



# Disaster Management

*Disasters (events usually characterised by negative human impact and exceptional demands for intervention) are inevitable. Impact can be substantially reduced by adequate preparation, early warning, and swift, decisive responses. Disaster Management encompasses all aspects of planning for and responding to disasters. It applies to management of both risks and consequences of disasters. Disasters need to be declared to secure the release of government resources for intervention.*

*Disasters are not entirely unpredictable. Floods occur in valleys, droughts occur in areas with unstable and low rainfall, and oil spills occur in shipping lanes. This predictability provides opportunities to prevent and to mitigate the impact of disasters.*

*Governments are key players in such prevention and mitigation. They exercise this role through legislation, through resource allocation and through rational planning and sustainable development. The capacity of civil society and NGO's, particularly at local level, play a significant role in mitigation of impact.*

*In South Africa, a White Paper on Disaster Management has been published. Its strength lies in a thoroughly modern and developmental approach with a focus on risk reduction, creation of permanent management structures, and delineation of accountability and responsibility. However, there is a lack of recognition of what is feasible. The White Paper makes incorrect assumptions around capacity of local level government and local civic organisations. Therefore the draft bill points to the ideal but fails to accommodate the reality of limited peripheral capacity, particularly in rural areas which are most vulnerable.*

*The local shortcomings were all-too-apparent in the 2000 floods in South Africa. Lessons were learnt and recommendations made which highlight the mismatch between policy and operational capacity and which offer suggestions for more appropriate and rapid responses during future disasters.*

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*The role of the media appears critical in mobilising public concern and response, and in holding the relevant authorities accountable. The recent oil spill off the Western Cape and its impact on penguins generated more media attention than the flood devastation in the Northern Province. Media interest during the 2000 floods focused more on Mozambique and the Kruger National Park and less on the many isolated and devastated villages in the extreme north east of the country, thereby downplaying their plight.*

*Future disasters are inevitable. The impact can be significantly reduced by development policies and strategies that target the most vulnerable, provided that interventions are co-ordinated, and sustained beyond the immediate emergency phase. South Africa has the right policy, but still lacks the peripheral capacity to deliver on that policy. These capacity shortcomings must be systematically and urgently addressed.*

## Introduction

The year 2000 saw a series of disasters in South Africa. They arose from both natural and human causes, and the responses stretched community and government capacity to the limit. Huge floods devastated the Northern Province, Mpumalanga and neighbouring countries; massive fires and an oil spill threatened Cape Town; and separate floods hit rural communities in KwaZulu-Natal and the Eastern Cape.

By coincidence, the government White Paper on Disaster Management<sup>1</sup> led to the release of a draft bill this year. They set out an advanced policy framework for dealing with such events in the future. How do they measure up to the need to plan for and mitigate disasters in South Africa?

Disasters are inevitable. We do not always know when they will occur. But their worst effects can be partially or completely prevented by adequate preparation, early warning, and swift, decisive responses. This chapter will outline the basic theory of disaster management; examine some recent disasters from a health perspective, and describe the lessons learnt for dealing with adverse events in the future.

## Disaster theory

A *disaster* is “a natural or human-caused event, occurring with or without warning, causing or threatening death, injury or disease, damage to property, infrastructure or the environment, which exceeds the ability of the affected society to cope using only its own resources”. Disasters can be *natural* (arising in the environment and outside our control) or *human-caused* (from identifiable human actions, directly or indirectly, deliberate or not). Often disasters such as famine or drought have interacting human and natural causes.<sup>2</sup>

Sudden disasters can lead to *emergency*: an unforeseen event that calls for immediate measures to minimise its adverse consequences. *Slow onset disasters* result when the ability of people to support themselves, and sustain their livelihoods, slowly diminishes over time. Such disasters may also be aggravated by ecological, social, economic and political conditions.

