

# Local Knowledge on Disaster Preparedness

With examples drawn from experiences on droughts and flash floods in Herat Province, Afghanistan

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## Natural Disaster Risks in Afghanistan

The people of Afghanistan live in some of the harshest environments in the world, characterised by extreme winters, recurrent droughts, and frequent natural hazards such as earthquakes, landslides, avalanches, floods and flash floods, and sandstorms. Combined with the impacts of prolonged war and other changing risk factors – population displacement, climate change, environmental degradation, and natural hazards – these factors contribute seriously to weakening the already tested capacities of the government and local communities. For example, all of the metro-hydrological stations in Afghanistan were destroyed during years of conflict, hampering data collection for the past 25 years. People – whether they are living in a remote village or in the suburbs of Kabul – are often the first victims of and respondents to natural hazards. They have developed knowledge and strategies to minimise, reduce, and/or avoid the effects of natural hazards on their livelihoods, properties, and on their daily lives.

This chapter provides a simple tool on how to understand, identify, and collect local knowledge for disaster preparedness, drawing from specific examples on droughts and flash flood disaster risks that have taken place in Herat and other provinces. The next steps – which are outside the scope of this paper – would be to assess local knowledge and practices and how to use it whenever relevant in order to develop new strategies and methods to prepare people for disaster. Since the Government of Afghanistan is organising itself to address disaster risks, this presents an opportunity to ensure that local knowledge and practices are considered in development activities. What local people know about natural disaster risks should be collected, made more visible, and be integrated into the decision-making processes.

## What is Local Knowledge and Where is It?

"What do you do to prepare yourself for the natural hazards that you constantly face?", asks a local NGO worker working on disaster risk reduction to a local farmer. "Nothing!" replies the farmer, "What can I do? I don't have anything."

If you ask people directly about their strategies to cope or adapt to recurrent hazards, in most instances they will respond that they are not doing anything. Yet, when you start asking indirect questions about their day-to-day life and how they make a living, you realise that most of the time people are doing many things that help them directly or indirectly to better prepare for natural hazards. For examples, they are able to reduce human and property losses from natural hazards by adopting a few, simple short-term strategies such as storing food, saving important belongings, or moving temporarily to safer places. They also adopt long-term adjustment strategies such as: building houses in safe places, diversifying income sources, sustainable management of water resources. As such, what we call “local knowledge” covers a range of different dimensions. (Box 1)

Outsiders often perceive people as accepting their fate without trying to change or improve their situation, and that “people live at risk due to lack of knowledge”. In reality, people often live in hazardous places not because they do not know the risks but because they do not have other options. Natural hazards are often among many other stresses that communities face, some of which might be perceived as more immediate threats than infrequent natural hazards.

Local knowledge is often misunderstood from ‘outside’ assistance. Indeed, it is a different type of knowledge. It goes beyond the standard sources of information (schools, books, radio, television, the Internet) and is often specific to a local context and derives more from oral transmission (story telling), learning by doing and experimentation (trial-and-error), and results in time-tested practices. Local knowledge is based on life experiences of a place or a region where people have lived for generations, instead of knowledge gained in the classroom. Local knowledge can be found everywhere: it is in people’s heads, in buildings and other infrastructure and tools, in the landscape in urban and rural settings, in cultural traditions and practices, in taboos, local songs, proverbs, beliefs, etc. Outsiders often consider local knowledge as ‘unscientific’ and inferior to conventional and

## Box 1: The different dimensions of local knowledge

Local knowledge is diverse and has many dimensions. Here are some examples.

**Local technical knowledge**, which includes local knowledge of construction methods, or the use and combination of specific materials for building.

**Local environmental and agricultural knowledge**, which includes natural resource management strategies, such as intercropping and agroforestry that conserve biodiversity and protect soil from erosion.

**Local socio-cultural and historical knowledge**, which refers to local beliefs, worldviews perceptions and any other socio-cultural aspects which influence the way natural hazards are perceived and the way people respond to them. Past experiences and understanding of natural hazards also influence current ones.

**Local knowledge about development projects** refers to people’s beliefs about regional, state, and international actors that are likely to intervene in disasters and influence how people will respond to those interventions.

specialised knowledge. However, case studies all over the world demonstrate that local knowledge has an important role to play in disaster risk reduction.

