

Weathering the Storm

Participatory risk assessment for
informal settlements



Disaster Mitigation for Sustainable Livelihoods Programme

Weathering the Storm:

Participatory risk assessment for informal settlements

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An integrated package of learning materials comprising a facilitator's guide and accompanying flipcharts, published by Periperi Publications.

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The development of this package would not have been possible without the financial support of the Development Bank of Southern Africa, the City of Cape Town and the Western Cape Department of Local Government and Housing, through its Provincial Disaster Management Centre.



FOREWORD

by the Provincial Government of the Western Cape

It is my pleasure to present *Weathering the Storm: Participatory risk assessment for informal settlements*, to you. This guide is an associated outcome of the Training, Education, Awareness and Marketing (TEAM) programme compiled by the Disaster Mitigation for Sustainable Livelihoods Project (DiMP) at the University of Cape Town (UCT). The TEAM programme is a collaborative initiative between the Provincial Disaster Management Centre (PDMC) and the Development Fund of the Development Bank of Southern Africa (DBSA) and DiMP was appointed as the service provider.

During 2005 the PDMC started embarking upon the TEAM programme, which is a disaster management project, with the intent and purpose to 'enhance risk reduction and coping skills', i.e. resilience of residents in most vulnerable areas in the Western Cape through the provision of training, education and marketing interventions. These interventions were tailored to specific disaster hazards and risks applicable to vulnerable communities. The following eleven most vulnerable communities were identified in the Western Cape, namely: Masiphumelele, Phola Park, Doornbach, Wallacedene, Khayelitsha (TR Section), Witsand, Kayamandi, De Doorns, Rooidakke and Water Works and Haarlem. A cadre of disaster management volunteers were trained in first aid (basic and advanced), home-based care, environmental health and fire awareness.

The TEAM programme foresaw the production of a facilitator's guide in community-based disaster risk management (CBDRM), the development of a short (accredited) training course in CBDRM and the implementation of training of twenty facilitators.

This guide is intended to strengthen participatory risk assessment capabilities for a wide range of municipal and development professionals and practitioners – including those who work in disaster management, fire services, catchment management and environmental health. It is also relevant to professionals involved in housing, social development, health, adult education, CBOs and NGOs.

Disaster management is everybody's business and it will require everybody's efforts to effectively deal with disasters and more importantly, to be proactive, in preventing them from occurring. With all stakeholders supporting this initiative this will contribute towards 'Making the Western Cape a safe home and resilient community for all'.

A handwritten signature in blue ink, appearing to read 'Q. Dyantyi', enclosed within a circular stamp or seal.

Qubudile Richard Dyantyi

Minister of Local Government and Housing

FOREWORD

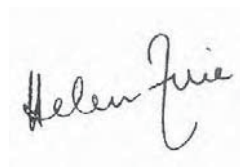
by the Mayor of Cape Town

This facilitator's guide, *Weathering the Storm: Participatory risk assessment for informal settlements*, reflects the work undertaken by the Disaster Mitigation for Sustainable Livelihoods Programme (DiMP) of the University of Cape Town (UCT). It is a pragmatic attempt to provide officials and role players in Disaster Risk Reduction, as well as communities in informal settlements at risk from hazards such as fires and floods, with a tool that will help them understand and address the factors contributing to disasters, and the effects of such incidents.

The City Of Cape Town has provided funding for this project and research by DiMP. By 2007 we had 223 informal settlements in the Cape Town region. The publication of this research will help government authorities and social agencies in our city find new ways of addressing the challenges this situation presents.

The facilitator's guide emphasises a number of key principles that need to be considered in forming an integrated and comprehensive approach to tackling hazards in informal settlements. It sets out a participatory approach by all stakeholders, and wide consultation with communities at risk, to consolidate disaster risk reduction measures and initiatives that will mitigate the impact of hazards such as fire, severe weather, floods, disease and other threats.

I hope that those who use this guide and apply the principles and research it contains will be inspired and better equipped to alleviate the negative impact that disasters have on the living conditions of residents in our informal settlements.



Helen Zille

Mayor of Cape Town

19 June 2008



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Acronyms

AIDS	Acquired Immunodeficiency Syndrome
CAPSFA	Child Accident Prevention Foundation of Southern Africa
CBDRM	Community Based Disaster Risk Management
CBO	Community Based Organisation
CDRA	Community Development Resource Association
CDW	Community Development Worker
CoCT	City of Cape Town
CPUT	Cape Peninsula University of Technology
CRA	Community Risk Assessment
CSAG	Climate Systems Analysis Group
DiMP	Disaster Mitigation for Sustainable Livelihoods Programme
FEMA	Federal Emergency Management Agency
GIS	Geographical Information System
GPS	Global Positioning System
HIV	Human Immunodeficiency Virus
IDP	Integrated Development Plan
ISDR	International Strategy for Disaster Reduction
NDMF	National Disaster Management Framework
NGO	Non-governmental Organisation
PAR	Participatory Action Research
PASASA	Paraffin Safety Association of Southern Africa
PHAST	Participatory Hygiene and Sanitation Transformation
PRA	Participatory Rural Appraisal
RRA	Rapid Rural Appraisal
SASSA	South African Social Security Agency
SAWS	South African Weather Services
SDF	Spatial Development Framework
TB	Tuberculosis
TEAM	Training, Education, Awareness and Marketing (Project)
UCT	University of Cape Town
UN	United Nations
UNISDR	United Nations International Strategy for Disaster Reduction

An introduction to using this guide

Zolani shivered. It had been raining since yesterday and the floor was wet, as water seeped up from the ground. No one had told her about the water from under the ground when she built her house. That's why she had made sure that the walls had been dug deep down into the sand, so the wind wouldn't blow them down. But every winter, the water came from underneath and her mattress stayed damp for weeks.

Outside, everything was grey – grey skies, grey rain and grey water on the ground. She sighed as she lifted her maize meal up off the floor onto the bed and wrapped it in black plastic to stop it getting wet from the rain coming in through the roof.

Her two-year-old son had started coughing again this morning – but how could she get to the clinic in this rain and through all this water? How could she get to work? No taxis would come through this. She wondered how much longer this storm would last – and how long before the next one would begin...



A baby wrapped in blankets on a bed, as it rains outside

1.1 Why have we produced this guide?

1.2 Who is this guide for?

1.3 How was the guide developed?

1.4 How is the guide organised?

1.5 When should you use the guide?

1.6 How should you use the guide?

1.7 Principles and ethics

1.8 How to read the guide

1.9 Chapter summary

1.1 Why have we produced this guide?

In 2002 South Africa's Disaster Management Act (no. 57 of 2002) was passed to reduce the vulnerability of disaster-prone areas, communities and households.

Residents of informal settlements in the Western Cape, as well as elsewhere in South Africa, bear the brunt of extreme weather and associated flooding. Thousands of households in the province and beyond suffer severe losses in informal dwelling fires. During floods and fires, poor families suffer significant development setbacks.. These disasters are also costly for the affected municipalities and provincial departments, and divert resources from other urgently needed services.

Weathering the Storm reflects current international practice in participatory risk assessment. It describes an approach to risk reduction that actively engages residents of informal settlements, as well as their civil society and government colleagues.

This guide has been tailored to the disaster risk profile of the Western Cape and to the cultural and language needs of disaster risk and development practitioners in the province - although many of the issues profiled may apply in other settings. The guide simplifies participatory risk assessment methods so that they can be used for integrated disaster risk management planning at settlement level – or used by a single department like Roads and Stormwater to improve flood risk reduction measures. For the purposes of this guide, the terms 'disaster management' and 'disaster risk management' are used interchangeably.

1.2 Who is this guide for?

Weathering the Storm has been developed for a wide range of development and disaster risk management professionals and practitioners. These include (but are not limited to) the following:

- Disaster risk management practitioners and fire fighters
- Roads and Stormwater, Water Services, Integrated Development Planning
- Solid Waste, Environmental Health and Environmental Management
- Primary Health Care
- Housing
- Social Services and Health
- Adult Education and Training
- Community-based and non-governmental organisations.

The table below shows how this guide is relevant for practitioners in the above fields.

Table 1.1 Target groups and the guide's relevance

Practitioner and Professional Group	Why this guide is relevant
Disaster risk management practitioners and fire fighters	The core business of disaster risk management professionals in the Western Cape is to reduce disaster risks and their resulting losses. As most of the province's fire and weather-related events affect informal settlements, the guide provides useful and tested approaches to assessing these risks.
Roads and Stormwater, Water Services, Integrated Development Planning	Extreme weather events result in considerable hardship for poor families. Many of the risks are the result of unplanned settlement in low-lying or naturally flood-prone areas. Many fire-prone settlements have poor coverage of potable water sources and fire hydrants - or poorly manage those they do have. The guide provides insights on how to assess urban flood and fire risks with residents of exposed settlements, so that risk reduction action is taken seriously and based on consensus across a wide range of stakeholders.
Solid Waste, Environmental Health and Environmental Management	The local management of solid waste and grey water is at the centre of risk reduction efforts in informal settlements. Poor coverage of sanitation services results in contaminated grey and standing water – especially after heavy rains. Litter and solid waste also block stormwater drains and natural water courses – increasing the flood risk. Dumped litter between dwellings also increases the fuel load in the event of fire – and increases a fire's potential severity. The location of thousands of informal homes in wetlands, near to water courses, on steep slopes or in areas surrounded by alien vegetation also increases their vulnerability to fire and extreme weather. The guide makes links between these processes so that disaster risk reduction efforts can be better integrated with environmental health and environmental management measures.

Practitioner and Professional Group	Why this guide is relevant
Primary Health Care	In many informal settlements, health problems, especially in young children, increase following heavy rains. Illnesses include respiratory, diarrhoeal and skin conditions, but are often not documented in clinic records. This is especially the case in settlements with limited access to primary health care services. Children also bear the life-long effects of burn-related injuries. <i>Weathering the Storm</i> recognises that clinic, day hospital and other primary health care workers provide essential services to the most vulnerable residents of informal settlements. The guide provides practical tools that can help reduce health risks in these areas.
Housing	Informal dwellings are an asset as well as a hazard for many residents of informal settlements. Housing is often the most valuable asset for poor families – but because of their location and poor construction, informal homes constitute a significant hazard themselves. While efforts by the provincial and local governments aim for more widespread formal housing, this will take some time. In the meantime, strengthened local risk management measures with improved access to essential services can help reduce the impact of the Cape's storms and the possibility of severe fires in informal areas. The guide helps to identify short- to medium-term local solutions, including risk-proofing strategies that either avert or reduce losses.
Social Services and Health	The poorest families are those who settle in the most at-risk areas and experience the greatest losses following severe weather. The guide introduces methods that help to assess these multiple sources of social vulnerability in informal settlements.
Adult education and training	Reducing disaster and other risks requires high levels of individual, group and local government responsibility. It also requires considerable insight, inventiveness and creativity. The guide is particularly relevant to adult educators who work in challenging development contexts with practitioners and community residents in a participatory way.
Community-based and non-governmental organisations	CBOs and NGOs involved in either single-sector or integrated development projects will find the guide useful for incorporating either a 'risk lens' into their ongoing planning, or a participative approach into their focus area.

1.3 How was the guide developed?

Weathering the Storm resulted from several processes.

It was a planned outcome of the *Training, Education, Awareness and Marketing* (TEAM) Project, jointly funded by the Department of Local Government and Housing of the Western Cape Provincial Government and the Development Bank of Southern Africa. The TEAM Project, implemented between November 2005 and April 2007, undertook to strengthen community-based disaster risk management capacities in 11 informal settlements within the Western Cape. This provided an opportunity to test and apply the methods used, and to adapt them to local risk conditions.

With additional financial support from the City of Cape Town's Office of the Mayor and Emergency Services Department, it became possible to further develop the basic materials used in TEAM. These additional resources allowed the original material to be adapted so it reached a wider range of municipal and provincial stakeholders.

Funding from these three sources supported the development of two teaching and learning modules that drew from the field experiences associated with the TEAM process, and which are credit-bearing courses within the framework of UCT's Diploma of Adult Education. *Weathering the Storm* is an important supportive document for those who undertake these two modules. However, the guide can also be used without completing the courses.

The TEAM initiative and resulting courses drew heavily on the risk assessment experience of the Disaster Mitigation for Sustainable Livelihood Programme (DiMP). They also benefitted from DiMP's short courses on disaster risk reduction and associated academic modules, offered since 2000.

The guide was developed during 2007 by UCT/DiMP following the completion of the 11 community risk assessments, and was significantly informed by a technical reference group, comprising disaster risk managers, fire fighters, roads and storm water practitioners and environmental health workers. It was circulated for extensive review, with changes being formally incorporated in early 2008.

1.4 How is the guide organised?

The guide is organised into six main sections.

Introduction to using the guide

The introduction provides important background information for using the document.

Chapter 1

Risk reduction –

a development priority in informal settlements

This chapter provides additional background on the role of disaster risk reduction as a development priority in the Western Cape, particularly for residents of poor neighbourhoods and informal settlements.

Chapter 2

Participatory risk assessment – preparatory steps

This chapter is part of the 'nuts and bolts' of the guide and covers the preparatory work to be done before the field assessment, as well as the materials you will need to prepare in advance.

Chapter 3

Chapter 4

Carrying out a participatory community risk assessment

This chapter is also part of the 'nuts and bolts' and covers the 'end-to-end' community risk assessment process, including explaining participatory methods that are especially effective. This chapter provides a day-by-day overview on how to carry out a community risk assessment, along with draft templates that should be ruled up on flipcharts or photocopied ahead of time.

Chapter 5

Flooding, storms, fire and environmental health risks – priority risks for informal settlements

This chapter is a risk-specific focus on the priority threats of flooding, fires and environmental health risks. It provides specific information on three clusters of priority risks that affect informal settlements in the Western Cape – flooding, informal dwelling fires and environmental health risks. Each section gives important background information for each risk type. There are guidelines and photographs showing what to look for when applying the risk assessment methods outlined in Chapter 4.

Chapter 6

Glossary

The glossary lists key disaster risk-related terms in English, Afrikaans and isiXhosa. It is a collection of terms and expressions that directly apply to informal settlement risk reduction in the Western Cape. The glossary is organised thematically, beginning with terms that are central to understanding disaster risk. It also contains important terms describing weather conditions that affect the Western Cape, as well as technical terms related to flooding, fire and environmental health risks.

A **CD version** of the guide is provided on the inside back cover.

A **laminated flipchart toolkit** has also been developed. It contains simple definitions for four important terms ('hazard', 'vulnerability', 'risk' and 'disaster') in English, Afrikaans and isiXhosa. The flipcharts have been developed for use on the first day of the community risk assessment. They can also be used at other times of the CRA process and in other meetings and discussions, where informal settlement concerns are being discussed.

1.5 When should you use the guide?

The guide has been conceptualised as a flexible resource that can be adapted and applied in numerous contexts and for a wide range of risks. It does primarily focus on fires, urban flooding and environmental health

risks, as these risks reflected the priorities identified during the TEAM Project. However, the processes outlined can just as readily be applied to crime, traffic accidents or other risks experienced in poor areas.

- This guide should be used to support risk-reduction planning efforts in risk-prone informal settlements and low-cost housing suburbs. It is particularly relevant for areas exposed to severe storms, settlements where informal dwelling fires occur often or in communities with serious environmental health risks.
- The guide should also be consulted when broader development initiatives are planned, including in-situ upgrading.
- The guide can also be used to support more focused efforts that address one principal risk type (ie informal dwelling fires or urban flooding), and which will be primarily implemented by one or two specific municipal departments.

1.6 How should you use the guide?

Weathering the Storm is **not** a manual that should be followed mechanically or rigidly in one order only. It is intended to be a flexible guide that can be (and should be) adapted and applied appropriately in different situations. Chapters 3 and 4 for instance, have been arranged primarily to assist practitioners who would like to carry out an 'end-to-end' assessment process and are unsure how to do this. However, this process can be (and should be) adapted for different situations.

For instance:

- some practitioners prefer to start the risk assessment process with an orientation transect walk rather than with an overview of concepts and a hazard identification activity
- others prefer to do the problem tree (proposed for Day One) and solutions/objectives tree (proposed for Day Three) 'back-to-back' instead.

Some professionals and practitioners find that incorporating one or more of the participatory activities adds value to participatory development planning processes – even if it is not possible to undertake a three-day assessment.

For instance:

- the seasonal calendar activity on Day One (see p 58) can be applied to almost any risk or livelihood process that has a daily, weekly or seasonal cycle
- the community mapping and transect walk activities on Day Two (see pp 69 and 76 – 80) are relevant to many developmental and urban planning processes.

1.7 Principles and ethics

Weathering the Storm outlines an assessment approach that is underpinned by a commitment to participatory engagement with at-risk communities

and other stakeholders. Although it **is not** a comprehensive participatory facilitation handbook (see 3.1 on p 24 for more reading on participatory methodologies), the guide calls for respectful developmental process when working in informal settlements with a range of stakeholders.

There are however important ethical guidelines to follow when conducting participatory research in informal settlements. These include:

- **Apply the precautionary principle of ‘do no harm’.** Sometimes, risk assessment processes in underserved areas raise local development expectations beyond realistic levels. These can lead to disappointment and undermine future development action.
- Respect, add value to and **build on existing efforts, programmes, initiatives and capabilities.** Don’t duplicate structures and reinvent projects.
- **Ensure inclusivity**, by including less vocal residents, minority language groups, residents who live further away from main tracks and roads and local officials, CBOs and NGOs who may play important ‘invisible’ roles in the settlement.
- **Keep personal or professional biases under control**, including projecting one’s own opinion. Informal settlements in the Western Cape are extremely diverse, with different risk conditions and socio-demographic profiles. It is neither ethical nor scientifically robust to project personal opinions in a participatory risk assessment process.
- **Be transparent with research findings** and view the assessment as a learning opportunity for all participants – rather than as an extractive process. Knowledge generated through a participatory process should be shared among those who generated it and not withheld from them.

WHAT IS... *Participation?*

Community or popular participation can be broadly understood as the involvement of people in making decisions about the design and implementation of processes, programmes and projects which affect them.¹

For more information on this subject, contact:
Centre for Developmental Resource Association (CDRA)
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Fax: + 27 21 462 3918
email: info@cdra.org.za
www.cdra.org.za

¹ R Slocum et al (eds), *Power, Process and Participation: Tools for change*, London: Intermediate Technology Publications, 1995.

1.8 How to read the guide

What the feature looks like	What it means and how to use it
WHAT IS... Community or popular participation can be broadly understood as the involvement of people in making decisions about the design and implementation of processes, programmes and projects which affect them.¹	WHAT IS ... boxes define important or useful terms. The definitions are often repeated in the glossary.
FACILITATOR'S TIP Materials needed in all sessions Coloured marker pens, flipcharts and Prestik or masking tape are needed in ALL sessions. This information is not repeated in the individual session descriptions for field-staff and other personnel.	FACILITATOR'S TIPS provide additional insight or information for the facilitator when carrying out an activity, for instance in interpreting information as well as anticipating and overcoming difficulties in the participatory process.
PARTICIPANT INSTRUCTIONS Meet with the director of each relevant government department to explain the initiative. Also seek advice about ongoing projects in the settlement and contact details for field-staff and other personnel who should be consulted.	PARTICIPANT INSTRUCTIONS describe the tasks that participants must carry out (usually in small groups). The instructions can be photocopied ahead of the assessment and handed out during the process.

Chapter summary

1. *Weathering the Storm* is a practical response to South Africa's Disaster Management Act (no. 57 of 2002), enacted to reduce the vulnerability of disaster-prone areas, communities and households.
2. In this guide we acknowledge that residents of informal settlements bear the brunt of recurrent fire, flood and environmental health risks, which are also costly for many affected municipalities and provincial departments, and which divert resources from other urgently needed services.
3. The guide has been developed for a wide range of development and disaster risk management professionals and practitioners and is intended to be a flexible resource that can be adapted and applied in numerous contexts and for a wide range of risks.
4. The guide has six chapters including a trilingual glossary in English, Afrikaans and isiXhosa. It is also accompanied by a flipchart set which contains simple definitions of 'hazard', 'vulnerability', 'disaster' and 'risk'.
5. The guide is accompanied by a CD version.
6. The guide is not intended to be a manual that is followed mechanically or rigidly in one order. It was developed as a flexible guide that can be (and should be) adapted and applied appropriately in different situations.

Risk reduction – a development priority in informal settlements

Thabo watched the young man as he carried another sheet of corrugated iron down towards the river. Almost every day now, someone new was building a house in New Situ. He could still remember when there were only a few houses there. Things had been better then: there was more space, and people built their houses away from the river. Now, more and more people seemed to be arriving from the Eastern Cape, hoping to find jobs. There was no more space, but New Situ was close to the factories and other work opportunities in the towns nearby, and people kept coming in.

The new ones didn't want to listen when he told them that it was unsafe to build by the river. They told him that such a small river would not cause trouble. They told him that he just wanted to prevent them joining the settlement. But they would see he was right in winter, when the river swelled with rain water. Every year, the houses by the river got flooded – sometimes they even got washed away. The people never stayed long after that, but always there were new people coming in to take their place. He wondered as he watched his little granddaughter chasing a chicken: how many more people would suffer this winter?



A settlement that is slowly densifying

- 2.1 Introduction**
- 2.2 What is the risk context for informal settlements in the Western Cape?**
- 2.3 What policy and planning frameworks guide informal settlement risk management?**
- 2.4 What do we mean by *disaster risk reduction* in informal settlements?**
- 2.5 How does good development action reduce disaster risks?**
- 2.6 What is community-based disaster risk management (CBDRM)?**
- 2.7 Can CBDRM add value to development support in other low-income neighbourhoods?**
- 2.8 Important points for facilitating a good CBDRM process**
- 2.9 Chapter summary**

Overview

This chapter introduces the general risk context for informal settlements in the Western Cape and the many challenges that face residents in these areas.

It also provides a brief overview of the policy and planning frameworks that guide risk management in informal settlements, specifically the Disaster Management Act and National Disaster Management Framework, Isidima (the Western Cape's Sustainable Human Settlement Strategy) and the City of Cape Town Informal Settlements Master Plan.

In this chapter we explain what disaster risk reduction means, and how good development action helps to reduce disaster risks. We conclude by introducing community-based disaster risk management (CBDRM), and by outlining important points for facilitating a good CBDRM process.

2.1 Introduction

This guide describes a community-based approach for reducing disaster risks in informal settlements in the Western Cape. The term ‘community-based’ has been chosen as a practical expression for working with a group of people who live in a particular cluster of households, settlement, suburb, village or neighbourhood.

Although the term ‘community-based’ is used in this guide, it is very clear that informal settlements in the Western Cape are not necessarily communities in which residents share the same values, history, language or culture.

Rapid migration into the province and natural population growth have increased the number of informal settlements across the province. Within Cape Town alone, by 2007, more than 220 separate informal settlements had been identified and mapped.

Migration has also increased national and socio-economic diversity. Many settlements are now occupied by residents who were born in the Western Cape, along with newcomers from as far away as the Horn of Africa and West Africa.

These new and changing forms of human settlements and suburbs are blurring what we used to separate into ‘formal’ and ‘informal’ neighbourhoods. In many low-income formally planned suburbs, there are increasing numbers of informal (‘backyard’) dwellings and Wendy houses. At the same time, ‘in-situ’ upgrading in what were originally known as ‘informal settlements’ is steadily increasing the number of more permanent formal homes and businesses.

WHAT IS... *The term ‘Community’*

‘Community’ suggests togetherness and a positive bond among people. Although this term is often used for people living in one area or settlement, communities also have their own power dynamics, cultural differences, political agendas and hierarchies. These factors must be taken into account when doing a participatory assessment.



A ‘mixed settlement’ where there are many Wendy houses or backyard dwellings in a formal area

This guide has been developed primarily for use in informal settlements where there are few permanent structures and limited provision of basic services. However, the same approach of inclusive assessment and planning should be applied in any risk reduction process. This is irrespective of whether 'the community' refers to residents of formal homes and backyard dwellings in a formally-planned suburb or an informal settlement experiencing in-situ upgrading or even a new low-income suburb that is exposed repeatedly to severe weather events and increased run-off.

2.2 What is the risk context for informal settlements in the Western Cape?

In the Western Cape, it is usually poor and marginalised households living in underserved informal settlements and low-cost housing that are most vulnerable to fires, severe weather events and seasonal flooding.

This is especially the case where informal settlements and low-income suburbs are located in risk-prone and ecologically fragile areas, for instance, in wetlands close to Cape Town, on mountain slopes in the southern Cape or close to rivers in the Cape Winelands.

The families who live in informal settlements must juggle many stresses, including lack of a reliable income, poor food security, and the combined threats of fire, flooding, poor health and crime. Their circumstances are made more difficult by limited access to essential services. Most government departments simply cannot keep pace with rapidly growing and often unplanned demands for service provision – including the maintenance and expansion of essential public infrastructure.

2.3 What policy and planning frameworks guide informal settlement risk management?

There are four particularly useful policy and planning documents to guide risk management in informal settlements:

- South Africa's Disaster Management Act (No. 57 of 2002)
- The National Disaster Management Framework
- Isidima: The Western Cape Sustainable Human Settlements Strategy
- The City of Cape Town Informal Settlements Master Plan.

2.3.1 Disaster Management Act (No. 57 of 2002)

South Africa's Disaster Management Act provides an integrated and co-ordinated policy to reduce the risk of and severity of disasters. The Act also provides for emergency preparedness, effective response and post-disaster recovery.

WHAT IS... *A disaster?*

The Act defines a disaster as:

A progressive or sudden, widespread or localised, natural or human-caused occurrence which:

- (a) causes or threatens to cause:
 - (i) death, injury or disease
 - (ii) damage to property, infrastructure or the environment or
 - (iii) disruption of the life of a community;
- (b) is of a magnitude that exceeds the ability of those affected by the disaster to cope with its effects using only their own resources.

The Act requires all government role players to increase their efforts to reduce risks developmentally, and clarifies these expectations for municipal disaster management centres, as shown below.

WHAT IS...

The role of a municipal disaster management centre?

Sections 47 (1) and (2) of the Disaster Management Act (No. 57 of 2002) state that

- (1) A municipal disaster management centre is required to guide those within its jurisdiction on how to "...assess and prevent or reduce the risk of disasters, including:
 - a) ways and means of:
 - i) determining levels of risk
 - ii) assessing the vulnerability of communities and households to disasters that may occur
 - iii) increasing the capacity of communities and households to minimise the risk and impact of disasters that may occur and
 - iv) monitoring the likelihood of and state of alertness to disasters that may occur;
 - b) the development and implementation of appropriate prevention and mitigation methodologies;
 - c) the integration of prevention and mitigation methodologies with development plans, programmes and initiatives; and
 - d) the management of high-risk developments.
- (2) A municipal disaster management centre must promote formal and informal initiatives that encourage risk avoidance behaviour by organs of state, the private sector, non-governmental organisations, communities, households and individuals..."

The Disaster Management Act does not limit its interpretation of 'disaster' to large-scale catastrophic events. It acknowledges that disasters can occur on many different scales and that in poor communities, recurrent small disasters undermine the chances of development, both for the settlement as a whole as well as for the families who live there.

2.3.2 National Disaster Management Framework

South Africa's National Disaster Management Framework (NDMF) guides the implementation of the Disaster Management Act and provides 'a coherent transparent and inclusive policy on disaster management appropriate for the Republic as a whole'. The NDMF also emphasises 'measures that reduce the vulnerability of disaster-prone areas, communities and households', recognising that efforts to reduce disaster risks should support and add value to developmental initiatives.

The NDMF emphasises the importance of community participation as a non-negotiable necessity for effective disaster risk reduction. This is explained below.

WHAT IS...

The community's role in disaster risk management?

The National Disaster Management Framework states that:

"The community is at the coalface of disaster risk management ...

"All disaster risk reduction planning, the development of projects and programmers and the allocation of responsibilities must be founded on the needs and priorities of communities. Disaster risk reduction is a community-driven process.

"Municipalities must involve local communities in the development of disaster risk profiles; facilitate understanding of the concepts and values of disaster risk reduction in communities; prioritise projects aimed at risk reduction in their IDPs (Integrated Development Plans); and facilitate community participation in training, preparedness planning and awareness programmers." (NDMF, Section 1.3.2.2)

2.3.3 Isidima: The Western Cape Sustainable Human Settlement Strategy

In June 2007, the Department of Local Government and Housing of the Western Cape launched Isidima: the Western Cape Sustainable Human Settlement Strategy. This policy represents a significant shift in thinking in relation to pressures for housing and urban development in the Western Cape. The policy highlights 'the shift from housing construction to sustainable human settlements; the shift to sustainable resource use; and the shift to real empowerment.'¹

Isidima, which means 'enabling dignified communities', is a long-term strategy to integrate poor families within cities better, rather than to leave them on the periphery of urban centres, far from employment opportunities and dependent on costly transport.

Weathering the Storm supports Isidima by promoting an approach that:

- engages those most at risk in consultative processes
- supports those most at risk to understand the risks better
- assists those most at risk to reduce recurrent disaster losses that compromise their health, assets and livelihoods.

¹ See <http://www.capegateway.gov.za/Text/2007/10/wcshss.pdf>

The approach outlined in this manual is a short- to medium-term approach to ease some of the immediate pressures faced by those living in underserved areas.

2.3.4 The City of Cape Town Informal Settlements Master Plan

In 2007, the City of Cape Town approved an Informal Settlements Master Plan that prioritised the provision of essential services and progressive upgrading to the city's more than 220 identified informal settlements. It also planned for the relocation of residents from high-risk sites that are either unsafe or unsuitable for development and for the acquisition of additional land for housing.

Weathering the Storm aims to add value to this long-term process by supporting efforts that reduce risks in the short and medium term, particularly in settlements at high risk of fires, flooding and environmental health threats.

2.4 What do we mean by *disaster risk reduction* in informal settlements?

Informal settlements in the Western Cape face many different kinds of risk on a daily basis, including health risks, environmental risks, financial risks and security risks. However, in the case of informal settlements, *disaster risk* specifically means the chance of hardship or loss resulting from the interaction between **natural or other hazards** and the **vulnerable households and communities** that are exposed to them.

Disaster risk reduction in informal settlements therefore refers to all policies, actions and initiatives that minimise vulnerabilities and disaster risks in informal settlements, including those that incorporate prevention, mitigation and preparedness.

Disaster risk reduction is a **transdisciplinary** concept that should be applied across municipal and provincial departments. The concept of disaster risk reduction crosses many disciplines, departments and sectors, transgressing the borders of the fields or disciplines involved. Disaster risk reduction can involve structural and engineering interventions (ie improving the strength and resistance of houses, roads and other essential physical infrastructure). Risk reduction can also be non-structural and involve urban planning, education, health and other social vulnerability reduction measures. Environmental interventions are at the forefront of risk reduction – particularly those that protect essential environmental services associated with rivers and wetlands.

2.5 How does good development action reduce disaster risks?

In the past, it was common to hear people refer to disasters as 'Acts of God' or 'Acts of Nature'. Today we understand that most disasters are due to a

combination of human and natural or other factors, which can, in fact, be reduced. For instance, careful development planning reduces risks by placing low-cost housing in areas safe from riverine or wetland flooding, or by upgrading and maintaining storm-water systems before the onset of heavy rains.

While careful urban planning and engineering works can ease exposure to risk for residents of high-risk settlements, social development actions that strengthen community involvement can also reduce risks. The provision of basic services helps to reduce environmental and individual health burdens on poor households and can also reduce fire risks. Similarly, closer cooperation and confidence between settlement residents and local authority representatives can improve municipal service delivery as well as strengthen local responsibility for recurrent risks.

Many risks in informal settlements are strongly rooted in social and economic vulnerability, along with unstable sources of employment or livelihood. Employment, education, skills generation and social protection measures that address these pervasive challenges are long-term developmental aspirations that will also reduce social vulnerability in poor neighbourhoods.

2.6 What is community-based disaster risk management (CBDRM)?

Because informal settlements in the Western Cape are diverse, risk reduction efforts will vary from one settlement to another or from one municipality to another, and almost always need to be tailored to local risk conditions and development capacities.

Community-based disaster risk management (CBDRM) is an approach that aims to reduce local disaster risks through the application of participatory assessment and planning methods. It is a practical bridging strategy to integrate local development efforts on one hand with strategies that reduce the impact of priority disaster risks on the other. CBDRM aims to reduce vulnerabilities and strengthen people's capacities to manage specific disaster risks, even if it is not possible to address all their day-to-day difficulties.

WHAT IS... *Community-Based Disaster Risk Management?*

CBDRM is a process of developmental disaster risk management in which the residents of communities at risk actively engage in identifying, analysing, managing, monitoring and evaluating disaster risks to reduce their vulnerabilities and enhance their capacities.

This approach places people at the heart of disaster risk reduction decision-making and implementation.

Adapted from Abarquez, I. and Mushed, Z. *Community-based disaster risk management: A field practitioners' handbook*, Hong Kong: Asian Disaster Preparedness Centre, 2004.

Available from www.adpc.net/pdr-sea/publications/12Handbk.pdf.

An enabling CBDRM process provides a relatively uniform approach that also recognises and can accommodate a diversity of opinions and needs. It allows a wide group of stakeholders, including residents, civil society organisations and local government role players to jointly understand the disaster risk profile in a particular settlement.

An inclusive CBDRM process also helps to build consensus on measures that reduce the likelihood of fires, flooding or environmental health risks. One example of this would be when residents and municipal representatives jointly agree that litter is contributing to local flooding and work together to manage the risk. In this example, the residents might agree to use skips and other litter containers rather than dropping refuse in drainage channels or between dwellings. Similarly, the local authority might agree to improve solid waste collection weekly so that litter does not accumulate.

2.7 Can CBDRM add value to development support in other low-income neighbourhoods?

Because risk and vulnerability are generally closely associated with poverty and underdevelopment, most disaster risk reduction interventions in the Western Cape target impoverished groups. However, it is not only the poorest communities, or their poorest members who are exposed to natural and other hazards, or who are most vulnerable to their effects.

Disaster events over the past ten years in the Western Cape show that people living in low-cost neighbourhoods and suburbs are often exposed to the same hazards as those living in informal settlements, and may even be more vulnerable to their effects. Examples are the Manenberg tornado of 1999, the Joe Slovo/Langa fire of 2005 and the South Coast floods of 2006.



Devastation caused by the Manenberg tornado

We assume these neighbourhoods are better off and unintentionally exclude them from development and risk reduction processes. This is despite the fact that their homes might also be poorly constructed and maintained, with inadequate surface storm water or other unreliable essential services.

Moreover, in low-cost neighbourhoods, there may be high densities of backyard dwellings for rental income purposes, or for accommodating extended family members.

While the risk context for formally planned neighbourhoods differs somewhat from that experienced in informal settlements, the CBDRM approach can also be applied and adapted to these neighbourhoods and suburbs.

2.8 Important points for facilitating a good CBDRM process

Be very careful when identifying and engaging community members

Identifying the right mix of community stakeholders is one of the greatest challenges in establishing community-based risk reduction initiatives. While formally elected community leaders and other influential residents are often the most eager to become involved, they may have limited understanding of the needs and circumstances of the most marginal and vulnerable households or groups. Their opinions can drown out those who are less vocal or well-organised. They may also have their own agendas.

At the same time, local leaders should not be excluded, because they are important stakeholders in their own right and have the power to disrupt community-based initiatives. This requires carefully balancing the involvement of different interest groups, and ensuring that both influential individuals as well as more marginal groups are acknowledged and actively involved.

Anticipate social tension and the possibility of conflict

Where participation involves real change in a settlement, it may increase the possibility of confrontation and conflict with those accustomed to holding power and influence and used to controlling resources.

In the Western Cape, this is often reflected in tensions between more established residents and more recently-arrived groups, especially if there are marked differences in language, culture and past experience. It may also be seen in settlements where delivery of essential services falls well below local expectations.

Be a supportive facilitator – not an ‘expert’

Effective CBDRM requires a shift from teaching to learning. Instead of imparting ‘expert’ knowledge, the facilitator should assist residents in at-risk settlements to understand and manage their risks better – with support from external role players such as government departments and non-governmental organisations. Successful facilitators should also be able to provide relevant additional information to support this process.

Chapter summary

1. In the Western Cape, it is usually poor and marginalised households living in underserved informal settlements and low-cost housing that are most vulnerable to fires, severe weather events and seasonal flooding.
2. *Disaster risk* means the chance of hardship or loss resulting from the interaction between **natural or other hazards** and the **vulnerable households and communities** that are exposed to them.
3. *Disaster risk reduction in informal settlements* therefore refers to all policies, actions and initiatives that **minimise vulnerabilities** and **enhance capacities** in informal settlements, including those that incorporate prevention, mitigation and preparedness.
4. *Disaster risk reduction* is a **transdisciplinary** approach that should be applied across municipal and provincial departments.
5. **A community-based disaster risk reduction** approach is a practical bridging strategy to integrate local development efforts on one hand with strategies that reduce the impact of priority disaster risks on the other. It aims to reduce vulnerabilities and strengthen people's capacities to manage specific disaster risks, even if it is not possible to address all their day-to-day difficulties.
6. Effective CBDRM requires a shift from teaching to learning. Instead of imparting 'expert' knowledge, facilitators should assist residents in at-risk settlements to understand and manage their risks better – with support from external role players such as government departments and non-governmental organisations.

Participatory risk assessment – preparatory steps

Jan sat at his desk in the disaster risk management centre. He compared the latest aerial photographs of the informal settlements with those taken a year earlier. He could see so many new structures tightly packed together in areas where there had been open space last year.

His eyes caught the day's headline: over 20 families had lost their homes in a fire. This was the fifth fire in an informal settlement in the last two weeks, and summer was just starting.

Jan wondered whether the fire education programme he and his colleagues had just carried out would help reduce the number of fires this year ... how many families would lose their homes next weekend ... how many children would be admitted to the burns unit ...?



A disaster risk management vehicle in an informal settlement

3.1 Introduction

3.2 The risk assessment and planning process: an overview

3.3 Phase I: Preparatory groundwork

3.4 Chapter summary

Overview

This chapter gives an overview of the **integrated risk assessment and planning** within settlements exposed to recurrent risks. You will find the following:

- the important preparatory steps that you should take, one to two months before a field assessment takes place
- the immediate preparations to make before the community risk assessment is conducted
- the specific materials and preparatory research required as part of the assessment.

In the chapter you will read an outline of a possible three-day programme for a community risk assessment.

The chapter covers the end-to-end process that incorporates a participatory community-level risk assessment and how this can help local risk reduction planning. This approach is especially useful when planning an integrated development process in an informal settlement that includes several different sectors and a wide range of settlement and institutional stakeholders.

3.1 Introduction

Participatory risk assessment is one of a range of methodologies that have evolved over the last three decades that engage communities developmentally and use highly participatory approaches. Although the methods may have different names and acronyms, they use many of the same tools. They all emphasise a bottom-up approach that aims to empower communities by involving them in defining problems, deciding solutions, implementing activities and evaluating the results of interventions. For example, *Participatory Rural Appraisal (PRA)*, *Rapid Rural Appraisal (RRA)* and *Participatory Action Research (PAR)* methods are widely used to identify communities' developmental priorities and needs.

The *Participatory Hygiene and Sanitation Transformation (PHAST)* methodology is also widely used to promote hygiene, sanitation and community management of water and sanitation facilities.

Participatory risk assessment is an approach that provides insights into how risks are generated and reduced. It can be applied in almost any context, urban or rural, and can be carried out within specific sectors or by specific departments (see Chapter 4). It can also take the form of an integrated process across sectors within one specific settlement or as part of a holistic planning process used by a community-based organisation.



A facilitator presents aerial photographs and graphs of fire frequency

3.2 The risk assessment and planning process: an overview

Participatory risk assessments can be carried out at any time, and can practically guide immediate risk reduction measures as well as more formal planning for the medium to long term (ie integration into IDP processes). The diagram below illustrates this.

