Box 3.2 Do people heed warnings?

Manuel Jonasse is the head of the Mudamufe resettlement area in Sofala province. He arrived there with his wife and five children in February 2001 after the Púngòe River flooded. He said he'd received no warning of impending floods and was quite unprepared. "I've never seen floods like this year. It was the worst ever," Jonasse commented. "The secretary of the neighbourhood did go round warning people to move to higher ground, but the flood had already arrived by then."

Not all communities in the Púngòe valley were taken by surprise in the 2001 floods. Manuel Zalela used to live next to the Púngòe River in the Zona Ferroviaria. He said that, starting in December 2000, the head of the local administration called several community meetings "to warn that a big flood was coming". But the warnings seem to have had little effect. "Nobody believed it would happen," Zalela said. "I myself didn't believe it." After spending a night in the family's grain store, which is raised above ground level to protect it from pests, Zalela and his family were rescued by Red Cross boats and taken to safety.

Warnings were similarly ignored in the Buzi valley, also in Sofala province. Angelina Passe used to live at Chissamba on the banks of the Buzi River. "We heard the flood warnings, but we paid no attention because one of the old men said that floods had never arrived in that area. The flood came during the night. When we woke up, the house was surrounded by water, but it was not flowing very fast." Angelina and her neighbours fled. "There were about 20 of us perched on the nearest high ground – we stayed there all day. In the evening a boat from the local administration came to rescue us."

When floods are a regular event, an early warning system is indispensable – and its reliability is essential if people are to heed the warnings. A possible solution in the context of Mozambique is to use teachers as flood monitors. This has several advantages. There are many teachers and they are respected in their communities. They are underpaid and would welcome extra income for doing community disaster education and for being "on call" during the flood season. The teacher-monitors could be part of a river-watch system in which they regularly check the height of the rivers with gauges, issue local warnings and report their findings to a district coordination centre. ■

simply too expensive to contemplate – in part because high ground is often 20 or 30 kilometres away and beyond the reach of community initiatives.

Yet poverty is not in itself a barrier to better preparedness. In Bangladesh, for example, where vast floods occur almost annually, the Bangladesh Red Crescent has helped villagers build raised earth mounds where they and their animals can take refuge during floods. So far, nothing like this has been considered in Mozambique. Such projects require a level of collective community action which, while evident in rescuing flood victims, subsides in the downtime between disasters.

One cheap way to spread disaster awareness through communities, and therefore improve their chances of survival, is to clearly signpost previous flood peaks, escape routes and safe refuges. Painting on lamp posts and walls the height of flood waters in, for example, 1977 or 2000 would allow future warnings to be keyed to memories of past floods. As Ian Davis, visiting professor to the UK's Cranfield University's disaster management centre, has pointed out, schoolchildren could do this during their geography lessons, and the cost would be "as much as a pot of paint".

Escape routes and safe refuges need to be identified by local people, based on their own experience and local knowledge. The government agency responsible for disaster management is canvassing for funds to build refuge platforms in the Limpopo and Save River valleys, where virtually entire resident populations were displaced by flood waters in 2000.

Legal powers also play a key role in improving disaster preparedness, and Mozambique's government has approved a bill on disaster management to be presented to parliament. If passed, this law will allow the president to declare a state of emergency in the event of disaster and will enable the cabinet to order the compulsory evacuation of areas at risk.

Practice improves preparedness

When, in late 1999, meteorologists warned of unusually heavy rains likely to hit southern Mozambique the following year, the Mozambique Red Cross (CVM – Cruz Vermelha de Moçambique) immediately began to retrain volunteers in the areas likely to be affected. The government's disaster management institute sent teams out to prepare and to warn people in vulnerable areas that floods could be as bad as record ones in 1977. The ministry of health (which normally delivers medicines quarterly to provincial clinics) dispatched January's shipments in December, to ensure adequate supplies in case of floods. Meanwhile, senior officials were sent out to confirm that health posts had adequate stocks to treat malaria and cholera. Government officials even cancelled their usual December/January holidays to be ready for the floods. And they renewed contacts with the South African air force, which had helped in previous emergencies.

All in all, Mozambique's own disaster management agencies were reasonably well prepared. But, some observers have asked, how could this happen in such a poor country? The answer lies in Mozambique's past experience of disasters and conflict. During the colonial era, the Portuguese authorities paid little attention to floods and droughts, because they mainly affected the "indigenous" population. At independence in 1975, the new government quickly had to respond to three years of serious floods and a major El Niño drought in the early 1980s. The young government set up a

department to prevent and combat natural disasters (DPCCN) in 1980; the CVM was established the following year.

Through the 1980s, Mozambique became a cold war battlefield, and western European countries poured in huge amounts of relief. As a result, says the CVM's secretary general Fernanda Texeira, this "accumulated experience from the emergency years, both in the Red Cross and within communities, contributed to the success of operations in 2000 and 2001".