## **Why is Local Knowledge on Disaster Preparedness Important?**

Conventional knowledge is often not attuned to local contexts and realities. There are various examples all over the world of engineering projects which, in turn, created new disasters. Ignoring local knowledge may lead to human and economic costs, especially over the long-term. Exceptional disasters do require external means beyond the normal coping strategies. But strengthening local knowledge and practices is important in the context of recurrent shocks that could gradually increase the vulnerability of communities. An understanding of local knowledge and practices can help outside organisations minimise unsustainable local practices and beliefs and conversely strengthen practices that are sustainable and equitable. Finally, people themselves need to be convinced that they have knowledge within themselves, and that some of this knowledge could actually be useful.

## **How to Identify and Document Local Knowledge on Disaster Preparedness**

### **Documenting Local Knowledge on Disaster Preparedness**

Collect information on how people

- Observe
- Anticipate
- Adapt to, and
- Communicate natural hazards

Listen to different groups, including the most vulnerable and marginalised

- Women
- Children
- Elders
- Disabled
- Indigenous or ethnic minority groups

This will help you understand how different people have diverse knowledge due to differences concerning, for example, access to natural resources, education, training, information, the division of labour between women and men, and different livelihoods (e.g. farmers, herders, others).

Collecting data based on semi-structured interviews, group discussion and focus groups, especially with elders, can be carried out based on the framework proposed in Figure 1, around four dimensions:

Figure 1: Framework for data collection on local knowledge on disaster preparedness



Source: Dekens 2007

## Peoples' ability to observe their surroundings

Local knowledge on disaster preparedness is based on people's observations of natural hazards from daily experience of their surroundings. People especially know about past disasters in their locality, where the previous disasters occurred, at what specific point in time and under what conditions, for how long, with what intensity, and such details. They are able to explain the nature of past natural hazards in their locality, such as its onset, origin, and the velocity of water flow (in the case of a flood or flash flood). Life stories also explain the evolution of people's vulnerabilities to recurrent natural hazards in combination with other stresses faced by the household and/or community.

## People's ability to identify and monitor environmental indicators

In some cases, people manage to anticipate or expect natural hazards in advance by identifying and monitoring local indicators, signs, or warnings of a forthcoming hazard. The most common early warning signals are based on the observation of changes in animal behaviour and vegetation patterns. People also manage to anticipate natural hazards through their knowledge of time thresholds – for example, when it is time to buy and store food in advance, leave the house for safer places, move the cattle, remove important belongings, and the safest and fastest escape routes. They also manage to anticipate hazards by relying on key actors (for example, community stewards, elders, local religious and political leaders) and they have the skills to know who knows what, who does what and when, who should stay behind, who should go first.



Irrigation canal near settlements in Injil district of Herat province. The community uses truck tires and plants trees to protect the houses from floods and to limit soil erosion

## People's ability to adapt to natural hazard risks

In many cases, people manage to cope with natural hazards. In some cases, they learn to adjust, experiment, and innovate in the face of natural hazards. In the arid and fragile environment of Afghanistan water management is probably the most important strategy for ensuring that people survive especially during periods of acute water scarcity. Traditional methods of managing water are some of the examples of how people adapt to and cope with droughts. (Box 2)

## Box 2: Examples of traditional methods of water management in Afghanistan

Over the centuries, Afghans have developed various water harvesting systems traditional based on sophisticated techniques. Examples include the kariz irrigation system, the houz and dabeh rainwater harvesting systems, and the Yakhdan or Barfdan snow harvesting methods. Combined with traditional regulation system for water rights, they allow for regular and equitable distribution of water to upstream and downstream communities. One such system is the mirab water distribution system (more details below). Another example of adaptation strategies to drought is found in the flat land of Herat and a number of other provinces of Afghanistan. A water management system takes advantage of the flood for agricultural purposes. Flood waters are diverted by canals and stored in a series of human-made plots of one to two hectares each located near the riverbed. Earthen bunds constructed from a few centimetres to two meters high enable water storage.

### Kariz traditional irrigation system

A kariz is an underground channel constructed to capture sub-surface water (Figure 2). This traditional irrigation system reduces water evaporation and requires less maintenance than open canals. It is used for irrigation as well as for drinking water. When Alexander The Great came to Afghanistan and saw the karizes, he praised Afghan wisdom. Underground water is collected through a series of wells built in the hilly areas and skirts along the mountain slope down to the water table. An underground tunnel allowing for the use of the water



The community planting Ash trees to protect a canal in the Injil district of Herat province



Cultivation of willow tree close to the riverbed (right) to protect agricultural land (left) from soil erosion in Kushk Robat Sangi district, Herat province



downstream connects the wells to one another. Recently, people started to add fish to prevent the tunnel from eutrophication (excessive plant growth in the water), and to ensure that water in the tunnel remained clean. The underground tunnels range from one to more than 10 km long. Because of the war many people had to leave their villages, abandoning most of these systems in near collapse from lack of maintenance.