Diagram 3.1 Risk assessment and planning process

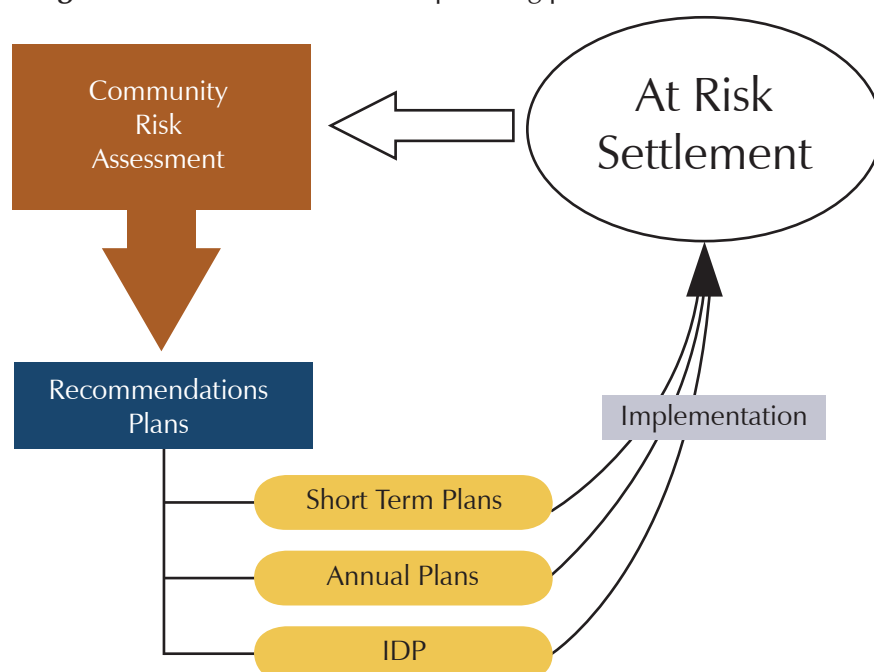
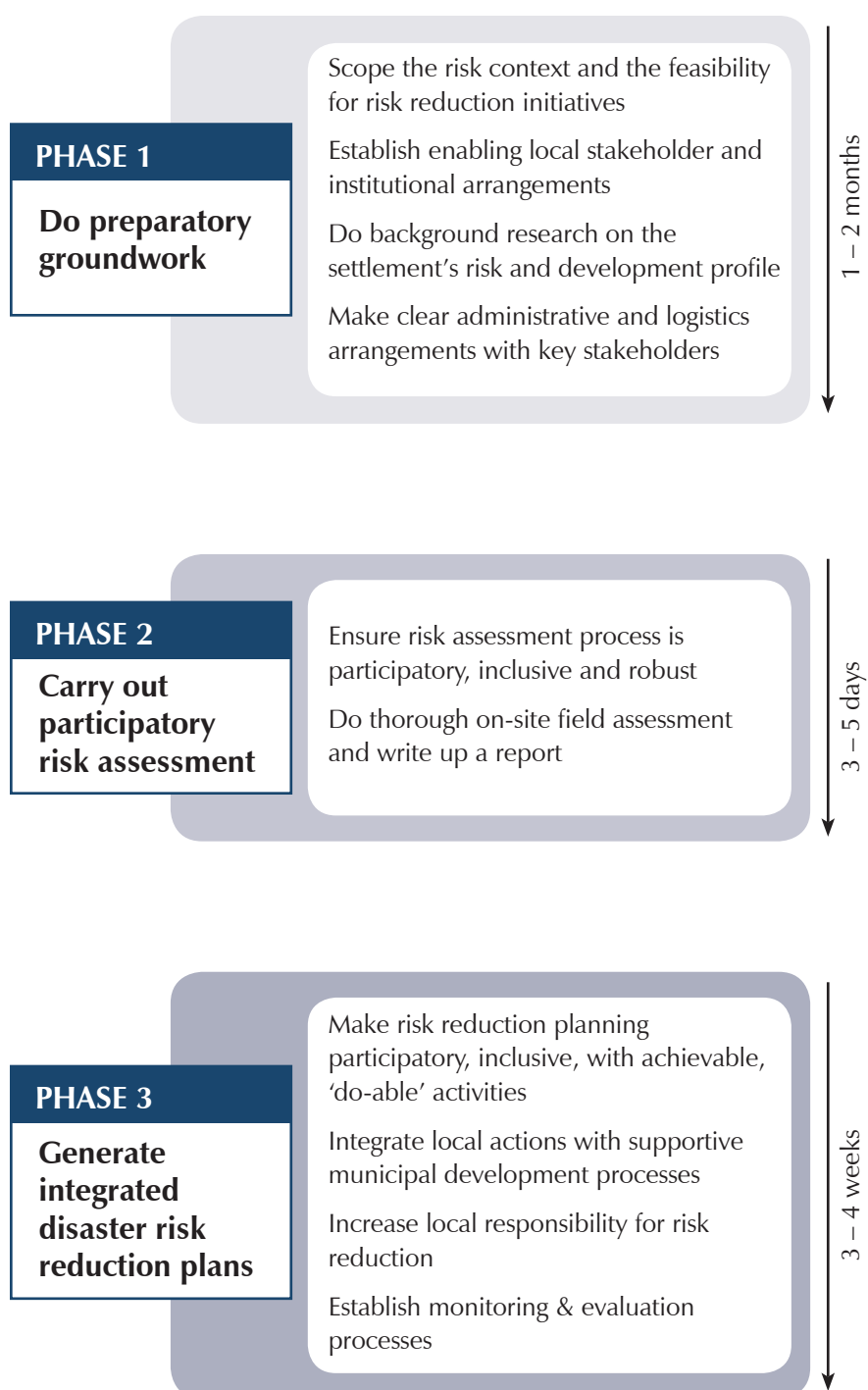


Diagram 3.2 The three phases of integrated participatory risk assessment

An integrated participatory risk assessment and planning process generally involves three **phases**, with clear **activities** and **outcomes**. The approximate time frame for each phase is shown to the right.



3.3 Phase I: Preparatory groundwork

This is the most important phase in the risk assessment and risk reduction planning process and should take one to two months to complete. This phase should never be rushed.

The main areas of work focus on:

- Scoping the risk context and the feasibility for risk reduction initiatives
- Establishing enabling local stakeholder and institutional arrangements
- Doing background research on the settlement's risk and development profile
- Making clear administrative and logistics arrangements with key stakeholders.

At the end of this stage, there is:

- Clarity and agreement on settlement(s) to be supported
- Identification and engagement of key stakeholders from the settlement and local government
- Consolidated information on the settlement's development and disaster risk profile (including maps, aerial photos and reports).

3.3.1 Scope the risk context and the feasibility for risk reduction initiatives

It is often difficult to choose which settlements to prioritise, especially when there are limited resources. 'Scoping the risk context' refers to a process of general consultation with a wide range of resource people (ie disaster risk management, urban planning, fire services and disaster risk university research units) on possible settlements that face increased risks of fire, environmental health problems or flooding.

At this stage, you need to determine whether the settlement has a significant disaster risk profile and if it is already identified for immediate in-situ upgrading or de-densification. You also need to consider carefully, whether risk reduction interventions are feasible and realistic in the proposed settlement(s).

At this stage, you do **not** yet require a detailed review of all existing documentation, aerial photographs or maps for a particular settlement.

Table 3.1 Questions to ask in identifying a site for a risk reduction intervention

Questions to ask	Explanation
Is the settlement in need of risk reduction support? Have residents sought help to reduce their risks?	Resources available for risk reduction are often limited. It is important to identify settlements that are most in need of assistance, and where interventions will achieve the maximum benefit.
Has the settlement been identified for developmental upgrading or other support?	Settlements benefiting from development processes may seem to be less at risk, but linking risk reduction interventions to development and integrated development planning (IDP) processes may achieve better results.
Is the settlement safe?	It is important to ensure that those working in the area are safe. Working in unsafe areas may compromise both the personal safety of staff and the effectiveness of interventions. It may also be difficult to work in a settlement where there is political tension, or where people are hostile towards outside organisations and interventions.

Questions to ask	Explanation
How accessible is the community?	Roads into some settlements may also be impassable – for instance in the rainy season.
What are the dominant languages and social and ethnic groups?	This is important for selecting the fieldwork team, with respect to age, language, gender and cultural sensitivity.
Does the settlement have some form of social cohesion?	Interventions in more socially cohesive communities, where people trust one another and are able to work together, will be more effective than interventions in socially fragmented settlements.

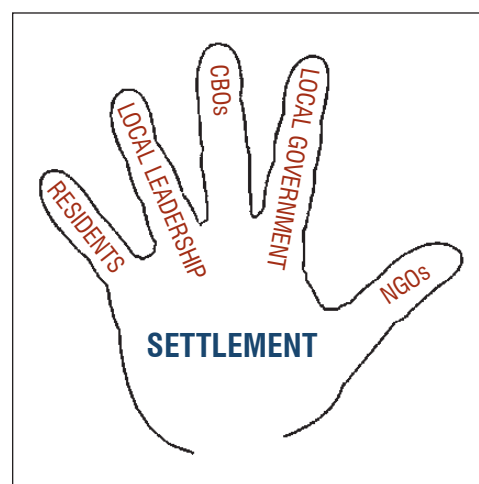
3.3.2 Establish enabling local stakeholder and institutional arrangements

Community-based risk reduction efforts should add value to existing developmental processes and programmes. This means they should generally align with and feed into activities that are already taking place or are proposed for an at-risk area – both within the settlement itself and as planned and implemented by local authorities. To ensure this happens, you need to consult carefully, both with representatives from the local authority as well as with stakeholders within the settlement.

Consultation entails many phone calls to and meetings with different officials within a municipality, including with disaster risk management and fire services. It may also require an initial meeting with the municipal manager to discuss and introduce the concept and attendance at a formal meeting with the local council to present the idea for feedback.

Once there is political and administrative support for the CBDRM process in a selected settlement, a careful consultation and information-gathering process should take place. This is important for identifying key stakeholders and interest groups **within the settlement** as well as the **external role players** that are most active and/or critical to the risk reduction process. It is important to involve all these role players from the beginning.

Figure 3.1 The different role players relevant to a risk reduction project



There are many different role players that need to be involved in a community-based risk reduction initiative. They are like fingers on a hand: the hand is made up of five fingers, which are all essential for the efficient functioning of the hand as a whole.

While the specific focus of a risk reduction initiative is likely to vary from site to site, almost always, the process will include local and provincial officials, disaster management personnel, NGOs and community-based organisations (CBOs) in the area, community leaders and other representatives of stakeholder groups.

FACILITATOR'S TIP

How to get key government officials and stakeholders interested and involved

- Meet with the director of each relevant government department to explain the initiative. Also seek advice about ongoing projects in the settlement and ask for the contact details for field staff and other personnel who should be consulted.
- Meet with the front line (field) staff from each relevant government department to explain the initiative, get advice on related projects and activities and discuss how this process can add value to existing programmes.
- Identify and meet with the local council and sub-council managers. They can help identify the ward councillor working in the selected settlement, who is an absolutely critical stakeholder. He/she is often the settlement's 'gatekeeper' and can help to identify and contact community leaders, as well as **Community Development Workers (CDWs)**, NGOs, CBOs and other community members who should be involved.

3.3.3 Do background research on the settlement's risk and development profile

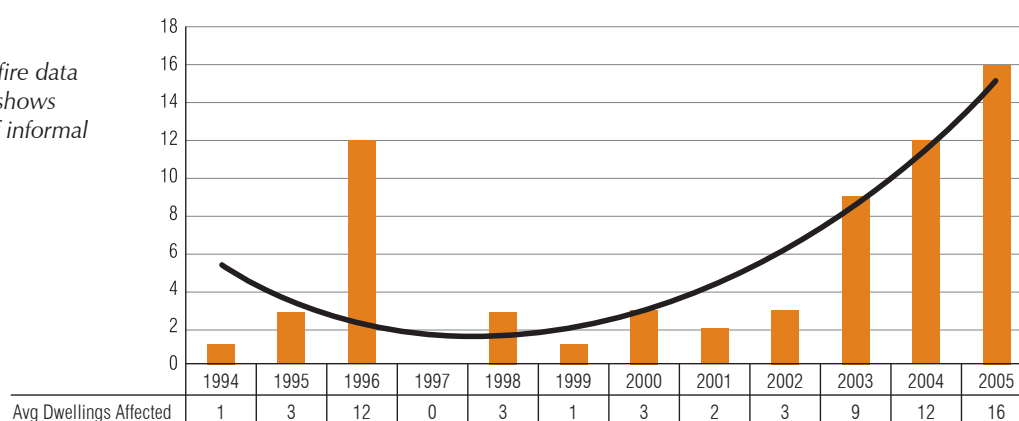
It is essential to gather background information on the settlement as part of the preparatory process. You need to understand the settlement's history, socioeconomic profile and disaster risk context. You will need to gather and consolidate information from a range of sources, as laid out in the table below:

Table 3.2 Gathering and consolidating information from a range of sources

For information on a settlement's:	Consult:	Locate and review:
Disaster risk profile	• Disaster risk management and fire services • Roads and Stormwater officials • NGOs/CBOs in the area	• Newspaper articles • Disaster events databases (eg MANDISA for fire in the CoCT) • Post-disaster reports • Graduate studies/theses
Socio-demographic profile and history	• Municipal authorities • Research and development organisations who have conducted settlement-based surveys	• Municipal reports • Published NGO or other studies • Census and poverty/other surveys

For information on a settlement's:	Consult:	Locate and review:
Service delivery information and development plans	• Municipal authorities, including planning departments and informal settlement departments • Community development forums • Health workers in area	• IDP documentation • Planning and in-situ upgrading documents • Roads and stormwater documentation • Clinic health data

Graph 3.1 Average number of dwellings affected per event from 2004 to 2005



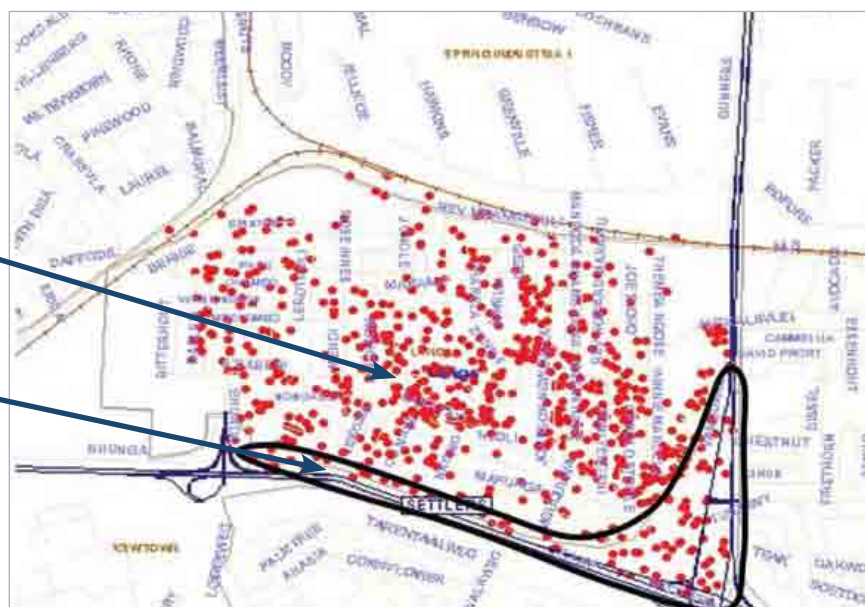
Map 3.1 Fires in informal dwellings in Langa

This map shows informal fires in the Joe Slovo area of Langa, Cape Town (1995-2004). Each red dot represents an informal fire event.

This area outside the black lines represents the formal suburb of Langa.

This area within the black lines represents the Joe Slovo informal settlement.

Note that fires occur in informal dwellings in both areas!



It is also useful to obtain spatial information and detailed maps of the area. Table 3.3 summarises useful types of spatial information that should be sourced as part of the preparatory research.

Table 3.3 Useful types of spatial information that should be used as part of the preparatory research

Types of Spatial Information	What do these show us?
District and metropolitan area level maps	They locate the settlement geographically within a district or city and show relevant features such as mountain ranges, rivers, wetlands, coastlines and major roads.
Municipal level maps	They provide more detailed information on the site and help to locate the settlement within its local environment.
Aerial photographs	They provide an overview of the settlement, including the location and number of structures, its perimeter and immediate proximity to features such as roads, rivers and wetlands.

The four photographs below illustrate settlement expansion and density over time in one informal settlement on the outskirts of Cape Town.



Time-series aerial photograph illustrating the change in settlement size and density over time. 1998



Time-series aerial photograph illustrating the change in settlement size and density over time. 2000

Time-series aerial photograph illustrating the change in settlement size and density over time. 2002



Time-series aerial photograph illustrating the change in settlement size and density over time. 2004



FACILITATOR'S TIP**How to use aerial photographs in the CRA**

Where possible, compile a set of **time-series** aerial photographs, like the ones on pp 31 and 32 that shows changes in the characteristics of the settlement over time (for instance density patterns, rate of spread, new roads).

The photographs can be displayed during the community risk assessment process as a prompt for discussion about changes in the settlement's risk profile over time.

For more information on where to find maps, contact the planning department in your municipality. In some district municipalities and metros, there may be a department that specialises in GIS (Geographical Information Systems).

Other sources include Map Studio (www.mapstudio.co.za) or the Provincial Directorate of Surveys and Mapping in the Department of Land Affairs (especially for topographical maps).

What if there are very poor records and no maps?

For newly-established settlements, there may be very limited formal documentation. It is always possible, however, to locate the settlement on a map or by using a spatial locator like *Google-Earth* (<http://earth.google.com>).

Background history on the settlement and its general socio-demographic profile may need to be recreated through consultation with the local councillor, early residents of the settlement or with other resource people.

General insights on the experience of fires and flooding may be available from emergency responders and CBOs familiar with the settlement, even if detailed recorded information is not readily available.

3.3.4 Make clear administrative and logistics arrangements with key stakeholders

It is simply **not possible** to try to perform a risk assessment at the last minute. Successful participatory processes in informal settlements take at least two to four weeks to arrange.

FACILITATOR'S TIP**Risk assessment checklist**

There are six things that you must do before the field assessment:

- Reach an agreement with key stakeholders on dates and times.
- Ensure that you have the right mix of participants.
- Develop a three-day programme that works.
- Identify, book and reconfirm an appropriate venue, and catering.
- Decide on and organize the assessment team.
- Consolidate all background materials, stationery and GPS equipment.

What are some of the challenges around dates and times?

If you schedule a risk assessment during work hours, residents who are employed usually cannot attend. This can limit the assessment's results and potential for follow-up action due to the absence of better resourced and informed community members.

In areas where there are high demands for seasonal or casual labour (ie in farming communities), there might also be few attendees if the risk assessment is scheduled during the harvesting or other high season.

Local government employees also have time constraints. Many field personnel are responsible for large areas, support a number of informal settlements and have demanding service delivery obligations. This makes it difficult for them to commit to a three-day process in one specific settlement. During high-risk seasons (ie the hot, dry summer months and wet winter months), it is unrealistic to expect fire fighters, disaster risk managers or roads and stormwater field staff to be available for a three-day process.

It is also not advisable to plan a community risk assessment during local or national elections or during the summer or Easter holidays when many residents visit their families in the Eastern Cape.

What is the right mix of participants?

A good number of participants is between 20 and 30 people. However, this should also reflect the size and experience of the facilitation team as well as the facilitator:participant ratio. A workable ratio is one facilitator to five participants.

From the community, there should be representation from the local leadership (ie councillor and community leaders), community development workers, as well as both men and women residents. Also make sure that there is representation from marginal groups (eg minority nationalities and refugees) and that those participating do not represent one political affiliation only.

From the municipality, it is ideal if field staff from the front-line risk management and essential services attend. Departments that should ideally be represented are fire services, disaster risk management, environmental health, solid waste management, roads and stormwater, housing and development planning. Participation by representatives of SAPS, Social Services and other national and provincial departments may also be useful.

A note on transport: if the venue for the risk assessment is not within easy walking distance from the settlement, then transport may need to be arranged. Confirm the pick-up point and time directly with participants the day before – and if necessary, again on the morning of the first day of the risk assessment.

FACILITATOR'S TIP**Are you sure who's going to attend?**

One to two weeks before the scheduled risk assessment compile a list of likely participants that includes their positions, cell phone numbers and landlines if applicable.

A week before the date: telephone all likely participants to confirm arrangements and their attendance.

One to two days before the date: telephone again to confirm arrangements, and to identify any last-minute participation difficulties.

How is a three-day risk assessment process structured?

This guide is structured around a three-day process that begins with an introduction to important disaster risk concepts, progresses through a joint process of assessing hazards, vulnerabilities, capacities and risks – and concludes with a platform for risk reduction planning.

The table below contains a more detailed agenda.

Table 3.4 Day-by-day breakdown

Day	In the Morning	In the Afternoon
Day One	Welcome participants and introduce key concepts: hazard, vulnerability, disaster, risk.	Identify causes and effects of settlement disaster risks and which groups are more at risk and why.
	Identify the settlement's primary hazards and the idea that people may view risks differently.	Identify the seasonal patterns and cycles (time of year, month, week or day) of each risk.
Day Two	Build understanding of the frequency and scale of previous disaster events and relate these to changes in the settlement over time.	Strengthen understanding of local vulnerability factors, as well as capacities that reduce disaster risks.
	Establish the spatial extent of disaster risks in the settlement and map the location of houses, roads, rivers and other features, as well as the situation of key services. Identify the social and institutional resources available within the settlement to reduce risk.	Improve understanding of factors that generate and drive vulnerability through field observation and interviews. Integrate understanding of priority risks and the factors that reduce vulnerability.
Day Three	Identify the local risk management capacities and strategies used and build a vision of a safer area.	Provide feedback to key stakeholders and agree on mechanisms to implement risk reduction priorities.

Carry out an orientation transect walk ahead of the CRA

When you plan the risk assessment programme, you should also have a good understanding of the settlement's location and the spatial, geographical and other features. Carry out at least one transect walk through the settlement

with a knowledgeable resident or community leader **before** the formal assessment date, to observe possible hazards and risk conditions.

The transect walk should also inform decisions on how best to divide the larger group for transect walks in the actual assessment. This must definitely be a **walking** and not a **'drive-by'** exercise.

Pay attention to areas that are further away from the main access routes and serviced zones, or on slopes and in wetlands. Poorer residents and more recent arrivals often live in these less desirable areas.

What kind of venue is best?

Find a community hall or centre, either within the settlement or close by. Check that it can be booked for three days and find out what facilities and equipment it provides. Check for electrical outlets, furniture (ie chairs and tables) and catering capacity (eg an urn for boiling water).

Be sure to have cell phone contact details for the caretaker of the venue and his/her supervisor and pay venue deposits timeously to confirm the booking.

What about catering?

Catering is also important, especially when unemployed informal settlement residents have been invited to participate in a three-day process. Catering arrangements for refreshments and lunch should be made and budgeted for. If an external caterer is engaged, s/he will need to be informed if there is no electricity. If there is no local caterer, the facilitation team must arrange the food.

The day before the risk assessment, telephone the caretaker and caterer again to reconfirm arrangements and approximate numbers attending.

What constitutes a good risk assessment and facilitation team?

The risk assessment team ideally should comprise three or four people who combine participatory facilitation skills, a strong knowledge base about disaster risks in informal settlements and demonstrable competence in applying risk assessment methods and tools.

Members of the team should be fluent in the languages spoken in the Western Cape (Afrikaans, English and isiXhosa), and they should be able to communicate the nuances associated with important risk concepts in each of the three languages.

The team should comprise men and women, ideally of varying ages, to signal respect for community leadership and more senior stakeholders. Older members in the facilitation team will bring the necessary maturity to respond to the hardships faced by poor households in informal settlements. As younger personnel may feel quite overwhelmed by the problems identified, it is necessary to have older colleagues to support and mentor them as they build facilitation skills and confidence. However, younger risk reduction practitioners may have had a stronger formal education, are more technically skilled, have more energy and are more open to new ideas.

When to finalise the programme?

One to two days before the risk assessment, finalise the programme in a simple document and make photocopies for all participants. The programme should be available in the main language spoken in the settlement.

What equipment and materials to take along?

It is not advisable to work with complex presentations, such as Power Point in most CRA processes. They often discourage active participation of settlement residents and increase the complexity of both logistics and security in the field.

There is a wide range of materials that should be prepared in advance. The team must:

- Organise **general stationery**
- Organise **equipment**
- Prepare **background materials** for general use
- Prepare **materials for specific sessions** and group work.

Estimates below are for 30 participants

Table 3.5 General stationery

Item	Quantity
Flipchart packets	4
Pens for participants	1 per person
Coloured marker pens (four sets of at least four colours)	16
Prestik or other adhesive (eg masking tape)	2 packets
Scissors	3 pairs
A4 cardboard sheets that can be cut into smaller labels (4 colours) (to be cut into around 10 labels per A4 sheet)	60 sheets
A4 lined note paper or Lined writing pads	10 sheets per person or 1 pad for ten people
Stapler and staples	1
Hole punch	1

Table 3.6 Equipment and materials

Item	Quantity
Flipchart stands	4
GPS instrumentation (optional)	4
Styrofoam or disposable cups	5
Small stones or marbles in a container	3 per person

General materials for facilitator

- Large (A0) aerial photographs of the settlement (One large photograph, or two or three aerial photographs taken of the site over the past 10 -15 years)
- Master folder containing CRA programme and background documentation on the settlement (See 3.3.3, p 29)

Materials to support working groups

For each group of ten people:

- Three folders containing the CRA programme and background information on the settlement (see 3.3.3, p 29)
- Three x A3 or A4 aerial photographs of the settlement.

Session-by-session advance preparation

FACILITATOR'S TIP

Advance preparation

- Just about all sessions need advance preparation.
- Coloured marker pens, flipcharts and Prestik or masking tape are needed in all sessions. This information is not repeated in the individual session descriptions.
- Additional materials, including flipchart templates (see pp 38 – 40) should be prepared for individual sessions.

Table 3.7 Session-by-session advance preparation

Activity	Other Materials Required	Preparation (Refer to 4.6, p 102 with templates)
Day One		
Session One		
Welcome and introductions. Assessment overview		
Session Two		
Introduction of key concepts	CRA toolkit	Display sheets from toolkit, in the appropriate language (you may need flipcharts and stands for more than one language). Cover each toolkit sheet with a blank flipchart – Show the heading only.

Activity	Other Materials Required	Preparation (Refer to 4.6, p 102 with templates)
Hazard identification and prioritisation	5 x small cards per participant 60 stones or marbles 5 – 10 Styrofoam cups	Collect stones before the risk assessment and place in cups.
Session Three		
Problem tree	5 x A4 cardboard sheets in one colour per group 5 x A4 cardboard sheets in another colour per group Flipchart with small group instructions	Cut cardboard sheets into 10 labels/sheet. Each group to get a pack of 50 labels of each colour.
Session Four		
Seasonal calendar	Pre-prepared monthly seasonal calendar for each group (refer to 4.6, p 103 with templates) Flipchart with small group instructions	Rule up 3 to 4 flipcharts (one per group) Prepare 1 weekly chart for fires.
Day Two		
Session One		
Risk history table	1 x prepared risk history table for each group Flipchart with small group instructions	Prepare a flipchart with headings containing proposed time divisions (for presentation to the large group). For each group, rule up a flipchart with 4 to 6 columns divided into the same time periods.
Session Two		
Community mapping	3 to 4 (A3 size) recent aerial photographs or maps of the settlement per small group. Flipchart paper Flipchart with small group instructions.	Obtain a recent map or aerial photograph of the settlement. Make 12 to 15 copies (black and white copies are fine).
Venn Diagram	Packs of 30 coloured paper circles for each small group. Flipchart with small group instructions	Cut out three sizes of coloured paper circles, sufficient for 10 circles per size per group. Make packs of 30 circles per small group (10 circles x each size). Tape or glue two blank flipcharts together end to end.

Activity	Other Materials Required	Preparation (Refer to 4.6, p 102 with templates)
Session Three		
Transect walk	Large aerial photo or map of settlement Flipchart with transect walk instructions Note-paper/observation forms for transect walk	Use community maps/aerial photos for each risk type x each transect walk team (ie 3 or 4 maps or photos)
Day Three		
Session One		
Risk management capacities matrix	Flipchart with small group instructions Pre-prepared matrices for each group	Tape or glue two blank flipcharts together. Prepare them as shown in template
Answering the six guiding questions	Pre-prepared flipcharts for each group	Tape or glue two blank flipcharts together. Prepare them as shown in template
Solutions/objectives tree	Flipchart with small group instructions 5 x A4 cardboard sheets in one colour per group 5 x A4 cardboard sheets in another colour per group Original Problem Tree from Day One for each group	Cut cardboard sheets into 10 labels/sheet. Each group to get a pack of 50 labels of each colour
Session Two		
Feedback to stakeholders		
Session Three		
Risk reduction planning and implementation		

Chapter summary

1. *Participatory risk assessment* is one of a range of methodologies that engage communities developmentally and use highly participatory approaches. They all emphasise a bottom-up approach that aims to empower communities by involving them in defining problems, deciding solutions, implementing activities and evaluating the results of interventions.
2. *Participatory risk assessment* is an approach that provides insights into how risks are generated and reduced within a community or settlement. It can be applied in almost any context, urban or rural, and can be carried out within specific sectors or by specific departments (see Chapter 4). It can also take the form of an integrated process across sectors within one specific settlement or as part of a holistic planning process used by a community-based organisation.
3. The integrated risk assessment and planning process involves three **phases**, with clear **activities** and **outcomes**.
4. Phase I focuses on preparatory groundwork. This is the most important phase in the risk assessment and risk reduction planning process and should take one to two months to complete.

Carrying out a participatory community risk assessment

Thembi carefully turned the handle of the pot away towards the wall, so that her little brother would not try to reach for it. When the fire fighters came to her school, they told her class to be very careful around fire and hot things. They told them never to leave a pot of food or water unattended on the stove, to make sure the pot handles were safely out of the reach of smaller children, and never to sleep with a candle burning. She thought it was good advice as so many children got burned by fire these days. Just last week she heard that Siphwiwe's little sister burned her arm when she knocked over the paraffin stove while playing a game with her friends. They were so lucky that Siphwiwe knew how to cool the burn, by putting his sister's arm in a basin of cool clean tap water for 20 minutes.

Now when Thembi cooked lunch for her little brother and sister after school, she was careful not to let them too close to the stove, but it was difficult to keep an eye on them all the time. She wished she did not have to care for them alone, but her mother only got home from work at six, and she was the oldest. She was determined that nothing was going to happen while she was in charge, but just in case, she had taught the little ones to 'stop, drop and roll', just as the firemen had showed them at school. She had also got her mother to help her fill a bucket with sand, which she kept near to the stove...



A little girl leads her brother around a pool of water

- 4.1 Introduction**
- 4.2 Community risk assessment: Day One**
- 4.3 Community risk assessment: Day Two**
- 4.4 Community risk assessment: Day Three**
- 4.5 Cross-cutting and supplementary tools**
- 4.6 Templates for flipcharts and other materials**
- 4.7 Community risk assessment report: suggested outline**
- 4.8 Chapter summary**

Overview

This chapter presents an end-to-end risk assessment process that takes three days. While this is a practical way to complete a participatory risk assessment, each of the activities described can also be carried out individually or used to add value to other development planning processes.

4.1 Introduction

4.1.1 Community risk assessment (CRA) outcomes

A well-conducted participatory risk assessment can help build a shared understanding of local risks and possible reduction measures. It can also strengthen cooperation and trust among those who participate, which are just as important as generating reliable assessment results. This especially applies in settlements where residents do not know each other well or where there has been limited cooperation between the residents and local officials.

CRA tasks

CRA tasks:

- Conduct a risk assessment that is participatory, inclusive and robust
- Write up a report and communicate the findings to key stakeholders

By the end of the CRA, there should be:

- A useful and robust community risk assessment
- Shared understanding and agreement on the settlement's risk profile
- Commitment by key stakeholders to jointly reduce identified disaster risks
- A written and disseminated report for key stakeholders.

What are the technical outcomes of a robust and participatory CRA?

A well-conducted CRA is an important learning opportunity for all stakeholders. It increases awareness about potential risks that might not be fully understood or about risk conditions believed to be unchangeable. It generates three clear technical outcomes. These are shown below.

Table 4.1 The technical outcomes of a robust and participatory CRA

Technical Outcome/ Deliverable	Detailed Explanation
Clear identification of priority hazards and risks in the settlement	Hazards and risks should be identified, listed and described in terms of their recurrence, seasonality, location and people's knowledge of them.
Clear spatial representation of risk conditions that can be upscaled into IDPs and Spatial Development Frameworks (SDFs)	Hazards, sites of vulnerability, natural resources and community facilities/ services and infrastructure should be captured in community-drawn and/ or digitised maps
Clear identification and assessment of risk-associated vulnerabilities and capacities	Settlement vulnerabilities and capacities should be examined and recorded, both for the settlement as a whole and specific vulnerable groups exposed to hazards or most susceptible to their effects. Vulnerable groups include women, children, the elderly, sick and disabled, but may also include other groups such as people living in more marginal areas of a settlement, recent migrants, ethnic minorities and foreign residents.

4.1.2 How best to work through the CRA process

Summary table for each day, with:
Objectives, Process, Activities, Timing
Each day has 3-4 sessions:
Session 1, Session 2 Session 3, Session 4
Each session describes:
1- 3 specific risk assessment activities
Each activity is presented as:
Objectives Method / Approach Materials / Equipment Procedure Consolidation

4.2 Community risk assessment: Day One

*A facilitator discusses
environmental health issues*



Day One summary

By the end of the day, there should be:

- Trust and mutual respect among those attending
- A shared understanding of basic disaster risk concepts
- Agreement on the priority hazards and risks in the settlement
- A shared understanding of how vulnerability conditions drive the settlement's priority risks
- An understanding of the times, days, months and seasons when priority risks are more serious.

Table 4.2 Community risk assessment: Day One

Session	Time	Activity and Page no	Process
One	09:00 – 10:30	Registration of participants Welcome, introductions and group ice-breaker p 47 Overview of CRA p 47	Introduce those attending, including facilitators, settlement residents, government and other role players. Introduce risk assessment objectives/ process.
TEA			
Two	10:50 – 12:30	Facilitator-led participatory learning activity supported by toolkit p 48 Hazard identification and prioritisation p 50	Introduce key concepts for understanding disaster risks. Allow definition of the priority hazards facing the settlement. Build appreciation of differing risk perceptions.
LUNCH			
Three	13:30 – 15:10	Problem tree p 54	Identify the causes and effects of prioritised risks. Build understanding of how vulnerability progresses and who is most at risk.
TEA			
Four	15:30 – 16:30	Seasonal calendar p 58	Identify the seasonality of prioritised risks - ie the month or time of week or day when disaster risk is highest.

4.2.1 Day One Session One: Welcome and introductions

(90 minutes)

Session purpose

This opening session allows all participants to introduce themselves and for the risk assessment team to clarify both the purpose of the CRA and the three-day process. The team should aim to build enabling relationships among those attending.

The opening session works best if it is co-facilitated by two people, especially if those attending represent two or more main language groups (eg Afrikaans and isiXhosa). It will also work best if it is led by a skilled process facilitator who is able to communicate in the dominant language group of those attending, supported by other members of the assessment team.

An ice breaker in the first session can help bring positive energy into the group, breaks down social barriers if participants have not met previously and can stimulate lively discussion in the group.

FACILITATOR'S TIP

Languages

The facilitation team must assure participants right from the start that they can speak or write in whatever language they feel most comfortable or confident.

It is the risk assessment team's job to provide translation and to interpret different understandings across languages and experiences.

4.2.2 Day One Session Two: Key concepts and key hazards

(90 minutes to 2 hours)

Session purpose

This session aims at introducing the key terms for discussing disaster risks. It achieves this by drawing on participants' perceptions and experiences and relating these to internationally-recognised terminology.

It also aims at identifying and ranking the main hazards facing the settlement, through a participatory hazard identification and ranking exercise.

The session comprises two parts: Activity A and Activity B.

Table 4.3 Activities

Methods/Approach	Activity Focus	Approx Time
Facilitator-led participatory activities in one large group	Activity A: Define Key Terms	45 mins +
	Activity B: Hazard identification and ranking (prioritisation)	1 hour

Activity A: Define key terms

Objectives

1. Introduce and build a shared understanding of the key disaster terms ('risk', 'vulnerability', 'hazard' and 'disaster').
2. 'Ground' these definitions in the participants' own experiences, understanding and languages.

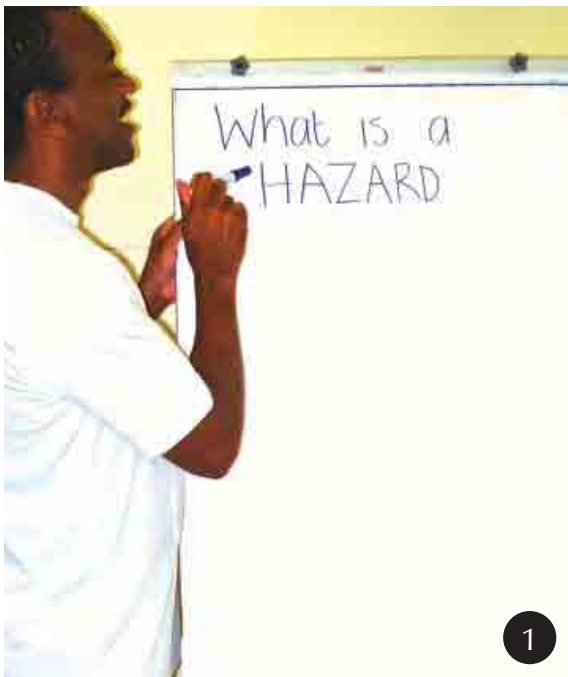
Materials/equipment

- Laminated flipchart of key terms open at the heading 'risk' and covered by a blank piece of flipchart paper below the heading
- A second flipchart displaying the heading 'hazard' in the second major language of the settlement.
- Cover the definition below the heading with a blank flipchart.

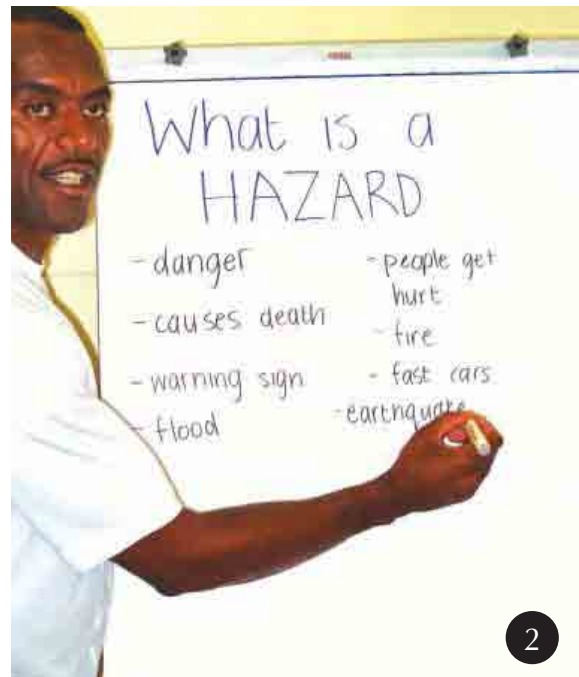
Procedure

1. Introduce the session, explaining that it is a good idea to have a shared understanding of the important terms that will be used over the next three days.

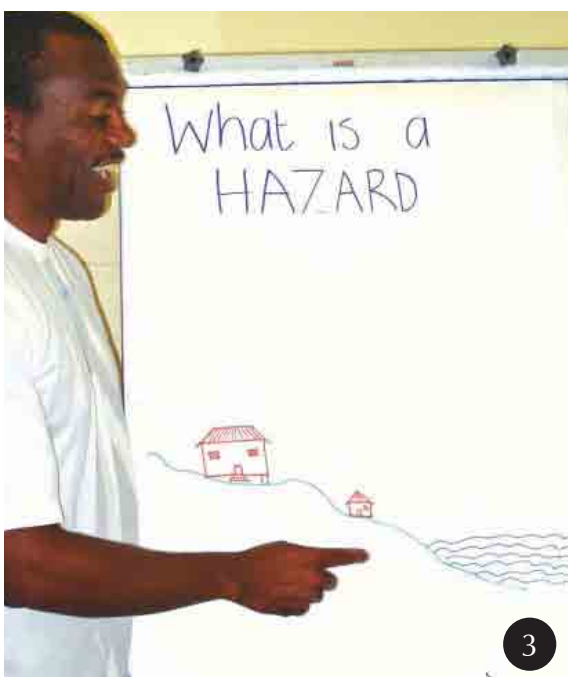
2. Point to the word 'hazard'. Ask participants: "What does this word mean to you?"
3. Write these responses in a list on the blank flipchart sheet. Encourage participants to tell their stories.
4. Sketch a simple drawing that illustrates the meaning of hazard.
5. Introduce the formal definition of hazard by lifting up the chart and reading out the definition. Ask participants for any responses to this.
6. Repeat this process for 'vulnerability' and 'risk' – each time, starting with participants' own understanding of the terms – and then introducing the recognised definition and grounding it in the local context and meaning.



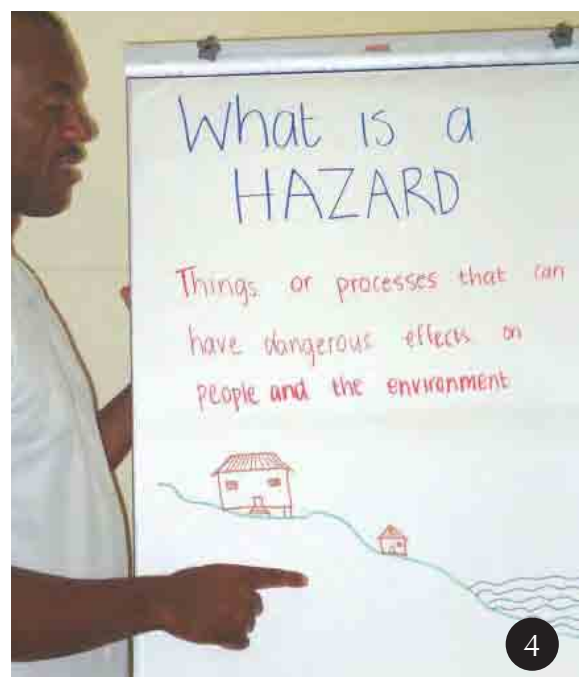
Facilitator poses the question 'What is a hazard?'



Facilitator writes down participants' suggestions



Facilitator explains 'hazard' with a drawing



Facilitator reveals definition

FACILITATOR'S TIP

Introducing key concepts

A good example that illustrates risk, vulnerability and hazard is one with a river and simple structures drawn alongside it.

When illustrating **risk**, you can discuss the possibility of the danger of flooding, and ask is it the river by itself...or proximity to the river that creates the risk of flood damage?

This leads into discussions about **vulnerability**: are all households equally exposed to flood risk ... or are some families more vulnerable?

The concept of **hazard** is also easily related to the river – which might normally be a resource as it brings water. However, ask what happens to the river when there is heavy rainfall. It becomes dangerous ... or a **hazard** and those **most vulnerable** to it are at greatest **risk**.

Note that the **disaster** definition is drawn from South Africa's Disaster Management Act. This is a good opportunity to refer to the Act and its emphasis on reducing risks – not just responding to disasters.

For an Afrikaans and isiXhosa translation of the key terms, see p 102 in the template section (4.6).