Which events qualify as ‘disasters’ is a social issue. Is HIV or TB a disaster? Poverty, taxi violence, global warming? Oil spills and threatened penguins? While all these problems are serious, we should remember that a disaster is an exceptional event. It should have some negative human impact and reach a scale where abnormal interventions are required. Disasters need to be *declared* in a legal sense to release government resources. In general,

smaller, insidious, and environmental events, affecting poor and remote communities, are less likely to be officially recognised as disasters.

It is not true that disasters are entirely unpredictable. Floods occur in valleys and flood plains; fires occur after the accumulation of dry material; wars after the accumulation of weapons. Earthquakes and cyclones occur mostly in places with a known history of such events. Mudslides may occur in uninhabited areas; but when there are homes in their path they can become disasters. *Hazards* are threats to life, well-being, property and/or the environment. Hazards result from extreme natural processes, technological developments, and various forms of social exclusion. They are risks that can be described in advance. *Vulnerability* results from the interaction of a community, its environment and those hazards. Storms of equal magnitude might cause minimal disruption in the USA, but kill thousands in Bangladesh - people in Bangladesh are more vulnerable to storms.

*Disaster management* encompasses all aspects of planning for and responding to disasters, including hazard analysis, vulnerability reduction (preparedness), prevention, mitigation, response, recovery and rehabilitation. It may refer to the management of both the risks and consequences of disasters. *Contingency planning* relates to events, which may or may not occur, in which objectives and scenarios are agreed, managerial and technical actions defined, and potential responses put in place to prevent, or respond to an emergency situation.

*Mitigation* is action to reduce the consequences of a disaster. While it may not be possible to prevent all disasters, the effects can be modified or reduced if appropriate steps are taken. Responses can be divided into early and late phases. Early responses are *rescue* and *relief*; later responses are *rehabilitation* and *reconstruction*. The first people to respond to any disaster are communities themselves, not governments. Their resourcefulness and resilience is the key to disaster mitigation. Local people are also the main drivers of reconstruction and continued development. In developing countries, longer-term effects of a disaster on local economies, social conflict, nutrition and disease patterns can cause far more deaths than the event itself.

Many international disasters have been described in terms of the ideal management, and what actually happened. Characteristically, even quite predictable and regular events have not been planned for; communities have been far more vulnerable than they could have been; and authorities have been slow to recognise and declare disasters. Responses have ranged from superb to downright incompetent or absent; relief has often been too little, too late, misdirected, or inappropriate. Often disaster responses are clouded in apathy and confusion; there are often severe deficiencies in communication and information systems. The usual *distortions* from a rational response are caused by political and media factors, corruption, inadequate resources, and various local and foreign agencies working at cross-purposes. Disaster responses often focus on short-term, high profile rescue operations and neglect the bigger, long-term issues.

Finally, several authors have described the interconnections between disaster management and *sustainable development*. While good disaster planning minimises interruptions to development, poor responses can divert scarce resources, increase dependency, and actually increase vulnerability to further disasters.

Post-mortems, enquiries and *evaluations* are an essential part of the cycle. While it is easy to criticise after the event, they are also opportunities to do better the next time. Let's examine our own and some international disasters to learn a few of those lessons.

### Case study: Maharashtra earthquake 1993

In September 1993 an earthquake struck the state of Maharashtra in India. Measuring 6.4 on the Richter scale, it killed 7 928, destroyed about 27 000 houses and extensively damaged roads and water systems. The state government, with outside help from the World Bank, the Asian Development Bank, the Department for International Development (DfID) and the national government devised and implemented a disaster management plan. It incorporated emergency and long-term strategies, with initial financial guarantees secured within 2 weeks of the disaster. Over the subsequent five years 28 000 new homes were built, 200 000 houses were strengthened, 157 km of road were constructed and numerous dams and other engineering projects undertaken, each aimed at economic development while reducing vulnerability and risk. Quality assurance was a critical dimension of the plan, protecting resources and ensuring efficiency. This intervention has become a model of disaster management and has been exceptionally well documented, offering a template for others to follow. Its strength lies in the systematic approach, co-ordination between local and international groups, tight financial controls, government commitment, and the balance achieved between the short and long-term interventions. This case study will be the point of reference when we reflect on South Africa's responses to recent disasters.