The war ended in 1992, followed by elections in 1994. Both the DPCCN and the Red Cross needed to rethink their roles and in 1999 they restructured to concentrate on natural disasters, while drawing on those members who had gained emergency experience during the decade of war. The DPCCN was resurrected as the national disaster management institute (INGC), and decided to concentrate on coordinating other agencies providing disaster relief. The Mozambique Red Cross, meanwhile, opted to concentrate on providing basic health care for isolated and displaced people in emergencies, and began training volunteers.

Limited floods in early 1999 gave both organizations experience in their new roles. In late 1999, the INGC ran a major simulation exercise in flood relief, involving the police, CVM, local flying clubs, fire brigade and scouts (continuing a practice established nationwide since 1995 of simulating response to different types of disasters each year). Thus both the CVM and INGC went into the 1999-2000 rainy season with some degree of readiness.

Stockpiled supplies too tempting

One of the key features of the restructuring of the DPCCN and the CVM was the recognition that stockpiles of relief supplies, while attractive in theory, provided too much temptation in practice. Mozambique has bitter experience of emergency reserves of food, fuel and vehicles being stolen or sold by corrupt officials, and salaries are so low that this seems unavoidable. Speaking in Maputo at a seminar on lessons learned from the floods in 2000, Mozambican foreign minister Leonardo Simão commented that during the 1980s, "thefts and pilfering were constant. Some staff thought they had the right to steal. DPCCN could not be reformed. So we had to create a new institution with a new conception. There would be no lorries or warehouses, because that is the basis of theft and misuse."

In addition, the gap between major droughts or floods is sometimes a decade or more – maintaining stocks in good condition for that long a period is almost impossible under Mozambique's climatic and economic conditions. As a result, both organizations slimmed down their large warehouses and transport fleets.

Yet one of the most important lessons learned from both floods is the need for stocks that can be drawn on quickly in case of emergency. Prior to both floods, the United Nations' (UN) World Food Programme (WFP) and children's agency (UNICEF) pre-positioned food and medicines, based on disaster predictions. And the CVM, along with other international Red Cross partners, also had relief stocks left over from 2000 in place for the 2001 floods. So while stockpiling supplies over long periods may not work, nevertheless agencies can ensure that relief stocks are requisitioned in time to ensure they can be moved to vulnerable areas before disaster strikes.

Francisco Pateguana, former governor of Inhambane province (hit hard by 2000's floods) argues for relief contracts or retainers, on the grounds that private companies are more likely to keep supplies in good condition if they continue using them for their own purposes afterwards. For example, the local petrol station would be paid a fee to maintain a stock of fuel during the annual three-month flood season. If there was a flood, the government would buy the fuel. But if there was no flood, the fuel would be sold off in the normal way over subsequent months. Similarly, boat owners would be paid a retainer if they agreed to supply a boat and pilot at 24 hours notice, if requested during the flood season.

More than 200 inflatable boats, donated by international agencies, were used to rescue people and transport food in both 2000 and 2001. Indeed, boat rescues during

2001's floods accounted for 4,400 of the 7,133 lives saved (see Figure 3.1). There was a debate about whether to reserve the boats for emergency use only. Arguments in favour are obvious. However, if kept in storage for long periods in tropical conditions, rubber boats would deteriorate and be attacked by rats. Also, since Mozambique is so poor and so short of river transport, using the boats as ferries would stimulate the economy. In practice, the boats were used commercially in between disasters to cross rivers where bridges or roads had been washed away.

Coordination works when locals lead

One of the most striking lessons from both years of flooding is that coordination of the relief effort worked best when Mozambicans led – or fully participated in – all aspects of the disaster response. In the first days of 2000's floods, before outside help arrived, internal organization was key. Local health workers and the CVM set up emergency health posts. Local government officials organized the resettlement centres; in Chiaquelane centre, for example, people were told to congregate according to their home neighbourhoods, and local leaders took charge of distributing tents and food, and constructing latrines and water tanks.

As 2000's floods became more severe, foreign minister Leonardo Simão personally took over coordination of the relief effort. The UN's office for the coordination of humanitarian assistance (OCHA) sent a team which, rather than being located in a UN office, was set up in the INGC's offices, in order to enhance the joint disaster coordination centre.

Thousands of people from 250 different organizations came to help. UN agencies alone had 500 people working on flood relief. Seven National Red Cross Societies sent teams. As aid flooded in, coordination was essential to prevent chaos. At both national and local levels there were daily meetings, usually chaired by the government. Individual agencies were given responsibility for tasks, such as food distribution or water supply, in a particular camp or area.

With large volumes of people, aircraft and aid to coordinate, a joint logistics operations centre (JLOC) was established at the INGC office in Maputo, linked to a logistics cell at the airport. Requests for transport of food, medicines, tents and staff were submitted daily to the JLOC, approved and prioritized, and sent to the airport where an afternoon meeting assigned tasks to available aircraft. For the first time during a natural disaster in Mozambique, nine military air forces accepted tasking by a civilian coordination system, rather than deciding individually what to fly and where.

