations, local people have knowledge about the history and nature of floods in their own locality. People can also describe and explain how their own vulnerability to floods has changed over time.

History of floods in people's localities

"Eighty families used to live here, but they had to be resettled twice due to major floods about 20 and 3 years ago. Forty-three years ago, the village school used to be right here in the current river bed. At that time, the river was not here. It was a

cultivated area. We never thought the river could go this way. The flood happened at night around 11-12 pm and lasted for 6-7 days. The water reached the settlement. For 8-9 days we could not eat because grain stores and livestock were washed away. Nobody died but lots of fields could not be cultivated anymore. After that, we made an embankment and the floods stopped for about 20 years. Recently, a new stream came and then disappeared again." (Kishun Devi Yadav, around 70 years' old, Katarait VDC, Dhanusha District)

Such stories about the history and nature of past floods abound in the eastern Terai of Nepal. They are a testimony to people's experience of floods based on historical observations of their own place which, in some cases, enables a speedy appreciation of the situation and flood forecasts. The eastern Terai of Nepal has a tropical monsoon climate characterised by hot, wet summers and mild, dry winters resulting in wide seasonal variations in terms of water discharged. Most of the rainfall is concentrated during the months from June to August. Any continuous and heavy rainfall during the monsoon season



Figure 3: Girl showing the level of the previous flood, Pipariya VDC, Sarlahi District

can provoke inundation in the already saturated soil. Similarly, heavy rainfall higher up in the mountains can trigger a flash flood or a riverine flood downstream. Loss of life due to floods is low, but physical damage to agricultural land and domestic property is high with important consequences for people's livelihoods, because people mainly depend on farming. Historically, it should be mentioned that,

"Before malaria eradication in 1956, almost all the river valleys, including those of the Dun or Inner Terai, where the threat of floods is high, were prone to malaria. People used to

shuttle between mountain ridges during the summer monsoon season and lowland areas during winter in order to avoid malaria. This also helped to avoid or reduce the impact of flood hazards. After the eradication of malaria, investment in the development of human settlements, other infrastructure, and agriculture in the lowland areas has increased tremendously and exposed [the area] to flood hazards." (Khanal et al. 2007)

Nature of floods in people's localities

Normal and exceptional floods

"The water started to come slowly so we had time to leave." (Ram Ekbal Yadav, 2003 flood in Jhauwa Tole, Bhaisarawa VDC, Rautahat District)

"No flood stays for more than one day here." (Byagiya Devi, 70, Singyahi VDC, Mahottari District)

"If we have one to three days of rain, the water stays for more than 20-30 days. If it rains just one day, it takes one week for the water to go." (Jeevan Roy, Deuri VDC, Dhanusha District)

"During the rainy season, the water can stay for one week then go away and then come back again." (Bhuli Devi Sahani, Laxmipur, Sukchaina)

"A normal flood is when we get water up to the knees." (Ram Ekbal, 52, Pipariya VDC, Sarlahi District)

The Snake and the River Don't Run Straight

Change in river paths and river size

“Before, the stream was further away but it came closer and closer to my house.” (Laxmi Suri, 60 years old, Singyahi VDC, Mahottari District)

“Every year the water takes another path!” (Deuri VDC, Dhanusha District)

“The river was not here before. It took a new path 15 years ago. Two years ago it took a new path again. The river has kept on changing its stream for the last 50 years!” (Ramkailash Roy, Shreepur VDC, Sarlahi District)

“We cannot trust the river because it can change its course within two hours.” (Ram Prasad, VDC President, Phoolparasi VDC, Sarlahi District)

“The current riverbed used to be fields 13 years ago. Rice, pulses, and wheat were cultivated here. In 1993 a major flood partially damaged the fields and two years ago they were completely damaged. Since the 1993 flood, the water has started to enter the village.”