Disaster management is a recognised dimension of government responsibility. Many have **permanent structures**, at national, regional and local level, set up specifically to manage disasters due to natural or other causes. Maharashtra had state, provincial and local structures active in the management of the 1993 earthquake.

### Southern Africa floods, 2000

Between February and March 2000 a rare series of tropical storms and cyclones from the Indian Ocean hit Southern Africa. These caused several waves of flooding in Madagascar, southern Mozambique and Zimbabwe, Botswana, Swaziland, Mpumalanga and the Northern Province.

Low-lying districts in Mozambique were submerged for weeks under metres of water, which swept away virtually all infrastructure. Hundreds drowned, and large populations were displaced and destitute. Outbreaks of malaria, dysentery and cholera added to the mortality. A major international rescue and relief operation was mounted, and reconstruction efforts are still in progress. Development in this extremely poor and indebted country has been set back by several years.

In South Africa, flash floods swept away dozens of roads and bridges, destroying crops, domestic animals and homes across much of the North-East Lowveld. Worst hit were poor rural communities in the former homelands of Venda and Gazankulu. Water and sewerage systems were destroyed, and at least a million people were left without clean water. Major roads such as the N1 and N4, and access to the Kruger Park were cut. The Limpopo river flooded to levels not seen for years. About 100 deaths were directly attributable to drowning, collapsed buildings and accidents.

The scale of the disaster stepped up with each new storm and flood wave. Temporary refuge places and repairs to roads, bridges and buildings were washed out soon afterward; attempts to replant destroyed crops met the same fate. Only toward the middle of March was the full extent of the disaster apparent.

In the Northern Province, Joint Operations Centres at Pietersburg and in each region were set up, led by the security forces and involving several government departments.<sup>5</sup> Initial responses were simply to rescue stranded people, distribute food and clothing parcels, and repair essential infrastructure. Regional Disaster Management Units under various local governments were responsible for assessment and aid distribution. The Health and Welfare Department set up its own Operations Centre to deal with concerns of disease outbreaks, to restore health and welfare services, and focus on planning for longer – term problems such as malnutrition.<sup>4</sup>

### **Cape Town fires, 2000**

In January 2000, the worst fires in many years spread through the peninsula mountains south of Cape Town.<sup>5</sup> There were fire warnings prior to the outbreak, fires were sporadic on farms in the Boland and hot dry winds were forecast. Despite this, when major fires first broke out, the allocation of resources was limited, giving the fires a chance to get established. Fire fighters struggled to cope and assistance had to be sought from the air force and fire fighters from as far afield as Gauteng. By then the fires were totally out of control.

Several homes were destroyed and many others were evacuated. It is not clear why fires in the south were never declared a disaster, as outside assistance had to be sought. Commentators argued that a better disaster plan, with a greater emphasis on prevention and containment, would have prevented the eventually very costly intervention that failed to prevent enormous damage.

### **Cape Town oil spill, 2000**

On 23 June the Panamanian oil carrier ‘Treasure’ sank and broke open near Cape Town harbour. An opportunity to tow the distressed vessel into deeper waters had been missed. The oil slick threatened Robben and Dassen Islands, home to the majority of the world’s rare African Penguins. Within hours of the event, a massive penguin cleaning and rescue operation was mounted. Resources from the province, the military, animal welfare organisations and community volunteers were mobilised. The rescue received massive international publicity and donations. The operation was a great success with only about 10% mortality of oiled birds. Again, an official disaster was not declared.

## **White Paper on Disaster Management**

Disaster Management is typically divided into an emergency rescue and subsequent rehabilitation phase. This approach is too simplistic and indeed is one reason why we are so susceptible to recurrent disasters. There is now a more comprehensive approach that is intended to address the more complex issues of risk, vulnerability and prevention in addition to ensuring capacity to respond to a given disaster. South Africa’s White Paper admirably incorporates this new approach.