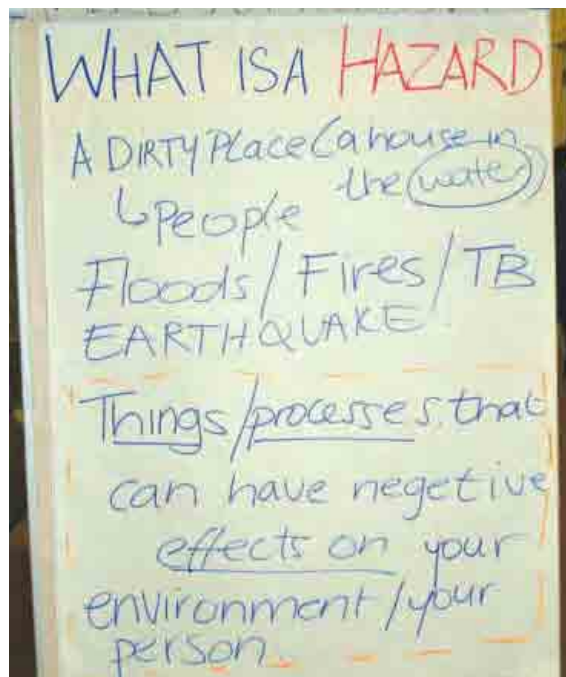
Consolidating the activity

1. Conclude the activity by inviting feedback and questions about the terms.
2. Explain that these terms will be used frequently over the next three days to help identify the most important risks in the settlement and strategies to manage them better or reduce them.

Activity B: Hazard identification and ranking (prioritisation)

Objectives

1. Apply the **hazard** concept to the conditions in a specific settlement.
2. Identify the primary hazards within the settlement.



Defining a hazard using flipchart paper

- Affirm residents' knowledge of local hazards.
- Show that there are differing perceptions of risk, even within one settlement.

WHAT IS... Hazard identification and prioritisation?

This two-step process allows participants to first brainstorm or list the hazards or threats that they individually view as significant. The second step (prioritisation or ranking exercise) allows them to 'vote' for the three threats that they feel are most important. This makes it possible to focus on three or four priority threats for the rest of the activity.

Figure 4.1 Hazard ranking

Hazard									
ENVIRONMENTAL HEALTH/ HEALTH (21)	TB HIV is the hazard in my area. People they die Singerayo TB mganyayimanz amalak amileyo	Dirty place Many diseases eg. TB, HIV/ AIDS A place that doesn't have toilets. People use buckets	ninkhalat angsenan isiTo Toilet buckets Carbon dioxide cause asthma dirty water	Lheriping People throw dirty things near the houses No toilets or taps No Healthy like taps water condition	The water that stuck in the street turns green The dirtiness of the place. You can get lots of diseases	A hazard is a place that is dirty. There is no water Dirty places eg. Floods, dirty places, people has a dumping	Water is not rinsing the road kids play in it Littering/ Dumping Dirty papers	We don't have flush toilet Dirty rubbish its part of my family to stay at a dirty place like TB	
FLOODING (7)	Flood caused ebantu befe bonke not mma nledwa	Waters are not running. Causes TB	diathooa to the person Blocked drain water stands	lot of water when it's raining	Water come in the house	Floods	water leads to wetness in house		
FIRE (8)	Hazard is dangerous fire in shacks	Fire: because we do not have enough water to need fire brigade	Fire Fire	ngumiloxo- kutsho yi iflegu nyadubula ishige	Fire, HIV/AIDS in our community	noxa mbaas/that's umilo ingayim- go zi mshise	Fire		
OTHER	overcrowding	car accident	Main Experienced	Lack of services by council	Lack of Education	The people is dangerous			

Materials/Equipment

- 5 x pieces of cardboard per participant
- Pens – 1 per participant
- Stones or marbles – 3 per participant
- 5 – 10 styrofoam or paper cups or plastic tumblers

Procedure

This activity has two parts:

- Hazard identification, where participants **identify** key hazards from their experience
- Hazard ranking, where participants **prioritise** the most important hazards.

An example of a hazard listing and hazard ranking activity. Participants write down hazards or problems experienced in their area and these are then put into clusters. In this example, environmental health is seen as the biggest issue, followed by fire and flooding.

a. Hazard identification

1. Introduce the activity and its purpose – to identify the priority hazards in the settlement.
2. Distribute five small cards and a pen to each participant and give the instruction shown below.
3. Collect the cards and ask participants to move closer to help with sorting the cards.
4. On a table or the floor, organise the cards in hazard categories (eg fire, flooding, crime, environmental health problems).
5. Identify the main hazard clusters from this.

PARTICIPANT INSTRUCTION

Hazard identification

Think about the hazards that you live with every day, or that affect you and your family.

Then write down what you think are the five most important hazards, on the cards (one hazard per card).

FACILITATOR'S TIP

Hazard identification

Often, participants will not write exact hazards, but rather an observation or experience, for instance 'the house has dirty water outside'. This often happens with urban flood-related hazards. You may need to guide or prompt participants so that they can identify relevant hazards and then lead the process of grouping these according to coherent hazard clusters – explaining your logic to the larger group.

b. Hazard prioritisation

1. Explain that although there are many different types of threats or hazards in the settlement, the risk assessment process must focus on the three or four most important ones.
2. Ask a participant to label each of the disposable cups with a specific hazard cluster heading (eg 'fire') identified in the activity before and place these on the table.
3. Write a list of the five to ten identified hazards on a flip chart.
4. Hand around the small stones (or marbles) in the container and give the instructions shown below.
5. Ask a participant to count the stones or marbles in each cup.
6. Write these totals next to the matching labels on the flip chart.
7. Identify the top three hazards (ie the three cups with the most stones).

PARTICIPANT INSTRUCTION

Hazard prioritisation

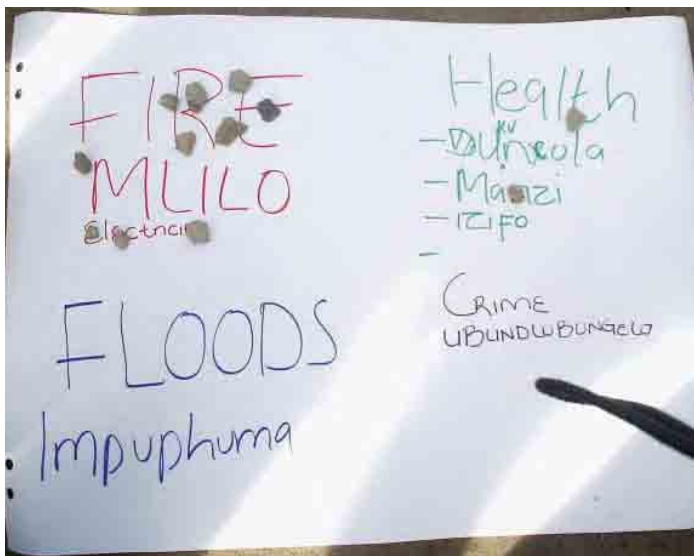
Take three small stones (or marbles) from the container being passed around.

What, in your opinion, are the three most important hazards when you compare the hazards written on the cups?

Place one stone (or marble) in each of the three hazard cups you feel is the most important.

Consolidating the activity

1. Explain that although the hazard identification process resulted in the group noting a large number of threats, it is best to start with the three or four that the group voted as being most important.
2. Explain that the top three hazards identified by the large group will now be the main focus of the next two to three days.
3. Invite comments and feedback from the participants about the process and address questions or concerns.



An example of a method for hazard prioritization. Participants prioritise hazards using stones. Fire is seen as a priority in this ranking exercise as there are ten stones placed on 'fire'.



Participants 'vote' for the hazard they see as most important by putting stones into different cups, representing the different hazards

4.2.3 Day One Session Three: Exploring causes and effects of priority hazards

(90 minutes: 60 minutes in small groups, 30 minutes report-back)

Session purpose

This session aims at building an in-depth understanding of each of the priority hazards identified in Session Two. It highlights the causes and effects of the main hazards and shows how vulnerability conditions worsen their impact.

Objectives

1. Identify the causes and effects of the priority hazards.
2. Show how vulnerability conditions can progress and worsen the severity of these hazards.
3. Identify and understand the direct and indirect knock-on effects of the risk or hazard.

Method

This is primarily a small-group activity with around seven to ten participants clustered into each of three hazard groups agreed on in the previous session (ie 'fire', 'flooding', 'environmental health hazards').

Use a problem tree to show the causes and effects of the disaster risks.

WHAT IS... *A problem tree?*

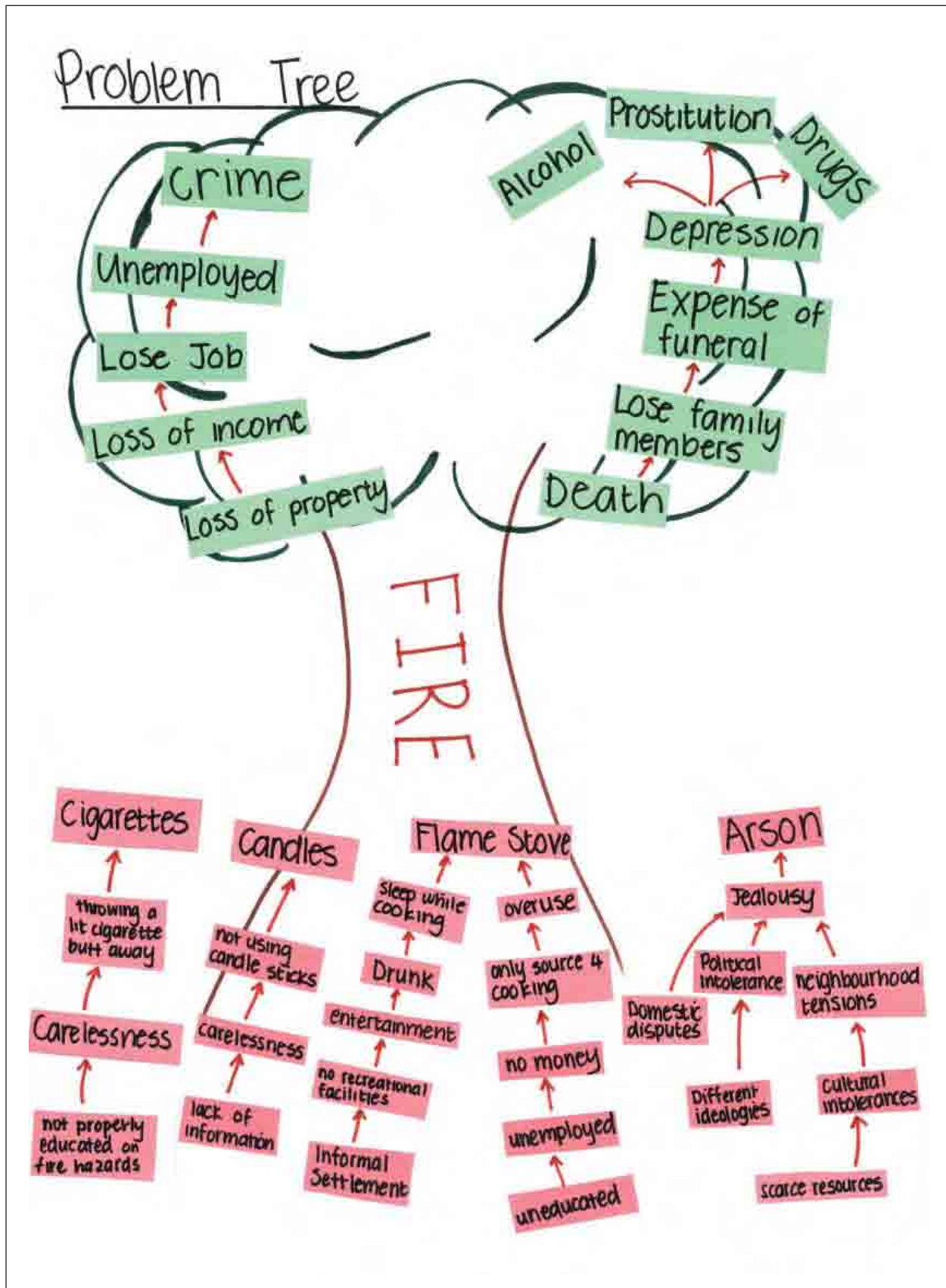
A problem tree is a flow diagram which shows the relationships between different aspects of an issue or problem.

It helps to analyse a situation by identifying the major problems and their causes. It also helps to clarify the context and relationships between several different problems, as well as potential impacts.

The output is a diagram of problems sorted according to causes and effects, joined by a core, or focal problem.

In the example on p 55, the tree trunk (or focal problem) is 'fire'. The pink cards represent the tree's roots (or causes of fire), while the green cards show the effects of fire in the settlement.

Figure 4.2 A problem tree



Materials and Equipment

- 100 cardboard labels for each small group (50 labels in one colour, 50 in a second colour)
- Flipchart displaying the six key risk assessment questions
- Flipchart with summary of small group instructions

FACILITATOR'S TIP

What are the six key questions for each risk?

An important first step in managing risks is to understand them, why they happen and who is most affected.

Six important questions need to be answered for each priority risk. They are:

1. Who is most at risk?
2. Why are they at risk?
3. When are they most at risk?
4. What is increasing (or reducing) the risk?
5. What is the outcome of the risk?
6. How do at-risk groups reduce and cope with the risk?

FACILITATOR'S TIP

Ask guiding questions only!

It is important that the facilitator asks only **guiding questions**. Don't lead the participants by giving examples of what you might want to hear, or by providing answers, no matter how obvious they might be.

It is crucial that participants arrive at the root causes and effects on their own, as this represents their own achievement. Participants will also reach a clearer understanding of the causes and effects of the risk or hazard.

Procedure

1. Begin by referring to the previous activity that identified the settlement's priority hazards.
2. Explain that the next two days focus on answering six key questions for each hazard, so these can be better understood and managed. Indicate the questions displayed in the top facilitator's tip on this page.
3. Introduce the next activity, called 'Problem tree' which helps to show the causes and effect for each hazard.
4. Explain that this activity will take place in small 'hazard-specific' groups (eg a fire or flood group).
5. Divide participants into four groups of around seven to ten people each and explain that participants will work closely together in the

same small groups over the next two days. Each group will have a CRA facilitator.

6. Ensure that the members of each small group can communicate easily in the same language.
7. Refer to the flipchart summary for the activity and outline the tasks to be carried out in small groups (see the instruction shown below).
8. Ask participants to meet in their groups and give the instructions outlined in the Participant Instruction feature below.
9. Ensure each group has a flipchart, coloured markers, prestik and a pack of coloured cardboard strips.
10. After 60 minutes, reconvene the large group and invite each small group to report back.
11. Encourage discussion and lively debate after each report-back. Ask groups to highlight any surprises or new information from the activity.
12. Identify recurrent causes and effects and cross-linkages between hazards.

PARTICIPANT INSTRUCTION

Problem tree

With your facilitator in a small group:

1. Draw a large tree covering the whole flipchart. The tree must have a trunk (named with the hazard), a crown (showing its effects), and roots (showing the hazard's root causes).
2. What do you think are the **main causes for the hazard**? Write each cause on a single card – but make sure all the 'root' cards are the same colour. Arrange these as roots of your tree. Each cause should create one root.
3. For each cause, discuss what causes that or, why the cause happens. Each time another underlying cause is identified it should be written on a piece of cardboard and placed lower than the previous cause. Consider human actions, attitudes and behaviours as well as other factors in the settlement.
4. Repeat these questions until the primary root cause is identified.
5. Use the same process to identify **effects of the hazard**. What do you think are the main effects of the hazard?
6. Write each effect on a single card – but make sure all the 'effect' cards are a different colour to the 'root' cards. Arrange these as branches of your tree. Each effect should create one branch.
7. For each effect, discuss what it leads to. Each time another effect is identified it should be written on a piece of cardboard and placed above the previous effect. This helps identify knock-on effects.
8. Discuss your tree. What are the root causes that drive your risk, as well as the processes that make it harmful? What are its effects? How do these affect individual families and the settlement as a whole?
9. Identify a group member to report back to the large group.

Consolidating the activity

1. Explain that this activity helps to identify why risks like fires, flooding and crime exist and their effects. It shows how risks and disasters unfold as the result of a complex process – and that there is seldom one single cause.
2. Also add that the different problem trees show how vulnerability pathways sometimes differ for each of the risks.
3. Ask what this activity does not explain. For instance, it does not explain when the risks are greatest or which groups are more vulnerable. These questions will be answered in further activities.
4. Thank all groups for their insights in helping understand how the different vulnerability pathways contribute to the risks they prioritised.

4.2.4 Day One Session Four: Understanding the seasonal and weekly cycles of different risks

(90 minutes: 60 minutes in small groups, 30 minutes report-back)

Session purpose

This session aims at producing a seasonal risk profile for the vulnerability conditions identified in the problem tree activity. It does this by looking for the yearly, monthly and even weekly cycles for the vulnerability factors linked to each of the priority hazards.

Objective

Identify the seasonality and/or cyclicity of each priority risk - the time of year, month, week or day when vulnerability is highest.

Method

Use a seasonal calendar to record the months, weeks or days when hazards are most likely to affect the community.

This is a continuation of the small group process in the previous activity. Participants remain in the same groups as before (ie seven to ten people supported by a CRA facilitator).

WHAT IS... *A seasonal calendar?*

The seasonal calendar was first developed to help understand agricultural and other seasonal activities throughout a year's cycle. The method can also be used to examine the occurrence of hazard or vulnerability conditions over the course of a year, month, week or day.

A seasonal calendar is a tool that is used to identify periods of stress or particular vulnerability, and can focus on seasonal risks such as floods; social and economic conditions, such as 'slow work' periods; or processes such as holidays or harvesting.

Figure 4.3 A seasonal calendar

Seasonal Calendar													
Hazard Type: Environmental Health													
Problem	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Reason
standing water	✓									✓	✓	✓	more water used in these months
Flies											✓	✓	it is hot & dirty toilets smell more
Skin Rashes	✓									✓	✓	✓	because of dirty water and hot sand
Diarrhoea	✓									✓	✓	✓	dirty water and increase of germs
conflict between residents for water	✓									✓	✓	✓	more people use water
Dirty toilets	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	too few toilets & they always full
air pollution (inside)	✓	✓	✓	✓	✓	✓	✓	+dust ✓	✓	✓	✓	✓	stove is used for everyday cooking makes dust
Air pollution (outside)						✓	✓	✓	✓				the chemical for planting & ploughing during season

This is an example of a seasonal calendar used to examine environmental health. It shows that standing water, skin rashes and diarrhoea occur mostly in hot, summer months. The reason for this is listed at the end of the column.

Figure 4.4 A weekly calendar

Weekly Calendar								
Hazard Type: CRIME								
Problem	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Reason & time of day
Robbery / Stealing	✓				✓ >19:00	✓ >18:00am	✓ 9am - 11pm	FRI - people get paid so rob salaries SAT - rob people going shopping SUN - steal while people at church
House Breaking	✓	✓	✓	✓	✓			People are at work during the week. Weekends - people are at home
Rape	✓ 19:00 - 18:00	✓ 19:00 - 18:00	✓ 19:00 - 18:00	✓ 19:00 - 18:00	✓ 19:00 - 18:00	✓	✓	week - small children go home alone weekend - people are drunk

This weekly calendar looks at crime. It shows that housebreaking is common during the week when people are not home. It gives times and possible reasons why this happens.

Materials

- Four pre-prepared flipcharts ruled into 14 columns (left-hand column for impacts, effects or problems arising from the group's specific hazard – and right-hand column for the reasons or vulnerability factors that lead to the effect). The remaining 12 columns are for the months of the year: Jan to Dec.
- One prepared flipchart with nine columns with the seven middle columns for each day of the week (M, T, W etc). This is for the 'fire' group, which will have two or even three charts to work with. (Refer to templates for seasonal and weekly calendars, pp 103 – 104)

Procedure

1. In the large group, summarise what the group has achieved so far. It has identified priority hazards and their effects, along with factors that increase these (therefore, it has already addressed two of the six key questions).
2. Explain it is also important to identify when these risks are more serious, either in seasonal, monthly or even weekly cycles. This can be answered in small groups using an activity called a seasonality calendar.
3. Refer to the flipchart summary for the activity and outline the tasks to be carried out in small groups (see the instruction on p 61).
4. Ask participants to return to their previous working groups.
5. Give the instructions on p 61. Ensure each group has a flipchart ruled into 14 columns, coloured markers and Prestik. The 'fire' group should also have a weekly calendar with nine columns.
6. After 60 minutes, reconvene and invite each small group to report back.
7. Encourage group discussion following each presentation and lively debate. Ask groups to highlight any surprises or new information.
8. Provide technical clarification when different types of risks are clustered together. For instance, standing water can be caused by grey water, flooding, ponding or simple overland flow. Show why it is important to differentiate between these risks.
9. Ask the group to compare the seasonal risk profiles for the different risks. Are there similarities ... are there differences? Why? Do the same vulnerability factors (or reasons for increased severity) happen in the same months ...different months for different hazards? Why?

PARTICIPANT INSTRUCTION

Seasonal calendar

With your facilitator in a small group:

1. In the left-hand column, write down the most important effects of your hazard that you identified in your problem tree. (These can also include effects on household, work or other settlement activities).
2. For each effect place a tick (✓) or (X) in the months when it happens most.
3. Show differences with more ticks in the high risk months: for example, a single tick indicates low severity, while three to four ticks (✓✓✓) show that it is high.
4. In the right-hand column, discuss and write down the reason why these effects are more serious during these specific months.
5. Discuss when the risk is less serious (when is it not so bad?) and why. Leave these squares blank.
6. Review and discuss your seasonality calendar. Write your answers on a separate flipchart or underneath the seasonal calendar.
 - Why is the risk more severe in different months? Why do you think it is less severe at other times?
 - Do the different effects happen at the same time? If so, do they build up the risk so that it is even worse in these months?
7. If you are in the 'fire' group, repeat the activity for weekly fire risks (ie which days in the week is fire risk more serious?). If you wish, repeat this for the 24 hour cycle (ie which time during the day and night is fire risk the greatest?)
8. Identify a group member to report back to the large group.

FACILITATOR'S TIP

Can we do this without flipcharts and coloured markers?

If you do not have paper and pens, you can still generate a seasonal calendar. Using a stick, mark lines for the risk table on the ground. Then, use sticks, stones or other objects to show the severity of the risk over months or days.

Consolidating the activity

1. Explain that this activity shows that risks never stand still and are very dynamic.
2. It also shows that they often have patterns or cycles when they are more serious. These can be daily, weekly, monthly or annual cycles.
3. The cycles are not always the same for different risks (draw from examples on the flipcharts).
4. Understanding these cycles and patterns helps to lower the risk by focusing efforts before and during risk periods.

5. Ask what this activity does not explain. For instance, it does not explain whether the risk is getting more or less serious, which organisations or groups can help manage the risks, or who is the most vulnerable. These questions will be answered in further activities.
6. Thank all groups for their insights in understanding the seasonality of the different risks faced in the settlement.

FACILITATOR'S TIP

Wrapping up Day One

If this is the last activity for the day, thank participants for their involvement and confirm arrangements for Day Two (ie starting time).

4.3 Community risk assessment: Day Two

Day Two summary

By the end of the day, there should be:

- An understanding of the settlement's disaster risk history
- A shared awareness of the key stakeholders who can help reduce settlement risks
- An understanding of the spatial distribution of risks and underlying vulnerability conditions
- An understanding of the spatial distribution of key resources to reduce priority risks.

Table 4.4 Community risk assessment: Day Two

Session	Time	Activity and Page no	Process
One	08:30 – 09:00	Review of Day One p 64	Facilitator-led discussion of key concepts, priority hazards identified and seasonal/weekly risk cycles.
	09:00 – 10:30	Risk history table activity in small groups p 65	Build an understanding of the frequency and scale of previous disaster events. Relate trends in disaster frequency and severity to changes in the settlement over time.
TEA			
Two	10:30 – 11:30	Community mapping in small groups p 69	Map the location of houses, roads, rivers and other features, as well as key services. Map the perceived extent of the priority hazards and vulnerability factors.
	11:30 – 13:00	Constructing Venn Diagrams in small groups p 72	Identify and illustrate the social and institutional resources available within the settlement to reduce risk.
LUNCH			
Three	14:00 – 15:30	Transect walk in small groups p 76	Improve understanding of factors that generate and drive vulnerability through field observation and interviews. Integrate understanding of priority risks and the factors that reduce vulnerability. Improve potential for immediate action and monitoring through photographs.
TEA			
Four	15:45 – 16:30	Large group report-back session p 80	Integrate an understanding of spatial distribution of risks and resources.

4.3.1 Day Two Session One: Review of concepts and settlement's risk history

(2 hours: 30 minutes review, 60 minutes groups, 30 minutes report-back)

Session purpose

This session aims to reinforce concepts introduced on Day One and to give an overview of Day Two. It also aims at building a shared understanding of how disaster risks have unfolded over time and how these relate to other changes that have affected the settlement.

This session has three parts: Activities A, B and C.

Table 4.5 Activities

Methods/Approach	Activity Focus	Approx Time
Activity A in large group	- review concepts presented on Day One - give an overview of Day Two	30 mins
Activity B in small groups	develop a risk history table	60 mins+
Activity C in large group	report back from small groups	30 mins
Session duration		2 hours

Activity A: Review of concepts and overview of Day Two

Objectives

1. Reinforce key concepts and priority risks from Day One
2. Provide an overview of Day Two
3. Address any emerging participant concerns.

Method

A facilitator-led discussion with all participants in one group

Materials

- Flipcharts from Day One displayed on the walls
- Toolkit definitions on flipchart stands
- Flipchart displaying Day Two programme

Procedure

1. Welcome participants to Day Two.
2. Ask if there are any logistical concerns that need addressing. Respond to these.
3. Ask if there are any concerns or questions about the content covered in Day One. Respond to these using flipcharts, the toolkit and maps from the previous day.
4. Invite participants to use their own words to describe the key concepts of hazard, risk, vulnerability and disaster. Provide clarification as needed.
5. Refer to the flipchart displaying the Day Two programme and provide an overview of the day. Explain that for the morning, participants will

be working in the small groups from the day before. In the afternoon they will carry out a group assessment walk through the settlement.

Consolidating the activity

1. Restate the learning points from Day One ... the priority hazards identified, key vulnerability factors and effects and their seasonal and other cycles.
2. Emphasise that there are still other questions to answer, like 'has the risk become more serious over-time?', 'what resources are available to reduce it?' and 'is it equally serious throughout the settlement – or are there areas where it is more ...or less serious?' These are the questions that Day Two should answer.

FACILITATOR'S TIP

Adjusting the timing for Day Two

The programme given here includes three activities for one morning. This is a very tight schedule and leaves little room for long discussions. It may be more practical to drop the risk history activity below and lengthen the community mapping and Venn Diagram activities. This increases the time for each activity to one hour and provides a 30 minute report-back after the mapping activity.

Activity B: Understanding the settlement's risk history (optional)

Objectives

1. Generate an understanding of disaster events and disaster trends through a participatory examination of the area's disaster history.
2. Increase an appreciation of the forces driving (or reducing) different risks by reviewing changes in the settlement over time.

Method

Use a risk history table.

WHAT IS... *A risk history table?*

A risk history table is an adaptation of the timeline activity used in many participatory research exercises.

A risk history table helps you to build a sense of change over time and to show how developmental changes within and around the settlement may have increased or reduced specific risks.

Settlement residents may not have a precise recollection of dates and events. However, the activity helps to identify general relationships and trends over time.

FACILITATOR'S TIP

Risk history table

Wherever possible, the facilitator should come prepared with background information on past disaster events in the settlement (ie from discussions with municipal officials, from newspapers, from data collected elsewhere). S/he should also have an understanding of the settlement's general development, political history, land ownership and tenure status.

This is important because settlement residents often cannot recall years or months when specific events or changes occurred. There may even be widely varying opinions on the history of the settlement – especially if it was originally settled by one main ethnic group, but has experienced relatively sudden in-migration of other groups in the past five to ten years.

It is not important to get the dates absolutely right in this activity. The point of the activity is to get a sense of the settlement's development over time and how this relates to disaster occurrences at different stages as well as the settlement's changing disaster risk profile.

Figure 4.5 A risk history table from 1960

1960 TO 1970	1971 TO 1980	1991 TO 2000	2001 - 2007	BEHOEFTES	
→ Grootste WET → NOMMER A.S.B → SKOLE 2 → ORKESTE → LUTHERSE → BOER/OND. KERK → RAMP → KONG KERK → OORSHOUD TNO → TRALGEBUIK ENIGES OM STOME → GIKTEPHEMIE → SPORT CLUB → BLIK LAMPE → VERDEREGTER → BOSKANTOOR → KLINIEK → OPBLOK → 4 WINKELS → 2 SLADHUISE → 3 KANIERSTELSEL (POLITIEK) → SPILKAMPPLAAS → WATERPIJPEN	→ GROOT HARTSTORM → DAMWALBEEK → INFRASTRUKTUUR (HUISE, PAAR) → OPGADERING VAN ELINIEKDEBOU EN KANDSGROU → ANKE VAN HUISROUWKE → WATER → OPGADERING VAN TELE-FOONSTELSEL → OPGADERING VAN HOER-SEKLE → 2 SMOKEEL HUISE (MIN MISDAAD) → SELFBOU SKEMA → KARTONFABRIEK → POSBUSSE IS AANGEBAUD BY BOSKANTOOR	→ ANKE VAN ESKOMKRAK → PETROLSTASIE → OPGAARDAM → VLOED (PAB) → 2000 INHOUSTAM → EERSTE DEMOKRATIESE VERKIESING (1994) → GROOT VELDREND → TEERPAARIE → SPORTSGROOND → ONTSTAN VAN ADVIES-KANTOOR → EERSTE MUNISIPALITEIT (S.B.) → HOP (HUISE) → BOU VAN COMMUNITY-HALL (MILITARYSTELSEL) → WOLKBEEK → SPOELTOELE → TOENAM IN SMOKEELHUIS (MISDAAD NEEM JOE)	→ 2^{de} DEMOKRATIESE VERKIESING 2004/05 → SATELIT POLISIE STASIE → HONE BASEN ONE → HARTSEARIE → 2 SUPERMARKTE → PLAYVISIE → SPRUIGTE → NUWE PETROLPOMP → 2^{de} KLEUTERSKOL → ATM → EERSTE WEDNE KUNDER VERKIESING → MOORE NEEM TOE → MISDAAD VAN HOOFTS → WERKLOOSE NEEM TOE → TOENAM IN KANTOORP LIKE TOELING	→ KLEINSORE → DMA TRUDFORUM → NIKANGVERANDERING → GOLAAN GAMES WERD INGEBAUD → EERSTE SAMENKOMES WERD OPGESLEI → TEERTKONINGE	→ DAGHOSPITAAL → AMBULANSDIENS → BINNELANDSE SAKKE → ONTSPANNINGSOERIEK → BRANDWEERSTASIE → SWAK TELEVISIE ONTVAAR → RSG

A risk history table starting in 1960, and clustered in approximate ten year blocks. This shows that the settlement is well established, having existed for more than forty years.

Figure 4.6 A risk history table from 1993

TIME LINE (WITSANDS)				
1993	'94-'96	'96-'00	'01-'04	'05-'06
- NO INFRA-STRUCTURE - 3 SHACKS - Rolo's shop (R300) (where there is 7 eleven selling thru the window) - No water but drinking from a tank (buying water from the farm Platou) - factories - Governance (Apartheid) most people were farm workers (the name Witsand is because of white sand) - one taxi (bakkie) - houses in between trees	- more shacks - no infrastructure - the shop on R307 became a bar - change of government - three taps - (community members build/dig trenches for installation of pipes; ask municipality to give them pipes) - 2 taxis (Khambutse) - no taxi rank - local government election - churches - Spaza shop (Zulu) (Khambutse) - soccer \$1.00	- more taps - informal dirt roads - there were more shacks - more crime - animal farming - creche - Public phones - Public toilets to deep hole (they were clean) - Spaza shop (Zulu) - Churches - shebeens	- more taps - more shacks - taxi rank (more taxis) - hall - show houses - one road constructed - more toilets (chemical) - shebeens with jukebox to pool tables	- more shacks - mobile clinic (Thursday) - more roads - electricity (street lights) - building of houses - flushed toilets - ward councillor - resource centre - move to new houses this year (March) - No more shacks were allowed

A risk history table dating back to 1993, clustered in two-year blocks. This shows a newer settlement than in Fig. 4.5

Materials

- Prepared flipcharts for each group with four to six columns ruled down the width of two flipcharts taped together (each column should be headed with a cluster of years (eg 1996-2000). The yearly clusters should be the same for all groups. (See Figures 4.5 & 4.6).
- Aerial photographs of the settlement at different points in time (if available)
- Two flipcharts displaying:
 - A summary of small group instructions
 - A blank risk history table with proposed time-period headings.

Procedure

1. Introduce the activity, explaining that risks also change over time, and can increase or decline in response to in-migration or changes in service provision.
2. Explain that the point of the next activity is to look back on changes that have happened in the settlement over time and how these have affected the occurrence of small, medium and large disasters.
3. If you have access to several aerial photographs of the settlement, taken at different points over five, ten or fifteen years, show how the settlement has changed in size or density, or in relation to new roads and infrastructure. Invite some brief discussion on these changes.
4. Refer to the flipchart summary for the activity and outline the tasks to be carried out in small groups (see the instruction shown below).
5. Refer to the second flipchart and present the proposed time divisions. Invite brief discussion on these to ensure consensus on the time-divisions to be used and alter the headings accordingly.
6. Ensure each group has ruled flipcharts to work with and that all are working to the same time-divisions in their tables. Ask participants to return to their groups and to carry out the group tasks (see the instruction on p 68).
7. After an hour, reconvene and invite each small group to report back. Encourage group discussion following each presentation – especially if there are differences in dates and significant events noted.
8. Ask the group to compare the tables for the different risks. Are there similarities in the development events that different groups have recorded? Are there differences? Why?

PARTICIPANT INSTRUCTION

Risk history table

With your group facilitator in a small group:

1. Discuss what you remember about the first period in the table. Do you recall any significant disasters (eg bad fires or severe storms) happening in the settlement at that time?
2. Record these disasters in the colour red in the column. If you know the month and year, and the number of families or homes that were affected for each event, write this too. Try to list these in order from top to bottom of the column, but leave spaces between them.
3. In another colour, write down other important events or changes that may have affected the settlement during this period (for instance rapid in-migration, building of a new road, new construction projects in the area or changes in work opportunities). Try to list these in order from top to bottom of the column, but leave spaces between them.
4. Also record important service delivery dates in this period (eg when a clinic was built, electrification took place, when new formal houses were built, waste collection improved, toilets were provided and taps installed and so on).
5. Repeat this for all the other columns. If you remember an event that happened earlier, go back and record it in the correct column.
6. Review your table. Does your risk happen more often or less frequently now compared to earlier years in the settlement? How do you explain this?
7. Identify a group member to report back to the larger group.

FACILITATOR'S TIP

Risk history table

It is best if small groups have representatives from different generations. This allows the older generation to provide details on the settlement's history and helps younger people to learn from their elders about past events.

It is useful to identify defining points where the settlement's risk profile changed markedly. This encourages participants to identify factors or events that may have increased their community's risk profile.

This may be a frustrating exercise, as settlement residents may have differing recollections of times and dates of significant events. These differences in recollection will depend on how long the settlement has been established, whether it has a stable or highly dynamic population and its level of social fragmentation.

If there are differing perceptions of the settlement's history, it may be helpful to invite each of the groups concerned to tell their story in a constructive way. This requires careful facilitation to ensure that the experiences will be related in a respectful way, not interrupted, and then consolidated to build an understanding and appreciation of the different experiences across groups.

Consolidating the activity

1. Compare similarities and differences in time-lines for different risks and relate these to development changes in the settlement.
2. Remind participants that the tables reflect perceptions of changes over time however, and that it is sometimes difficult to recall events that happened some years earlier.
3. Where applicable, show how gradual (or even sudden) development changes in the settlement have contributed to its risk profile. Show how accumulating risk conditions often creep up quietly, and it is only after there are settlement fires or other incidents that these factors are recognised.

4.3.2 Day Two Session Two: Participatory mapping and identifying active risk reduction role players

(2½ hours: 2 hours small groups, 30 minutes report-back)

Session purpose

This session aims to build on local knowledge to generate risk maps for the settlement. It also aims to identify active institutions, groups and individuals who are already active or could potentially play key roles in reducing settlement risks. The session has two parts; Activity A and Activity B.

Table 4.6 Activities

Methods/Approach	Activity Focus	Approx Time
Activity A in small groups then in one large group	• Conduct settlement mapping • Report-back	45 mins 30 mins
Activity B in small groups then in one large group	• Generate Venn Diagrams	45 mins+ 30 mins
Session duration		2 ½ hours

Activity A: Settlement mapping**Objectives**

1. Map the spatial arrangement of houses, roads, rivers and other features, as well as the location of services in the settlement.
2. Map the sites and areas with greatest risk.
3. Map the resources available within the settlement to reduce risk.

Method

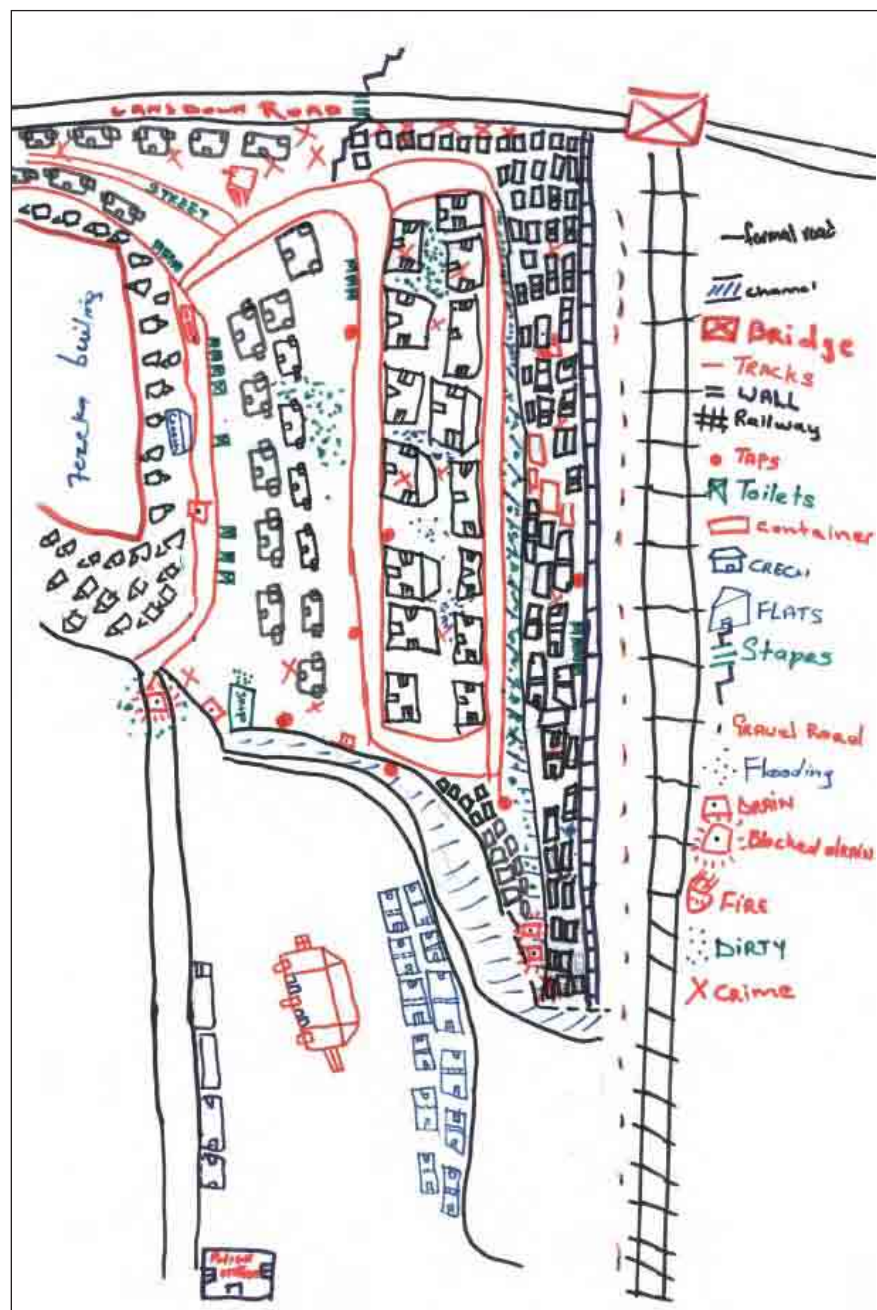
Settlement mapping

WHAT IS... A community or settlement map?

A community/settlement map is a drawing of a settlement by community residents who live there. It often shows resources (such as taps) and dangers (such as dirty areas, unsafe areas due to crime and places where fires occur). It draws heavily on local knowledge and general understandings about the location of resources. However, this may still be quite rough and require adjusting after the transect walk activity that comes next.

Look at Figure 4.7, for example. The key shows formal roads, channels, bridge, wall, railways, taps, toilets, containers, crèche, flats, areas that flood, drains (blocked drains), fire and crime.

Figure 4.7 A settlement map



Materials

- Three or four aerial photographs (size A3) or settlement maps for each small group

Procedure

1. Introduce the activity by linking it to the previous activity which showed that risks don't stand still over time. Risks can also differ considerably, depending on what part of a settlement you're in. For example, the risk of flooding might be greater in low-lying areas or near to a river or at the bottom of a slope.
2. Explain that the community-mapping activity helps show the location of houses, roads, rivers and other features, as well as the key services in the settlement. It also helps to map sites and areas with the greatest risk as well as the resources available to reduce risk.
3. Refer to the flipchart summary for the activity and outline the tasks to be carried out in small groups (see the instruction on p 72). Confirm that this activity will be done in the same small groups as before.
4. Ensure that each group has either flipchart paper or an A3 aerial photograph to work with. Ask participants to return to their groups and to carry out the group activity (see the instruction on p 72).
5. After 45 minutes, reconvene and invite each small group to report back. Encourage brief group discussion following each presentation – especially if there are differences in the spatial distribution of risks and resources.
6. Ask the group to compare the maps for the different risks. Are there similarities in the location of risks and key services that different groups have recorded? Are there differences? Why?
7. Display the maps on the wall.