“Before, the course of the stream was straight.” (Gropi Shah, Piparyia VDC, Sarlahi District)

“Twenty years ago you could jump across the river in one step!” (Gropi Shah, Pipariya VDC, Sarlahi District)

“The river used to be narrower and deeper and it was not a problem for us 15 years ago.” (Ram Prasad, Phoolparasi VDC, Sarlahi District)

Part 3 – The Case Study

Comments on nature of floods

People have been living with floods and have learned to survive. Flooding has become part of their lives, as it generally happens every year. They know the nature of floods; they know they can happen during the day or night; and they know that flooding often comes in waves. They often remember the water levels of previous floods. They know that the nature of rain as well as the number and the spatial and temporal location of rainy days influence floods. The level of floods varies from village to village and place to place within the village itself, depending upon the number of continuous rainy days before and during a flood event, the local topography, and infrastructure. Water generally stays for a period of from one day to one month. People can easily draw a boundary between normal yearly flooding and exceptional floods that are more destructive and that happen at greater intervals than normal ones.

Local communities are closely related to – and dependent upon – their local environment for survival. Over the years, they have accumulated knowledge about the morphological changes that have occurred in their surroundings. Their stories provide many elements for landscape interpretation based on daily observation and life experiences. As such, many anecdotes relate to the constant expansion of the river bed due to heavy sediment loads, constant rise in bed level, riverbank cutting, and frequent channel shifting. As suggested by the title of this report, the shape of the river can be compared to the movement

of a snake. The water channels are very unstable, taking new directions and changing the landscape on a regular basis. This active landscape makes the environment very unpredictable. The behaviour of the rivers described here is fairly common in the pro-Himalayan plains and piedmont area, especially in the eastern Himalayas. The Brahmaputra River provides us with a very good example with fairly frequent flood discharges from rain in the mountains, middle mountains, and sub-hill areas; local inundation and water-logging due to localised heavy rain; and shifting channels and lots of sediment (generally fine sands) that are deposited, eroded, and re-deposited by succeeding floods. Two different ‘flood’ processes are happening in the region. One process is channel overflow and the other is surface water-logging from heavy rain. People’s stories reveal that both these processes are taking place. Often the latter is more damaging because the water stays around longer than in the case of the former. The former, of course, causes more physical damage because of erosion and sedimentation and re-arrangement of the land surface.

Evolution of vulnerability to floods

Social and gender vulnerabilities

“Wherever they are found, members of the various occupational castes and the fewer higher castes form a socially and economically interdependent group. In the Terai, as elsewhere in strongly Hindu districts, high and low caste is closely correlated with, but not identical to, wealth and poverty

levels. Many of the high-caste people are wealthy landowners in need of the services of people of occupational (lower) and other castes. In return, the occupational castes are tied to their respective roles because the income from the meagre land holdings of those who have land is not enough to maintain the family.” (Bista 2004, p134)

People are not equal in their capacity to respond to floods. In other words, floods do not impact everybody in the same way – and this is particularly true for the Terai region of Nepal. Compared to the rest of the country, most communities in the Terai are more conservative and the Hindu caste system influences people’s socioeconomic relationships more strongly. In the study area, the few high-caste persons in the village were mostly landowners and moneylenders. Poorer, lower-caste people are therefore often dependent on the higher castes for survival because of their lack of access to assets. Important differences exist in social vulnerabilities between wealthier and poorer people and (high and low castes) and among different age groups. Small children and elders are the most vulnerable groups during floods because they may not be physically fit enough for rapid and urgent movement. Gender vulnerability is also more pronounced in the studied districts as women in the Maithali culture, which predominated in the villages, mainly stay and work at home. However, variations can be found among different castes and socioeconomic levels and within each household, especially following increased male migration. More and more men are working outside the village



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Figure 4: Woman with baby in front of a small elevated house, Phoolparasi VDC, Sarlahi District

or the country and more women must undertake work outside their homes.