The traditional kariz system has both positive and negative impacts: the system has found a way to reduce water evaporation, but poor maintenance can lead to contaminated waters. Therefore, one must investigate further what we can learn from the system and how it can be improved further. Consulting with elders, the government and NGOs began to rehabilitate some of these traditional underground irrigation systems, a concrete example of combining traditional and conventional knowledge. The elders and other water specialists in the community can determine the direction of the water flow by observing local environmental conditions. They can also advise on the best places to locate the wells and tunnel. However, over generations, they have forgotten how to build the rings used for the wells (the practice of using rings has been found to be at least 700 years old), a technique that is now being reintroduced by local NGOs, but using cement as ring material.



Water storage for animals to drink in Koohsan district of Herat province

### **Mirab traditional water distribution system**

For generations, communities in rural areas have been using a traditional system of water distribution called the mirab system. The community selects someone called a 'mirab' to manage water distribution from irrigation canals; the Department of Irrigation at district and provincial levels also recognise the mirab's authority. The mirab is knowledgeable about water rights, irrigation canals, their maintenance, how to protect them from flash floods, and other relevant information. He is responsible for the equitable and sustainable allocation of water among farmers. Based on the number of hectares of land owned by each farmer, the mirab allocates water rights for a certain number of hours per day. Gates at various levels control the water flow. After harvesting the crops, the community pays the mirab back with a small amount of wheat or other cereal crops. During the war, the system changed: powerful people started to take more water than allowed, and water gates were vandalised, some people installed water pumps to get more water, and other unregulated activities. Currently, the government is trying to introduce a new system of water rights, further threatening the use of this traditional water distribution system.

### Box 3: **Story from the field**

In 2003, in the Adraskan district, a villager saw a flash flood during the night. Instinctively grabbing the loudspeakers in the mosque, he was able to warn community members before the flood could reach the village. The entire community managed to escape to neighbouring communities in time and as a result, no one died, everyone was spared from what could have been a calamity of great human toll.

Some adaptation strategies contribute only indirectly to reducing disaster risks. For example, people are adopting techniques that reduce underlying risk factors through natural resources conservation. The ghorogh system is an informal mechanism for controlling the pastures and forest area. The village leader decides which areas need to be protected from grazing or tree-cutting and for how long a time. The community ban is signalled by using stones, trees, topographic landmarks and others. This locally devised system contributes to rehabilitating pastures and forestlands. In some cases, people plant trees along open canals to protect the canals and prevent soil erosion (photos).

### **People's ability to communicate about natural hazards**

The ability to spread the word about past hazards and imminent hazard risks is crucial to enabling people to react on time and to learn from previous hazards. Imminent hazard risks can be communicated among community members through visual and audio signals and other traditional means such as beating a big drum, playing the bugle, the sorna, building a fire to sound the alarm to community members. One such example is to utilise the mosque for flood early warning system. (Box 3)

Historic hazardous events have been transmitted for generations through various means including through local songs and proverbs, and names of specific places that reflect stories of previous hazards. Particular taboos may also prevent people from going to certain hazard-prone areas. Hazard risks might be further communicated through ceremony, which help the community to remember past natural hazards and relieves their anxieties related to threats of future ones.

### **How to use Local Knowledge in Disaster Preparedness**

The importance of understanding local knowledge does not mean that the local scale is the only appropriate scale of action. Different things can be done better on various scales depending on the nature and type of natural hazards. For example, partnerships among local government, private sector, non-government organisations, and community groups should be explored.



Not all local knowledge, practices and beliefs are relevant in a given context. Nor are local knowledge, practices, and beliefs always sustainable or equitable. Still, local knowledge should always be taken into account to ensure project acceptance and sustainability.

The purpose of documentation is not to conserve local knowledge but to learn from it in order to create new concepts, methods, or strategies for improved disaster management, and to strengthen relevant and sustainable local coping mechanisms.

Examples of potential application of local knowledge in disaster preparedness include accounting for local advice about safe locations, construction sites (for example, for buildings and roads), combining local knowledge with conventional wisdom for hazard risk mapping, surveying, and other inventories in order to verify information, adapt communication strategies to local understanding and perceptions, and integrate local values into decision-making.

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**Figure 2: Kariz rehabilitation in Adraskan district, Herat: (a) Communities are digging a new channel for the Kariz irrigation system after it had been destroyed by floods; (b) Concrete rings to reinforce the tunnel; (c) Covering the tunnel with soil; and (d) A gabion wall protects a Kariz outlet in Sangi district, Herat**