FACILITATOR'S TIP

Settlement mapping

This activity can be carried out by drawing directly onto an A3-size aerial photograph of the settlement or by asking participants to draw a free-hand map on a flipchart.

If you use a large aerial photograph, ask participants to begin by labelling key features, such as roads, railway tracks, mountains, wetlands or rivers. Then, suggest they identify houses, followed by the location of their group's specific hazard or risk. Last, suggest they mark the location of important infrastructure, as well as other services and resources available within the settlement. Mark the areas that are high-risk with a red coloured marker.

If you are not using aerial photographs, ask participants to draw a free-hand map of the settlement on a sheet of flipchart paper (as in Figure 4.7 on p 70). It is useful to begin by mapping the landmarks within and adjacent to the settlement. Continue as with aerial photographs.

PARTICIPANT INSTRUCTION

Settlement mapping

With your facilitator in a small group:

1. Produce three or four similar settlement maps. If you are using aerial photographs, make sure the information on each one is the same. If you are using flipcharts, try and copy these so they are similar. You will need these maps for the transect walk activity later.
2. Discuss and agree on the symbols you will use to represent the landmarks, risks, hazards, vulnerable people, and resources on the map. List these symbols and their descriptions on the side of your map.
3. Mark the main access roads, rivers, mountains, wetlands and other physical features.
4. Map places or areas that are most at risk from your group's specific hazard.
5. Who are the community members that are most exposed or vulnerable to the risk or hazard? Where do they live? Show this on your map if possible.
6. Who does not have access to services and resources? Why? Where are they located? Show this on your map if possible.
7. What settlement infrastructure, services and resources are most likely to be damaged or affected by the hazard? Map these.
8. What resources (hospitals, clinics, schools, fire stations, police stations, taps, toilets, detention ponds, large drains, community halls etc) are available to the settlement? Where are they located? Show them on your map.
9. Choose a group representative to report back to the larger group.

Consolidating the activity

1. Conclude the activity by comparing the maps - especially if there are areas where several risks are concentrated.
2. Point out the underlying vulnerability or exposure factors that increase different risks in these areas.
3. Identify areas that the small groups generally considered safer and discuss the factors that may have contributed to this.
4. Display all maps on the wall and explain that these will be important resources for guiding the routes for the transect walks after lunch.

Activity B: Identifying active and potential risk reduction role players

Objectives

1. Show the extent to which individuals, organisations, projects or services involved in the settlement interact with one another or overlap.
2. Demonstrate links between different types of groups as well as their relative influence in the settlement.

3. Identify individuals, groups, or organisations that already play a role in disaster risk management and should be involved in the risk reduction initiative.

Method

Construct a Venn Diagram.

WHAT IS... *A Venn Diagram*

A Venn Diagram shows organisations within a community, outside the community and those that affect the community. It shows which organisations are important to the area and which organisations could potentially play a more significant role, but do not, at present.

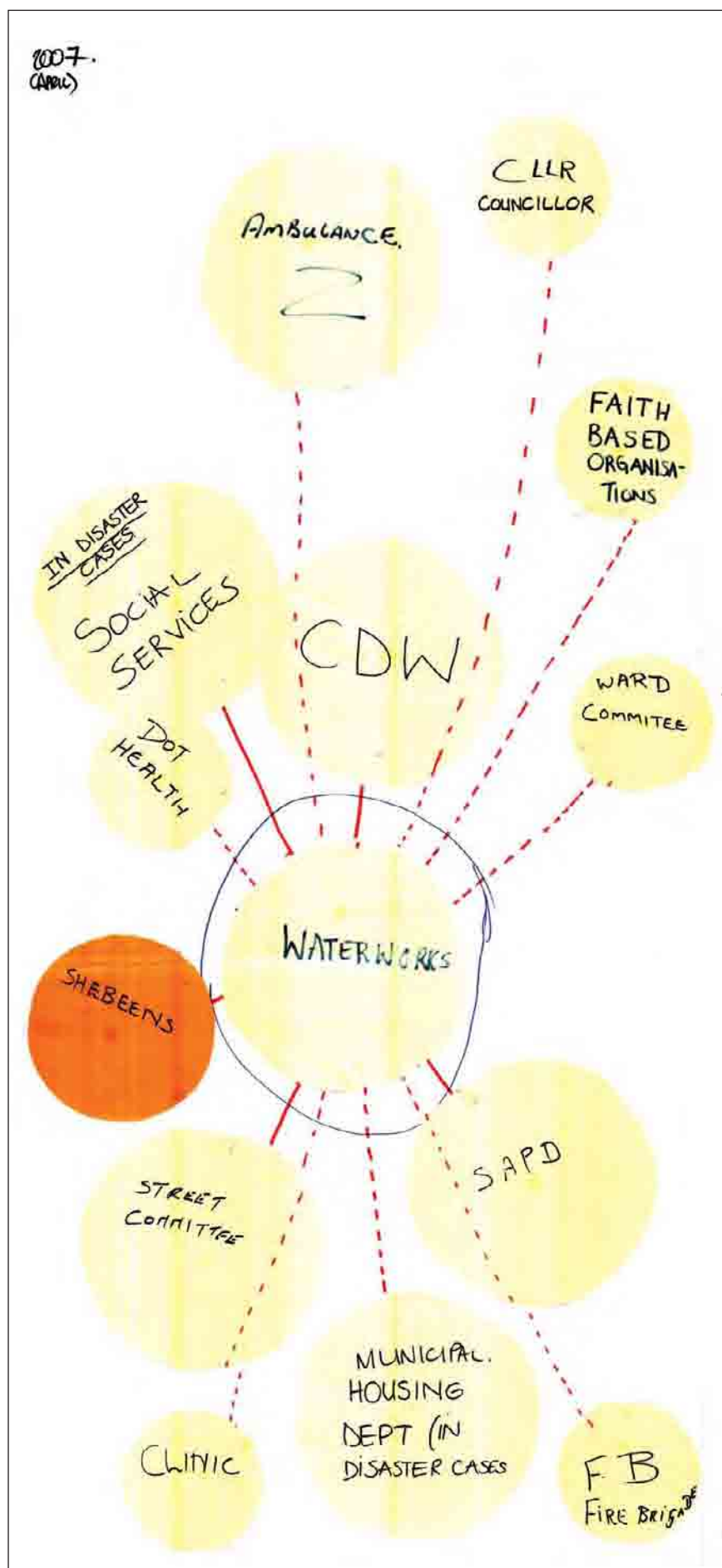
- **large circles** represent the more important individuals and groups to the community
- circles that are **closest to the centre** represent organisations with the strongest relationships with the community.
- **circles next to each other** represent close relationships and those further away from each other, weaker relationships.
- **solid lines** indicate a strong relationship, while broken or dotted lines indicate weak relationships

Figure 4.8 shows an example of a Venn Diagram. The **sizes** of the circles show how important settlement residents view the different organisations (eg organisations reflected by large circles are considered very important).

The circles' **distances** from the centre indicate how close or involved the residents view the different organisations – or how distant they are perceived. This is a qualitative judgment, not merely an expression of physical distance. However, resident perceptions may also be influenced by the physical proximity of a service or programme.

In this example, the **dark lines** show that the street committee, police and community development worker are seen as important role players in the community. The ambulance services, however, and the councillor are seen as important but not as involved.

Figure 4.8 Venn Diagram



Materials

- A flipchart displaying a summary of small group instructions
- A flipchart showing a mock-up of a Venn Diagram
- Adhesive tape
- Circles of three different sizes for each small group (large, medium and small)

Procedure

1. Introduce the activity by underlining that a risk assessment goes beyond pointing out the negative or hazardous factors in a settlement. A good risk assessment also should identify the key people or organisations that are already active in the community, as these are accessible role players who can immediately help reduce risks.
2. Explain that the Venn Diagram activity works by using different-sized circles with the names of individuals and groups active in the settlement and arranging these on a flipchart. Explain what the different-sized circles and lines mean.
3. Refer to the flipchart summary for the activity and outline the tasks to be carried out in small groups (see the instructions on p 76). Confirm that this activity will be done in the same small groups as before.
4. Ensure each group has flipchart paper, coloured markers and the pre-cut circles. Ask participants to return to their groups and to carry out the group activity (see the instructions on p 76).
5. After 45 minutes, reconvene and invite each small group to report back. Encourage brief group discussion following each presentation – especially if there are differences in the organisations and individuals identified by the different small groups.
6. Ask the large group to compare the Venn Diagrams for the different risks. Are there similarities in the way the groups and organisations identified have been represented? Are there differences? Why?

FACILITATOR'S TIP

Managing different views

It may be necessary to mediate between different points of view in this activity, as participants may have opposing views on who is, or is not, actively involved or important in the community.

It may also be necessary to stress that these opinions are often the result of personal relationships or experiences with the organisations or individuals represented. While these are important, the activity requires everyone to step back somewhat from their personal opinions to consider the broader community context.

PARTICIPANT INSTRUCTION

Venn Diagram

With your facilitator in a small group:

1. Make a dot at the centre of the joined flipcharts. This central point represents your community.
2. What institutions, groups or individuals are present or active in the community? How important are they to the community?
3. Write their names down on the different-sized circles. Use big circles for important groups and individuals and smaller circles for less important ones.
4. Place the labelled circles on your flipchart, taking into consideration the central point and the other circles. Arrange them to show closer and more distant relationships between organisations and individuals.
5. Draw lines between the circles. A solid line indicates a strong relationship, while a broken line a weak relationship.
6. Discuss your Venn Diagram and the activities of the individuals or groups labelled on the circles. How well do they function? How well do they coordinate their activities? Which groups and individuals are important to community decision making? Which are important when disasters occur?
7. Choose a group representative to report back to the larger group.

Consolidating the activity

1. Conclude the activity by comparing the Venn Diagrams, and indicating those individuals and groups that feature strongly across all the risk groups.
2. Also highlight differences, and explain that just because a group may not seem active in one risk category, it doesn't necessarily mean that it is inactive in other areas.
3. Caution against stereotyping a group that is not yet actively engaged as always staying that way. Sometimes, new opportunities for engagement need to be created so these groups can get more involved.
4. Ask for participants to think back over the morning's activities. What did they learn from the activities?
5. Draw attention to the fact that all activities so far have been based on group work and discussion – but that a robust risk assessment also requires careful observation on foot to cross-check or 'ground-truth' these conclusions. This activity, called a transect walk, will take place after lunch.

4.3.3 Day Two Session Three: Spatial verification of risks and identification of local risk reduction strategies

(2½ hours: 30 minutes large group preparation, 60-90 minutes field-work, 45 minutes feedback and consolidation)

Session purpose

The aim of this session is to apply and improve the risk insights that have been gained in the previous activities. There will be a structured risk observation activity called a transect walk, through the settlement along several pre-planned routes. This encourages participants to observe their environment with new eyes, using their experience and knowledge from previous activities.

There are three stages in this session. These are shown in the table below.

Table 4.7 The stages of a transect walk

Transect Walk Stages	Activity Focus	Approx Time
Preparing for the transect walk in one large group	• Give overview of transect walk • Form transect walk teams	30 mins
Conducting the transect walk in small groups	• Carry out a transect walk through the settlement • Consolidate observations and findings for specific risks	60 – 90 mins
Consolidating information in one large group	• Report back from small groups • Consolidate and compare risk information	45 mins
Session duration		2 ½ hours

Objectives

1. Observe and record specific points and areas where risks are increased or reduced.
2. Strengthen the understanding of specific household and neighbourhood conditions that increase vulnerability to priority hazards.
3. Improve the understanding of specific household and neighbourhood conditions (or opportunities) that help reduce priority risks.
4. Integrate information on the spatial distribution of different risks and resources.

Method

Multi-risk transect walk

WHAT IS... *A multi-risk transect walk?*

A transect walk involves walking through a settlement along a pre-determined path, observing particular physical conditions that increase or reduce specific risks and informally interviewing settlement residents on their risk experiences.

A multi-risk transect walk is guided by the community mapping activity conducted earlier. Each transect walk team should comprise at least one representative from each of the separate hazard groups who have worked together. This helps to integrate input on three or four risks simultaneously while the walk takes place.

An aerial photograph showing a possible route through the settlement using a map from Google Earth



Materials

- One large community map or aerial photograph displayed for the large group discussions
- Flipchart displaying a summary of the transect teams' tasks

For each transect walk team:

- One completed community map or aerial photograph for each of the priority risks (making three or four risk-specific community maps altogether)
- Pens and observation sheets or note-paper
- 1 x camera
- 1 x GPS instrument (optional)

Procedure

Preparing for the transect walk

1. Introduce the activity. Restate the importance of direct observation to improve the accuracy and relevance of ideas generated over the preceding days.
2. Explain that three or four transect walk teams will walk through the settlement along different routes. These teams will comprise of representatives of each of the previous risk groups (ie one or two members of the fire group, plus one or two members of the flooding group and so on), so that the team will look at all risks at once and the conditions that increase or reduce them.
3. Explain the need to choose three or four different routes through the settlement, so the high-risk areas are covered. Refer to the community

- maps already displayed and in consultation with CRA participants, identify and mark three or four different routes. If the settlement is large, this means only the highest risk areas can be visited this time.
4. Agree on common symbols for likely risks and resources (eg flood-risk areas and taps or toilets).
 5. Assign participants to the transect teams by asking them to regroup briefly in their original risk groups and to count off 'one, two, three, four'. All the 'ones' from the different risk groups then form a multi-risk transect walk team, all the 'twos' a second team, the 'threes' a third team and so on.
 6. Ensure that all the transect walk teams have risk maps and observation sheets or note-paper. Refer to the flipchart summary for the activity and outline the tasks to be carried out (see the instructions on p 80).
 7. Ask participants to carry out their transect walk activity.

FACILITATOR'S TIP

Transect walk

During the walk, differentiate between risk conditions that involve **group actions** (or lack of action) and those that reflect actions taken by **individual households**.

Also, look for risk reduction efforts that indicate **risk avoidance** compared to **coping** strategies. For example, a risk avoidance measure would be constructing a fence around an informal dwelling to prevent encroachment by others and greening the yard to reduce dust and run-off. Risk avoidance strategies are more developmental, and illustrate capacity to anticipate and reduce possible risks long before a difficult situation happens.

On the other hand, **coping strategies** help people just get by when they are under pressure. For instance, one coping strategy would be for a family in a flood-prone informal settlement to pack all moveable property into black bags to stop it getting wet in a heavy rain storm.

If you observe a clear risk reduction measure (for example an elevated house in a wetland or flood-prone area), stop and ask the resident to tell the story of how this came about (ie what motivated it, how it was implemented and if there was any outside support). This provides insights about how to support individual and household efforts to reduce risks.

Do not take photographs of dwellings or property or other residents without their permission. Do not take photographs of children without their parents' permission.



Participants view a map while doing a transect walk

PARTICIPANT INSTRUCTION

Transect walk

With your facilitator, your team should:

1. Introduce yourselves, describing which risk group you have been working in over the past two days.
2. Discuss your team's proposed path. Draw on previous group work to identify areas along the path that you expect to be more high risk for different hazards and where known services and resources are located.
3. Choose one existing map and a person to be the map recorder to consolidate all the spatial information you gather on your walk.
4. Clarify other responsibilities for recording hazards and resources. For example, the fire risk group members should primarily look for, write down and map fire-related hazardous conditions and resources.
5. Follow your planned path through the settlement in a respectful way. Respond politely to questions from other residents about the purpose of the activity and invite their insights about risks within their area.
6. Observe, record and photograph risk conditions (for example leaking taps, broken toilets, blocked drains, dumped litter) – to motivate prompt attention by local authorities and settlement residents.
7. Identify points and areas that are concentrations of risk, where several risks are worse. Why? Identify points and areas where risks are uniformly low. Why? In each of these areas, interview the residents for insights on why the risks are so high or so low.
8. Record, map and photograph **risk-increasing** conditions according to whether they affect single dwellings, or whole areas. Do the same for **risk-reducing** measures (for example no dumped litter in one area or an elevated house in a flood-prone area).
9. On completing the walk, make sure all the spatial information is consolidated on **one** of your team's maps. Then:
 - copy this information onto the map used for the large group
 - record the key observations from your team's transect walk on a flipchart for reporting back.
10. Choose two team members to report back.

Reporting back and consolidating information

1. Reconvene the large group after 60 to 90 minutes.
2. Ask individual groups to report back for the areas they visited, using both the map and the flipchart findings.
3. Draw attention to recurrent risk factors across all groups as well as differences in the risk profiles for particular areas and households. Are there patterns concerning who is more at risk and who is less at risk? Are risks generated by location (for example in a wetland or next to a servitude), by behaviour (for example dumping grey water outside neighbours' homes), social exclusion (for example cultural or language minority groups) or as a result of a shortfall in service delivery (erratically collected solid waste disposal)?
4. What new information on risks and risk reduction opportunities has this activity generated?

Consolidating the activity

1. Conclude the activity by pointing out areas within the settlement that have higher exposures for **specific risks** (eg fire, crime, flooding)

- as well as areas where the transect walk has indicated there are concentrations of **all three or four priority risks**.
- 2. Draw specific attention to evidence of risk-reducing actions at household or neighbourhood levels and invite discussion on reasons why these happen only in some areas or for individual households.
- 3. Ask the group to consider what they still do not know about managing risks in the settlement. For instance, the group still has to consider the relative effectiveness of different risk management strategies ... which approaches are more effective for different risks or in different areas? This will be addressed the following day.
- 4. Thank all participants for their insights from the transect walk.

FACILITATOR'S TIP

Wrapping up Day Two

If this is the last activity for the day, thank participants for their involvement and confirm arrangements for Day Three (ie starting time and general programme).

4.4 Community risk assessment: Day Three

Day Three summary

By the end of the day, there should be:

- An integrated understanding of the settlement's risk profile
- An understanding of local risk management and coping strategies for the three to four priority risks
- A clear understanding on follow-up actions and institutional arrangements by different role players.

Table 4.8 Community risk assessment: Day Three

Session	Time	Activity and Page no	Process
One	08:30 – 09:00	Facilitator-led review of key issues from Day Two and activities for Day Three p 82	Review Day Two and overview of Day Three.
Two	09:00 – 10:30	Risk management capacities matrix in risk groups, followed by large group report-back p 83	Identify local risk management and coping strategies for priority risks.
TEA			
Three	10:45 – 12:00	Focus group discussion on the six guiding questions, followed by large group report-back p 88	Consolidate information on the risk assessment findings.
	12:00 – 13:00	Solutions/objectives tree activity in small groups p 89	Generate solutions for reducing specific risks.
LUNCH			
Four	14:00 – 15:00	Consolidated risk assessment and solutions tree report-back to large group and invited guests p 92	Generate vision for a safer area. Establish a basis for integrated risk reduction planning.
TEA			
Five	15:15: – 16:00	Facilitator-led large group discussion p 94	Confirm arrangements for following up on CRA process and implementation of risk reduction recommendations.

4.4.1 Day Three Session One: Review of Day Two and overview of Day Three

(30 minutes)

Session purpose

The aim of this opening session is to reinforce the information gathered the previous day and to provide an overview of Day Three.

Objectives

1. Reinforce information gained from Day Two
2. Provide an overview of Day Three
3. Address any emerging participant concerns.

Method

A large group discussion

Materials

- Flipcharts and maps from Days One and Two displayed on the walls
- Flipchart displaying Day Two programme

Procedure

1. Welcome participants to Day Three.
2. Ask if there are any logistical concerns that need addressing. Respond to these.
3. Ask if there are any concerns or questions about the information collected on Day Two. Respond to these using flipcharts and maps from the previous day.
4. Refer to the flipchart displaying the Day Three programme and provide an overview of the day. Explain that in the morning, participants will be working in their risk groups. The afternoon's session, however, will take place in the large group and will focus on planning for future risk reduction in the settlement.

Consolidating the activity

1. Ask participants if they remember what the six guiding questions are. Today's activities should address these.
2. Restate that a community risk assessment not only intends to identify risks. It also aims at uncovering local and other solutions. The focus of today's session aims at identifying risk management actions that can be implemented jointly by both residents and institutional role players to reduce the risks prioritised on Day One.

4.4.2 Day Three Session Two: Identifying risk management capacities and pathways to overcome disaster risks

(3 ¾ hours: 2¾ hours in three small group sessions, 2 x 30 minute report-back sessions)

Session purpose

The aim of this session is to consolidate information gathered in the activities so far. It aims to identify local capacities and strategies to manage and cope

with recurrent risks and then to find answers to the six guiding questions introduced in 4.2.3 on Day One (p 56). It also aims to generate a shared vision for reducing priority risks.

This session comprises three activities: Activities A, B and C.

Table 4.9 Activities

Methods/Approach	Activity Focus	Approx Time
Small group discussion	Activity A Risk management capacities matrix	60 mins
Large group discussion	Report-back from risk managements capacities activity	30 mins
Focus group discussion	Activity B Answering the six guiding questions	45 mins
Large group discussion	Report-back from six guiding questions activity	30 mins
Small group discussion	Activity C Solutions/objectives tree	60 mins
Session duration		3 hours 45 mins

Activity A: Identifying local risk management strategies and capacities

Objectives

1. Identify local capacities and strategies to manage and cope with priority risks.
2. Identify those capacities and strategies that are more effective.
3. Determine which groups use particular strategies and reasons for this.

Materials

Two flipcharts displaying:

- A summary of small group instructions
- A blank risk management capacities matrix with headings

Method

Risk management capacities matrix

WHAT IS... *A risk management capacities matrix?*

A risk management capacities matrix identifies the strategies used by individuals and households to both **avoid** and **cope with** recurrent risks.

The activity also helps participants to think about why certain people are more proactive in reducing risks than others.

It can also help people to understand how they can take simple interventions to lower their own risks and how these can be strengthened by outside organisations.

Figure 4.9 Risk management table

Type of risk:
 (A) Examples of risk avoidance measures
 (How do people AVOID or reduce their risk?)

What avoidance measures observed	Who uses this? (household)	How effective is it?
build away from wetland	people in settlement longest	effective as floods affect them less
build house on stilts	Few people	effective but wind affects them more
council cleans wetland	for community	helps as not so much dirt comes in when floods

Examples of risk management tables. They both represent flood risks. The first table shows how people avoid flood risks completely (such as building away from the wetland) and the second table shows how people cope with flood risks (such as putting their valuables on their beds to keep dry from seeping water.)

Figure 4.10 Risk management table

Type of Risk:
 (B) Examples of "coping strategies"
 (How do people "get by" or "cope" with risk)

Coping measures observed	Who uses this	How effective is it? Why?
Put down buckets for leaks	everyone	effective as same places leak
put important items on bed as water comes thru ground	people in wetlands	Not effective as roof leaks too
stay with friends/family	Near river or people in wetland	moderate. Puts strain on friends/family

Procedure

1. Introduce the activity by underlining the need to build on existing capacities within the settlement that can help to reduce priority risks. Explain that in the next activity, the risk management capacities matrix focuses on identifying these strengths.
2. Point out the difference between coping strategies and adaptive or risk management strategies. Explain that the aim of this activity is to identify both these types of responses – but that risk management or adaptive strategies help people avoid or minimise serious risks before they even start, while coping strategies apply to actions taken after a fire or storm has already started.

3. Refer to the flipchart summary for the activity and outline the tasks to be carried out in small groups (see the instruction on p 87). Confirm that this activity will be done in the original risk groups – but will draw on information from the transect walks.
4. Ensure that each group has prepared flipchart matrices to work with. Ask participants to return to their groups and to carry out the group activity (see the instructions on p 87).
5. After 60 minutes, reconvene and invite each small group to report back. Encourage brief group discussion following each presentation – especially if there are differences in risk management and coping strategies identified by the different small groups.
6. Ask the large group to compare the risk management strategies for the different risks. What similarities and differences exist? Why? Repeat for coping strategies.

FACILITATOR'S TIP

Risk management capacities matrix

An important outcome of this activity is to compare the importance of **developmental risk management capacities** with **coping strategies**.

An example of a developmental risk management capacity is making sure there is space between dwellings to avoid or reduce exposure to a fire risk (in this case, the chance that fire can spread).

An example of a coping strategy (ie measures taken when a risk is more acutely imminent, to help people get by) is lifting belongings off the floor onto beds and putting them in black plastic bags when it starts to rain.

A second important point is differentiating between actions that individuals can take (eg elevating their floors) and those taken collectively to reduce group wide risk (eg a neighbourhood watch group for drunken behaviour around cooking over open flames) that protects a neighbourhood or entire settlement.

PARTICIPANT INSTRUCTION

Risk management capacities matrix

With your facilitator in a small group:

1. Identify three of the most important coping strategies that apply to your specific risk. They do not only include physical or building strategies. They can also include access to knowledge and skills and financial or social support. The same applies to protective social control mechanisms.
2. Write your three strategies in the left-hand column of your table.
3. For each strategy, discuss and write down:
 - Who mainly uses it? (Types of households, locations, specific groups...?)
 - When is it more likely to be used? (eg after a fire when belongings have been destroyed)
 - How does it work? (eg stops clothes and bedding from getting wet)
 - How effective is it? (eg it helps families rebuy food that became wet)
 - Does it have any adverse effects on the household concerned or on other households? (eg digging trenches that channel water to other homes).
4. In the next table, identify three of the most important **risk management (adaptive) strategies** that apply to your specific risk. Write them in the left-hand column.
5. For each strategy, discuss and write down:
 - Who mainly uses it? (Types of households, locations, specific groups...?)
 - What led them to use it? (eg they attended an environmental health course that explained the dangers of dumped litter)
 - How does it work? (eg a neighbourhood watch group looks out for drunken men cooking meat late at night)
 - How effective is it? (eg it is very good at stopping drunken residents from starting fires at night)
 - Does it have adverse effects for the household concerned or others?
6. Review your two tables. Are there similarities in the types of households and groups who actively manage their risks? Are there groups who have a markedly lower risk management capacity (ie are more vulnerable)? Why?
7. Choose a representative to report back to the large group.

Consolidating the activity

1. Conclude the activity by comparing the matrices and identifying those individuals and groups who seem to be the most active in managing their risks. Why are some more proactive than others?
2. Underline some of the challenges of implementing avoidance strategies. There is almost always a time-lag between investing in a risk-reducing adaptive strategy and seeing the benefits of the investment – compared to a coping strategy, which is almost always implemented when it is immediately needed. Are there examples of adverse effects of the coping strategies identified?
3. Focus on the coping and adaptive strategies that have been identified for more than one risk. Could these be more widely implemented?
4. Also underline new, interesting and innovative risk management and coping strategies. How did these evolve or get invented? Could these be more widely implemented?
5. Ask participants to note the most effective coping and adaptive strategies for later discussions on possible solutions to the risks that they have prioritised.

Activity B: Answering the six guiding questions

Objectives

1. Consolidate information learned during the CRA for specific risks.
2. Support risk reduction planning interventions.

Materials

- Flipchart displaying a summary of small group instructions
- Flipchart with columns showing the six guiding questions
- Two joined flipcharts with columns displaying the six guiding questions as headings (for each group)

Figure 4.11 Six questions: fire

6 Questions (FIRE)	
1) Who?	babies, elderly & sickly
2) Why?	they may not be as mobile as others + can't run away fast when fire starts
3) When?	Hot, windy months & weekends when people drink
4) Increases?	no electricity, Panda stoves, drunk
5) Outcome	lose lives & belongings
6) Cope?	Church houses people after fire

An example of a summary of the six questions, focusing on fire

Procedure

1. Introduce the activity by restating the six guiding questions that were introduced on the first day. This consolidating activity requires the risk groups to look back over what they have covered, so that they can answer these six questions.
2. Refer to the six guiding questions and outline the tasks to be carried out in small groups (see the instructions p 89).
3. Ensure each group has access to its previous flipcharts, maps and other materials and has flipchart paper to work with. Ask participants to return to their groups and to carry out the group activity (see the instructions p 89).
4. After 45 minutes, reconvene and invite each small group to report back. Encourage brief group discussion following each presentation – especially if there are differences in the group reports.
5. Ask the large group to compare the report-backs for the different risks. What similarities and differences exist? Why? Are the same at-risk groups identified for different threats?

PARTICIPANT INSTRUCTION

Answering the six guiding questions

With your facilitator in a small group:

1. Discuss the six questions as these apply to your risk and complete the columns in the table.
2. Use information from the earlier activities to help you answer the questions.

Table 4.10 The six questions

Question	Activities/ tools that provide information
Who is most at risk?	Community map, transect walk, risk history table
Why are they at risk?	Community map, transect walk, problem tree
When are they most at risk?	Seasonal calendar
What is increasing (or reducing) the risk?	Risk history table, problem tree, seasonal calendar, community map, transect walk
What is the outcome (effect) of the risk?	Problem tree, community map, transect walk
How do at-risk groups reduce and cope with the risk?	Venn Diagram, community map, transect walk, risk management capacities matrix

3. Identify a representative to report back to the larger group.

Consolidating the activity

1. Conclude the activity by comparing the report-backs and identifying recurrent characteristics that apply to more than one risk.
2. Identify specific groups, periods and areas of the settlement where risks are highest and those where they are reduced.
3. Revisit the range of coping and risk-reducing adaptive strategies identified in the previous exercise. Reflect on possibilities for applying these more widely. Is this feasible? Could local government and local CBOs identified in the Venn Diagram activity support this process?
4. Conclude by introducing the next activity, the solutions or objectives tree which aims at moving beyond identified problems to risk solutions.

Activity C: Identifying risk reduction solutions for priority risks

Objectives

1. Build a vision of a safer area for the future.
2. Identify conditions most desired by community members.
3. Identify priority risk reduction issues requiring intervention.

Materials

Two flipcharts displaying:

- A summary of small group instructions
- A recently completed problem tree from Day Two

- 200 cardboard strips 15cm x 5 cm, in two colours (different to those used in the problem tree), one for solutions and one for positive outcomes.

For small groups:

- Problem trees already developed
- Cardboard strips organised into sets containing around 20 strips of each colour for each group.

Method

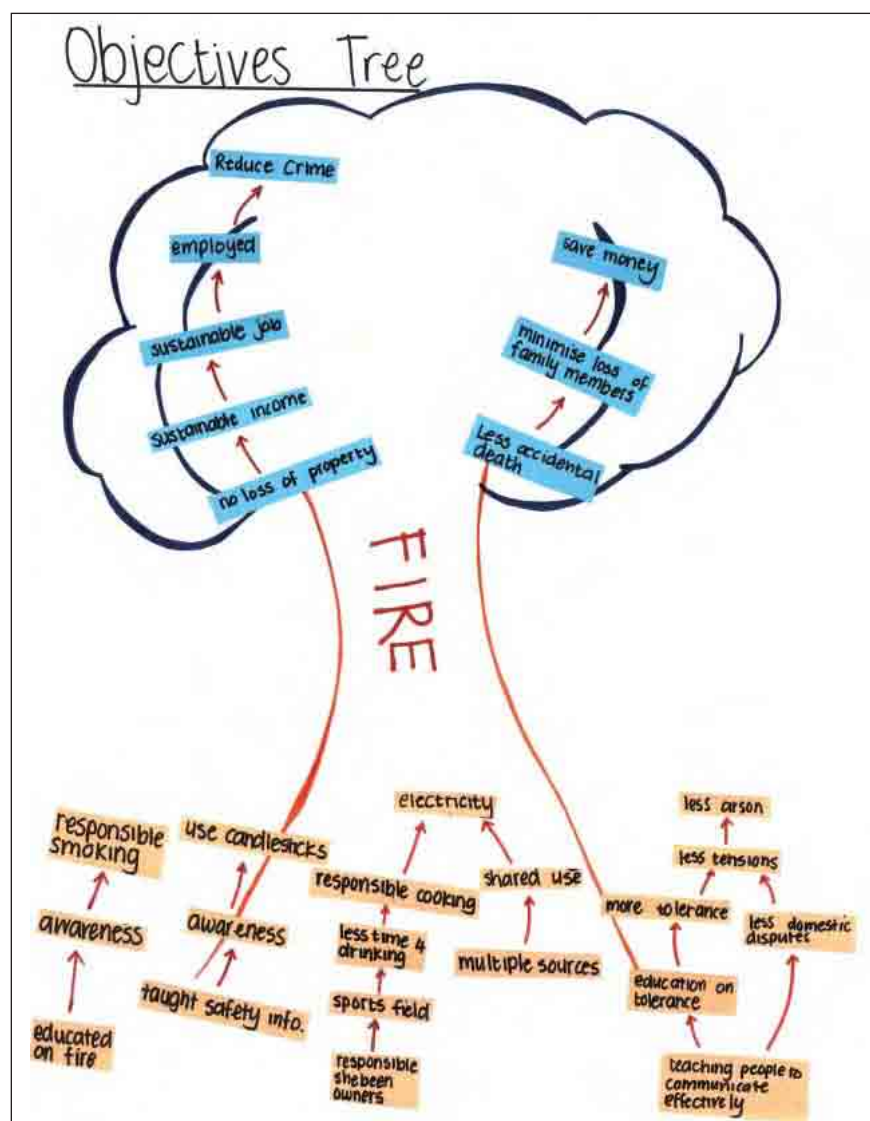
Solutions/objectives tree

WHAT IS... A solutions/objectives tree?

An objectives tree builds on the problem tree and looks at workable solutions to issues brought to light in the problem tree and throughout the risk assessment. It helps participants to visualise solutions and to manage their own risks.

The example in figure 4.12 looks at solutions to do with fire and builds on the fire problem tree. In the problem tree, the orange roots are causes and the blue leaves are outcomes.

Figure 4.12 Solutions tree



A solution tree, following from the problem tree (Fig 4.2, p 55) which investigates fire

Procedure

1. Introduce the solutions/objectives tree activity by underlining the need to move towards risk-reducing solutions within the settlement.
2. Indicate the problem tree and demonstrate how the activity transforms problems into solutions by changing a negative cause into a positive action.
3. Refer to the flipchart summary for the activity and outline the tasks to be carried out in small groups (see the instructions p 92). Make sure all groups use the same coloured card for solutions and the other coloured card for positive outcomes.
4. Explain that this is the last activity in the CRA process and that after lunch, the assessment process will be consolidated in a report-back by all groups on their findings and solutions. The three-day process will then conclude with a discussion on how best to go forward, including agreement on the most effective institutional arrangements.
5. Ask participants to meet in their groups and give the instructions below.
6. Ensure each group has their original problem tree, coloured markers, Prestik and a pack of coloured cardboard strips.

FACILITATOR'S TIP

Solutions/objectives tree

The aim of this activity is to identify pathways to overcome disaster risks by transforming the negative phrases given in the problem tree into positive phrases.

Note that the logical chain of causation generated by the problem tree might not flow as neatly in the solutions tree. This is because the process of changing the negative to positive statements does not automatically result in the same cause and effect sequence as in the problem tree.

When you introduce the activity, ask participants to use positive words or expressions, not just the opposite word or phrase. This is because the opposite expression might not always indicate a positive action. Also suggest that all expressions must be phrased in the present and that groups must avoid using 'should be' in the wording.

PARTICIPANT INSTRUCTION

Solutions tree

With your facilitator in a small group:

1. Take your original problem tree with its branches displaying your hazard's effects and its roots displaying root causes. In this activity you will transform your problem tree into a solutions tree.
2. Start with your root causes. Ask 'what is the positive word/phrase for ?' each of the causes on your problem tree.
3. Change each cause on your problem tree to a positive word or action. These are your solutions. For example:

Phrase on problem tree card	Positive phrase on solutions tree card
Flooding around the house	Dig trenches before it rains
Many youngsters are gangsters	Many youngsters take part in social and sporting activities

4. Write your solution expressions on coloured cards and stick these next to or on the top of your root causes.
5. Repeat this for the branches on the problem tree, to change the effects into positive outcomes. Write each positive outcome on a single card – but make sure they are all a different colour to the solutions cards.
6. Discuss your tree. Compare your solutions with the risk-reducing strategies identified in the risk management capacities matrix and from the community mapping and transect walk exercises. Are there similarities? Differences? Why?
7. Which solutions do you consider to be the most effective and realistic to take forward?
8. Review your findings for your specific risk, including your suggestions from the solutions tree activity.
9. Identify group members to report back to the large group.

4.4.3 Day Three Session Three: Consolidated feedback to key stakeholders and decision-makers

(60 minutes)

Session purpose

The aim of this report-back session is to present the CRA findings to key decision-makers from within the settlement and representatives from the local authority. Wherever possible, directors of relevant departments, along with their technical field staff should be invited, along with the sub-council manager, ward councillor, NGOs, CBOs, and community leaders.

It is usually impractical for these individuals to attend the three-day CRA process. However, the feedback session on the afternoon of Day Three provides useful information from the assessment activities that can lead to immediate improvements in the settlement's risk profile. It also provides an informed basis for planning longer-term risk reduction interventions.

Objectives

1. Provide feedback on CRA findings.

2. Generate discussion and consensus on risk reduction action priorities.
3. Identify action priorities for all stakeholders.

Method

Facilitator-led group presentations and plenary discussion

Materials

- Flipcharts and maps from Days One, Two and Three displayed on the walls
- Blank flipchart to record action priorities and stakeholders responsible

Procedure

1. Welcome participants to the CRA report-back session, especially guests, department directors, councillors or other individuals in leadership positions. Invite visitors to the session to briefly introduce themselves.
2. Provide an overview of the CRA process and the priority hazards identified. Explain that each of the hazard-specific groups will now present their findings and suggestions on how to reduce their specific risk.
3. Invite each group to report back (10 minutes), allowing brief questions of clarification between presentations.
4. After the presentations, invite responses from the local authority or other visitors on the findings.
5. Facilitate agreement on immediate risk reduction priorities, and associated actions by the local authority and settlement residents.
6. Record these on the flipchart, as shown below according to 'what is the problem', 'how it can be solved', 'who should be responsible', 'when it should be done'.

Figure 4.13 Risk reduction priorities

WHAT	HOW	WHO	WHEN
* Density	Create spaces Regulate as a by-law w/ship the community	Community; Councillor; Commi- TEE; LIESBESHO	Now
* Paraffin stoves	Workshop on how to use paraffin safely Not using faulty stoves	Everybody; committee NGOs/CBOs/CDWs Pabasa	Very soon A.S.A.P
* Candles	Encourage people to sell buy/use candles encourage people when and how to use them use pamphlets w/ship school children	Everybody who uses candles; community children	A.S.A.P; during school terms
* Imbawula African Heater/Tine drum	Not used without being attended People should be more careful on windy days Warning on windy days	Community; Fire Services; committee	Very soon (prepare now for the next winter)
* Electricity	proper planning and inform- ation	Committee; Eskom; municipality officials	Soon

This example outlines specific actions that can reduce fire risk – and indicates who should be responsible.

Consolidating the activity

1. Conclude this session by restating the key findings of the CRA and action priorities.
2. Underline the importance of establishing an appropriate institutional mechanism that involves both settlement residents and representatives of CBOs, NGOs and the local authority, to ensure that these measures are implemented and sustained.
3. Introduce the last session of the three-day process, in which you will discuss a realistic institutional mechanism for taking forward the most important risk reduction priorities.

4.4.4 Day Three Session Four: Risk reduction planning and implementation

(45 - 60 minutes)

Session purpose

The aim of this session is to generate a clear implementing framework for taking forward the risk reduction priorities already identified. Focus on identifying measures that:

- can achieve priority risk reduction objectives
- are realistic for the participating stakeholders
- can be supported by local authorities and other institutional role players.

Objectives

1. Reconfirm priority risk reduction measures and the stakeholders that are responsible for their implementation.
2. Discuss and confirm institutional arrangements for taking risk reduction measures forward.
3. Identify specific point people within the settlement and local authority to follow up on the implementation of the risk reduction measures as agreed.
4. Confirm arrangements for completing documentation of the CRA and management of the flipcharts and other materials.
5. Conclude the process.

Method

Facilitator-led plenary discussion.

Materials

- Flipcharts and maps from Days One, Two and Three displayed on the walls
- Flipcharts with action priorities and responsible stakeholders from previous session

Procedure

1. Welcome participants to the final session of the CRA and explain its purpose.
2. Underline the importance of agreeing on a realistic institutional mechanism for taking forward the risk reduction process – that ideally adds value to existing structures and provides an interface between the settlement and local authority.
3. Outline possible institutional mechanisms in relation to the risk reduction priorities identified earlier (see facilitator's tip on p 96).
4. Invite responses and suggestions on institutional alternatives from settlement residents and local government representatives.
5. Facilitate discussion on the various institutional alternatives, and generate consensus on the best option. Write this on a flipchart so it is visible to all.



plenary session



plenary session

FACILITATOR'S TIP

Realising community-based disaster risk management planning

There are many different arrangements for taking forward the findings of the CRA. The most important requirement is to identify a clear, credible and dependable mechanism for communicating disaster risk priorities between settlement residents and local government departments - and across relevant government departments.

The most effective integrated risk management model is the establishment of a multisectoral community-based disaster risk management committee. This should comprise representatives of the settlement, civil society organisations and the local authority. The committee should be linked to the settlement's local development forum or ward committee, and be supported by consultations at least every month by the disaster risk manager for the area.

Unfortunately, due to logistical and human resource constraints faced by settlement residents and local authorities, this option is often unrealistic and unsustainable in many municipalities.

One simple alternative or start-up approach is to mandate the local councillor as the risk reduction liaison point. Similarly, this role could be adopted by the settlement's community development worker, environmental health worker or an active CBO.

If the risk reduction priorities identified fall primarily within the remit of one local government department (eg Roads and Stormwater or Environmental Health), identify a settlement focal point or community-based flood risk committee to liaise directly with the departmental field officer concerned.