In the White Paper, the critical issues of purpose, policy frameworks, organisational structure, and financing are comprehensively addressed. Particularly strong points in the White Paper relate to the incorporation of modern principles of disaster management, particularly the link to development and reduction of vulnerability of communities, an emphasis on prevention and mitigation and clear delineation of accountability and responsibility. Potential weaknesses relate to what is currently a pervasive problem in South Africa: the gap between progressive legislation and current capacity to deliver on and implement that legislation. A problem linked to capacity is the relatively complex bureaucracy envisaged.

Each of the recent disasters can be examined in the light of the White Paper policies. How well was the problem managed? Would the new Disaster Management structures and processes have helped?

### **Planning and Recognition**

There is little evidence that a comprehensive plan existed to deal with any of the floods, fires or environmental disasters seen this year. None of them were impossible to predict. Hopefully the mandatory disaster offices at all levels of government could have allowed better planning, and at least at local levels the severity of the danger could have been assessed earlier.

For the Cape fires, one factor was the danger of alien vegetation reducing water run-off and increasing the fire hazard. This is not new and it should not have needed a disaster on such a scale to produce the regulations now promulgated to control the removal and eradication of alien plants. However, vegetation was only part of the picture and more careful planning and provision of housing might have avoided the fires, which from all accounts started in informal settlements.

Alien vegetation and informal settlement patterns are examples of predisposing factors for fires. No-one can expect government to cope with the massive influx into cities such as Cape Town, but it is reasonable to expect that sites be set aside for informal housing where open fires do not pose a general environmental hazard. Any planning and management consequence of the fires that does not include a strategic approach to the organisation of informal settlements is deficient in that it leaves a large group vulnerable, fails to reduce risk and thereby predisposes to a similar disaster in the future.

### **Declaration**

Successful disaster management is partly about enabling authorities to react quickly and with certainty that resources consumed in a rescue will be recouped; the White Paper is less reassuring in this regard and depends on a relatively still-too-clumsy process of disaster declaration. However the mechanisms allowing for early local or provincial declaration might have been helpful in the disasters of 2000.

Evidence from the recent floods in the Eastern Cape shows that the disaster was declared too long after the event, with at least two months between the floods in February and Gazette 21064 declaring a disaster on 4 April 2000. Disaster declarations in Mpumalanga were even more delayed with Gazette 21167 declaring a disaster on 10 May 2000. Such tardy declarations delayed access to urgently needed provincial and national resources. The fires and oil spill in the Cape were not declared as disasters. It is not clear that the requirements of the White Paper will ensure a more rapid response in future disasters.

### **Emergency responses**

Perhaps the fastest emergency reaction seen this year was the penguin rescue, which started within hours. Responses to the Southern African floods were rapid in places, but the scale of the unfolding disaster and poor communications left many people on their own. South African helicopters responded quickly in the Northern Province and Mozambique; international assistance at anything like the level needed for rescue operations took weeks. Aid parcels were still in storage at Maputo at the time of writing.

In the Northern Province, the Joint Operations Centre at a military base co-ordinated

emergency responses. Food parcels and blankets were rapidly moved from the central warehouse to local Disaster Management Units. Local government officials were charged with assessing need and distributing the aid, but in many places it was impossible to verify that the material reached its intended recipients. Weeks afterward, researchers flew into isolated valleys in Venda which had not even been assessed, because the officials could not reach them! Here, destroyed bridges and roads meant an additional 40km walk for the elderly to collect pensions. Prices for mealie meal and taxi transport rocketed after the floods. With no crops left nor income, the result was near starvation for whole communities.

With the Cape fires, initial fire fighting reactions were inadequate considering the potential consequences, but gathered momentum as public indignation grew. The willingness of communities to help was remarkable, but stories abound of lack of co-ordination and inappropriate deployment of volunteers. Often this led to volunteers putting themselves in danger and distracting from a properly co-ordinated response. Yet without the huge volunteer contribution, it seems certain that property loss would have been much greater than it was.