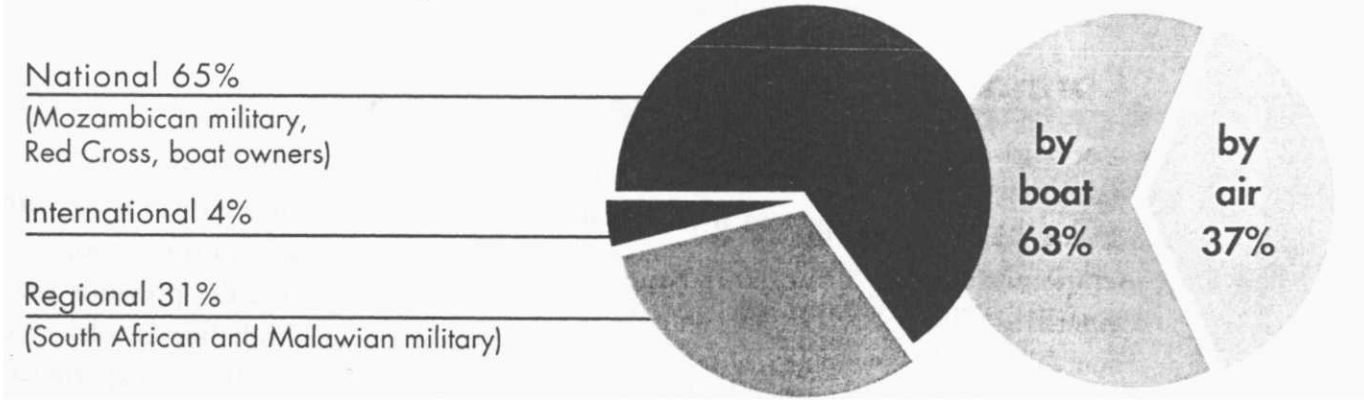
The effect of the coordinated effort was spectacular. Adequate water and sanitation meant there was no cholera; sufficient health staff kept malaria under control; enough

food meant there was little hunger. Overall, the death rate of displaced people was lower than if they had stayed at home.

Yet strangely the great success of the joint logistics operations centre in 2000 was not repeated in 2001. During the latter flood, the JLOC was based up the coast in Beira and fewer agencies participated. By 2001, Mozambique had two military helicopters in service. But neither they, nor the South African air force, nor the aircraft hired by INGC worked through the JLOC. Allegedly management problems – on the part of both the INGC and the UN – were to blame. According to one UN official, the magnitude of 2000's floods meant that contingency planning for 2001 started late and this in turn contributed to the weakness of the Beira-based JLOC. According to a Red Cross official, the government's provincial staff in Beira were far less competent than those based in Maputo, which had

Operator	2000		2001	
	Air	Boat	Air	Boat
Mozambican military		17,612	1,850	3,100
South African military	14,391		357	
Mozambique Red Cross		4,483		
Malawian military	1,873			
Air Serv (international NGO)	208			
French military	79			
Portuguese Civil Protection				1,300
Fire service, private boats		7,000+		
Miscellaneous rescuers			526	
Total rescued, at least	**16,551**	**29,095**	**2,733**	**4,400**
Total by year	**45,646**		**7,133**	

Analysis of rescuers during both 2000 and 2001 floods



formed the hub of 2000's relief operation. As a result, with fewer planes in the pool and poorer coordination, the airborne element of 2001's disaster response was less effective than in 2000.

One lesson from two years of flood relief operations is that coordination mechanisms remain very fragile, based more on personalities than structures. A key aspect of improved disaster preparedness in Mozambique would be to enable the INGC to coordinate disaster relief throughout the country, by providing it with well-trained staff and resources, as well as to require all aid operators to work through it.

The Red Cross system proved particularly effective during both years of flooding – and this too was the result of Mozambicans preparing for and fully participating in disaster response. The Mozambique Red Cross worked directly with Red Cross societies from other countries, which took responsibility for various aspects of relief and reconstruction. During 2000's floods, 683 CVM volunteers assisted over half of those displaced. CVM's secretary general Fernanda Teixeria stressed that material aid from overseas Red Cross societies matched local needs: "They know what is needed in a disaster. They sent what we asked for – tents, soap, kitchen sets." And they sent money quickly, so that CVM could buy locally what it needed urgently.

During 2001's floods, provincial Mozambique Red Cross coordinators played an even bigger role and were given more power than in 2000. The International Federation of Red Cross and Red Crescent Societies, while maintaining a significant presence in Mozambique during 2001, worked in CVM offices and often through CVM's provincial coordinators. Mark Wilson, the International Federation's head of delegation in Mozambique at the time, points to improvements in the Red Cross response in 2001: "We had stockpiled 4,000 family relief kits. We had trained more volunteers through disaster preparedness programmes, and crucially, working with the CVM, we were able to manage and coordinate international Red Cross responses so that the CVM was not submerged. We were able to gradually expand our response to meet growing needs in a seamless way."

Continuity key to success

Not surprisingly, international agencies found that their ability to respond to 2001's disaster was greatly improved if their staff had had prior experience of dealing with disasters in Mozambique. UNICEF's provision of water and sanitation for people in temporary centres during 2001 benefited from experience gained the previous year. Jonathan Caldwell, UNICEF emergency coordinator during both floods, observed that, "Operations were much better in 2001 because of existing staff with experience. This was one of the lessons taken over from 2000 to 2001."