Neither of these two options provides for fully integrated community-based disaster risk management. However, they do provide a simple start-up mechanism for interfacing between local government and the settlement on an identified risk reduction priority. Over time the scope of work can be extended to other risks.

Consolidating the activity and the CRA process

1. Refer to the identified priority risk reduction actions to be taken by settlement residents and specific local government departments and confirm agreement on these.
2. Confirm the names and contact details as well as the formal administrative arrangements necessary for the implementation process. Record these visibly on a flipchart.

A participant receives a certificate after attending a risk assessment process.



3. Discuss and confirm concluding arrangements for the CRA, including the CRA report (to whom must this be submitted?) and the flipcharts, aerial photographs and other outputs of the CRA (who will be the custodian of these materials?)
4. Invite concluding observations. Thank all those attending for their constructive suggestions – and especially the settlement residents for their commitment, insights and wisdom.
5. An optional closure to the process involves presenting certificates of attendance to those participants who attended the entire three-day process.

4.5 Cross-cutting and supplementary tools

There are other social science and spatial risk assessment tools that can supplement the above activities and be used as part of each activity. In-depth interviews can be done during a transect walk, for instance.

4.5.1 Focus groups

1 hour



A focus group

Focus group interviews are group discussions guided by a facilitator. They usually spotlight only a few issues, and are most effective when they are held with small groups of between six and twelve people. They are often held at a later stage in the research phase, with people from similar or specialised backgrounds, such as officials working on a particular issue. They are also helpful in identifying the issues that should be incorporated into tools, such as surveys. The goal of a focus group is to encourage frank, open and spontaneous discussions by all members of the group.

Objective

To rapidly gain a range of different viewpoints on a topic or topics.
To provide insight into issues highlighted by other research tools.

Materials

- A1 flipchart paper
- Coloured markers
- Prestik
- Tape recorder
- A4 paper and pens

Method

Focus groups can be conducted in several different ways and their format will depend on the type of people involved in the group. Focus groups can consist purely of discussion. In this case, it is useful for the facilitator to either tape record the session and transcribe it or make notes on it afterwards, or to be accompanied by someone who can take notes while they guide the discussion.

Focus groups can also be more interactive, where participants nominate someone from the group to take notes and to summarise and feed back to other groups what has been said. In this case it is useful to provide participants with A1 flipchart paper and markers.

It is helpful to prepare a list of no more than six questions to guide the conversations within the group.

Note: Where focus group discussions seek to obtain additional perspectives on the information gathered through the participatory tools above, it is helpful to display the flipcharts and photographs gathered from the preceding activities.

Conclude by reviewing what has been learnt through the activity.

4.5.2 In-depth interviews

Woman interviews man



In-depth interviews involve one-on-one discussions with key respondents, usually people with detailed or specialised information on a topic. They are useful in obtaining background information for community assessments from role players like government officials or community leaders. They can also be used to discuss in more depth, issues identified through other research tools.

Objective

To gather detailed information on a specific topic or topics.

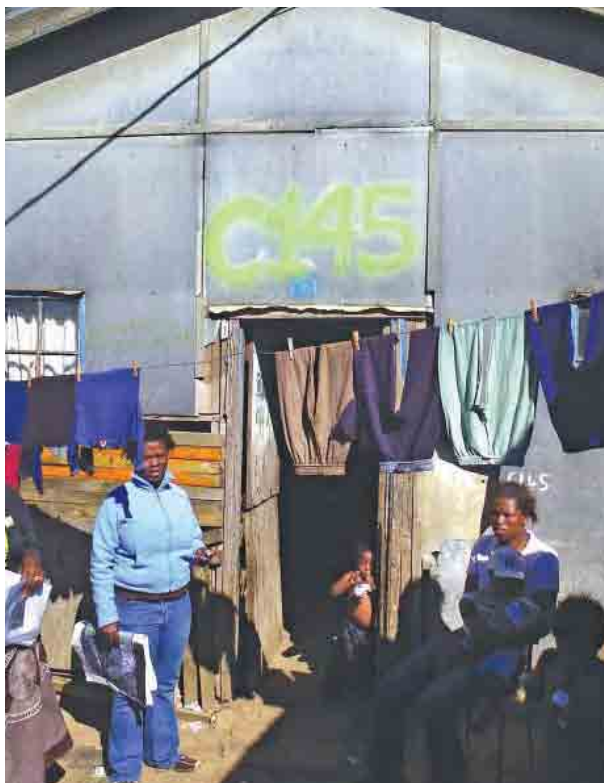
Method

In-depth interviews are generally semi-structured. This means that they are guided conversations in which an interviewer asks a series of broad pre-determined questions, to which new questions can be added as the discussion unfolds.

As for focus groups, it is important to prepare a list of no more than ten questions to guide the conversation. It is important to limit the number of questions, as you can expect several new questions to arise during the course of the interview. The interviews can be taped and transcribed, or you can take notes during the session. In this case, it is best to do the interviews in pairs, so that one person can focus on asking questions and the other can take notes.

The time required varies according to the number of questions, but should not exceed one hour, as respondents are likely to get tired or have other things to do.

4.5.3 Surveys



Participants conducting door to door surveys

Surveys collect data from a large number of people using a standardised questionnaire, which either they fill out, or the interviewer completes for them. Surveys can collect a wide range of information; they can ask for people's opinions on issues, collect data on people's experiences, assets or knowledge, or personal information such as demographic characteristics.

The use of surveys to assess risk is still relatively uncommon, but surveys are useful when used in conjunction with the more widely used participatory tools. While mapping exercises and other participatory tools provide broad information on who in a community is most exposed and vulnerable to the effects of hazards, administering a standardised questionnaire to a larger number of people can help to tease out the differences within vulnerable groups. Surveys can also be used to generate statistics, which are useful in influencing decision-makers to take action. Finally, because they are administered to a larger number of people, they can produce information that is more representative than the information provided by a small group, whose participants may or may not share similar experiences with those around them.

Objective

To obtain standardised information from a large number of people on a particular topic or topics.

Method

Surveys can use either semi-structured or structured questionnaires. A semi-structured questionnaire contains some open-ended questions which allow the person answering the questions some flexibility in how they answer them. In a structured questionnaire, all the questions are given pre-determined answers, from which the respondent must choose.

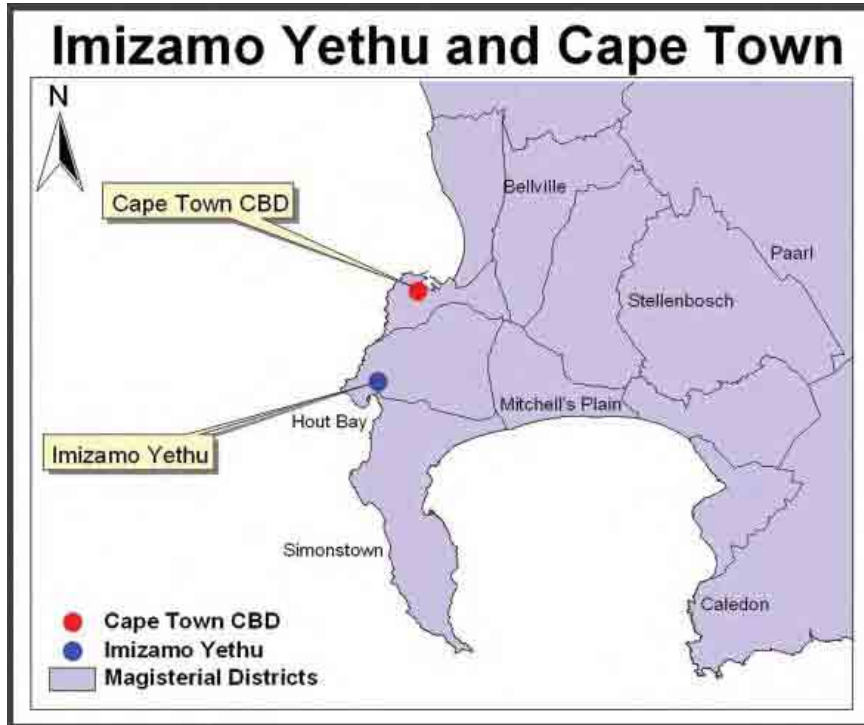
In most cases, surveys will involve some kind of sampling. A sample consists of a group of people who are chosen in such a way that they represent the experiences and views of a much larger group. It would be very difficult and expensive to interview every disaster manager in South Africa, for example, but it is possible to select a smaller group of managers that share the skills and experiences of their colleagues in the country as a whole.

It is important to test a survey on a smaller group of respondents before administering it, to ensure that the questions obtain the information that you are looking for. This is called piloting, and while it may take a little longer, can save you a lot of time and money in the long run.

The time required varies according to the number of questions, but should not exceed one hour, as respondents are likely to get tired or have other things to do.

4.5.4 Spatial mapping using geographical information systems (GIS)

Map 4.1 Imizamo Yethu and Cape Town



ArcView utilised to create a map and mark off an informal settlement within Cape Town

Geographical information systems (GIS) are increasingly used to aid policy design, implementation and monitoring. They are very useful in analysing the spatial relationships between factors, and because they present data visually, can help government officials and other end-users to quickly and easily understand information.

GIS analysis can be used in place of, or ideally, to complement the paper maps generated by communities. GIS is particularly helpful in analysing and presenting changes over time, and can examine much larger areas than is feasible with paper maps.

Objective

To analyse and present spatial data on the distribution of hazards and risks in a study area, visually.

Method

Any electronic data can be used in a GIS, so long as it can be connected to a spatial reference that the system can use to put the data on a map. Many electronic data sources, such as South Africa's census, already contain spatial information. It is also possible to digitise paper maps, match non-spatial data to spatial data, such as municipal demarcations, or to collect your own spatial data using a global positioning system (GPS).

You can use a GPS to assign a spatial reference to the information collected during a transect walk, for example. These data are entered

into specialised computer software, such as ARCGis, which allows you to analyse and present the data on maps.

The length of time required to collect and analyse the data will vary depending on your data source and the level of analysis.

4.6 Templates for flipcharts and other materials

Translations for flipcharts in Activity A, p 48.

What do we mean by Hazard?

Things or processes that may have dangerous or harmful effects on people and the environment.

Wat bedoel ons met Gevaar?

Voorwerpe of prosesse wat 'n gevaarlike of skadelike uitwerking op mense en die omgewing tot gevolg kan hê.

Sithetha ukuthini xa sisithi Ubungozi?

Izinto okanye iimeko ezinokukhokelela kudodobalo lwendalo okanye ukhuseleko loluntu

What do we mean by Vulnerability?

Internal conditions that increase people's exposure and susceptibility to hazards or other shocks and stresses.

Wat bedoel ons met Kwesbaarheid?

Interne toestande wat mense se blootstelling aan gevare en sodoende die vatbaarheid vir spanning en ander skokke as gevolg van die gevaar vermeerder.

Sithetha ukuthini xa sisithi Isichenge?

Yimeko ngelinye ixesha engaqapheleki msinyane eyenza kube lula ukugaxeleka ebungozini

What do we mean by Risk?

The chance of harmful effects occurring due to the interaction between a hazard and vulnerable conditions.

Wat bedoel ons met Risiko?

Die kans dat die wisselwerking tussen 'n gevaar en kwesbare toestande tot skadelike gevolge kan lei.

Sithetha ukuthini xa sisithi Umngcipheko?

limeko ezibeka ukhuseleko ebungozini

What do we mean by Disaster?

A serious disruption of a household, community, ecosystem or society that leads to hardship, damage or property loss and that is too difficult for those affected to manage without outside help.

Wat bedoel ons met Ramp?

'n Ernstige ontwrigting van 'n huishouding, samelewing, ekosisteem of gemeenskap, wat tot ontberings, skade, of eiendomsverliese lei, en wat vir diegene wat daardeur getref is, te moeilik is om te hanteer sonder hulp van buite.

Sithetha ukuthini xa sisithi Intlekele?

Ku xa bethetha ngophazamiseko olumandla kumakhaya, ekuhlaleni, kuluntu nendalo ngokubanzi, oluthi lukhokelele kumonakalo, nakwilahleko engamandla. Loo nto ithi inyanzelise abo bachaphazelekayo bafune uncedo

Template 1 A seasonal calendar

Seasonal Calendar													
Hazard Type:													
Problem	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Reason

Template 2 A weekly calendar

[illegible]

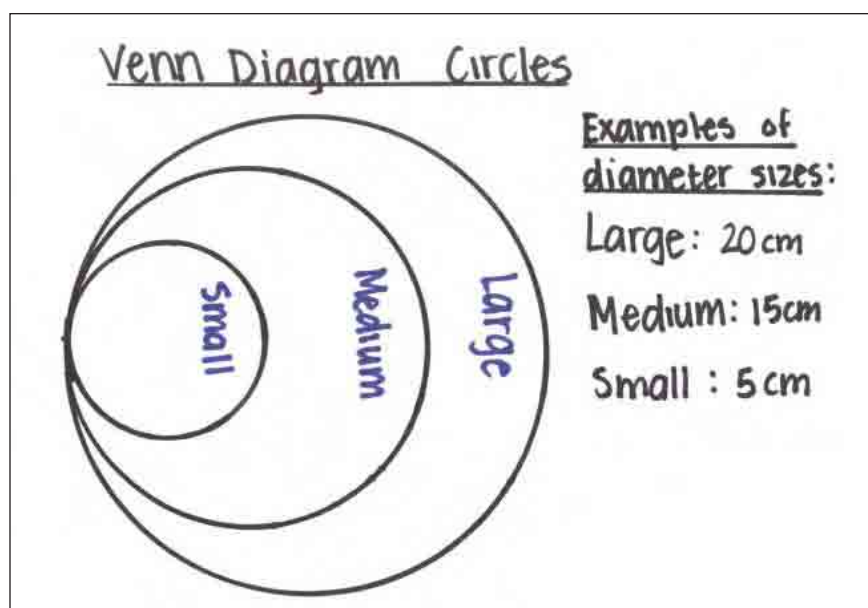
Template 3 A risk history table

Risk History Table

Period →					
1980 - 1985	1985 - 1990	1990 - 1995	1995 - 2000	2000 - 2005	PRESENT

* > examples of a time period

Template 4 Circle sizes for a Venn Diagram



Template 5 Risk avoidance measures

Type of risk:

Ⓐ Examples of risk avoidance measures
(How do people AVOID or reduce their risk?)

What avoidance measures observed	Who uses this? (household)	How effective is it?

Template 6 Risk coping strategies

Type of Risk:

Ⓑ Examples of "coping strategies"
(How do people "get by" or "cope" with risk)

Coping measures observed	Who uses this	How effective is it? Why?

Template 7 Six questions

6 Questions

1. Who?	
2. Why?	
3. When?	
4. Increases?	
5. Outcome?	
6. Cope?	

Template 8 Table for plenary discussion

WHAT	HOW	WHO	WHEN

4.7 Community risk assessment report: suggested outline

It is important to prepare a risk assessment report, and to share this with settlement residents as well as other government and civil society stakeholders. The outline below is one possible format for consolidating the assessment process and findings.

Table 4.11 Community risk assessment report format

Section	Content	Information sources and suggested research methods
Executive summary	Motivation and justification for methods used - Outline the motivation for the assessment – the reason(s) for the process (ie a rapidly changing fire profile or in-migration pattern) - Describe the type of research methods used (ie CRA methods or survey tools) and what they aimed to identify Institutional arrangements - Who facilitated the assessment? - Who funded or sponsored the assessment? Ethical considerations Assessment limitations	

Section	Content	Information sources and suggested research methods
Assessment context	- Relevant historical background (South Africa, within the province and specific municipality or Metro) - How and when the settlement formed, and how it has changed or developed over time - The settlement's current socio-demographic profile, including gender, languages spoken, ethnic groups and nationalities represented - Housing status/servicing and upgrade process, development priorities and constraints - Documented disaster risk profile, past flood, fire or severe weather events	Community leadership Municipal planning departments Maps and time-series of aerial photographs Integrated development plans Disaster risk management, fire reports, South African Red Cross or other humanitarian agency reports Newspaper reports
Description of the settlement	- Location and key geographic features (eg roads, rivers and industrial centres) - Location and provision of key services and facilities - Demographic and socio-economic profile - Main livelihood strategies Hint: Provide maps and/or aerial photographs of the settlement to show where it's located. Also, a graph or table to show population change, if applicable.	Spatial development plans Published and unpublished reports Student research Census data Topographical maps and aerial photographs Relevant environmental and engineering reports on wetlands, rivers, catchment and stormwater management
Data collection	In this section provide the following: - Assessment dates - Where assessment was held - Who the assessment was hosted by - Who attended the assessment, and the number of attendees - A brief summary of the activities carried out on each day	
	The following sections follow the CRA process Identify the priority risks - Explain how the priority risks were identified, what these were and why they were significant. In-depth examination of priority risks - Spatial analysis to map areas of exposure, contributing risk factors and assets that reduce risks - Temporal analysis to investigate historic trends and changes over time - 'Risk-drivers' that increase vulnerability, including economic, social, perceptual, attitudinal, political, environmental and infrastructural factors Hint: Include scanned-in copies of maps, tables and charts to illustrate important points. You can also photograph the flipcharts and insert these if scanning is difficult.	Topographical maps Aerial photographs Participatory methods Quantitative data on past disaster events Hazard identification and assessment Hazard prioritisation Hazard mapping Community risk mapping Transect walk and focus groups Seasonal calendar Risk history table Concept mapping Venn Diagram

Section	Content	Information sources and suggested research methods
Opportunities to manage/ reduce risk	This section describes why some households manage their risks and/or cope better than others. It also describes levels of support from government and other formal structures. It includes: - Indigenous and/or local risk management knowledge - Coping - Local adaptation (risk management strategies) - Livelihood diversification activities that reduce household vulnerability	Qualitative data gathering (ie focus groups, household interviews) Participatory methodologies Risk management capacities matrix Solutions/objectives tree
Conclusions and recommendations	Feedback to settlement residents It is unethical to carry out extractive research that does not transparently communicate findings to those who generated them. - The report should recommend at least one mechanism for communicating the assessment results to settlement residents in an accessible format and forum. - The report should also reflect on levels of attendance and participation by residents in the CRA. Was it well attended? If not, why not? Was it viewed as a positive or enabling opportunity by residents? Recommendations to government departments These should be clearly listed under headings such as 'Solid waste' or 'Disaster risk management' to assist with implementation and follow-up.	
Appendices	Include - CRA programme - Participant list - Illustrative tables, maps and graphs from the CRA process	

Chapter summary

1. A well-conducted participatory risk assessment can help build a shared understanding of local risks and also strengthen cooperation and trust. It uses a wide range of participatory methods to answer:
 - Who is most at risk?
 - Why are they at risk?
 - When are they most at risk?
 - What is increasing (or reducing) the risk?
 - What is the outcome of the risk?
 - How do groups at risk reduce and cope with the risk?
2. Community risk assessments do not always need to follow the sequence described in this chapter. They do not need to include all the activities. You can include one or more of the activities in other community-based planning or integrated development planning processes.
3. There are other social science and spatial risk assessment tools that can supplement the participatory activities. These include focus groups, in-depth interviews, surveys and spatial mapping.
4. There are many different possible arrangements for taking forward the findings of the CRA. One of the most effective is to establish a community-based disaster risk management committee – or to build this into an existing community-based structure.
5. To support good follow-up by all concerned, it is important to record the risk assessment process and to make a plan for transparently communicating back to those who participated in the assessment.

Flooding, storms, fires and environmental health risks: priority risks for informal settlements

Shanaaz parked her bakkie*, and joined the disaster risk management field officer and local ward councillor. Since the cold front had moved in yesterday morning, there had been heavy rains and driving winds across the district. Although this settlement had flooded badly last year, with 200 families needing temporary shelter in the community centre, she was hoping they wouldn't need to evacuate so many people this time.

As the area's roads and stormwater field officer, she had made sure that there had been a serious clean-up of litter, vegetation and other debris from river channels and stormwater drains before the winter rainy season. She was impressed that the settlement residents had kept the detention pond clear of new structures and that the culverts were not blocked. She observed that more homes now had locally-built retaining walls to prevent water flowing inside. In some homes, people had even raised their floor levels higher than the surrounding ground with sand or stilts.

They discussed the latest weather forecast, which anticipated another two frontal systems sweeping in over the next week, and the likelihood of needing the community centre if conditions worsened. Based on past experience and this year's local risk assessment, they expected that around 30 families would need temporary shelter until the storms passed and the waters subsided.

**pickup truck or light utility vehicle*



Flood coping strategy – a bed is put on paint cans to stop it from getting wet

5.1 Introduction

5.2 Storms and flood risk in informal settlements

5.3 Fires in informal dwellings

5.4 Environmental health risks in informal settlements

5.5 Chapter summary

Overview

Chapter 4 gave an outline for a programme for a community risk assessment. This chapter focuses on three specific risk clusters:

- storms and flooding
- informal dwelling fires
- environmental health risks.

Each section begins by outlining the municipal, provincial and other role players who should be involved in a risk assessment and reduction process at settlement level. Each section then provides a brief overview of the risk – why it happens and the key underlying risk factors. The section continues with pointers for the risk assessment and concludes with suggested actions that are useful for reducing risk and indicators for monitoring them.

5.1 Introduction

5.1.1 Integrated risk management – thinking ‘across risks’

Informal neighbourhoods in the Western Cape face many risks – crime, ill health, flooding, informal dwelling fires and environmental health risks.

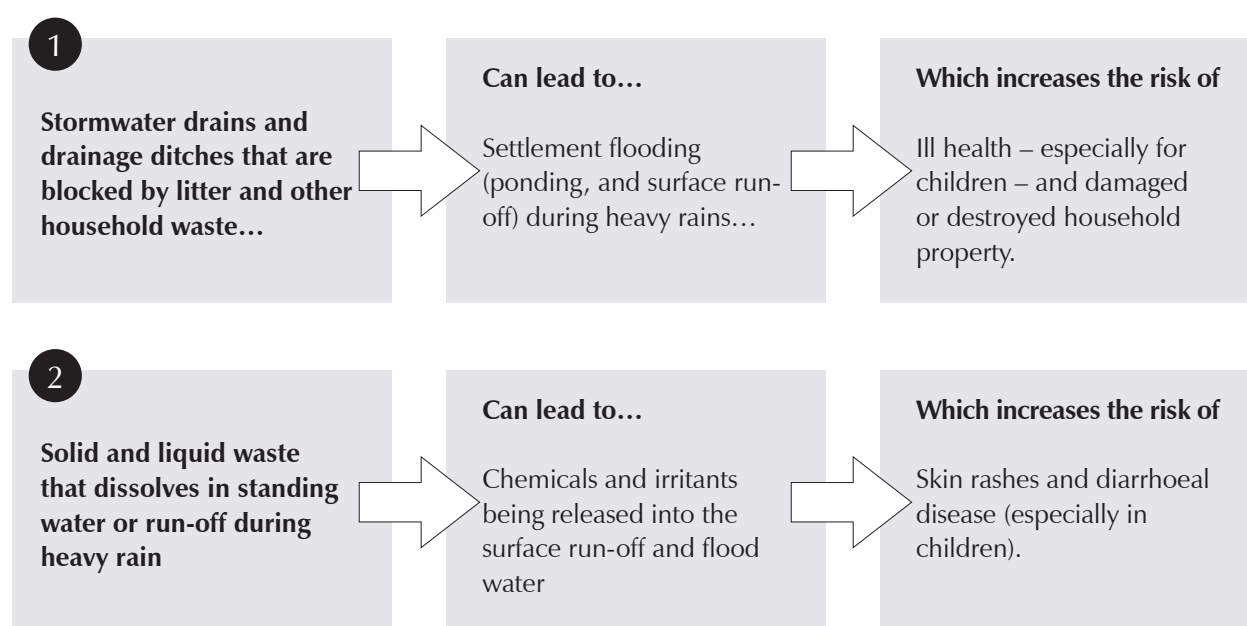
People in many informal settlements experience flooding, fires and environmental health risks as everyday, chronic risks. These risks can also rapidly upscale into local emergencies, leading to widespread loss of property, temporary displacement and prolonged hardship. For instance, severe storm events that have occurred annually in the western and southern Cape since 2003 have seen thousands of low-income residents evacuated from high-risk low-lying areas or sites adjacent to rivers and natural water-courses.

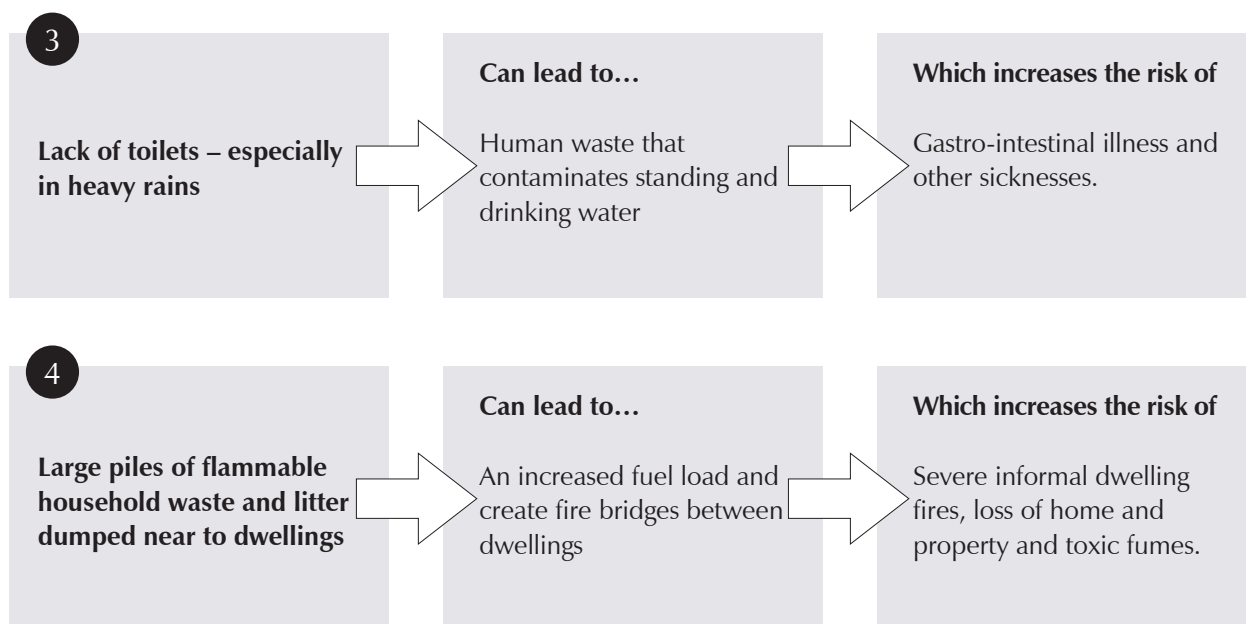
Similarly, in the case of informal dwelling fires, from 1995-2005, more than 8 554 informal dwelling fire incidents occurred in Cape Town alone, affecting 40 558 households – around 160 000 people. Most of these incidents resulted in houses being destroyed, along with household property and identity documents, seriously setting back the households affected.

Within the province, each of these threats affects thousands of poor families every year. They also create enormous demands on local authorities and humanitarian assistance organisations.

Many settlements experience both severe fires and urban flooding – sometimes even within the same season. This is because many of the same vulnerability factors increase exposure to these different risks, and lower local capability to manage them. For example, poor levels of environmental health increase the severity of both flooding and fires.

Here are some examples of the ways in which vulnerable communities can be exposed to a range of risks:





These examples show the importance of integrated or ‘multisectoral’ risk management in informal settlements. For instance, although roads and stormwater departments may be primarily responsible for managing flood risks, environmental health workers also play an essential role in flood risk management by providing accessible, dependable solid waste collection and disposal.

The sections below apply to all municipal and provincial departments who support informal settlements. They also apply to community-based and nongovernmental organisations working in poor areas. They are not intended to provide in-depth specialist information – but rather, an integrated overview of flood, fire and environmental health risks.

5.2 Storms and flood risk in informal settlements

5.2.1 Relevant departments and organisations

Table 5.1 Relevant stakeholders

Municipal Departments	Provincial Departments	Others
Disaster Risk Management	Department of Housing	NGOs
Roads and Stormwater	Department of Transport and Public Works	CBOs
Utility services, including Water and Sanitation Services and Solid Waste Management	Department of Health Community Development Workers	
Environmental Health		
Fire and Emergency Services		
Planning, including Integrated Development Planning		

Who else to include?

Local civil society organisations should always be involved (including faith-based organisations, advocacy groups and environmental agencies). They can help to build communication links between local residents and service providers and assist in building the capacity of community stakeholders to identify and manage risk. They can also help to close gaps in service delivery, maintenance and in reporting of inadequate, blocked or broken infrastructure.

It is vitally important to include residents who are most at risk. On one hand, people who live closest to a wetland or stormwater channel, for example, are the most vulnerable to flooding. On the other, they are often the most marginalised people in a settlement who have no option but to live in the least desirable spaces. Groups such as women, children, the elderly and the chronically ill also tend to suffer the worst effects of flooding.

WHAT IS... *An example of an existing community organisation you can mobilise for flood risk reduction?*

In a settlement situated on a wetland, a Wetland Committee had already been established. This group was taken into account and participated in the CRA process. As this committee was already established, it was more sustainable to work with this structure than to establish a new one.

5.2.2 The Cape of Storms

The Western Cape, specifically the Cape Peninsula, has long been known as the Cape of Storms. Powerful cold fronts sweep in from the South Atlantic bringing stormy weather, heavy rains and strong winds. The other type of weather system that brings heavy rain is known as a cut-off low. Cut-off lows often result in very heavy rain and are associated with the province's most severe flood losses.



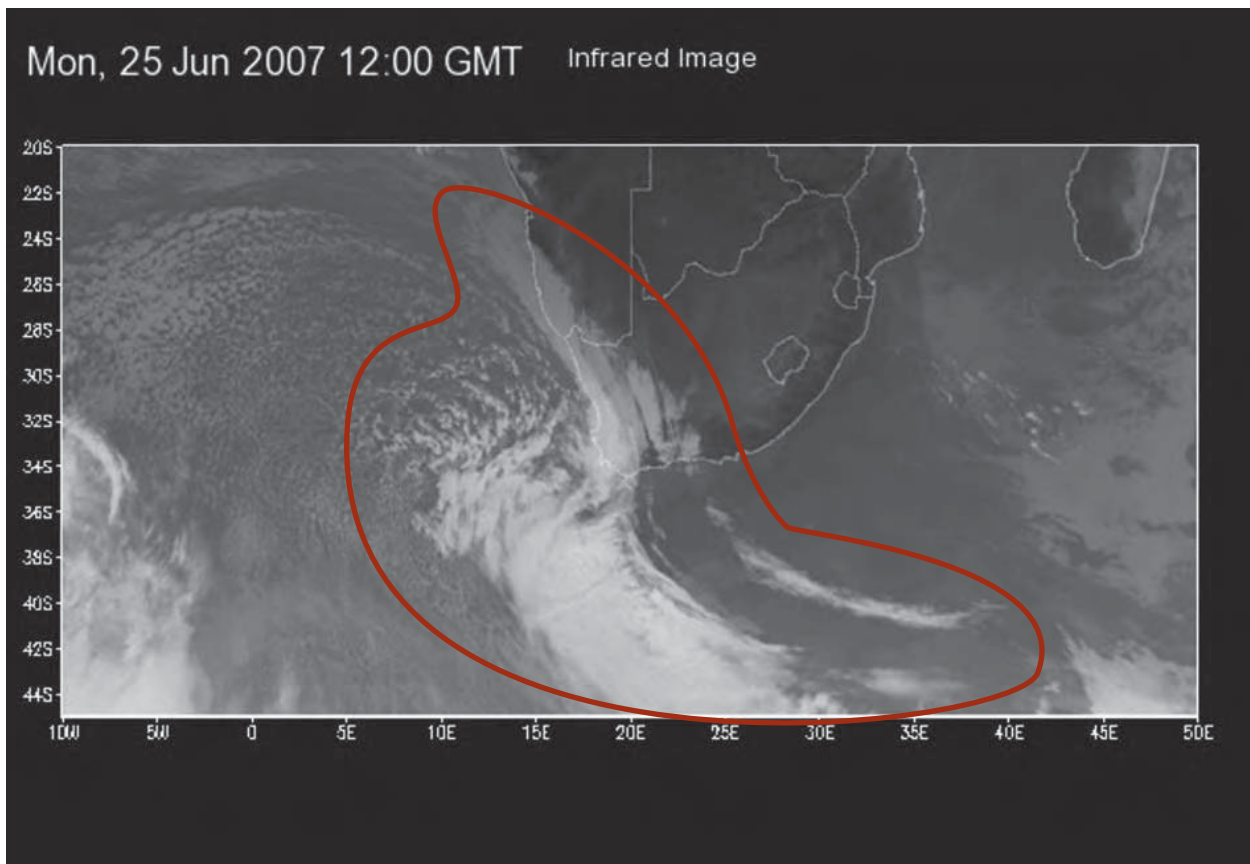
Informal dwellings surrounded by water after heavy rain

WHAT IS... *A cold front?*

This is an atmospheric transition zone created when a moving cold air mass replaces the warm air in front of it.

An understanding about cold fronts is important for managing flood risks because cold fronts are often accompanied by heavy rain and strong winds – and move swiftly across the Western Cape from the South Atlantic Ocean.

Figure 5.1 A photograph of a cold front taken from space

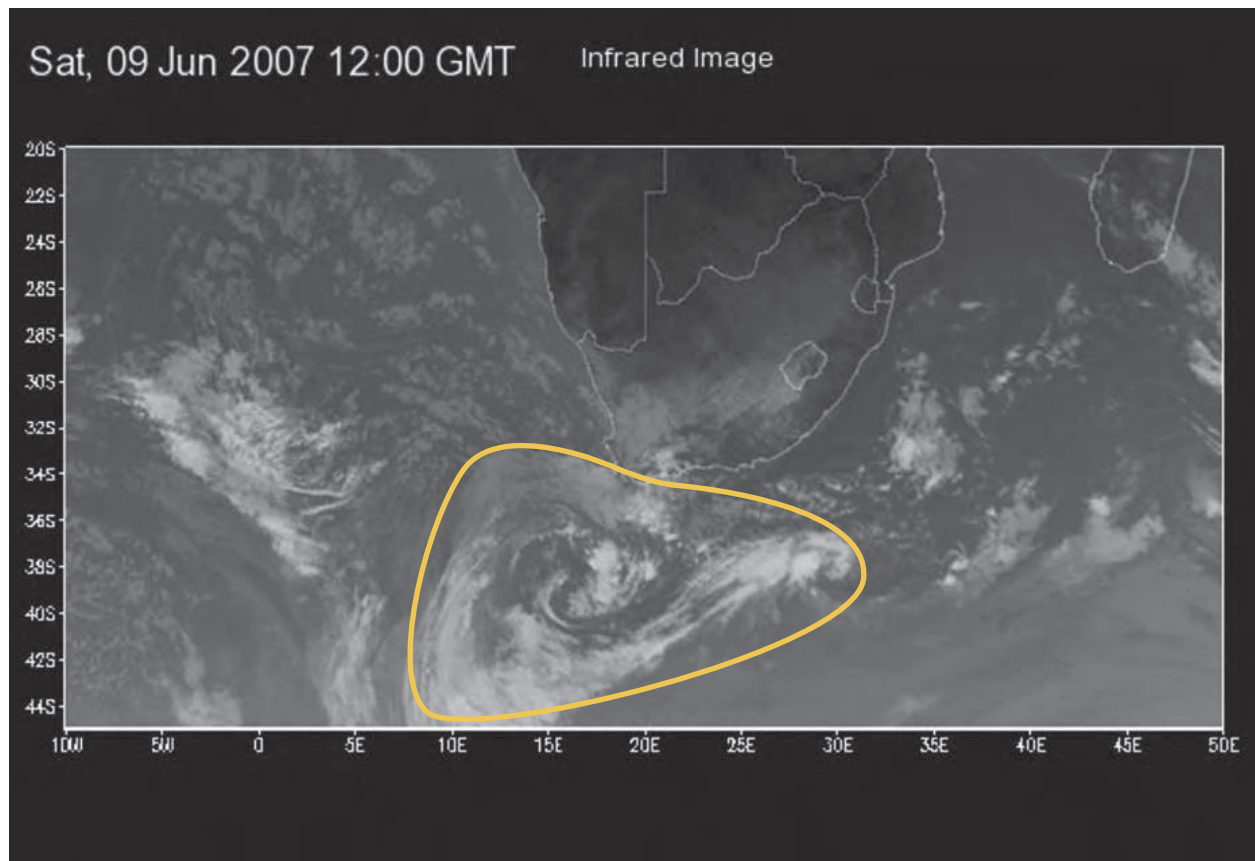


WHAT IS... *A cut-off low?*

A cut-off low is atmospheric circulation that becomes separated (or cut off) from the main flow/system and often results in heavy rainfall, gale-force winds and other severe weather.

An understanding of cut-off lows is important for managing flood risks as cut-off lows are slower-moving than cold fronts, and can cause very heavy rainfall. They are historically associated with many of the most severe flood events in the Western Cape, including the Laingsburg floods of 1981, the Montagu floods in 2003 and the South Coast floods of 2006/2007

Figure 5.2 A photograph of a cut-off low weather system taken from space

**WHAT IS...** *The impact of climate change?*

Scientists who make climate change predictions expect the Western Cape to become drier from west to east. They also foresee lower winter rainfall, slightly more summer rain (mainly in the east of the province), a shift to more irregular rainfall and rising average, minimum and maximum temperatures everywhere.

While rainfall is expected to be less predictable, storms are projected to become more intense and severe. This is likely to increase flood risks in many areas. In coastal zones, rising sea levels may also increase coastal flooding during storms, as well as coastal erosion.

For more information on the effects of climate change in the Western Cape, refer to p 192.

A photograph of a cut-off low weather system. The yellow lines show how the cut-off low is more circular than the cold-front in the preceding image

Informal settlement flooding, however, is not only caused by heavy rainfall. There are many informal settlements located in wetlands or in low-lying areas that normally flood following rainfall. In Cape Town, for instance, there are many settlements on the Cape Flats that are in areas that are actually supposed to flood each year. These areas also have high water tables. This means that the water below the ground is close to the surface, so that when it rains, the water seeps up into dwellings very easily.

Other settlements are at risk of flooding because they are close to detention ponds (see photos on p 120) or near water courses (eg Doornbach) or located on steep slopes (eg Hangberg or Thembaletu in the Southern Cape).

Being close to water or on steep slopes places them at risk from flash floods and heavy surface run-off when it rains.

In formal settlements, engineers plan and build stormwater and other drainage systems to reduce flood risk. Unfortunately, once hundreds of informal dwellings have already been built in informal areas, it is much more difficult to construct adequate drainage, especially in wetlands or on steep slopes. This means that informal settlement flooding is driven by a combination of factors: exposure to flooding due to location in high-risk areas, limited formal stormwater drainage and dwelling design that often 'sinks' the informal structure below ground level to stabilise it against the Cape's strong winds. Unfortunately, this also allows water to flow in or seep up through the floor, leading to flooding inside informal homes.



Informal dwelling with sand packed against the back of it

5.2.3 Types of flooding

Flooding in the Western Cape is historically associated with the rainy winter months between May and September. However, changing weather patterns mean that heavy rainfalls can also occur at other times of the year. The Montagu floods occurred in March 2003 and in December 2004, a cut-off low triggered severe flooding in the Southern Cape.

The Western Cape is exposed to many well-researched and understood flood risks such as riverine and coastal flooding. However, in the case of informal settlements and other poor, under-served areas, the term 'flooding' also includes other risk conditions.

Table 5.2 describes the difference between these more commonly understood flood risks (highlighted in yellow) with emerging urban flood processes like ponding (see p 122), ‘rising’ floods and inside leakage (highlighted in blue).

Table 5.2 Types of flooding in the Western Cape

Types of flooding	Why this is important
Coastal or marine flooding	Storms or geological events such as earthquakes cause destructive flooding in coastal areas.
Riverine and estuarine flooding	Storms or rains raise water levels in rivers, estuaries, lakes and wetlands. Riverine flooding can also take the form of flash floods , where intense storms produce fast-flowing but short-lived floods.
Ponding	Rain lies or stands on the surface of the ground for days or weeks in poorly-drained, low-lying areas.
Seepage (also called ‘rising flood’)	Water continually percolates up to the ground surface. Seepage tends to occur in areas where there is a high water table , such as in many areas of the Cape Flats, in Cape Town.
Surface run-off	Water drains off surfaces, particularly hardened surfaces such as tarred roads without adequate stormwater drainage, or runs down steep slopes.
Leaking	Rainwater leads to inside flooding through poorly constructed and inadequately flood-proofed structures – often due to roofing and walls that cannot handle heavy rainfalls.

In some areas, heavy rains may trigger **mud flows**, where surface run-off collects soil, rocks and other debris. These are most common on steep slopes or in mountainous areas, particularly where the surface vegetation that should absorb excess water has been destroyed by fire or cleared through human activity.

In coastal areas, structures are often built on sand dunes. These are vulnerable to **subsidence**, where the soil on which they are constructed is washed away by water and wave action.

WHAT IS... *A detention pond?*

This is a basin or reservoir where water is stored for regulating flooding. It has outlets for releasing the flows during flood events.

Detention ponds are important flood risk reduction structures in informal settlements, where formal stormwater channels have not – or cannot be sited due to residential density or wetland conditions. They are designed to catch run-off after heavy rains and to channel this into the formal stormwater system.

In the summer, detention ponds are usually empty. They don't have walls or look like dams. So, people build homes in the apparently open space – not knowing that the pond is supposed to fill up when it rains.

They then find themselves and their homes flooded when it rains.