## The media

The tremendous influence of communications is perhaps the most important lesson of the year. There is usually considerable media and public support for emergency measures. However this depends on how easily the message can be found, packaged, and used to capture the public imagination.

The Southern African floods were not adequately reported in the first weeks. Images of broken bridges and raging rivers held limited interest, until TV pictures showed helicopter rescues from trees and rooftops in Mozambique. The rescue of a woman and her baby born in the tree was shown all over the world, and probably mobilised more relief than anything else.

But the pictures showed a distorted view of the total situation; in most places the destruction of infrastructure and basic services was the real threat. Radio messages on how to clean contaminated water were useful. Starvation and epidemics were to kill far more people than drowning; people started to die just as the media was losing interest.

The biggest story by far was the oil threat to the penguins. Skilful communications enabled conservation groups to maintain a massive and expensive volunteer operation. The scales of the flooding and oil spill disasters were completely reversed in the international media. The Mozambique coverage largely obscured the facts of South Africa's own worst flood disaster for decades.

## Reconstruction

Medium and long-term effects are very important with 'natural' disasters like fires and floods. Unfortunately, media and public attention to reconstruction is limited. If the enemy of initial rescue operations is confusion, the enemy of reconstruction is apathy.

In the Northern Province, the medium-term threat was epidemics of cholera and malaria, as happened in Mozambique. This realisation prompted the Department of Health and Welfare to set up its own operations centre to urgently restore services and prepare to respond. Even then, co-operation from some officials was deficient – managers had to order staff to attend briefings, and the centre had to be run largely by students and volunteers.

In South Africa major roads and bridges were re-opened, and larger water supply schemes

repaired, in the first few months. However, poor rural communities rely even more on small, local infrastructure. The effort to fix smaller road and water systems across the region will take years, and there is no prospect of the hundreds of millions of rands required to do it. The lack of sufficient international or government funding for reconstruction will be a profound setback to economic development, resulting in further poverty, malnutrition and disease.

## Review

The only formal disaster review the authors know of was on the response of the Northern Province Department of Health and Welfare to the floods; this is a pity since without learning the lessons we are likely to repeat them.

The Northern Province review identified several strengths and weaknesses. In general, the responses were well managed centrally, mobilising NGO and academic public health support. Peripheral management was poor in some places, but most health workers performed superbly. The major problems were inadequate communications, information and transport capacity, as existed prior to the floods. Public health interventions were largely successful. These included 'disaster packs' to re-supply clinics, public education on water and sanitation, training with new disease control protocols, helicopter support for evacuations and surveillance, and preparations for outbreaks. There was however some reliance on inappropriate technology – expensive water purification tablets and mosquito coils, which could not be distributed to the whole population at risk. In the event, big epidemics of malaria and cholera did not occur: this was largely due to repeated flooding of mosquito breeding sites, and limitations on transport slowing disease transmission.

The disaster review led to the following recommendations under a series of headings:

### Management

- ◆ Establish a permanent disaster management line function assigned to a senior post - director or higher (currently Director Health Care Support)
- ◆ Create a post of Assistant Director to head a "Disaster Unit" with full-time responsibilities for disaster planning and management, which would include:
  - Develop and maintain a written and regularly updated Disaster Plan
  - Set up and run a disaster operations room and team that can be activated at short notice
  - Establish a central epidemiological and administrative data facility and functional communications network with centre and periphery
  - Liaise and network with key officials, other departments, NGOs, and with Disaster structures at all levels of government
  - Plan health/welfare scenarios for likely or predictable disasters
  - Train and evaluate for disaster readiness, and advocate for prevention, especially reductions in vulnerability and risk.

**Personnel**

- ❖ Delegated Disaster Manager to have authority to co-opt essential personnel
- ❖ Training materials for likely eventualities to be made immediately available e.g. protocols for diarrhoea management
- ❖ Trainers should keep abreast of interventions likely in disasters so that they can offer training at short notice
- ❖ Disaster plans to have capacity to cover basic board and lodging costs of volunteers
- ❖ Officials unable to reach their normal place of work in a disaster must report to the nearest health facility
- ❖ Disciplinary action to be taken against staff who neglect their duties during a disaster.