Poverty spiral

“Our houses that collapsed were better than the new ones!” (Dalit women’s group discussion Deuri VDC, Dhanusha District)

“We have been living here on the riverbed for 22 years. Before we used to live in a safer place than this, but we took a loan from a rich person in the village. Because we couldn’t pay it back we lost our land and had to shift here to this vulnerable spot.” (Ram Chandra Yadav, Singhyahi VDC, Mahottari District)

“The people of this yard used to have lots of land! I used to have seven bigha of land [1.5 bigha = 1 ha] and 80% of my land was close to the river. Some people have lost all their land, some 50%..., it depends.” (Gropi Shah, Piparyia VDC, Sarlahi District)

Households know how their own vulnerability to floods has been changing over time. Every year a flood might damage people’s houses and/or cultivable land. Progressively their purchasing and adaptive capacities decrease, especially for the poorest among them who have fewer resources to fall back upon than others; and, what is more, those who do not have access to land are compelled to buy bamboo to rebuild their houses.



Figure 5: Dalit women's group discussion Deuri VDC, Dhanusha District

If they do not have cash, they are forced to take loans from moneylenders in the village and to pay interest rates ranging from three to five per cent per month. Every year it becomes more difficult for them to rebuild their houses and they enter into a spiral of poverty. Their houses, as much as themselves, become even more vulnerable to the next flood. Each new flood weakens their houses and worsens their health and general economic circumstances. In most cases, the floods may lead to organisational adaptations but no or few structural adaptations: the floods cause the poor to become poorer.

Social relationships, and especially caste arrangements, are an important element evolving from this case study that help

in the understanding of local knowledge. The caste, social, and economic contexts are important issues to be noted in any checklist that implementing organisations might use. Because poor and wealthy and lower and higher castes are so interdependent, measures should focus not only on 'the poorest of the poor' but on the entire system, including the interrelations between different economic groups, different castes, and different social groups. Further, most communities are facing multiple stress factors. In the eastern Terai of Nepal, the two main natural hazards most communities have to cope with are floods and fire – together with political and economic stress, for example, at the time of the study, the role of the Maoist movement. Focusing only on one stress factor might give a false picture because households and communities are making decisions and are adjusting their practices according to the combination of stresses they face. The process of pauperisation and its linkages with natural hazards are complex. Populations affected may not always be from a 'poor group' and a specific event may contribute to a change in their status. The time factor is another important element to consider. A household with 10 young children could be poor today, but might become wealthier later on, if and when the 10 children contribute income and manpower to the household (human assets).

Box 1: Did you ask? Observation and experience of 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 exceptional flood? How many people died? What damage was caused by the flood? How do people understand and interpret the situation or the landscape from 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, and types of rain? To what extent does local knowledge vary or not, according to different types of floods (normal versus abnormal floods; flash floods versus riverine floods)?

Vulnerability assessment – What are people's understanding of their own vulnerability (e.g., in pre-disaster situations) and of the factors that influence it? Are they now living in a more vulnerable dwelling than before? Why? What happened? Do people have different priorities now than before and how do these 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 initiatives? How does disaster change, increase, and/or create new, vulnerable groups (i.e., emerging vulnerability or vulnerable groups)?

Socioeconomic and other contextual factors – How do social relationships (age, gender, class, caste, physical ability, and ethnicity) influence local knowledge of and practices in flood preparedness? How do the caste arrangements influence people's ability to adapt to floods? How do the floods affect different economic and social groups such as women, children, and elders? Who benefits from the floods? Is it only the wealthiest households (i.e., those who have land in different places) who can benefit from the flooding or do the poorest also manage to receive benefits? Can you describe how people gain new land, lose old land? How do the individual and collective historical, cultural, and religious backgrounds influence people's perceptions of natural hazards and responses to natural hazards? Did rich people become 'poorer' because they were living in a flood-prone area or were they able to maintain their status. Did the sociocultural milieu provide richer people with access to goods and services denied to those poorer?

Multiple stress factors – What other natural hazards and stress factors do the community face and how might they influence local knowledge on disaster preparedness?