Informal dwellings surrounding an empty detention pond



The same pond after it has rained



WHAT ARE... *Accumulating risk conditions?*

Risk conditions accumulate in informal settlements, affecting both human and ecosystem health. The photograph below shows how the close proximity of the dwellings to the river exposes the residents to flash flood risks. In addition, their close proximity constitutes a risk to riverine health, because solid, liquid and human waste pollutes the river, and the natural environment downstream.



Informal homes on the edge of a river

WHAT IS... *Seepage?*

Seepage occurs when water continually percolates up to the ground surface. Seepage tends to occur in areas where there is a high water table, such as in many areas of the Cape Flats, in Cape Town. Seepage is sometimes called a rising flood.



Water seeps through the floor of the houses

WHAT IS... *Ponding?*

Ponding occurs when rain lies or stands on the surface on the ground for days or weeks in poorly-drained, low-lying areas.

Ponding in and around the houses



Drains clogged by waste



Several specific features increase the risk of flooding in the Western Cape. These can be grouped into three broad categories, associated with inadequate drainage, inadequate structural conditions and flood/weather exposure. These are described in Table 5.3, together with their likely effects.

Table 5.3 The sources of flood risk in the Western Cape

Broad source of hazard	Hazard	Factors increasing risk	Effects
Poor drainage	Ponding	- Poor drainage around communal water taps - Shallow, hand dug informal drains between houses - Blocked drains - Clogged drainage ditches	- Health problems, particularly among children who play in the water, and related costs - Missed school or work days
	Surface run-off	- Inadequate drainage alongside hardened surfaces such as roads - Structures in close proximity to hardened surfaces	- Health problems, particularly where waste is washed into homes, and related costs - Missed school or work days - Damage to structures - Damage to and loss of assets, documents and possessions
Structural problems	Seepage	- Structures in close proximity to wetlands and water bodies - Home foundations below ground level - Poor building materials - Inadequate weather proofing	- Damage to and loss of assets, documents and possessions - Health problems, as people become ill from damp and cold conditions, and related costs - Missed school or work days
	Leaks	- Poor building materials - Inadequate weather proofing	
Flood exposure factors due to location and surroundings	Coastal flooding	- Structures built on sand dunes close to coast - Disturbance of natural water drainage and flow patterns	- Injuries and deaths and related medical costs - Homes completely or partly washed away - Damage to and loss of assets, documents and possessions - Damage to and loss of infrastructure - Negative effects on businesses and industries, particularly in the tourism sector
	Riverine/estuarine flooding	- Structures in close proximity to water bodies - Structures built in dry water courses - Disturbance of natural water drainage and flow patterns	- Isolation of communities as bridges and roads are damaged or washed away - Injuries and deaths and related costs - Homes completely or partly washed away - Damage to and loss of assets, documents and possessions - Damage to and loss of infrastructure - Negative effects on businesses and industries
	Mud slides and debris flows	- Destruction of vegetation on mountain slopes - Disturbance of natural water drainage and flow patterns	- Isolation of communities as bridges and roads are damaged or washed away - Injuries and deaths and related costs - Homes completely or partly washed away - Damage to and loss of assets, documents and possessions - Damage to and loss of infrastructure - Negative effects on businesses and industries

5.2.4 Useful participatory risk assessment tools

Hazard mapping

Hazard mapping helps establish the sites and specific nature of flood risk. However, as flooding is more likely to be a seasonal hazard associated with the wet winter months, flood risks may not be as obvious if the CRA takes place in the summer.

Table 5.4 Hazard mapping for flood risk (refer to p 69)

Pointers for hazard mapping	Questions to ask
Always gather information on sanitation and the management of solid waste. Even minor flooding can create health problems where water is contaminated with raw sewerage or by the chemicals released by decomposing solid waste. Differentiate between flooding of dwellings due to inadequate drainage, and flooding due to leaky roofs.	• Where are the main access roads, rivers, mountains, wetlands etc located? • What places or areas in the settlement are most at risk of flooding? Why? • Where are the drains or drainage ditches? • Where are the toilets that residents use? • Where are the taps that the community uses? • Who is most affected by flooding? Why? • What infrastructure and resources are most likely to be damaged or affected by flooding? • Is it possible to identify and map examples of positive actions taken to reduce the risk of flooding?

Seasonal calendar

Table 5.5 Seasonal calendar for flood risk

Pointers for seasonal calendar	Questions to ask
A seasonal calendar shows the months when flooding occurs and when it is most severe. Certain illnesses, such as influenza, chest infections, rashes and diarrhoea are often associated with flooding.	• During which months do you or your children get sick most often? What kinds of illnesses do you get? • In which months is flooding most severe? Why? • When are the effects of flooding least severe? • Why?

Transect walk

A transect walk can help identify measures taken by the community to reduce the likelihood of flooding. Community members may not mention what measures they have taken during a mapping exercise, as they often take these actions for granted.

WHAT ARE... *Flood risk reduction measures that residents can take?*

- Raising structures above ground level using sand, wood or stilts (see photos below)
- Using cement rather than wooden or sand floors
- Using metal sheeting or sandbags to divert or hold back water (see photo on p 126)
- Digging channels to draw water away from dwellings (photo on p 126)
- Building away from bodies of water or roads.



A house built on stilts



A house built on stilts

Zinc sheeting and concrete blocks laid around the plot to form a retaining wall, to prevent water flowing in from the road



House elevated using a combination of sand and planking. The carpet covered step in the foreground leads to a raised interior.



A man digs a channel to divert water away from the house



Risk management capacities matrix

This tool helps to explain why some people adopt mitigation measures and others do not. This is useful for later development of a local flood risk management strategy.

Table 5.6 Pointers for risk management capacities matrix around flooding

Pointers for risk management capacities matrix	Questions to ask
This matrix will help you to identify who is taking steps to reduce risk, and the effectiveness of these steps. It also helps identify barriers that limit local risk reduction measures.	• What actions are being taken to reduce flood risks? • Who uses them? • When are they used? • How effective are they? • Why do some people not use them? • What can be done to make them more effective/ increase their usage?

5.3 Fires in informal dwellings

5.3.1 Which role players should be involved?

Table 5.7 Role players to involve

Municipal Departments	Provincial Departments	Others
Disaster Risk Management	Department of Housing	Cape Nature Conservation
Fire and Rescue Services	South African Police Services (enforcement)	PASASA
Metro Police	Community development workers	CAPSFA
Informal settlement planning	Department of Health	Other NGOs and CBOs
Utility services, particularly Solid Waste Management	Table Mountain National Park	Eskom
	Department of Social Services and Poverty Alleviation and/or the South African Social Security Agency (SASSA)	

Who else to include?

Always involve street committees, NGOs, CBOs and CDWs. They can help to build communication links between local residents and service providers. They can also assist in closing gaps in service delivery, maintenance and in reporting of inadequate, blocked or broken infrastructure (eg broken hydrants).

In many areas, fire risk increases because of excessive alcohol consumption and its adverse impact on responsible behaviour. This means engaging stakeholders who, in the past, may not have been so actively involved in risk management, such as shebeen owners and members of community watches.

Informal dwelling fires often result from interpersonal disputes and lack of political tolerance. Therefore, it may be beneficial to involve conflict resolution groups or structures, if these exist.

In addition, as many fires are started accidentally by children, they should also be included, along with school, crèche and sporting groups.

5.3.2 Fire risk in the Western Cape

The Western Cape is affected by many different types of fires. They can be classified by location and/or type of structure affected. While this guide focuses mainly on informal dwelling fires, there are other types of fires as well – including commercial and industrial, rubbish and grass fires.

Depending on weather and other conditions, a small grass or rubbish fire can quickly upscale into a more serious urban fringe or veld fire that can endanger property and human safety in both formal and informal neighbourhoods.

Table 5.8 The major types of fires that affect informal dwellings

Types of fires	Main location	Frequent causes
Wild fires/ veld fires/ bush fires	Occur mainly in natural, wild, vegetated areas and farmland	Carelessly discarded cigarettes Camping fires Lightning
Urban fringe fires	Occur on the fringes of urban settlements where homes and infrastructure intermingle with forests and other vegetation	As above Arson (where people deliberately and maliciously set fires)
Formal dwelling fires	Affect one or more formal dwellings	Electrical faults, kitchen fires or poorly tended hearth fires Arson
Informal dwelling fires	Affect one or more informal dwellings	Frequently associated with poor people's reliance on cheap but hazardous sources of energy; Occasionally arson

WHAT IS... *An example of legislation that reduces fire risk?*

City of Cape Town - Community Fire Safety Amendment By-Law

On 29 June 2007, the City of Cape Town published the *Community Fire Safety Amendment By-Law* in the Western Cape Provincial Gazette (No. 6447). This law regulates fire safety in the Cape Metropole. Among its other provisions, the by-law stipulates that a person who throws a lit match or cigarette that is likely to cause a fire, from a vehicle, shall be presumed to be culpable and liable for a fine.

Within the metropole, you can report people throwing lit matches or cigarettes out of their car windows by dialling the 24 hour Emergency Control Centre at 021 424 7715.

You will need to provide the location, date and time of the incident and a description of the vehicle.

WHAT IS... *Another example of legislation that reduces fire risk?***Western Cape Liquor Bill**

On 27 March 2007, the Western Cape Parliament passed the *Western Cape Liquor Bill*. This regulates the selling of liquor from shebeens by:

- Requiring that shebeens register with the government
- Restricting the amount of alcohol that can be sold to informal outlets
- Enforcing regulations on operating times, holding owners accountable for the behaviour of patrons
- Placing restrictions on locations for shebeens.

The significantly increased severity of informal fires over weekends and late at night or early in the morning is attributed in part to compromised levels of individual responsibility due to alcohol consumption. This legislation is intended to better regulate the sale of alcohol as well as endangering social behaviour associated with high levels of consumption. The legislation is scheduled to be promulgated by December 2008.

The province's high-risk fire season is generally from November to March, when temperatures are highest. During these months, there is greater use of natural recreation areas and the indigenous fynbos is also more likely to burn.

5.3.3 Focus on informal dwelling fires

Informal dwelling fires constitute a serious disaster risk in the Western Cape. These occur primarily within informal settlements. However, they also happen frequently in formal neighbourhoods when backyard dwellings and Wendy houses catch on fire.

WHAT ARE... *Important informal dwelling fire facts?*

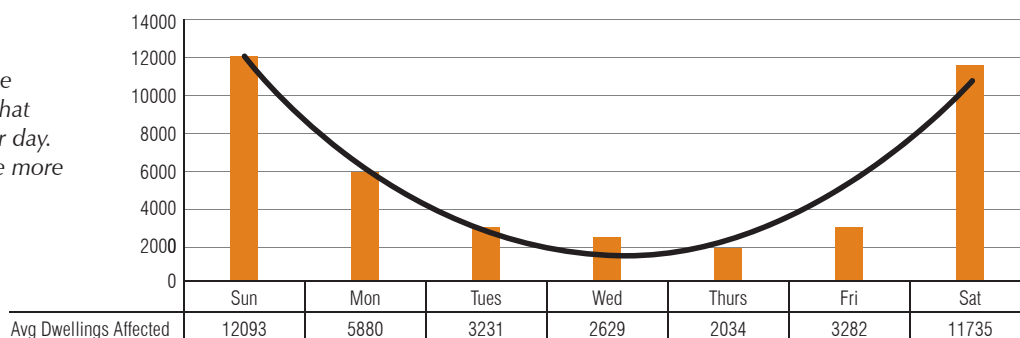
A review of informal dwelling fire data by UCT/DiMP from 1995-2005 in the City of Cape Town provided some useful facts.

1. The vast majority of informal dwelling fires affect between one to two structures - 6 085 out of 7 213 informal dwelling fires (84%) in the Cape Town affected two dwellings or less.
2. Informal dwelling fires are much more serious on weekends.
3. Informal dwelling fires are much worse at night time – and especially in the early hours of the morning.
4. Weather conditions (hot gusting winds) play an important role, increasing the possibility of spread. However, hot windy weather is not the primary risk factor for fire severity.

As with flooding, informal dwelling fires result from the interaction of environmental and human factors. The hot, dry and windy summer conditions in many parts of the province create the ideal environment for fires to spread, but most endangering fires are started by people. There is never any one single risk factor – but a combination of weather, institutional, infrastructural, social, and temporal (ie time of day, week, month, year) conditions can converge to result in destructive fire events.

Graph 5.1 below shows, for example, that in the city of Cape Town from 1995-2005, around 12 000 of all informal dwellings destroyed by fire were burned on Saturday or Sunday, with as few as 2 000 – 3 000 dwellings being destroyed daily from Tuesday-Friday. This shows that even although weather conditions and settlement density may be consistent across all days of the week, informal fire risk in the metro is significantly driven by human behaviour.

Graph 5.1 Dwellings affected per day for the accumulated 11 year period, i.e. 1995 to 2005



A graph that shows the number of dwellings that are affected by fire per day. It shows that there are more fires over weekends.

Factors that increase fire risks

Open flames and paraffin stoves

Open flames and paraffin stoves are widely used in informal settlements. Technically, these constitute a fire hazard in informal dwelling fires. They are, of course, also cooking, heating and lighting resources for poor families. However, many behavioural and other vulnerability factors increase the likelihood of an endangering fire event. For instance:

Fire hazard

Paraffin stoves that fall over or rupture

Candles that topple over or burn down to a flammable surface.

Vulnerability condition...

When paraffin is contaminated with a fuel with a lower flash point (eg petrol) that may increase the fire threat

When candles are unattended by a competent adult or poorly managed by children

leads to increased fire risk



Heating on a paraffin stove

Fire hazard

Uncontrolled open flames

Vulnerability condition...

When children are left to play unsupervised around open fires

leads to increased fire risk



Children play close to an open fire

Fire hazard

**Electricity cables
Electrical equipment
and appliances**

Vulnerability condition...

When there is high usage of illegal and overloaded electrical connections or 'spaghetti wires'.

When the ventilation ducts of unserviced appliances (eg TV sets) become blocked with dust and dirt

leads to increased fire risk



High usage of electricity cables

WHAT IS... *The impact of electrical connections on informal fire risk?*

Both legal and illegal electrical connections are used in informal settlements and each poses risks.

Extension of legal electrical connections for income generation

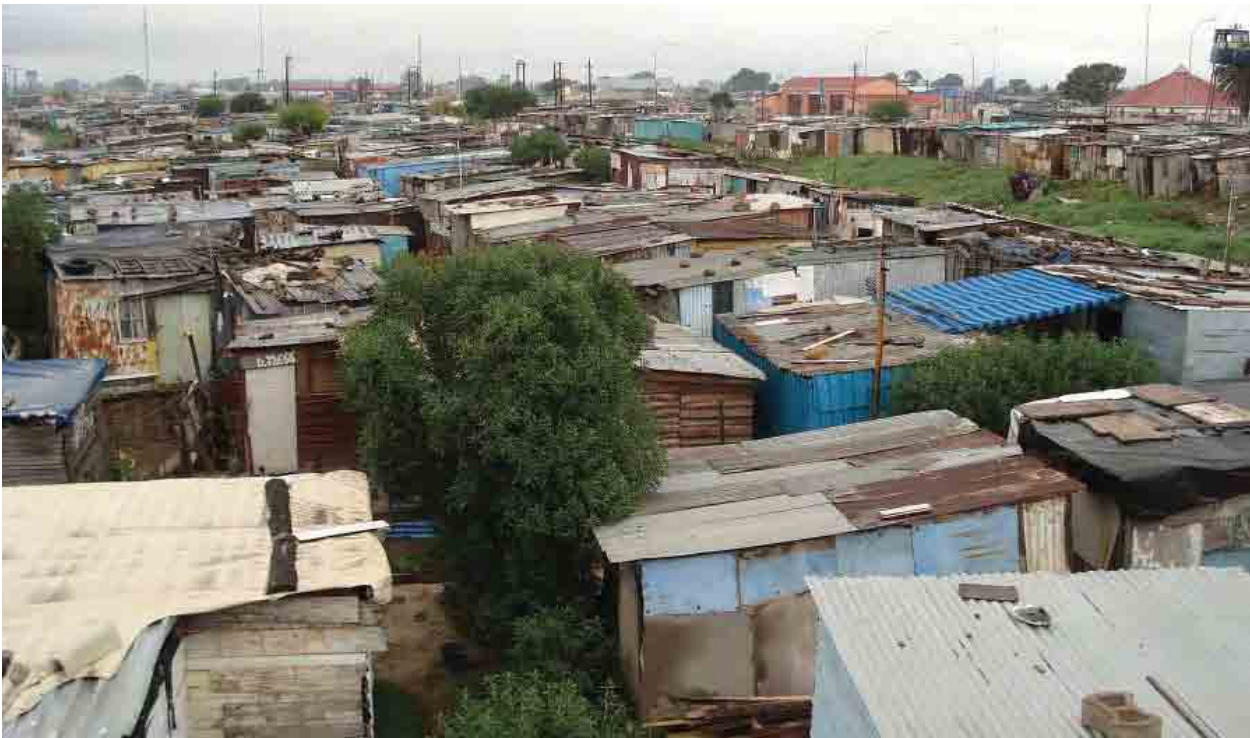
Here, residents with access to legal electricity 'rent' it out by supplying other areas and households who are not connected to formal services – often off one plug or power outlet.

People who then pay 'rent' for electricity are often required to limit its use (eg for TV but not cooking) to avoid tripping the power through overloading the system.

Illegal forms of electricity are sourced from traffic lights or streetlights

Electricity is accessed by connecting wires that may be strung above the ground, laid on the ground or even placed below the ground (the tar in roads may be chopped up to allow this). These cables melt when they are overloaded.

Settlement Density



*Houses built closely together
with few fire breaks*

WHAT IS... *The impact of settlement density on fire risk?*

Although density is not the main cause of fires, it contributes to severe fire risk in several ways:

- Density increases the number of potential ignition sources when there are many cooking and lighting points in a congested settlement.
- Density increases the likelihood of fires spreading easily from one dwelling to another.
- Housing density and exposure to low-hanging electrical wires (often called 'spaghetti wires') also limit access for fire fighting and response vehicles.

Social and behavioural factors¹

Physical or structural risk factors are not the only drivers of informal dwelling fires. The high incidence of fires on public holidays, weekends and at night suggests important social risk factors. These include:

- **Alcohol abuse:** when people return to their informal dwellings after drinking alcohol at a local shebeen, they often fall asleep while attempting to cook on a paraffin stove or leave a candle burning, both of which can easily start fires.
- **Domestic violence:** angry or jilted lovers can deliberately set fire to their partner's dwelling or that of the person sleeping with their partner.
- **Inadequate social support:** working parents are forced to leave their children unsupervised. Children are often expected to cook for themselves and their siblings, and even very young children use paraffin stoves, light candles and tend open fires. In the absence of recreational and safe playing spaces, children end up playing around the home, increasing the risk of knocking over a stove or candle and starting a fire.
- **Low levels of social cohesion:** the rapid pace of in-migration and social change in a settlement alter social relations and reduce the degree to which residents know, trust or support each other. This also affects the degree of collective social control over endangering fire behaviour.



Left: Men playing foosball in a shebeen. Many of Cape Town's most severe informal fires occur after people return home late at night after drinking at shebeens and try to prepare food on paraffin stoves.

Right: A young man carrying a case of beer on his shoulder. High levels of alcohol consumption reduce levels of individual responsibility around open flames.

¹ Adapted from: James Morrissey and Anna Taylor, *Fire Risk in Informal Settlements: A South African case study*, Open House International, vol. 31(1):98-105, 2006

WHAT IS... *The most commonly used fuel source for poor households in South Africa?*

Domestic households consume over 700 million litres of paraffin (kerosene) every year in South Africa for cooking, lighting and heating. Paraffin is the most commonly used fuel source for low-income communities throughout the country and is used in over half of all South African homes. Paraffin is often used in conjunction with other forms of energy such as electricity, coal and wood. The majority of domestic paraffin incidents involve children as they are more likely to mistake paraffin stored in cooldrink bottles for water or cooldrink or be injured in paraffin-related fires. (PASASA)

Table 5.9 Important conditions that increase informal fire risk

General fire risk conditions	Specific fire hazard and vulnerability factors
Weather-related risk conditions	• Hot, dry, windy conditions • Cold and wet weather (need for families to keep warm)
Temporal factors	• People away from home during holidays means fewer people to extinguish blazes • More alcohol consumption over public holidays and weekends • More alcohol consumption when people have been paid
Regulatory and institutional factors	• Unregulated and unplanned growth of informal settlements and resulting short-falls in service delivery • Widespread use of illegal electrical connections • Vehicles parked between dwellings create a fire bridge especially because car seats are made of polyurethane • Cars parked on top of hydrants so they are difficult to locate by Fire Services
Built environment and infrastructural factors	• Flammable building materials, such as wood, plastic, hessian, canvas and wall paper • Closely packed dwellings • Wood, planks, rubbish, waste and debris between dwellings • Small dwellings more quickly engulfed in flame • Lack of streets and access routes • A lack of fire hydrants: water must be sourced from another location which creates pressure problems
Social and behavioural risk factors	• Unemployment/under-employment • Alcohol abuse, domestic violence and jealousy in relationships • Lack of social cohesion in rapidly densifying settlements with high levels of in-migration, inadequate social support networks and limited capacity for working together • Apathy • 'Me' and 'mine' emergency response when it comes to protecting assets • Lack of knowledge about fires • Lack of political tolerance and associated use of fire as a form of political intimidation

5.3.4 Useful tools for assessing informal dwelling fire risk

Several of the tools described in Chapter 4 are useful in assessing the extent, nature and response to fires in an area. The following are particularly useful:

Hazard mapping

Table 5.10 Hazard mapping for fire risk (refer to p 69)

Pointers for hazard mapping	Questions to ask
Hazard mapping helps establish where fires occur most frequently, why they tend to occur, as well as how accessible these hotspots are to fire fighters and other emergency personnel.	• Where are the main access roads and routes located? • What places or areas in the settlement are most prone to fires? Why are they prone to fires? • Are there fire hydrants in the community? Do they work? Do people know how to use them? Where are they? • Where are taps or water sources that can be used to put out fires? • Are there other measures in place to respond to fires (e.g. a fire pole or buckets of sand in a central place)? Where are these located? • Who is most affected by fires? Why? • What community infrastructure and resources are most likely to be damaged or affected by fires? • What actions are taken to reduce the risk of fires?

Seasonal calendar

Fire risk often has a temporal component: fires may be most common in the dry, windy summer months, over holidays when people are away from home, over weekends or at the end of the month when people are more likely to socialise and consume alcohol.

Table 5.11 Seasonal calendar for fire risk (refer to p 58)

Pointers for seasonal calendar	Questions to ask
The seasonal calendar helps establish when fires are most common and when the losses to fires are most severe. While a seasonal calendar is most often used to assess differences between seasons or over the course of a year, the method can be adapted to examine shorter time periods, such as a day, week or a month.	• When do fires occur most frequently? • Why do they occur often at these times? • What effects do fires have on the community? • When do fires occur less frequently? • Why are they less common at these times?

Transect walk

A transect walk can help identify measures taken by the community to reduce the likelihood of fires. These may not be mentioned during a mapping exercise, as they are often taken for granted by community members. It is also essential for identifying high-risk areas and hazardous sites.

The photographs illustrate what to look for in a fire risk transect walk.

Debris accumulates in an informal structure, directly adjacent to an electric sub-station



A woman warms herself at an open fire





A car stands over a fire hydrant and next to an informal dwelling



Massive amounts of debris and litter, which are potential fuel for fires, accumulate in an informal settlement



An electric sub-station concealed in cardboard in the middle of a spaza shop



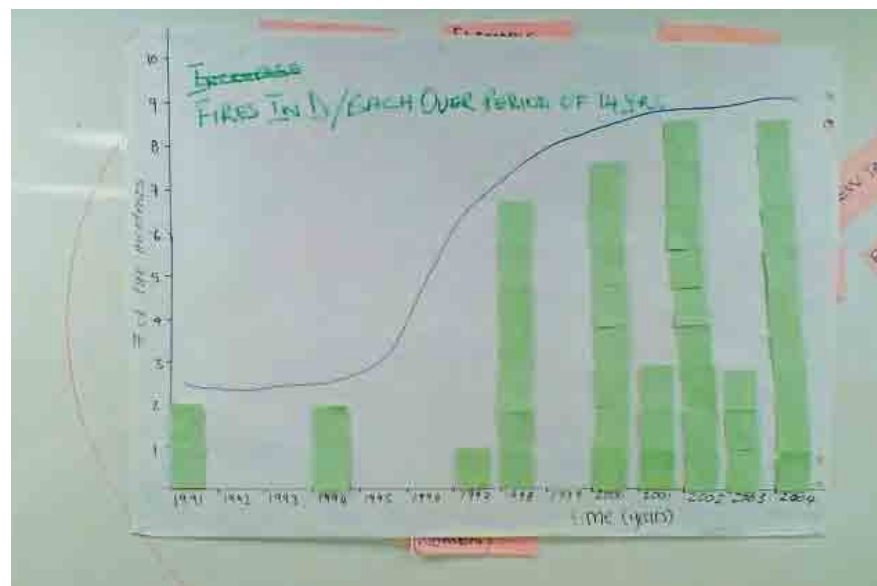
Children keep themselves warm at an open fire in a metal drum ('jerryblik')

Risk history table

Table 5.12 Risk history table for fire risk (refer to p 65)

Pointers for risk history table	Questions to ask
A risk history table can show the years when major fires occurred. These events can be used as a basis for questions on where the fire occurred, how it started and the extent and nature of the losses.	- Has the number of fires increased, decreased or stayed the same? Why? - Were all fires reported to the fire services, or were some extinguished locally, without outside help?

Graph 5.2 Fire frequency



The graph shows the annual frequency of fires over a 14 year period

Problem tree

Table 5.13 Problem tree for fire risk (refer to p54)

Pointers for problem tree	Questions to ask
A problem tree helps understand fire risk by identifying the main causes and effects of fires and the relationships between them. It is particularly useful in understanding the socio-economic factors that increase fire risk.	• What are the main causes of fires? • Why do these causes occur? • What are the effects of fires? • Why do they have this effect?

Risk management capacities matrix

Table 5.14 Risk management capacities matrix for fire risk (refer to p83)

Pointers for risk management capacities matrix	Questions to ask
A risk management capacities matrix helps identify any measures being taken to reduce fire risk and it identifies who is implementing the measures. It can also help determine the relative effectiveness of the measures, as well as identify obstacles to their implementation.	• What measures are people taking to reduce the risk of fires? • Who uses the measures? • When are they used? • How effective are they in reducing the number of fires? • Why do some people not take these measures? • What steps are being taken to make the measures more effective/increase their usage?

5.4 Environmental health risks in informal settlements

5.4.1 Relevant service providers and role players

Table 5.15 Relevant service providers and role players

Municipal Departments	Provincial Departments	Others
Disaster Risk Management	Department of Housing	NGOs
Roads and Stormwater	Department of Transport and Public Works	CBOs
Utility services, including Water and Sanitation Services and Solid Waste Management	Department of Health Community Development Workers	
Environmental Health		
Fire and Emergency Services		
Planning, including Integrated Development Planning		

Who else to include?

Always involve NGOs, CBOs and CDWs. They can help to build communication links between local residents and service providers and assist in capacity-building. They can also assist with reporting on breakdowns and negotiating support and improvements in provision, operation and maintenance of essential basic services.

Also actively involve those who are most at risk. This includes people living close to water-points, standing water, contaminated water sources and areas where solid waste is dumped. Groups such as women, children, the elderly and the chronically ill are likely to suffer the worst effects. The elderly and those suffering from HIV and AIDS and tuberculosis (TB) are also more vulnerable in unhygienic environments, where they come into contact with more germs and contaminants.

Illness places an additional burden on carers – usually women – who may be less able to care either for themselves or all of the others in their care. These groups should be able to voice their concerns and participate in generating and implementing solutions.

5.4.2 Environmental health in the Western Cape

Environmental health refers to the health of the everyday environment in which people live. The health of an environment is affected by how people live, eat, wash, produce solid waste and go to the toilet, as well as by the systems in place to manage the waste generated by human communities. Good environmental health means that management infrastructure and services are appropriate and affordable to users.

Unfortunately, rapid urbanisation in many parts of the Western Cape has reduced the levels of environmental health, particularly in unplanned informal settlements, where residents have little or no access to municipal services. Planned urban settlements also face problems, as the provision of water and sanitation facilities lags far behind urban population growth.

For poor households, low incomes and a lack of secure land tenure discourage residents from improving the safety of their homes and the sanitary conditions of their immediate surroundings. On the other hand, contaminated food and water and poor hygiene associated with poor urban living conditions contribute to childhood malnutrition and diarrhoea, as well as infant death rates.

Table 5.16 Common environmental health challenges in informal settlements

Specific environmental health challenges	Why this is important?
Water supply points	Heavily burdened water points are frequently shared by many people, but are not used properly. They are poorly maintained and often broken.
Grey water disposal	There is inadequate or absent capacity to dispose of waste water. This results in domestic grey water ending up as used, dirty water that contaminates the environment.
Solid waste disposal	Collection and disposal facilities and services are often insufficient, and much solid waste remains in and around settlements.

Specific environmental health challenges	Why this is important?
Sanitation systems	Not all settlements have toilet facilities. In those that do, the facilities are often improperly used, overburdened and are infrequently maintained and serviced.
Stormwater drainage	Run-off that is not drained away from houses, roads and pathways mixes with contaminated waste water, sewage and solid waste, polluting the local and surrounding environment, and natural water sources.
Health services	Primary healthcare facilities in many parts of the province are overstretched. Health workers have insufficient time and capacity to provide community-level education about preventable contamination, disease transmission and effective home treatments for common illnesses, such as diarrhoea.
Environmental health inspection	For the same reasons, environmental health inspection, monitoring and reporting of poor service provision is also inadequate. Environmental health officers are often seriously overstretched and lack the time or capacity to monitor conditions in all informal settlements.

Environmental health risks in the Western Cape

Two main factors increase environmental health risks in the Western Cape:

- The inadequate delivery of basic services, particularly in informal settlements
- Individual and group behaviour that foster unsanitary practices, littering and neglect of infrastructure.

Tables 5.17 and 5.18 respectively show how shortcomings in infrastructural and service delivery, and unhelpful individual and group behaviour increase environmental health risks in informal settlements.

Table 5.17 Environmental health risks: focus on infrastructural and service delivery risk factors

Hazard	Vulnerability factors increasing risk	Effects
Standing water around taps	• Inadequate or blocked drainage systems • Poor maintenance of taps • Large numbers of users	• Health problems, particularly among children who play in the water, and related costs • Missed school and work days
Standing grey water	• Inadequate or blocked drainage systems • Inadequate provision for grey water disposal	• Contamination of the environment in and around dwellings • Contamination of surface run-off • Health problems, particularly among children who play in the water, and related costs.

Accumulation of water around a poorly maintained community tap



Over-burdened and blocked drains result in contaminated standing water



Table 5.18 Environmental health risks: focus on behavioural risk factors

Hazard	Vulnerability factors increasing risk	Effects
Contaminated water sources/ water bodies	• Inadequate or blocked drainage systems increase the likelihood of contaminated surface run-off flowing into natural water sources • Accumulation of solid waste around and in water-sources • Inadequate access to piped water encourages the use of natural water sources for bathing, washing clothes • Inadequate toilet facilities	• Contamination and pollution of downstream environments • Health problems, and sometimes deaths, particularly amongst children, and related costs • Missed school and work days

Hazard	Vulnerability factors increasing risk	Effects
Overloaded and blocked sanitation systems	• Inadequate toilet facilities • Poor maintenance of toilet facilities • Inadequate knowledge amongst communities of how to use and maintain toilets • Large numbers of users	• Contamination of the environment in and around dwellings • Increased number of disease-spreading flies and other vectors • Health problems, deaths and related costs • Missed school and work days
Accumulation of solid waste	• Poorly functioning waste collection and disposal systems • Inadequate access to refuse bags • Models of behaviour that tolerate littering	• Contamination of the environment in and around dwellings • Contamination of standing water and surface run-off • Blockages of drainage systems with solid waste leads to increased flooding during the rainy season • Increased number of disease-spreading flies, rats and other vectors • Health problems and related costs • Missed school and work days
Unsanitary practices	• Accumulation of waste in and around homes • Inadequate facilities to wash hands after visiting the toilet or before handling food • Inadequate knowledge about good hygiene practices • Poor handling and storage of food by suppliers, such as informal butcheries • Storage and transportation of water increases opportunities for contamination	• Health problems, and sometimes deaths • Missed school and work days



Waste blocks a water course

Overflowing container toilets



Waste accumulates close to dwellings and obstructs a water course



5.4.3 Useful tools for assessing environmental health risks

Several of the tools described in Chapter 4 are useful in assessing the extent, nature and response to environmental health problems in an area. The following are particularly useful:

Hazard identification and ranking

A hazard identification and ranking activity helps to identify the main environmental health challenges in the settlement, as well as the differing perceptions of risk held by different vulnerable groups. The CRA process may reveal numerous environmental health challenges. Depending on the resources available, it may be more practical to identify, examine and seek to address just the top three or four challenges.

Hazard mapping

Table 5.19 Hazard mapping for environmental health risk (refer to p 69)

Pointers for hazard mapping	Questions to ask
Hazard mapping helps to establish the sites and nature of the environmental health hazards in a community.	• Where are the main access roads, rivers, streams, lakes, wetlands etc located? • What are the main environmental health challenges? • In which places or areas in the settlement are these problems most severe? Why are they most severe? • Where are the drains or drainage ditches? • Where are the toilets that residents use? • Where are the taps that residents use? • Where are the refuse disposal tips or skips that residents use? • What are the effects of the main environmental health challenges? • Who is most affected by these problems? Why? • What actions can people take to improve the health of their immediate environment and/or environmental health of the settlement?

Transect walk (refer to p 76)

A transect walk will allow you to see for yourself the nature and distribution of the features identified during the mapping exercise. It can help you to identify the practices that both increase and lower environmental health risks in the settlement.



Environmental health challenges are identified during a transect walk

Problem tree

Table 5.20 Problem tree for environmental health risk (refer to p 54)

Pointers for problem tree	Questions to ask
A problem tree can help to identify how hazards, such as flooding, may impact on environmental health issues, and vice versa.	• What are the main causes of this problem? • Why do these causes occur? • What are the effects of these problems? • Why do they have this effect?

Focus on one problem at a time if several environmental health challenges are identified.

Objectives tree (refer to p 89)

Constructing an objectives tree will help to identify solutions to improve environmental health in the community. This exercise is conducted in the same way as the problem tree, but in place of the causes and effects of a particular hazard, you will identify solutions and the outcomes they will achieve. As in the case of the problem tree, it will be helpful to examine the solutions to one problem at a time. Key questions include:

- What are the main solutions to this problem?
- How can these be implemented?
- Who can implement them?
- What effect will implementing these solutions have?
- Why will they have this effect?

Trained, community-based risk monitors can help to identify and monitor environmental health risk on an ongoing basis, and report facilities that need to be repaired, particularly where governmental capacity is limited.

Hazardous storage of materials is noted by local risk monitors in training



Chapter summary

1. Informal neighbourhoods in the Western Cape face many risks – crime, ill health, flooding, informal dwelling fires and environmental health risks.
2. Flooding, informal dwelling fires and environmental health risks are experienced both as everyday or chronic risks in many informal settlements. However, they can also rapidly upscale into local emergencies, leading to widespread loss of property, temporary displacement and prolonged hardship.
3. The Western Cape is affected by powerful cold fronts that bring stormy weather, heavy rains and strong winds. It is also exposed to cut-off lows. Cut-off lows often result in very heavy rain and are associated with the province's most severe flood losses.
4. Informal settlement flooding is not only caused by heavy rains. There are many informal settlements located in wetlands or low-lying areas that normally flood following rainfall.
5. Informal dwelling fires also constitute a serious disaster risk in informal settlements. However, they also happen frequently in formal neighbourhoods when backyard dwellings and Wendy houses catch on fire.
6. Rapid urban growth in many parts of the Western Cape has reduced the levels of environmental health, particularly in unplanned informal settlements, where residents have little or no access to municipal services.
7. While flood, fire and environmental health risks in informal settlements are influenced by weather and other conditions, they are also driven by social and behavioural risk factors.
8. Participatory risk assessment processes can be usefully applied to better understand these conditions, and with the active involvement of key local and provincial departments, can help to identify and promote appropriate risk management strategies.

Glossary

Mrs Jacobs scanned the room as members of Zingini High's School Safety Committee arrived for their end-of-term meeting. She was encouraged to see such a good turn-out of parents this evening, even though it was nearly the end of the school year.

As principal of a high school with more than 1 000 learners, mainly from very poor families, Mrs Jacobs knew that the up-coming school holidays were always a tough time. In previous years, the school had been vandalized over the holidays and expensive equipment stolen. However, since they had upgraded the alarm system to cover all the classrooms and toilets and engaged a security company to do school holiday patrols, there had been no more burglaries. She smiled at the four Grade 8 children standing next to the risk map they had drawn of Zingini - their Life Orientation project for this term. The map showed where the wetland began, where the area flooded in the winter and where people usually dumped their litter. It also pointed out where the roads were not lit and the drivers were reckless. The map even showed the places where gangs were likely to meet – as well as the safer buildings, the community centre, the crèches, the clinic and the police station. She was very proud that the children, João, Beauty, Siphó and Felipe, all newcomers to Zingini, had done such an impressive project. The community and the school would benefit from their hard work.



A child learns about how to reduce flood and fire risks in class at school

This chapter is intended to be a trilingual resource for those interested in integrated development planning in risk-prone informal settlements. It does not intend to be an exhaustive encyclopaedia, but rather a simple glossary of terms across six major thematic areas. It provides a simple definition or explanation for each term in English, Afrikaans and isiXhosa.