**Communication infrastructure**

- ❖ A high-profile telephone connection campaign, with censure of Telkom for past failures to prioritise health facilities (most clinics still do not have telephones, and old radios were unreliable)
- ❖ In circumstances where lines are not available digital radios should be introduced
- ❖ Managers are given access to email and outdated fax technologies are replaced
- ❖ Some calls from private phones in disasters to be cost recoverable to facilitate better contact
- ❖ A dedicated “disaster hotline” should be established at all co-ordinating facilities. During normal times such lines form part of the routine communication infrastructure.

**Communication channels and practices**

- ❖ Disaster Unit to have direct access to any appropriate level within the department
- ❖ Health service to ease communication (a flatter organisation and faster verbal authorisations)
- ❖ Up-to-date records of key contacts and their numbers to be compiled.

**Information and epidemiology**

- ❖ Accelerate implementation of basic district and hospital information systems (information capacity was a major weakness after the floods)
- ❖ Collection of additional facility-based data during a disaster should be determined and managed by a specialist epidemiologist
- ❖ The disaster team should have the capacity to plan and execute rapid assessments in the field (independent verification of interventions was essential)
- ❖ Province to update the geographical information system (GIS) capturing all facilities and their map locations (available GIS data was out of date)
- ❖ Provision of health care takes precedence over administrative “processing” of refugees.

## Facilities

- ◆ Facilities should be designed and built with hazards in mind (many were susceptible to flood damage, and the floods exposed pre-existing maintenance backlogs)
- ◆ Access to facilities should be a priority in road network design and maintenance
- ◆ Facilities should have emergency supplies of drinking water, and hospitals should have standby generators
- ◆ Hospital disaster plans should anticipate natural disasters and epidemics, not just acute trauma
- ◆ All health facilities should clear helicopter landing sites and have means of identification from the air.

## Health Promotion

- ◆ Liaise with regional and community-based radio stations. They should be obliged to assist with disaster messages
- ◆ Prepare health promotion messages in advance for likely disaster scenarios. They should be in appropriate languages as printed and audio materials, for rapid dissemination as required.

## Welfare Branch (Department of Health and Welfare)

- ◆ The Welfare Branch to designate an individual or specified post as member of the disaster response team
- ◆ Mechanisms to rapidly restore pension pay-outs after disasters to reduce the burden on relief handouts
- ◆ Profiteering on essentials such as food during disasters should be monitored as it puts an extra burden on victims. Price controls in disaster situations need consideration.

## South Africa: a reality check

Disaster management is about mobilisation of resources, rapid responses, and having a long-term strategy to prevent disasters and reduce the risks of vulnerable groups. We have seen that the community and media respond to emergencies – but that apathy and even neglect surround the long-term consequences and prevention issues. It is this apathy that necessitates a structured and legislated approach to disaster management, so that there are always people who can be held accountable and so that processes of maintenance and prevention are enabled. The Disaster White Paper and Bill go a long way to ensuring that we are well prepared, at least in theory.

At the level of implementation the picture is different. The White Paper alerts the authorities to the need to integrate disaster management and overall development. It includes complex management and financing mechanisms at three levels of government, but are the resources and capacity available on the ground? Without political will and redistribution of resources, the circumstances aggravating and predisposing to disasters will go unattended.

Disaster management must be seen in the context of our other problems. Paraphrasing the comments of the Director of Disaster Policy at the International Red Cross and Red Crescent Societies in Geneva:

“While 80 000 died as the consequence of disasters world-wide in 1999, 30 million died from entirely preventable diseases”.

South Africans must try to balance preparedness for the disasters with disastrous background of ill-health in the country, especially TB and HIV/AIDS. Our region is at the mercy of the faceless ‘global economy’, while Third World debt is arguably one of the world’s great creeping disasters. We have no choice but to integrate disaster planning with an overall development strategy; otherwise crippling disasters will continue to occur, affecting the poorest and most vulnerable as usual.