6.1 Disaster and disaster risk

Disaster and disaster risk	English
Adaptation	Adaptation A process by which strategies to moderate, cope with and take advantage of the consequences of climatic events are enhanced, developed, and implemented.¹
Capacity	Capacity The combination of all the strengths and resources available within a community, society or organisation that can reduce the level of risk, or the effects of a disaster. Capacity may include physical, institutional, social or economic means as well as skilled personal or collective attributes such as leadership and management. Capacity may also be described as capability. <i>Source: UNISDR</i>
Climate change	Climate change Any change in climate over time, whether due to natural variability or as a result of human activity. <i>Source: IPCC TAR, 2001 a</i>
Coping capacity	Coping capacity The means by which people or organisations use available resources and abilities to face adverse consequences that could lead to a disaster. In general, this involves managing resources, both in normal times as well as during crises or adverse conditions. The strengthening of coping capacities usually builds resilience to withstand the effects of natural and human-induced hazards. <i>Source: UNISDR</i>

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Afrikaans	isiXhosa
Aanpassing Aanpassing is 'n proses waardeur strategieë versterk, ontwikkel en toegepas word om die gevolge van klimaatsveranderinge te versag, te hanteer en voordelig aan te wend.	Ukuzilungelelanisa Indlela yokuzilungiselela nokumelana nemo yezulu, ethi ize namacebo kuphuhliso olunemiphumela esa kwimpumelelo
Kapasiteit 'n Kombinasie van al die kragte en hulpbronne wat in 'n gemeenskap, samelewing of organisasie beskikbaar is, wat die risikolak of die uitwerking van 'n ramp kan verminder. Kapasiteit mag fisieke, institusionele, sosiale of ekonomiese middele sowel as bekwame persoonlike of kollektiewe eienskappe soos leierskap en bestuur insluit. Kapasiteit kan ook beskryf word as vermoë.	Amandla nezakhono Izinto ezahlukeneyo ezithi zandise ubuchwepheshe nolwazi kunye namandla kuluntu nakwimibutho, ezinokuthi zehlise ubuzaza bengozi. Luthi olulwazi luncede ukucutha ucinezelelo olunokuzisa ungqipheko, okanye iziphumo intlekele
Klimaatsverandering Klimaatsverandering verwys na enige verandering in die klimaat wat oor 'n tydperk ontstaan – hetsy as gevolg van natuurlike wissel werking of as gevolg van menslike aktiwiteite.	Utshintsho lwemozulu Utshintsho lwemozulu lubhekisela kulo nakoluphi na utshintsho kwimozulu ngokuhamba kwexesha nokuba kungenxa yokutshintsha kwendalo okanye ngenxa yemisebenzi yabantu
Weerbaarheidskapasiteit Die manier waarop mense of organisasies beskikbare hulpbronne en vaardighede gebruik om nadelige gevolge wat tot 'n ramp kan lei, die hoof te bied. Oor die algemeen behels dit die bestuur van hulpbronne, sowel in normale tye en of gedurende krisisse asook nadelige omstandighede. Die versterking van weerbaarheidskapasiteite bou gewoonlik weerstand teen die uitwerking van natuurlike of mensgemaakte gevare.	Amandla okumelana Iindlela abantu okanye imibutho esebenzisa ngayo izibonelelo ezifumanekayo kunye nokuba nako ukujongana neziphumo ezibi ezinokukhokelela kwintlekele. Jikelele, oku kubandakanya ukulawula izibonelelo, kumaxesha aqhelekileyo ngokunjalo nakumaxesha obunzima okanye eemeko ezingalunganga. Ukolulwa kwamandla okumelana kaninzi akha uxhathiso lokodlula iziphumo zeengozi zendalo okanye ezibangwe ngabantu

Disaster and disaster risk	English
Disaster	Disaster A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources. A disaster is a function of the risk process. It results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk. <i>Source: UNISDR</i>
Disaster Risk Management	Disaster Risk Management The systematic process of using administrative decisions, organisation, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activities, including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards. <i>Source: UNISDR</i>
Disaster Risk Reduction	Disaster Risk Reduction The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development. <i>Source: UNISDR</i>

Afrikaans	isiXhosa
Ramp ‘n Ernstige ontwingting in die funksionering van ‘n gemeenskap of samelewing wat wydverspreide menslike-, materiële-, ekonomiese- of omgewingsverliese veroorsaak - verliese wat die vermoë van die geteisterde gemeenskap of samelewing om die ramp deur middel van sy eie hulpbronne te oorkom, oortref. ‘n Ramp is ‘n funksie van die risikoproses. Dit is die resultaat van ‘n kombinasie van gevare, kwesbare toestande en onvoldoende kapasiteite of maatreëls om die potensieel negatiewe gevolge van risiko’s te verminder.	Intlekele Ukuphazamisa olumandla oludala umonakalo onemiphumela echaphazela ilahleko kuluntu nakwinqubo yemihla ngemihla, ethi yonakalise indalo, izakhiwo nelahleko yobomi okanye ukulimala, kuze kunyanzeleke kubizwe uncedo lwangaphandle Intlekele ngumsebenzi wenkqubo yengozi. Ikhokelela kwindibaniselwano yeengozi, iimeko zokungakhuseleki kunye namandla okanye amanyathelo angonelanga okwehlisa iziphumo zengozi ezibi ezinokwenzeka.
Ramprisikobestuur Die sistematiese proses waardeur administratiewe besluite, organisering, operasionele vaardighede en vermoë gebruik word om die gemeenskap en die samelewing se strategieë en weerbaarheidskapasiteite in te span, om die aanslag van natuurlike gevare en verwante omgewings- en tegnologiese rampe te verminder. Dit bestaan uit alle vorme van aktiwiteite, insluitend strukturele en nie-strukturele maatreëls, om die nadelige gevolge van gevare te vermy (voorkoming) of te beperk. (versagting en gereedheid).	ULawulo loMngcipheko kwintlekele Indlela yenkqubo yokusebenzisa izigqibo zolawulo, umbutho, izakhono zokusebenza kunye namandla okuphumeza imigaqo-nkqubo, izicwangciso kunye namandla okumelana oluntu ukuze kwehle iimpembelelo zeengozi zendalo kunye neentlekele zokusingqongileyo nezobuchwepheshe ezinxulumeneyo. Oku kuquka zonke iintlobo zemisebenzi, kuquka namanyathelo amisiweyo nangamiswanga ukuthintela okanye ukudambisa nokuzilungiselela iziphumo ezingalunganga zeengozi ethi ikhawulelane nokuncedisa ukulungiselela nokujongana neentlekele ngokusebenzisa ulwazi, ubuchule, nokuthabatha izigqibo ezikhawulelana nokucutha imiphumela enokuba nobuzaza kuluntu, nakwindalo.
Ramprisikovermindering Die konsepsuele raamwerk van elemente wat in aanmerking geneem word by die moontlikhede om kwesbaarheid en ramp-risiko’s in ‘n samelewing tot ‘n minimum te beperk, om die nadelige impak van gevare te vermy (voorkoming) of te beperk (versagting en gereedheid) in die breë konteks van volhoubare ontwikkeling.	Ukwehliswa kobungozi bentlekele Inkqubo-sikhokelo yengqiqo yezinto ezithathwa ngokuba zinako ukunciphisa ubuzaza kunye neengozi zeentlekele kuluntu xa lulonke, uthintelo okanye ukudambisa nokuzilungiselela iimpembelelo ezinokuba mbi zeengozi, kumxholo obanzi wophuhliso oluzinzileyo nedlela equlunqwe ngenjongo zokuthomalalisa ungicipheko nobungozi bentlekele phakathi koluntu, ukuze kuqandwe, okanye kulungiselelwe ubungozi bungabi ngaphaya kokuqondwa

Disaster and disaster risk	English
Early warning (Weather – storms and fires)	Early warning (Weather – storms and fires) The provision of timely and effective information, through identified institutions, that allows individuals exposed to a hazard to take action to avoid or reduce their risk and prepare for effective response. Early warning systems include a chain of concerns, namely: understanding and mapping the hazard; monitoring and forecasting impending events; processing and disseminating understandable warnings to political authorities and the population; and undertaking appropriate and timely actions in response to the warnings. <i>Source: UNISDR</i>
Hazard	Hazard A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. Hazards can include latent conditions that may represent future threats and can have different origins: natural (geological, hydrometeorological and biological) or induced by human processes (environmental degradation and technological hazards). Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterised by its location, intensity, frequency and probability. <i>Source: UNISDR</i>
Mitigation	Mitigation Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards. <i>Source: UNISDR</i>
Preparedness	Preparedness Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations. <i>Source: UNISDR</i>

Afrikaans	isiXhosa
Vroeë waarskuwing (Weer – storms en brandgevaar) Die vroeëtydige en effektiewe verskaffing van inligting deur geïdentifiseerde instellings, wat individue wat aan gevaar blootgestel is, in staat stel om betyds voorsorgmaatreëls te tref om hulle risiko ten opsigte van ramp gevare te vermy of te verminder en gereed te maak vir effektiewe reaksie. Vroeë waarskuwingstelsels sluit 'n reeks aangeleenthede in, naamlik: die begrip en kartering van die gevaar; monitering en voorspelling van dreigende gebeurtenisse; verwerking en verspreiding van verstaanbare waarskuwings aan politieke owerhede en die bevolking, asook die uitvoering van geskikte en tydige optrede in reaksie op die waarskuwings.	Isilumkiso sakwangoko (iMozulu- iziphango, nemililo) Ulwazi nokusasazwa kwalo ngamaziko athile, ngenjongo zokunqanda okanye ukuthoba izinga lomonakalo kwabo bachaphazelekayo Iindlela ezilumkisa kwangoko ziquka uluhlu lwezinto ezikhathazayo, ezizezi: ukuyiqonda kunye nokuyibona ingozi; ukuhlola kunye nokuqikelela izehlo ezisongelayo; ukulungisa kunye nokusasaza izilumkiso eziqondwayo kwiziphathamandla zezopolitiko kunye nabemi, kunye nokuvuma ukuthatha amanyathelo afanelekileyo kwaye kwangexesha ukusabela kwizilumkiso
Gevaar 'n Potensieël vernietigende fisiese gebeurtenis, verskynsel of menslike aktiwiteit wat lewensverlies, beserings of beskadiging van eiendom, sosiale en ekonomiese ontworting, of skade aan die omgewing kan veroorsaak. Gevare kan onsigbare toestande insluit wat toekomstige bedreigings van verskillende oorspronge inhou: natuurlik (geologies, hidrometeorologies en biologies) of deur menslike toedoen (omgewingskade en tegnologiese gevare). Gevare kan enkelvoudig, opeenvolgend of gekombineerd wees in hul oorsprong en uitwerking. Elke gevaar word gekenmerk deur sy ligging, intensiteit, frekwensie en waarskynlikheid.	Ubungozi Isenzo esinokubangela umonakalo kuluntu olungenza ukwenzakala okanye ukufa okanye ukulimala, nokonakala kwempahla yoluntu, nezakhiwo, kunye nezinto zabantu, kutshintshe nokuhlala, kuchaphazele nezezimali, nomonakalo kwindalo
Versagting Strukturele en nie-strukturele maatreëls wat daargestel word om die nadelige impak van natuurlike gevare, omgewingskade en tegnologiese gevare te beperk.	Ukudambisa Iindlela eziqulunqiweyo nezingacwangcisiwanga ezithi zisetyenziswe ukuthomalalisa umonakalo onokubangelwa bubungozi bendalo, nomonakalo kunye nomonakalo obangwa zizixhobo zobungcali obuyingozi
Gereedheid Aktiwiteite en maatreëls wat vooraf daargestel word om effektiewe optrede rakende die impak van gevare te verseker, insluitend die uitreiking van vroeë en effektiewe waarskuwings en die tydelike ontruiming van mense en besittings uit bedreigde gebiede.	Ukulungiselelwa Isiseko esihleliweyo esithi sisetyenziswe kumaxesha obungozi. Oko kuthi kuxhaswe lulwazi lokuqonda izinto nemo ezinokubeka abantu kumngcipheko. Zibangele abantu basuswe kwezondawo ziphantsi kocinezelelo lobungozi

Disaster and disaster risk	English
Prevention	Prevention Activities to provide outright avoidance of the adverse impact of hazards and means to minimise related environmental, technological and biological disasters. Depending on social and technical feasibility and cost/benefit considerations, investing in preventive measures is justified in areas frequently affected by disasters. In the context of public awareness and education related to disaster risk reduction, changing attitudes and behaviour contribute to promoting a 'culture of prevention'. <i>Source: UNISDR</i>
Recovery	Recovery Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk. Recovery (rehabilitation and reconstruction) affords an opportunity to develop and apply disaster risk reduction measures. <i>Source: UNISDR</i>
Relief or response	Relief or response The provision of assistance or intervention during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected. It can be of an immediate, short-term, or protracted duration. <i>Source: UNISDR</i>
Resistance	Resistance The result of, or reflection of economic, psychological and physical health, and the way in which these components are maintained. Resistance also represents the ability/capacity of an individual or group of people to withstand the impact of a hazard.

Afrikaans	isiXhosa
Voorkoming Aktiwiteite wat daarop gemik is om die nadelige impak van gevare te vermy en wat die middele voorsien om die verwante omgewings-, tegnologiese- en biologiese rampe te minimaliseer. Afhangend van oorwegings rakende die sosiale en tegniese uitvoerbaarheid en koste/voordele, is beleggings in voorkomende maatreëls in gebiede wat gereeld deur rampe getref word, regverdigbaar. In die konteks van openbare bewustheid en opvoeding rakende die vermindering van ramprisiko's, dra veranderings in mense se houdings en gedrag by tot die bevordering van 'n "voorkomingskultuur"	Ukuthintela Indlela zokunqanda ngokupheleleyo kobungozi kunciphiswa umonakalo wendalo, nobungcali kwintlekele Ngokuxhomekeke ekwamkelweni ngokwezentlalo kunye nobugcisa kunye nothathelo ngqalelo lwexabiso/uncedo, ukuxhobisa kumanyathelo okuthintela bubulungisa kwiindawo ezichatshazelwa rhoqo zintlekele. Kumxholo wokwazisa uluntu kunye nemfundo, ngokunxulumene nokwehliswa kwengozi yentlekele izimvo kunye nokuziphatha okutshintshayo zifaka isandla ekuphakamiseni u "mkhwa wothintelo"
Herstel Besluite en aksies wat na afloop van 'n ramp geneem word met die oog op die herstel of verbetering van die lewensomstandighede wat voor die ramp in die geteisterde gemeenskap geheers het, terwyl die nodige aanpassings aangemoedig en teweeggebring word om die risiko van rampe te verminder. Herstel (rehabilitasie en rekonstruksie) bied die geleentheid om maatreëls vir die vermindering van ramprisiko te ontwikkel en toe te pas.	Ukubuyisela imo kweyesiqhelo Izicwangciso namanyathelo athatyathwayo ukubuyisela immo yoluntu nendalo kweyesiqhelo kunye nokuhlala emva kwentlekele, ngenjongo zokulungisa umonakalo nokucutha kulungeleliswa ukumelana kwintlekele yexesha elizayo Ukubuyisela kwimo yangaphambili kunye nokwakha ngokutsha kunika ithuba lokuphuhlisa nokusebenzisa amanyathelo okwehlisa ubungozi yentlekele.
Hulpverlening of reaksie Die voorsiening van hulp of ingryping gedurende of direk na die voorkoms van 'n ramp, om die behoud van lewens te verseker en in die geaffekteerde mense se basiese bestaansbehoefte te voorsien. Dit kan vir 'n onmiddellike-, korttermyn- of langdurige tydperk wees.	Ukubuyisa nokuhlangabezana Amalungiselelo okuhlangabezana noluntu oluthe lwachaphazeleka kwintlekele ngenjongo zokubuyisela imo ethe yachaphazeleka
Weerstandigheid Weerstand: Dit is die resultaat van, of die weerspieëling van ekonomiese, sielkundige en fisieke gesondheid en die wyse waarop hierdie komponente in stand gehou word. Weerstandigheid verteenwoordig ook die vermoë van 'n individu of groep mense om die impak van 'n gevaar die hoof te bied.	Ukumelana Ukumelana nokunyamezela ubungozi obuthi buchaphazele abantu.

Disaster and disaster risk	English
Risk	Risk The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions. Conventionally risk is expressed by the notation $\text{Risk} = \text{Hazards} \times \text{Vulnerability}.$ Some disciplines also include the concept of exposure to refer particularly to the physical aspects of vulnerability. Beyond expressing a possibility of physical harm, it is crucial to recognize that risks are inherent or can be created or exist within social systems. It is important to consider the social contexts in which risks occur and that people therefore do not necessarily share the same perceptions of risk and their underlying causes. <i>Source: UNISDR</i>
Risk proofing	Risk proofing Specific environmental, engineering or social risk reduction measures taken during the initial planning, design and implementation of a development project or programme – or as a consequence of upgrading or retro-fitting - that minimise the exposure of people or property, or their susceptibility to a specified natural or other hazard, thus reducing the likelihood of disaster losses.
Vulnerability	Vulnerability The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards. For positive factors, which increase the ability of people to cope with hazards, see definition of capacity. <i>Source: UNISDR</i>

Afrikaans	isiXhosa
Risiko Die waarskynlikheid van nadelige gevolge, of verwagte verliese (sterftes, beserings, eiendom, lewensonderhoud, ontwigting van ekonomiese aktiwiteite of skade aan die omgewing) as gevolg van die interaksie tussen natuurlike of mensgemaakte gevare en kwesbare omstandighede. Risiko word gewoonlik soos volg geformuleer: $\text{Risiko} = \text{Gevaar} \times \text{Kwesbaarheid}$. Sommige dissiplines sluit ook die konsep van blootstelling in, om spesifiek te verwys na die fisiese aspekte van kwesbaarheid. Buiten die moontlikheid van fisiese skade, is dit noodsaaklik om te besef dat risiko's inherent is of deur bestaande sosiale stelsels geskep kan word. Dit is belangrik om die sosiale konteks waarin risiko's voorkom, in aanmerking te neem, asook dat mense juis daarom nie noodwendig dieselfde persepsies in verband met risiko en die onderliggende oorsake daarvan het nie.	Umngcipheko Imo ebeka umntu okanye izinto kungcipheko (lemo inokudala ilahleko yobomi, ukulimala, ukuphazamiseka kwinkqubo yokuphila yemihla ngemihla, nakwezezimali kunye nokonakala kwendalo). Oku kubangwa kukuba sesichengeni nakwingozi
Risiko beskerming Spesifieke maatreëls vir risikovermindering rakende die omgewing, ingenieurswese of samelewing wat tydens die vroeë beplanning, ontwerp en implementering van 'n ontwikkelingsprojek of -program getref is – of as gevolg van opgradering of herbouing met verbeterde strukture – wat die blootstelling van mense of eiendom, of hulle kwesbaarheid vir bepaalde natuurlike of ander gevare minimaliseer en dus die waarskynlikheid van rampspoedige verliese verminder.	Ukukhusela ubungozi Amanyathelo akhethekileyo okwehlisa ingozi kokusingqongileyo, ubunjineli okanye kwezentlalo athathwe ngexa loyilo lokuqala, ukucebisa, kunye nokuphunyezwa kweprojekithi okanye inkqubo yophuhliso – okanye njengesiphumo sokuphucula okanye ukufakwa noko kuyakunciphisa ukungakhuseleki kwabantu okanye ipropati, okanye ubuntununtunu kwingozi ebalulweyo yendalo okanye enye ingozi, oko ke kwehlise ukuba nokwenzeka kwelahleko zentlekele.
Kwesbaarheid Die toestand wat deur fisiese-, sosiale-, ekonomiese- en omgewingsfaktore of prosesse bepaal word, en wat die vatbaarheid van die gemeenskap vir die impak van gevare verhoog. Positiewe faktore wat die vermoë van mense versterk om gevare die hoof te bied, word in die definisie van kapasiteit uiteengesit	Isichenge Imo ebaka indalo, ukuhlala, nezezimali kuxinezelelo olubangela abantu bazibone bekumngcipheko olumandla oludala ubungozi Kwiimeko ezintle, ezinyusa ukuba nako kwabantu ukumelana neengozi, jonga inkcazelo ngamandla nezakhono

6.2 Informal Settlement Development

Informal Settlement Development	English
Backyard dwelling	Backyard dwelling An informally constructed or assembled dwelling – not approved by municipal authorities - that is located within the property boundaries of or adjacent to a formally approved and constructed residence and that is occupied as a home, crèche or other living space by one or more people.
Basic services	Basic services Shared water supply and sanitation, refuse removal, stormwater management, access by emergency vehicles, together with some fire prevention/limitation measures. They are provided to an informal settlement to ensure that the health and safety of the community meet basic minimum criteria.²
Community	Community Groups of people living, working and interacting together in a form that may result in organised activities, views and opinions. Often used to refer to residents of a particular settlement, development or suburb but may also refer to culture or religion. (See p 13 for problems with the term 'Community') <i>Source: UNISDR</i>
Community-Based Disaster Risk Management (CBDRM)	Community-Based Disaster Risk Management (CBDRM) A process used to undertake a risk reduction planning initiative. In other words, the aim of CBDRM meetings/workshops is to address ways in which relevant stakeholders can reduce risks and people's vulnerabilities towards them in a given settlement. This is made possible through the strengthening of people's capacity to cope with the risks they live with on a daily basis. <i>Source: ProVention</i>

Afrikaans	isiXhosa
Agterplaas-woning / tydelike / informele woning ‘n Informele konstruksie of saamgeflante woning - nie deur munisipale owerhede goedgekeur nie – wat binne die eiendomsgebied of aangrensend aan ‘n formeel goedgekeurde opgerigte woonhuis is en deur een of meer mense as ‘n huis, bewaarskool of ander lewensarea bewoon word.	Ukunxusa eyadini yomntu Indawo yokuhlala eyakhiwe ngokungekho sikweni okanye indawo elhanganisiweyo – engavunywanga ziziphathamandla zikamasipala eyakhiwe ngaphakathi kumda womzi okanye ekufuphi nendawo yokuhlala evunywe ngokusesikweni ekuhlaliwa kuyo njengekhaya, isikolo sabantwana abangekaqali esikolweni okanye esinye isithuba ekuhlala kuso umntu omnye okanye ngaphezulu.
Basiese dienste Basiese dienste bestaan uit die verskaffing van gedeelte watertoevoer, sanitasie, rommelverwydering, stormwaterbeheer, toegang vir noodvoertuie, tesame met brandvoorkomings/-beperkingsmaatreëls. Dit word aan die informele nedersetting verskaf om te verseker dat die gesondheid en veiligheid van die gemeenskap aan die minimum-vereistes voldoen	linkonzo ezisisiseko linkonzo ezisisiseko ziquka amanzi ekwabelwana ngawo nogutyulo, ukuthuthwa kwenkunkuma, ulawulo lwamanzi esiphango nemvula, ufikelelo zizithuthi zengxakeko, kunye namanyathelo othintelo lomlilo. Zinikwa kwindawo zokuhlala ezingekho sikweni, ukuqinisekisa ukuba impilo kunye nokhuseleko loluntu luyahlangabezana nobuncinane bendlela esetyenziswayo yokukhetha esisisiseko.
Gemeenskap Groepe mense wat saam leef, werk en in wisselwerking met mekaar verkeer waaruit ‘n vorm van ge-organiseerde aktiwiteite, oogpunte en opinies. Groepe mense wat so met mekaar saamleef, saamwerk of in interaksie tree dat dit georganiseerde aktiwiteite, menings en opinies tot gevolg mag hê. (Kyk bladsy 13 vir probleme met die term “Gemeenskap”)	Abahlali Abantu abahlala kunye besebenzisana, benenjongo nemibono ezifanayo neenqubo ezifanayo nezamkelekileyo phakathi kwabo. Lisetyenziswa kakhulu kubantu abahlala kwingingqi enye okanye benancubeko ifanayo okanye bkhonza kunye
Gemeenskapsgebaseerde ramprisikobestuur Gemeenskapsgebaseerde Ramprisikobestuur (GGRRB) is ‘n ontwikkelingsproses wat gebruik word om ‘n risikobeplanningsinisiatief uit te voer. Die doel met GGRRB-vergaderings/werksinkels is met ander woorde om maniere te vind waarop relevante rolspelers risiko’s en mense se kwesbaarheid in ‘n bepaalde nedersetting kan verminder. Dit word moontlik gemaak deur mense se kapasiteit te vermeerder om sodoende risiko’s beter te hanteer waarmee hulle op ‘n daaglikse basis saamleef.	Ulawulo Longcipheko kwintlekele olusekelwe kwimibono nezicwangciso zoluntu Yindlela yokuqulunqa intsebenziswano yabantu nabo bachaphazeleka kwinkonzo ezithi ziziswe ebantwini baloo mmandla, okanye ingingqi. Ezi zicwangciso zithi zibe negalelo lokucutha uxinzelelo oluthi lubangwe yimo le abantu bazibona bekuyo.

Informal Settlement Development	English
Community Risk Assessment (CRA)	Community Risk Assessment (CRA) An approach that uses participatory action research methods to place communities in the lead role for the assessment, active planning, design, implementation and evaluation of activities aimed at reducing the community's risk to disaster. <i>Source: ProVention</i>
Complex residential area	Complex residential area A settlement that can be formal but may also have unplanned, informal structures within the area. This may be an actual informal settlement within a suburb or backyard shacks attached to formal homes.
Geographical Information System (GIS)	Geographical Information System (GIS) Analysis that combines relational databases with spatial interpretation and outputs, often in the form of maps. A more elaborate definition is that of computer programmes for capturing, storing, checking, integrating, analysing and displaying data about the Earth that is spatially referenced. Geographical information systems are increasingly being utilised for hazard and vulnerability mapping and analysis, as well as for the application of disaster risk management measures. <i>Source: UNISDR</i>
Global Positioning System (GPS)	Global Positioning System (GPS) A system of satellites and receiving devices used to compute positions on the Earth. GPS is used in navigation, and its precision supports cadastral surveying. ³

Afrikaans	isiXhosa
Gemeenskaps-risikowaardering Gemeenskaps-risikowaardering (GRW) gebruik deelname-gerigte aksie-navorsingsmetodes om aan gemeenskappe die leidende vermoë rol te bied in die waardering, aktiewe beplanning, ontwerp, uitvoering en waardebeplanning van aktiwiteite wat gerig is op die vermindering van ramprisiko's vir die gemeenskap.	Uhlolo lweNgozi kuluNtu Uhlolo lweNgozi kuluNtu (Community Risk Assessment) (CRA) lusebenzisa iindlela zophando lothabatho nxaxheba ukubeka uluntu kwindima ephambili kuhlolo, uyilo ngokukhuthala, ukwenza amacebo, ukuphunyezwa nokuhlolwa kwemisebenzi ejoliswe ekunciphiseni ingozi yoluntu kwintlekele.
Komplekse residensiële gebied ‘n Nedersetting wat formeel kan wees, maar wat ook onbeplande, informele strukture in die gebied kan hê. Dit kan ‘n teenswoordige informele nedersetting in ‘n voorstad wees, of agterplaastrukture wat by formele huise toegevoeg is.	Indawo yokuhlala, exandileyo. Indawo yokuhlala enokuba sesikweni kodwa enokuba nezakhiwo ezingayilwanga ngokusesikweni kummandla lowo. Le inokuba yindawo yokuqala yamatyotyombe kwidolophana okanye amatyotyombe angasemva ahlonyelwe kwizindlu ezisesikweni
Geografiese inligtingstelsel Analise wat verwante databasisse met die vertolking van ruimtelike inligting en die interpretasie daarvan in die vorm van kaarte kombineer. ‘n Meer uitgebreide definisie is dié van rekenaarprogramme vir die vaslegging, storing, kontrolering, integrasie, analise en vertoning van data oor die aarde met betrekking tot ruimtelike ontwikkeling. Geografiese inligtingstelsels word al hoe meer gebruik om kwesbaarheid en gevare te karteer en te analiseer, sowel as vir die aanwending van risiko-bestuursmaatreëls. ISDR	Indlela yolwazi yejografi Ucazululo oluhlanganisa ii-database ezinotoliko lwezithuba kunye nezimvo, ngokohlobo lweemaphu. Inkcazo enabe ngokungaphaya yileyo yeenkqubo zekhompyutha yokubamba, ukugcina, ukukhangela, ukuhlanganisa, ukucazulula kunye nokubonisa idata emalunga noMhlaba ekubheksielwa kuwo ngezithuba. Kuthi kuqokelelwe ulwazi lwehlabathi liphela ngokusetyenziswa kobucedu-cedu bobugcisa. Buthi buqulunqwe ngokuthi benziwe bukwazi ukuchaza ubume belizwe-kazi, nokolatha buveze izinto nendawo ezikuyo. Umzekelo, xa ufuna ulwazi olushicilelweyo malunga nobungozi, okanye ufuna ukushicilela ulwazi oluloluhlobo Lindlela zolwazi zejografi ngokunyukayo ziyasetyenziswa ekuzotyweni kweemaphu kunye nakucazululo kwingozi kunye nakubuntununtunu, ngokunjalo nasekusetyenzisweni kwamanyathelo olawulo lwengozi yentlekele.
Globale posisioneringstelsel (GPS) ‘n Satellietstelsel en ontvangsapparaat wat gebruik word om posisies op die Aarde te bereken. GPS word gebruik vir navigasie en die akkuraatheid daarvan steun kadastrale opmetings.	Isixhobo sendlela Jikelele yokwalatha indawo okuyo Sisixhobo esithi sisetyenziswe xa kujongwa apho umhlaba ume khona sisebenzisa isatilayithi (ejikeleza umhlaba emajukujukwini) ezithi zibe zizalathisi zendawo ezisemhlabeni siqhagamshelana nezisatilayithi zisemajukujukwini

Informal Settlement Development	English
Informal settlements	Informal settlements Residential areas that do not comply with local authority requirements for conventional (formal) townships. They are, typically, unauthorised and are invariably located upon land that has not been proclaimed for residential use. They exist because urbanisation has grown faster than the ability of government to provide land, infrastructure and homes. Informal settlements tend to be characterised by: - Infrastructure that is inadequate - Environments that are unsuitable - Population densities that are uncontrolled and unhealthily high - Dwellings that are inadequate - Poor access to health & education facilities and employment opportunities - Lack of effective government and management.⁴
In situ upgrading	In situ upgrading Upgrading in an informal settlement as it stands - with the objective of having to relocate as few dwellings as possible. Roads and other infrastructure are designed to fit into the shape of the settlement. As a result of this unconventional approach to township layout, sites will tend to be of irregular shape and size. For this reason some unconventional approaches to tenure may also have to be adopted. In situ upgrading is increasingly being recognised as an appropriate mechanism, and the Provincial Department of Housing is developing a policy for financing such projects. ⁵
Livelihoods	Livelihoods People, their capabilities and their means of living, including food, income and assets. Tangible assets are resources and stores, and intangible assets are claims and access. A livelihood is environmentally sustainable when it maintains or enhances the local and global assets on which livelihoods depend, and has net beneficial effects on other livelihoods. A livelihood is socially sustainable when it can cope with and recover from stress and shocks, and provide for future generations. ⁶

Afrikaans	isiXhosa
Informele nedersetting Informele nedersettings is woongebiede wat nie aan plaaslike owerhede se vereistes vir formele dorpsgebiede voldoen nie. Hulle is meestal ongemagtig en sonder uitsondering op grondgebiede geleë wat nie vir residensiële gebruik geproklameer is nie. Hulle bestaan omdat verstedeliking vinniger plaasgevind het as die regering se vermoë om grond, infrastruktuur en huise beskikbaar te stel. Informele nedersettings word gewoonlik gekenmerk deur: - Onvoldoende infrastruktuur; - Ongeskikte omgewings; - Bevolkingsdigtheid wat onbeheersd en ongesond hoog is; - Wooningsstrukture wat onvoldoende is; - Onvoldoende toegang tot gesondheids- en onderwysfasiliteite en werksgeleenthede; en - Tekort aan effektiewe owerheidsbestuur.	Amatyotyombe Olu hlobo loyanyaniswa nabantu abahlala kwindawo ezingalungelanga okanye ezingabekelwanga ukuba mayibe zindawo zokwakha izindlu. Abanye bathi abantu abahlala apho ngabangcucalazi. Zilapho kuba abantu abasuka emaphandleni besanda ngenjongo zokufuna imisebenzi ezidolophini, babe bengalungiselelwanga ndawo yokuhlala
In situ-opgradering Dit verwys na 'n informele nedersetting wat opgegradeer word op dieselfde plek waar dit tans bestaan – met die bedoeling om so min huise as moontlik te verskuif. Paaie en ander infrastruktuur word ontwerp om by die huidige vorm van die nedersetting in te pas. As gevolg van hierdie onkonvensionele benadering tot die uitleg van 'n dorpsgebied, sal die bouversele onreëlmatig in vorm en grootte wees. Onkonvensionele benaderings tot besitreg van eiendom sal daarom ook aanvaar moet word. In situ-opgradering word al hoe meer aanvaar as 'n gepaste meganisme, en die Provinsiale Departement van Behuising is besig om 'n beleid vir die finansiering van sulke projekte te ontwikkel.	Uphuculo lwamatyotyombe Olu luhlobo lophuhliso oluthi lweziwe ekutshintsheni uhlobo lokuhlala ngethuba abantu behlala apho. Baye abanye basiwe kwezinye indawo ukuze kwenziwe izinto ezifana neendlela kuba kuphungulwa uxinano
Lewensnoodsaaklike onderhoudsmiddel Lewensnoodsaaklike onderhoudsmiddele is mense se vermoë en hulle lewensnoodsaaklikemiddele, wat voedsel, inkomste en bates insluit. Tasbare bates is hulpbronne en voorrade, terwyl ontasbare bates eise en vrye toegang is. Lewensnoodsaaklike onderhoudsmiddele is omgewingsvolhoubaar wanneer dit die plaaslike en globale bates waarvan dit afhanklik is, in stand kan hou en die waarde daarvan kan verhoog, en 'n voordelige effek op ander se bestaan het. Lewensnoodsaaklike onderhoudsbestaan is sosiaal volhoubaar as dit spanning en skokke kan hanteer, daarvan kan herstel en vir toekomstige geslagte voorsiening kan maak.	Ukuphila ngokubanzi Eli gama limele abantu, izinto abakwazi ukuzenza, neendlela zokuphila, ezihlanganisa ukutya, ingeniso, nezinto abanazo.. Ukuphila kuzinziswa kokusingqongileyo xa kugcina okanye kuphakamisa izinto nempahla zethu ezibalulekileyo kwimpilo zethu zengingqi okanye ezozinto jikelele apho ukuphila kuxhomekeke, kwaye kukho iziphumo ezancedayo kokunye ukuphila. Ukuphila kunokuzinziswa ngokwentlalo kwaye kunokumelana kwaye kuvulke kuxinzelelo nakumothuko, kwaye kubonelele kwizizukulwana ezizayo.

Informal Settlement Development	English
Roll-over upgrades	Roll-over upgrades A portion of land in or adjoining an informal settlement that is cleared, levelled and then serviced. It is then occupied by all the residents of a portion of the settlement. The next vacated portion is then levelled, serviced and occupied by the residents of another portion, and so on. ⁷
Seasonality	Seasonality Periodic fluctuations in the climate, related to seasons of the year e.g. wet winters, drier summers. ⁸
Shebeen	Shebeen Local term for an unlicensed bar. ⁹
Wendy house	Wendy house A small informally constructed or assembled dwelling with wooden walls that is generally prefabricated or manufactured in 'kit' form and that has multiple uses including: a child's play house, garden or tool shed or storage area. It can also serve as a low-cost living and workspace, including a home, crèche or sleeping space in the backyard of a formally approved residence or business.

Afrikaans	isiXhosa
Opgradering deur middel van oorrolbewoning Dit verwys na 'n grondgebied binne, of aangrensend aan 'n informele nedersetting, wat skoongemaak, gelykgemaak en gediens word. Hierna word dit dan deur al die inwoners van 'n sekere gedeelte van die nedersetting beset. Die vakante gedeelte word dan gelykgemaak, gediens en deur die inwoners van 'n ander gedeelte beset, ensovoorts.	Uphuculo oluqhubekekayo Kuthi kuchithwe amatyotyombe kwakhiwe baze bathi abo bathe basuswa kule ndawo bebehala kuyo bafakwe kule ndawo iphuhlisiweyo. Baze bathathe abanye abantu babafake kwindawo ethe yaphuhliswa ngokususa aba bantu basiwe kwenye ephuhlisiweyo. Ukutsho kukuthi kwindawo nendawo abathe basusa abantu kuyo iyaphuhliswa ngenjongo zokulungiselela abo basahlala kwimo efanelwe kukutshitshwa.
Seisoensgebondenheid Periodieke klimaatwisseling as gevolg van die jaarlikse seisoene, bv. nat winters, droër somers.	Amaxesha athile enyakeni Ukutshintsha ngokunxulumene namaxesha athile onyaka esimo sezulu, umzekelo ubusika obunemvula, ihlobo elomileyo
Smokkelhuis / Sjebien Plaaslike benaming vir 'n ongelisensieërde kroeg	Isimokolo Umzi othengisa utywala kuselelwe khona, ungumzi womntu okanye ekuhlalwa kuwo
“Wendy” huis 'n Kleinerige informele konstruksie of opslaangebou, informeel geboude of saamgeflanse woonplek met houtmure wat gewoonlik as 'n monteesterel vooraf vervaardig is, met veelvuldige gebruike, insluitende 'n kinder-speelplek, 'n afdak vir tuingereedskap of 'n stoorplek. Dit kan ook dien as laekoste leef-en-werkplek, 'n werkswinkel, 'n huis, bewaarskool of slaapplek in die agterplaas van 'n formeel goedgekeurde woning of besigheid.	Indlu eyakhiwe ngamaplanga Indlwana encinane eyenziwe okanye edityaniswe ngamaplanga ezindongeni jikelele ithengwa sele yakhiwe kwaye inokusetyenziswa ngeendlela ezininzi kuqukwa nokuba, ibe yindlu yokudlala yabantwana, indawo yokugcina izixhobo zasegadini okanye zokusebenza. Inokusebenza kwakhona njengendawo yokuhlala ebiza kancinane okanye i-ofisi kuqukwa nokuba ibe likhaya, indawo yokugcina abantwana, okanye indawo yokulala ngasemva endlini okanye indawo evunyiweyo yokuhlala okanye yokuthengisela

6.3 Storms, flooding and water

6.3.1 Rain, wind and storms

Storms, flooding and water	English
Berg wind	Berg wind A hot dry wind blowing off the interior plateau of South Africa, roughly at right angles to the coast. Occurs mainly in winter when there is a low pressure system south of the country and a strong high over the country. <i>Source: SAWS</i>
Black south easter	Black south easter A specific application to a local wind, the south easter of Table Bay, South Africa (Table Mountain south easter). When there are dark clouds over Table Mountain, it is a black south easter; when there are no clouds, it is a blind south easter. ¹⁰
Cape Doctor	Cape Doctor A strong, invigorating south east wind on the south coast of South Africa. In Cape Town it brings the 'tablecloth', a sheet of hill cloud that covers Table Mountain. ¹¹
Catchment	Catchment Catchment means an area of any size that drains into a lake, stream, or other body of water; also known as 'basin' or 'watershed'. <i>Source: FEMA</i>
Cold front	Cold front Any non-occluded front that moves so that the colder air replaces the warmer air; i.e. the leading edge of a cold air mass. <i>Source: SAWS</i>

Afrikaans	isiXhosa
Bergwind ‘n Warm droë wind wat van die binnelandse plato van Suid-Afrika af waai – feitlik reghoekig met die kus. Dit gebeur hoofsaaklik in die winter wanneer daar ‘n laagdrukstelsel suid van die land en ‘n sterk hoogdrukstelsel oor die land voorkom.	Umoya onobushushu onkoliso ivela ngasentlango Ngumoya oshushu owomileyo ovuthuza kwithafa elisentabeni elingaphakathi loMzantsi Afrika, kakhulu kwicala elisekhohlo kunxweme. Wenzeka kakhulu ebusika xa kukho uxinzelelo olusezantsi kumazantsi elizwe kwaye uphezulu ungamandla kwilizwe
Swart Suidooster ‘n Spesifieke toepassing op ‘n plaaslike wind is die suidooster in Tafelbaai, Suid-Afrika (Tafelberg se suidooster). Wanneer daar donker wolke oor Tafelberg (Kaapstad) waai, is dit ‘n swart suidooster, en wanneer daar geen wolke op die berg is nie, is dit ‘n blinde suidooster.	Umoya odala ubumnyama ovela emazantsi eMpuma Ngumoya othi uvele ngasemazantsi empuma yelizwe. Uthi wambhathisa iNtaba yeTafile.
Kaapse Dokter ‘n Sterk, kraggewende suidoostewind aan die suidkus van Suid-Afrika. In Kaapstad bring dit die spreekwoordelike “tafeldoek”, ‘n dik laag wolke, oor Tafelberg.	Isivungu-vungu somoya waseKapa Umoya ongamandla, ohlaziya umoya ngokubanzi womzantsi-mpuma kunxweme olusemazantsi loMzantsi Afrika. Ekapa lizisa “ilaphu letafile”, lilifu eligquma iNtaba yeTafile
Opvangsgebied Opvangsgebied beteken ‘n gebied van enige grootte wat in ‘n meer, stroom of ander watermassa dreineer; Dit staan ook bekend as ‘n “kom” of “waterskeiding”.	Isikhongozeli-mvula Kuxa amanzi eqengqeleka esihla intaba esiya emlanjeni nasemadanyeni. Ezintaba zisecaleni lomlambo zisebenza nje ngezikhongozeli-mvula, kuba amanzi ahla macala omabini athi akufika ezantsi kudaleke umlambo.
Koue front Enige ongeokkludeerde front wat só beweeg dat die kouer lug die warmer lug verplaas; byvoorbeeld die voerpunt van ‘n bewegende koue lugmassa.	Umsinga oBandayo Nawuphi na umsinga ohambayo ukuze umoya obandayo ungene endaweni yomoya oshushu, ingqumba yomoya obandayo okhokekayo

Storms, flooding and water	English
Cut-off low	Cut-off low A cold low which has become displaced out of the basic westerly current, and lies to the south of this current. A cut-off low is a 'closed low in the upper air, supported by a low-pressure system on the surface' (SAWS report). In other words, it is atmospheric circulation that becomes separated from the main flow/system, and often results in heavy rainfall, gale force winds and other severe weather. (DIMP) <i>Source: SAWS</i>
Debris flow	Debris flow Very rapid downslope movements of rock debris and regolith. Many debris flows enter drainage systems and then follow them down slope.
Debris loading	Debris loading The quantity of debris located within a specific water course or channel. It can be due to natural process and due to anthropogenic causes such as litter.¹²
Flash flooding	Flash flooding A flood that rises and falls quite rapidly with little or no advance warning, usually as the result of intense rainfall over a relatively small area. <i>Source: SAWS</i>
Flood proofing	Flood proofing Any combination of structural and non-structural additions, changes, or adjustments to structures that reduce or eliminate flood damage.¹³
Flooding	Flooding The temporary inundation of normally dry land areas resulting from the overflowing of the natural or artificial confines of a river or other body of water, including groundwater.¹⁴
Flood plain	Flood plain A general term used to mean the area most prone to flooding, mapped or not. The flooding may be a localised problem.¹⁵

Afrikaans	isiXhosa
Afsnylaagdruk ‘n Koue laedrukstelsel wat uit die basiese westelike stroom verplaas is en wat suid van hierdie stroom lê. Die ‘afsnylaagdruk’ is ‘n geslote laagdrukgebied in die bolug wat deur ‘n laagdrukstelsel ondersteun word (SAW verslag). Met ander woorde, dit is atmosferiese sirkulasie wat van die hoofvlei/stelsel af verwyder word, en wat dikwels swaar reën, stormsterkte winde en ander strawwe weersomstandighede tot gevolg het. (DIMP)	Umoya obandayo osezantsi Umoya obandayo osezantsi olahlekileyo kumsinga osisiseko wasentshona, kwaye olele emazantsi alo msinga. Umoya obandayo osezantsi uvalekile usezantsi kumoya ophezulu, uxhaswa yindlela yoxinzelelo olusezantsi phezulu (ingxelo ye-SAWS). Ngamanye amagama, kukujikeleza kwesibhakabhaka okuye kohluwe kumsinga ongundoqo/indlela, kwaye kaninzi oku kuye kukhokelele kwimvula enkulu, imimoya engamandla kunye nenye imozulu emandundu. (DIMP)
Drifselvloei Drifselvloei is ‘n baie vinnige afwaartse vloei van rotspuin of regoliet wat teen steil hange af beweeg. Baie van die drifselvloei beland in dreineringsstelsels en vloei dan afwaarts daarin.	Zezonto zikhukhuliswe ngamanzi ezithi zifumaneka emiseleni elungiselelwe amanzi ngexesha lezantyalan-tyala. Ezinye zibandwa yindalo xa kuthi amagqabi awe emthini kunethe emke namanzi.
Opdriksellading Dit verwys na die hoeveelheid opdriksels wat in ‘n spesifieke affloop of stroompkanaal beland. Dit kan as gevolg van ‘n natuurlike proses gebeur, en ook eens antropogeniese oorsake, soos die strooi van rommel.	Ngumthamo wezonto zikhukhuliswe ngamanzi ezithi zifumaneka emiseleni elungiselelwe amanzi ngexesha lezantyalan-tyala. Ezinye zibandwa yindalo xa kuthi amagqabi awe emthini kunethe emke namanzi.
Fratstvloed Vloedwater wat vinnig styg en daal sonder voorafgaande waarskuwing, gewoonlik as gevolg van hewige reën oor ‘n relatief kleiner gebied.	Izikhukhula Zizantyalan-tyala ezingabhungisiyo; zinemvula ezinandla aphezulu.Zitsho ngamandla endaweni incinci.
Vloedversterking Enige kombinasie van strukturele en nie-strukturele toevoegings, veranderings, of verstellers aan bestaande strukture wat vloedskade kan verminder of uitskakel.	Izikhuseli kwizantyalan-ntyalan Zizikhuseli kwizantyalan-ntyalan ezinemvula ezinandla aphezulu. Ziphungula umonakalo.
Oorstroming ‘n Tydelike watervloed op gewoonlik droë grondgebiede, as gevolg van riviere of enige ander watermassa wat oor hul natuurlike of kunsmatige walle oorgvlei, insluitend grondwater.	Impuphuma Ukuzaliswa ngamanzi kwexeshana kwemimandla yomhlaba esoloko yomile ngamaxsha amaninzi. Oko kubangwa kukuphuphuma komlambo wendalo okanye owenziweyo okanye enye indawo yamanzi, kuquka namanzi aphansi komhlaba
Vloedvlakte Vloedvlakte is ‘n term wat oor die algemeen gebruik word vir ‘n gebied wat die meeste onderheilig is aan oorstromings, of dit op kaarte aangedui is of nie. Die oorstroming mag ‘n plaaslike probleem wees.	Indawo yezikhukula Yindawo esoloko ithandwa zizantyalan-ntyalan. Ezigantyalan-ntyalan zigaba yingxaki ekulondawo rhoqo

Storms, flooding and water	English
Ground water level	Ground water level The level at which soil and porous rock begin to be saturated with water. <i>Source: UN</i>
Informal settlement flooding	Informal settlement flooding Flooding that takes place in an informal settlement. This includes ponding, leaks and seepage.
Mud slide	Mud slide The slow, downhill flow of soil or soil layers saturated with water. <i>Source: Delfi</i>
Ponding	Ponding The process, occurring after rain, when water gathers in low-lying areas throughout a watershed (including in formal and informal areas). Frequently referring to water standing in the streets when the capacity of the storm water drainage is exceeded. ¹⁶
Seepage	Seepage The gradual movement of water into, through or from a porous medium. Also the loss of water by infiltration into the soil from a canal, ditches, laterals, watercourse, reservoir, storage facilities, or other body of water, or from a field. In an informal settlement context, often water comes through the base of a shack because it is built in an area with a high water table and the shack lacks a foundation. ¹⁷
Standing water	Standing water Stagnant water.
Subsidence	Subsidence The sinking or downward settling of the Earth's surface not restricted in rate, magnitude, or area involved. ¹⁸

Afrikaans	isiXhosa
Grondwater vlak Die vlak waarteen grond en poreuse rots met water deurdrenk is.	Inqanaba lamanzi angaphantsi Inqanaba apho umhlaba kunye nelitye elinemingxutya liqala ukugcwala ngamanzi
Oorstroming van informele nedersetting Oorstroming wat in 'n informele nedersetting plaasvind. Dit sluit opdamming, lekplekke en insypeling van syferwater in.	Izikhukula zasematyotyombeni Izikhukula ezenzeka ematyotyombeni. Oku kuquka amachibi, ukuvuza nokuthontsiza.
Modderstorting Stadige afwaartse grondvloeï of grondlaagverskuiwings wat met water deurdrenk is.	Udiliko lomhlaba Kukudilika kwendonga zibangwa zimvula
Opdamming Die proses wat na 'n reën bui plaasvind wanneer water regdeur 'n waterskeiding in laagliggende dele opdam (ook in formele en informele areas). Dit verwys dikwels na water wat in strate opdam wanneer die kapasiteit van stormwaterdreinerings nie voldoende is nie.	Idanyana Amanzi athi adame emva kwemvula, okanye xa kuphalazwe amanzi kumhlaba owomileyo La ngamanzi athi adame ingakumbi ezindleleni kuba imisele emiselwe ukukhonzela lamanzi ingakwazi ukwamkela imithamo emikhulu
Syferwater Die geleidelike beweging van water in, deur, of van 'n poreuse medium af. Ook die verlies van water deur insypeling in die grond in, van 'n kanaal, slote, syspruite, waterlope, opvangsdam, opgaarfasiliteite, of 'n ander waterbron of van 'n veld af. In die konteks van 'n informele nedersetting syfer water dikwels deur die vloer van 'n plakkershut omdat dit op 'n area met 'n hoë watertafel gebou is en omdat die hut geen fondasie het nie.	Amanzi aphuma ngaphantsi komhlaba Amanzi aphuma ngaphantsi komhlaba, ethambekeni okanye kumadama okugcina amanzi Emantyotyombeni oku kubangelwa ngamanzi angaphantsi komhlaba apho abantu bakhe khona kumhlaba ongalungiswanga. Kuthi kwakunetha kube lula ukunyuka kwawo kuba ebengekude kuyaphi ngaphezu komhlaba, nomngangatho ungenziwanga ngokufanelekileyo Kumxholo wasematyotyombeni, kaninzi amanzi angena kumphantsi wetyotyombe kuba lakhiwe kwindawo enamanzi aphezulu kwaye ityotyombe alinaso isiseko.
Staande water	Amanzi amileyo Amanzi angahambiyo
Insinking Die insinking of wegsakking van die grondoppervlakte, onbeperk in snelheid, omvang of gebied wat betrokke is.	Ukuwutha Ukutshona okanye ukuhlala phantsi kwamanzi kumphezulu womhlaba, enganyinwanga ngokwezininga, ubukhulu, okanye indawo ebandakanyekayo

Storms, flooding and water	English
Surface runoff	Surface runoff The natural drainage of water away from an area. It includes both surface and subsurface flow. <i>Source: Delfi</i>
Water table	Water table The level below the Earth's surface at which the ground becomes saturated with water. The surface of an unconfined aquifer which fluctuates due to seasonal precipitation. ¹⁹

6.3.2 Infrastructure

Infrastructure	English
Channel	Channel An open conveyance of surface storm water. Channels can be natural or man-made. ²⁰ In informal settlements where there is a lack of drainage, residents may resort to digging channels.
Culvert	Culvert A sewer or drain that passes under a road or embankment. ²¹
Detention pond/basin/reservoir	Detention pond/basin/reservoir A basin or reservoir where water is stored for regulating a flood. It has outlets for releasing the flows during the floods. ²²
Retention pond/basin/reservoir	Retention pond/basin/reservoir A basin or reservoir where water is stored for regulating a flood. Unlike a detention basin, it does not have outlets for releasing the flows. The water must be disposed of by draining into the soil, evaporation, or pumping systems. ²³
Stilts	Stilts A column of wood or steel or concrete that is driven into the ground to provide support for a structure ²⁴ . This can apply to informal structures too.

Afrikaans	isiXhosa
Oppervlakafloup Afloup – die natuurlike dreinerings van water weg van ‘n gebied af. Dit sluit bogrondse sowel as ondergrondse vloei in.	Ukuhamba kwamanzi ngaphezulu komhlaba Ukomiswa kwamanzi yindalo endaweni. Kuqukwa ukuhamba ngaphezulu nokuhamba ngaphantsi
Watertafel Die vlak onder die aardkors waarteen die grond met water deurdrenk is. Die oppervlakte van ‘n onbepaalde akwifer wat fluktueer tydens seisoenale neerslae.	Amanzi angaphantsi komhlaba Amanzi angaphantsi komhlaba athi xa kune kakhulu avele phezu komhlaba

Afrikaans	isiXhosa
Kanaal Dit verwys na 'n oop sloot vir die vervoer van bogrondse stormwater. Kanale kan natuurlik of mensgemaak wees. By informele nedersettings waar daar 'n gebrek aan dreinerings is, mag die inwoners hulle eie kanale grawe as 'n uitweg om water te herly.	Umjelokazi Oku kubhekisele ekuhanjiseni okuvulekileyo kwamanzi aphezulu esiphango. Imijelokazi inokuba yeyendalo okanye ibe yenziwe. Ematyotyombeni apho imibhobho ehambisa amanzi inqongopheleyo, abahlali banokubhenela ekombeni imijelokazi
Duikslot Riool of drein wat onder 'n pad of 'n spoorwal deurloop.	Ikhohle Umjelo onqamleza phantsi kweendlela okanye udonga.
Retensiedam 'n Oopdam of reservoir waar 'n watervoorraad gebruik word vir die regulering van vloedwater, met sluis vir vloedbeheer.	Izakhiwo ezenzelwe ukumelana nezantya-ntya. Ithi ibe nemibhobho yokukhuphela amanzi
Retensiehoudam Retensiereservoir (opvangsdam) – 'n Dam of reservoir waarin water gehou word om vloedwater te reguleer. Anders as by 'n detensie-dam, het dit nie uitloep om die vloeiing vry te laat nie – die water moet deur dreinerings in die grond, verdamping of pompstelsels verwyder word.	Izakhiwo ezithi sakhiwe ukumelana nezantya-ntya, kodwa azinazi izakhiwo zokukhuphela amanzi, koko athi atshone emhlabeni okanye abiliswe abengumphunga. Ngelinye ixesha afunxwe yimibhobho elungiselelwe oko
Stelte 'n Kolom van hout, staal of beton wat in die grond ingedryf is om steun aan 'n struktuur te verleen. Dit kan ook op plakkershutte van toepassing wees.	Izithuthi Imithi okanye isinyithi okanye isamente efakwa emhlabeni ukuze inike inkxaso kwizakhiwo. Oku kusenokwenziwa nakwizakhiwo ezingekho sikweni.

Infrastructure	English
Stormwater drain	Stormwater drain A drainage system for collecting runoff of storm water on roads and highways and removing it to appropriate outlets. The system includes inlets, catch basins, storm water pipes, drains, reservoirs, pump stations, and detention basins. ²⁵
Trench	Trench A long, narrow excavation commonly dug for drainage or to install pipes. ²⁶
Wetland	Wetland A general term applied to land areas which are seasonally or permanently waterlogged. It is an area of low-lying land submerged or inundated periodically by fresh or saline water. ²⁷ Wetlands (vleis, bogs, swamps, sponges or marshes) are vital ecosystems which have been described as some of the most productive in the world. They help to cleanse water of pollutants, provide habitats for a variety of plant, animal and insect species and regulate floods. <i>Source: Enviropaedia</i>

6.4 Fire

Fire	English
Accelerant	Accelerant Flammable or combustible liquid used to initiate or increase the spread of fire.
Access roads/tracks	Access roads/tracks A travel way to provide a safe, fixed route of travel for moving livestock, equipment, products and supplies. This practice applies to roads that provide access to farm or ranch headquarters.

Afrikaans	isiXhosa
Stormwater dreinerings 'n Dreineringsstelsel vir die opvang van stormwaterafloop op paaie en snelweë en vir die verwydering daarvan na geskikte afvoerpype. Die stelsel bestaan uit inlope, opvangsdamme, stormwaterpype, rirole, reservoirs, pompstasies en retensiedamme.	Isikhuphi manzi esiphango Isixokelelwano semibhobho esiqokelela amanzi ahambayo esiphango ezindleleni kunye nasemigaqweni kwaye iwase kwiindawo aphuma kuzo ezifanelekileyo. Iindlela ziquka iindawo ekungena kuzo amanzi, amachibi aqokelela amanzi, imibhobho yamanzi esiphango, iindawo ezikhupha amanzi irizwevo, izikhululo zempompo, kunye namadama okugcina amanzi
Sloot 'n Lang, smal uitgraving wat gewoonlik vir dreinerings of vir die installering van pype uitgegrawe is.	Umsele Ulwambiwo olumxinwa, ngokuqhelekileyo olwenzelwa ukukhupha amanzi okanye ukufaka imibhobho.
Vleiland Dit is 'n algemene term wat van toepassing is op grondgebiede wat seisoenaal of permanent met water deurdrenk is. Dit is 'n laagliggende gebied wat onder water is, of wat periodiek deur vars- of soutwater oorstroom word. Vleilande (moerasse) is aller belangrike ekostelsels wat al as van die mees produktiewe in die wêreld beskryf is. Hulle help om die water van besoedeling te suiwer, voorsien 'n habitat aan verskeie plantsoorte, dier- en insekspesies, en reguleer vloede.	Umgxobhozo Eli, ligama elisetyenziswa jikelele, elibhekisele kwimimandla ehlala ime amanzi ngamaxesha athile onyaka, okanye ekuhlala kumi kuyo amanzi isigxina. Ingummandla onomhlaba ophantsi evela okanye izaliswe ngamanzi amatsha okanye amanzi amtyuba kumaxesha athile Imigxobhozo (i-vleis, i-bogs, imigxobhozo, imfunxa okanye iindawo ezimanzi) zizizinto ezingqonge abantu izityalo nezilwanyana zonke eziphila endaweni ezibalulekileyo ezichazwe ngokuba zezona zivelisayo elizweni. Zinceda ukucoca izingcolisi-manzi; zibonelele ngendawo yokuhlala kwiintlobo zezityalo, izilwanyana kunye neentlobo zezinambuzane. Kwaye zilawule izikhukula.

Afrikaans	isiXhosa
Versnellingsmiddel Ontvlambare of brandbare vloeistof wat gebruik word om 'n vuur aan die gang te kry, of om die verspreiding daarvan te bespoedig.	Isikhawulezisi Ulwelo olutshayo noluvuthisayo olusetyenziswa ukuqala okanye ukunyusa ukusasazeka komlilo
Toegangspaaie / -spore 'n Toegangspad is 'n reisweg wat 'n veilige, vasgestelde roete voorsien om vee, toerusting, produkte en voorrade te verwyder. Dit sluit paaie in wat toegang verleen tot plase en kantore op groot boerderye.	Iindlela /imizila eFikelelayo Iindlela efikelelayo yindlela ekuhanjwa ngayo ebonelela ngokuhamba okukhuselekileyo kwaye iyindlela yokuhamba esisigxina ukuze kuhambe imfuyo ehambayo, izixhobo, iimveliso kunye nezinto ezihanjiswayo. Esi senzo sibhekisele kwiindlela ezinika ufikelelo kwiifama, okanye kwizindlu

Fire	English
Arson*	Arson The willful and malicious burning of one's property or the property of another. An act of firesetting.
Arsonist*	Arsonist A person who commits arson.
Asphyxiation*	Asphyxiation A condition that causes death because of a deficient amount of oxygen and an excessive amount of carbon dioxide or other gases in the blood.
Backdraft*	Backdraft The instantaneous explosion or rapid burning of superheated gases that occur when oxygen is introduced into an oxygen-depleted confined space.
Building density	Building density The concentration (amount) of buildings in a given geographic area.
CO2*	CO2 The abbreviation for carbon dioxide.
Conduction*	Conduction The transfer of heat energy from one body to another through a solid medium.
Convection*	Convection Heat transfer by the movement of fluid or gases, usually in an upward direction.
Fire*	Fire The rapid oxidation of combustible materials accompanied by a release of energy in the form of heat and light.
Fire break*	Fire break A natural or constructed barrier utilised to stop or slow down fires that may occur, or to provide a control line from which to work.

Afrikaans	isiXhosa
Brandstiging Die opsetlike en kwaadwillige verbranding van 'n persoon se eie eiendom of die eiendom van 'n ander. Om 'n brand te begin.	Kukutshisa indlu okanye impahla, nayiphina into yomntu ngabomu
Brandstigter 'n Persoon wat brande stig.	Umtshisi Umntu otshisayo ngenjongo zentlonti
Versmoring / Verstikking 'n Toestand wat die dood veroorsaak deur 'n onvoldoende hoeveelheid suurstof en 'n oormaat koolsuurgas of ander gasse in die bloed.	Oku kuthi kubangele ukufa kuba kucutheka okanye kuphele lomoya siwuphefumlayo ufunwa yimiphunga yethu, kwande lo ungafunwayo ngumzimba ngamandla
Lugterugtrekking Die oombliklike ontploffing of vinnige verbranding van oorverhitte gasse wanneer daar suurstof in 'n suurstof-verarmde, beknopte ruimte ingelaat word.	Ugqambuko Ukudubula ngephanyazo okanye ukutsha okuqhubayo kweegesi ezitshisa kakhulu ezenzeka xa i-oksijeni izezwa kwisithuba esigcwele i-oksejini
Geboudigtheid Die konsentrasie (aantal) geboue in 'n gegewe geografiese gebied.	Ukuxinana kwezakhiwo Ukuxinana (ubuninzi) kwezakhiwo kummandla wejografi onikiweyo
CO₂ Afkorting vir koolsuurgas.	I-CO₂ Isifinyezo se-carbon dioxide
Geleiding Die oordrag van hitte energie van een liggaam na 'n ander deur 'n soliede medium.	Unikezelo Ukudluliswa kwamandla obushushu esuka komnye umzimba esiya komnye ngento eqinileyo
Konveksie Hitte-oordrag deur die beweging van vloeistowwe of gasse, gewoonlik in 'n opwaartse rigting.	Ukutyhutyha kobushushu Ukudluliswa kobushushu ngokuhamba kolwelo okanye igesi, ngokuqhelekileyo ngecala eliya phezulu
Brand Die vinnige oksidasie van ontvlambare materiale met 'n gepaardgaande energievystelling in die vorm van hitte en lig.	Umlilo Ukutsha okuphindaphindekayo kwezinto ezitshayo zikhatshwa kukukhutshwa kwamandla ngokohlobo lobushushu nokukhanya
Brandpad / Voorbrand 'n Natuurlike strook afgebrande gras of aangelegte versperring om in geval van brand te voorkom dat die res afbrand, of om 'n beheer lyn daar te stel om vanuit te werk. 'n Natuurlike of geboude versperring wat gebruik word om brande te blus of te vertraag, of om 'n beheerlyn te skep waarvandaan gewerk kan word.	Isinqandi Mlilo Umqobo wendalo okanye owakhiweyo osetyenziswa ukunqanda okanye ukwehlisa umlilo onokwenzeka, okanye ukunika umgca wolawulo ekunokusetyenzwa kusukwa kuwo

Fire	English
Fire hydrant*	Fire hydrant A discharge pipe with a valve for drawing water from a water main or cistern, used for combating fire. ²⁸
Fire load*	Fire load The maximum amount of heat that can be produced if all the combustible material in a given area burns, measured in BTU (British Thermal Units) per pound per square foot.
Fire retardant*	Fire retardant A chemical that is applied to a material and is designed to retard ignition or fire spread in that material.
Fire triangle*	Fire triangle A model of the three elements necessary to sustain combustion: HEAT, OXYGEN, and FUEL.
Formal dwelling fire*	Formal dwelling fire A fire that occurs in a dwelling that has been approved or constructed in compliance with municipal building codes and regulations. Such dwellings include flats, hotels and boarding houses.
Fuel*	Fuel Flammable and combustible substances available for a fire to consume.
Incendiary*	Incendiary Relating to or involving a deliberate burning of property.
Informal dwelling fire	Informal dwelling fire A fire that occurs in a dwelling that has not been formally approved or constructed in compliance with municipal building codes and regulations. Usually, such fires occur in informal settlements, which are densely congested residential areas, often lacking basic amenities and services such as piped water and electricity. An informal dwelling could also be a Wendy house or similar structure in the back yard of an approved building/home that is occupied by people.

Afrikaans	isiXhosa
Brandkraan 'n Uitlaattyp met 'n uitlaatklep om water uit 'n hoof-toevoertyp of tenk te tap, om 'n brand mee te blus.	Isicima-mlilo Umbhobho otshizayo onesiciko wokutsala amanzi kwindawo engundoqo yamanzi okanye etankini, osetyenzisa ukulwa umlilo.
Brandlading Die maksimum hoeveelheid hitte wat geproduseer kan word as al die ontlambare materiale in 'n gegewe gebied brand, in BTE (Britse Termale Eenhede) per pond per vierkante voet gemeet.	Idangatye lomlilo Amandla obushushu obuthi bubangwe koko kutshayo. Kunezixhobo zokuchaza amandla obu bushushu ngokusebenzisa i-BTU (British Thermal Unit)
Brandvertrager Chemikalieë wat op 'n materiaal aangewend word om ontvlaming of vuurverspreiding in daardie materiaal te vertraag.	IsiLibazisi Mlilo Ikhemikhali efakwa kwinto kwaye eyilelwe ukuba ilibazise ukutsha okanye ukunwenwa komlilo kwinto leyo
Branddriehoek Model van die drie elemente wat benodig word om verbranding te laat voortduur, HITTE, SUURSTOF en BRANDSTOF.	Unxantathu woMlilo Imodeli yezinto ezintathu eziyimfuneko ukugcina ukutsha UBUSHUSHU, I-OKSIJENI, namaFUTHA
Formele woningsbrand / huisbrand Brande wat plaasvind in formele wonings wat volgens munisipale voorskrifte en regulasies goedgekeur en gebou is. Dit sluit woonstelle, hotelle en losieshuise in.	Umlilo wendlu esesikweni Imililo ebaswa kwizindlu zokuhlala ezivunyiweyo okanye ebaswe ngokungqinelana nemigaqo zezakhiwo zikamasipala kunye nemimiselo. Iquka iifleti, iihostele kunye nezindlu zengqesho.
Brandstof Ontvlambare en brandbare materiale wat beskikbaar is om deur 'n vuur verteer te word	Amafutha Izinto ezitshayo kunye nezinokutsha ezifunakekayo ukuba uqale umlilo
Brandstigter Verwys na die betrokkenheid by 'n opsetlike verbranding van eiendom.	Utshiso Kunxulumene okanye kubandakanya ukutshisa ipropati ngabom.
Informeel woningsbrand Verwys na brande wat voorkom in wonings strukture wat nie formeel 'goedgekeur' of volgens munisipale voorskrifte en regulasies vir konstruksies gebou is nie. Sulke brande kom gewoonlik voor in informele nedersettings, wat digte opeengehoopte residensiële gebiede is, en wat dikwels gebrekkig is aan basiese geriewe en dienste soos aangelegde water en elektrisiteit. 'n Informele woning kan ook 'n 'Wendy-huis' wees, of 'n soortgelyke struktuur in die agterplaas van 'n goedgekeurde gebou/woning wat deur mense bewoon word.	Umlilo wasematyotyombeni Ubhekisela kumlilo owenzeka kwiindawo ezi 'ngavunywanga' ngokusesikweni okanye zakhiwe ngokuthobela imigaqo yokwakha zikamasipala kunye nemimiselo. Ngokuqhelekileyo, imililo enjalo yenzeka ematyotyombeni, aziindawo zokuhlala ezixineneyo kakhulu, kaninzi apho kunqongophele khona izinto ezisisiseko kunye neenkonzo ezi namanzi ahamba ngemibhobho kunye nombane. Ityotyombe linokuba 'yindlu eyakhiwe ngamaplanga' okanye isakhiwo esifana nayo endlini ngasemva kwisakhiwo/ikhaya elivunyiweyo ekuhlala kuyo abantu.

Fire	English
Jerry blik	Jerry blik A container or drum used to make a fire in.
LPG*	LPG Liquid Petroleum Gas.
Open flame fire*	Open flame fire Any burning of fuel, including any torch, flare, decorative light, fondue or other heating, burning, or lighting equipment or device having an open flame. ²⁹
Non flammable*	Non flammable Incapable of combustion under normal circumstances, usually used when referring to liquids or gases.
Radiation*	Radiation The transfer of heat energy through air by electro-magnetic waves, also called radiated heat.
Tenability*	Tenability The determination of whether or not people can remain unhurt or escape a fire area without serious injury.
Toxicity*	Toxicity The ability of a substance to do harm within the body.
Veld/wild/bush fire	Veld/wild/bush fire Fires in South Africa that result in the burning of grass, shrubs and trees in a single event. These can occur in national parks and rural areas as well as within the urban fringe around cities and towns.

Afrikaans	isiXhosa
Jerry-blik (Konka) ‘n Houer of drom wat gebruik word om ‘n vuur in te maak.	Imbawula (Jerry-blik) Isiqulathi okanye umgqomo osetyenziselwa ukubasa umlilo
Vloeibare Petroleum Gas	I-LPG Igesi yoLwelo lwePetroliyam
Oopvlamvuur “Oopvlamvuur” beteken enige verbranding van brandstof, insluitend enige fakkel, ligvlam, ligversiering, fondue of ander verwarming, brandende of liggewende toerusting of apparaat met ‘n oop vlam.	Umlilo onamadangatye angakhuselwanga “Umlilo onamadangatye angakhuselwanga” uthetha nawaphi na amafutha atshayo, aquka naliphi na, idangatye, isibane sokuhombisa, unyibilikiso okanye nakuphi na ukufudumeza, ukutshisa, okanye isixhobo sokulayita esinomlilo ongakhuselwanga.
Brandvas Nie in staat om onder normale omstandighede te brand nie, gewoonlik wanneer daar na vloeistowwe of gasse verwys word.	Izinto ezingatshi lula Ezingenako ukutsha phantsi kweemeko eziqhelekileyo, kaninzi kusetyenziswa xa kubhekiselwa kwizinto ezilulwelo okanye igesi
Brand bestraling Die oordrag van hitte-energie deur elektromagnetiese golwe, ook bestralende hitte genoem.	Utshiso ngomtha Ukudluliswa kwamandla okutshisa ngomoya ngamaza eletroniki-zibuthe, ekuthiwa kwakhona ukutshisa ngemitha
Brand verdraagsaamheid Om vas te stel of mense ongeskaad kan bly, of sonder ernstige beserings van die brandende gebied kan ontsnap, of nie.	Ukumelwa Ukumisela ukuba abantu banokuhlala bengonzakali okanye bayibaleke indawo enomlilo ngaphandle kokwenzakala okumandundu
Toksisiteit/Giftigheid Vermoë van ‘n stof om skade in die liggaam te berokken.	Ubutyhefu Ukuba nako kvento ukwenzakalisa emzimbeni
Veldbrand / Bosbrand Verwys na brande in Suid-Afrika wat die verbranding van gras, struik en bome in ‘n enkele voorval tot gevolg het. Hierdie brande kan in nasionale parke, in landelike gebiede, asook in die omliggende stedelike en dorpsgebiede voorkom.	Umlilo weDlelo /waseNdle/weDobo Ubhekisela kwimililo eMzantsi Afrika ekhokelela ekutsheni kwengca, imithi emifutshane kunye nemithi kwishele esinye. Oku kwenzeka kwiipaki zesizwe nakwimimandla yasemaphandleni ngokunjalo nasezidolophaneni ezijikeleze iidolophu nezixeko

6.5 Education

Education	English
Education, Training and Development (ETD)	Education, Training and Development (ETD) The diverse fields of adult education practice: from accredited formal adult education programmes in educational institutions or the workplace; to non-accredited, non-formal work-related training in business and industry; to informal community and social development programmes. It is generally acknowledged that adults learn more effectively if their life experience and knowledge (local and cultural knowledge) is incorporated into the learning process, if they are active participants in the learning process and if the learning process enables them to construct their own meaning (knowledge and understanding).
Education, Training and Development Practitioner (ETDP)	Education, Training and Development Practitioner (ETDP) The practitioner performs different adult education roles in the different fields of ETD practice: educator, trainer or social/community development roles. People working in the field of disaster risk reduction enact an ETDP role of social or community development. This role can entail: facilitation of participatory action methodologies in communities; feedback of disaster risk assessment to a community and the local leadership; as well as facilitating local stakeholder management of community disaster risk.
Participatory research	Participatory research A method of research in which community members participate to varying degrees in question formulation, design of methods and instruments, and conduct analysis or research and evaluation. This type of research can raise awareness of issues and provide information around which to develop action plans.³⁰

Afrikaans	isiXhosa
Onderwys, Opleiding en Ontwikkeling (OOO) Hierdie term dek die uiteenlopende soorte volwasse onderwys: vanaf erkende formele volwasse onderwysprogramme in opvoedkundige instellings of die werksplek; tot by onerkende informele werksgeoriënteerde opleiding in besighede en industrieë; tot by informele gemeenskaps- en maatskaplike ontwikkelingsprogramme. Daar word algemeen aanvaar dat volwassenes meer effektief leer as hulle lewenservarings en kennis (plaaslik en kultureel) deel uitmaak van die leerproses, as hulle aktief deelneem aan die leerproses en as laasgenoemde hulle in staat stel om hulle eie kennis en begrip te vorm (kennis en begrip).	IMfundo, uQeqesho noPhuhliso (Education, Training and development (ETD)) Uqhelaniso lweMfundo, uQeqesho kunye noPhuhliso (ETD). Eli gama lifaka imimandla eyahlukeneyo yoqhelaniso lwemfuno yabadala: ukusuka kwiinkqubo ezivunyiweyo zemfundo yabadala kumaziko emfundo okanye emisebenzini; ukuya kwangavunywanga, uqeqesho olungekho sikweni olunxulumene nomsebenzi kwezoshishino; ukuya kuluntu olungekho sikweni kunye neenkqubo zophuhliso lwentlalo. Kuyaziwa jikelele ukuba abantu abadala bafunda ngokubonakalayo ukuba amava nolwazi lwabo lobomi (ulwazi lwengingqi nolwenkcubeko) lufakwa kwinkqubo yokufunda, ukuba ngaba bangabathabathi nxaxheba abakhutheleyo kwinkqubo yokufunda kwaye ukuba inkqubo yokufunda iyabavumela ukuba bazakhele ezabo iintsingiselo (ulwazi nokuqonda).
OOO-Praktisyn Die praktisyn tree in verskillende volwasse onderwysrolle op die verskeie gebiede van OOO-praktyk op: as opvoeder, instrukteur, of in maatskaplike- of gemeenskaps-ontwikkelingsrolle. Mense wat op die gebied van die vermindering van ramprisiko werk, vervul die OOO-rol van maatskaplike- of gemeenskapsontwikkeling. Hierdie rol kan die volgende insluit: fasilitering van deelnemende aksie-metodologieë in die gemeenskap; terugvoering aan die gemeenskap en plaaslike leierskap omtrent ramprisiko-berekenings; asook die fasilitering van plaaslike belanghebbers se bestuur van ramprisiko's in die gemeenskap.	I-TDP UMsebenzi ngeMfundo, uQeqesho noPhuhliso Umsebenzi wenza iindima ezahlukeneyo zemfundo yabadala kwimimandla eyahlukeneyo yomsebenzi we-ETD: ngumfundisi, umqeqeshi okanye iindima zophuhliso lwentlalo/uluntu. Abantu abasebenza kummandla wokwehlisa kwengozi yentlekele badlala indima ye-ETDP yophuhliso lwentlalo okanye yoluntu. Le ndima inokuquka: ukuququzelela okanye iindlela zokuthabatha inxaxheba koluntu; impendulo yokuhlolwa kwengozi yentlekele kubunkokheli boluntu nobengingqi; ngokunjalo nokuququzelela ulawulo lwengozi yentlekele yoluntu ngabathelelani bengingqi.
Deelnemende navorsing Dit is 'n navorsingsmetode waarby lede van die gemeenskap op verskillende vlakke deelneem aan die formulering van vrae, die ontwerp van metodes en instrumente, en analyses of navorsing en evaluerings maak. Hierdie tipe navorsing kan bewussyn omtrent vraagstukke opwek, en kan inligting verskaf waaruit planne van aksie ontwikkel kan word.	Uphando loThabatho Nxheba Le yindlela yophando apho amalungu oluntu athabatha inxaxheba ngokwamazinga awohlukeneyo ekwakheni imibuzo, uyilo lweendlela nezixhobo kwaye aqhube ucazululo okanye uphando nohlolo. Olu hlobo lophando lunokwenza kwaziwe imiba kwaye linike ulwazi ngokujikeleze ekuphuhlisweni koyilo lwezenzo

6.6 Environmental health

Environmental health	English
Basic sanitation	Basic sanitation The minimum acceptable basic level of sanitation as a system for disposing of human excreta, waste water and solid waste (rubbish) which is affordable, easy to maintain, safe and environmentally acceptable.
Black water	Black water Human excrement or matter contaminated with human excrement discharged from a toilet. ³¹
Contamination	Contamination Exposure to or addition of poisonous or polluting substance.
Hygiene	Hygiene Conditions or practices conducive to maintaining health and preventing disease, especially through cleanliness.
Public Health	Public Health All organized measures (whether public or private) to prevent disease, promote health, and prolong life among the population as a whole. Its activities aim to provide conditions in which people can be healthy and focus on entire populations, not on individual patients or diseases. Thus, public health is concerned with the total system and not only the eradication of a particular disease. The three main public health functions are: • The assessment and monitoring of the health of communities and populations at risk to identify health problems and priorities. • The formulation of public policies designed to solve identified local and national health problems and priorities. • To assure that all populations have access to appropriate and cost-effective care, including health promotion and disease prevention services.

Afrikaans	isiXhosa
Basiese sanitasie Dit verwys na die minimum aanvaarbare basiese vlak van sanitasie as 'n stelsel vir die verwydering van menslike ontlasting, vuilwater en soliede afval (rommel) wat bekostigbaar is, maklik in stand gehou kan word en omgewingsvriendelik is.	UCoceko olusisiSeko Oku kubhekiselwa kubuncinane obamkelekileyo bomgangatho wococeko njengendlela yokulahla ilindle labantu, amanzi amdaka kunye nenkunkuma eqinileyo (inkunkuma) efikelelekayo, ekulula ukuyigcina, ekhuselekileyo neyamkelekileyo ngokusingqongileyo.
Swart Water Menslike ontlasting of voorwerpe besmet met menslike ontlasting, wat deur 'n toilet uitgestort word.	Amanzi amdaka/elindle Ilindle labantu okanye izinto ezingcoliswe lilindle labantu ezivela kwindlu yangasese
Besmetting Blootstelling aan, of die toevoeging van giftige of besoedelende stowwe.	uNgcoliseko Ukungakhuseleki okanye ukongezwa kwizinto ezinetyhefu okanye kwizinto ezenza ungcoliseko
Higiëne Toestande of gebruike wat die handhawing van gesondheid en die voorkoming van siektes sal bevorder, veral deur die toepassing van sindelikheid.	Ucoceko limeko okanye izenzo ezifanelekileyo ekugcineni impilo kunye nokuthintela izifo, ingakumbi ngococeko.
Openbare Gesondheid Openbare gesondheid verwys na alle georganiseerde maatreëls (hetsy openbaar of privaat) om onder die bevolking as 'n geheel siektes te voorkom, gesondheid te bevorder en lewens te verleng. Dié aktiwiteite poog om toestande te voorsien waarin mense gesond kan wees en fokus op totale bevolkings en nie op individuele pasiënte of siektes nie. Openbare gesondheid is dus begaan oor die hele stelsel en nie slegs oor die uitwissing van 'n spesifieke siekte nie. Die drie vernaamste funksies van openbare gesondheid is: • Die waardering en kontrolering van die gesondheid van riskante gemeenskappe en bevolkings, om gesondheidsprobleme en -prioriteite te identifiseer. • Die formulering van openbare beleidsrigtinge om oplossings te vind vir geïdentifiseerde plaaslike en nasionale gesondheidsprobleme en prioriteite. • Om te verseker dat alle bevolkingsgroepe toegang het tot geskikte, koste-effektiewe sorg wat gesondheid sal bevorder en siekte-voorkomende	IMpilo yoluNtu Impilo yoluntu ibhekisela kuwo onke amanyathelo aququzelelweyo (nokuba ngawabucala okanye ngawoluntu) okuthintela izifo, aphakamise impilo, aze olule ubomi phakathi kwabemi ngokubanzi. Imisebenzi yayo ijolise ekuboneleleni ngezimo apho abantu banokuba sempilweni kwaye ijolise kubemi xa bebonke, hayi kwizigulane ezingazodwa okanye kwizifo. Yiloo nto impilo yoluntu ithathela ingqalelo iindlela xa zizonke hayi kuphela ukupheliwa kwesifo esithile. Imisebenzi yempilo yoluntu engundoqo yile: • Ukujonga nokuhlola isimo sezempilo kuluntu nakubemi abasengozini ukuze kuchongwe iingxaki zempilo kunye nezinto eziza kuqala., • Ukuyilwa kwemigaqo-nkqubo eyenzelwe ukusombulula iingxaki kunye nokuza kuqala okuchongiweyo kweengingqi kunye nokwesizwe.. • Ukuqinisekisa ukuba bonke abemi banalo ufikelelo kukhathalelo olungabizi kakhulu kwaye olufanelekileyo, kuquka nokuphakanyiswa kwempilo kunye neenkonzo zokuthintela izifo.

Environmental health	English
Rudimentary Service – Water & Sanitation	Rudimentary Service – Water & Sanitation Services provided for those settlements that are temporary or short term in nature. Rudimentary water and sanitation services include water standpipes and community sanitation (shared) facilities.
Sewage	Sewage Waste water and excreta conveyed in sewers.
Sewer	Sewer An underground conduit for carrying off drainage water and waste matter.
Sewerage	Sewerage The provision of drainage by sewers.
Transmission	Transmission The process that causes the passing on (of disease) from one person or place to another.

Afrikaans	isiXhosa
Elementêre Dienste – Water & Sanitasie Dit verwys na dienste wat voorsien word aan tydelike of korttermyn-nedersettings. Elementêre water- en sanitasiedienste sluit waterstaanpype en gemeenskaplike (gedeelde) sanitêre fasiliteite in.	Inkonzo zeziQalelo – aManzi noCoceko Oku kubhekisele kwiinkonzo ezinikwa ezo ndawo zizezexeshana okanye zexesha elifutshane ngokwendalo. Amanzi eziqalelo kunye neenkonzo zococeko eziquka imibhobho yamanzi okusela kunye nezibonelelo zococeko (ekwabelwana ngazo) zoluntu
Rioolwater Vuilwater en ontlasting wat in rioolpype vervoer word.	Ugutyulo Amanzi amdaka endawo kunye nelindle elihanjiswa ngemibhobho ephantsi komhlaba.
Rioolpyp 'n Ondergrondse leikanaal vir die afvoer van dreinwater en afvalstowwe.	Isigutyuli Umjelo ophantsi komhlaba ohambisa amanzi amdaka endawo kunye nokungcola
Riolering Die verskaffing van dreinerings deur middel van rioolpype.	Ugutyulo Ulungiselelo lothungelwano lwemijelo phantsi komhlaba
Oordraging (aansteeklikheid) Die proses waardeur siektes van een persoon of plek na die ander oorgedra word.	Usasazo Inkqubo ebanga ukudluliswa (kwesifo) sisuka komnye umntu okanye kwenye indawo

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Additional reading and resources

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Chapter 4

- **Environmental Health Short Course for local Risk Monitors:**
The Community Water Supply & Sanitation (CWSS) Unit, Belville Campus, Cape Peninsula University of Technology (CPUT), is an accredited Training Provider (ESETA Accreditation No: 583/0138)
Contacts: Claudius Zindoga ZindogsC@cput.ac.za; Deborah Cousins cousinsd@cput.ac.za
Tel: 27 (0)21 959 6639/6895.
A CWSS Training Manual guides facilitation and provides the tools for course completion. Assessment instruments accommodate Learners at both NQF Levels 2 and 4. The aim is to equip community-based learners with the understanding and skills to recognize and respond to specific risks and hazards.
The following registered Unit Standards (US) apply:
Level 2, Unit Standard 14042: Demonstrate knowledge of environmental health and community hygiene practices (6 credits).
Level 4, Unit Standard 14035: Promote environmental health to community members (5 credits).
- For comprehensive information on GIS and its uses, as well as software, online courses, tutorials and user assistance visit the Environmental Systems Research Institute (ESRI) website at: <http://www.esri.com/>.

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WIDELY USED RESOURCES

Books and other publications

Benson, C. and Clay, E., *Understanding the Economic and Financial Impacts of Natural Disasters*, Disaster Risk Management Series, Washington, World Bank, No. 4; 2004.

Department for International Development (DFID), *Reducing the Risk of Disasters – Helping to Achieve Sustainable Poverty Reduction in a Vulnerable World*, A DFID policy paper, March 2006.
www.unisdr.org/news/DFID-reducing-risk-of-disasters.pdf

Department for International Development (DFID), *Disaster Risk Reduction: a development concern: a scoping study on links between disaster risk reduction, poverty and development*, 2005. <http://www.dfid.gov.uk/Pubs/files/drr-scoping-study.pdf>

International Federation of the Red Cross (IFRC), *World Disasters Report: Focus on Community Resilience*, 2004

Pelling, M. and Wisner, B. (eds) *Disaster Risk Reduction: Cases from Urban Africa*, Earthscan, London, 2008.

Pelling, M., *The Vulnerability of Cities: Natural Disasters and Social Resilience*, Earthscan Publications Ltd, London, 2003.

Twigg, J., *Disaster Risk Reduction: mitigation and preparedness in development and emergency programming*, Humanitarian Practice Network, Overseas Development Institute, London, 2004.

United Nations Development Program (UNDP), *Reducing Disaster Risk: A challenge for development*, Geneva, 2004. www.undp.org/cpr/disred/rdr.htm

Wisner B, Blaikie P, Cannon T, Davis I, *At Risk: Natural Hazards, People's Vulnerability and Disasters*, 2nd Edition, Routledge, 2004

United Nations, *On Better Terms: A Glance at Key Climate Change and Disaster Risk Reduction Concepts*, 2006. www.eird.org/encuentro/extra/On-better-terms.pdf

United Nations International Strategy for Disaster Reduction (ISDR), *Building Disaster Resilient Communities: Good Practices and Lessons Learned*, 2007. www.unisdr.org/ngos-good-practices

United Nations International Strategy for Disaster Reduction (ISDR), *Living with Risk: A global review of disaster risk initiatives*, New York and Geneva, 2004
http://www.unisdr.org/eng/about_isdr/bd-lwr-2004-eng.htm

Journals and Publications Series

Journal name	Web Link
Disasters	http://www.blackwellpublishing.com/journal.asp?ref=0361-3666&site=1
Environment and Urbanisation Journal	www.iied.org/human/eandu/eandu_details.html
The Australian Journal of Emergency Management	www.ema.gov.au/agd/ema/emainternet.nsf/Page/AJEM
Humanitarian Practice Network publications	www.odihpn.org/hpnpubs.asp

International Websites

Name of Organisation	Description	Web Link
Asian Disaster Preparedness Centre (ADPC)	ADPC supports the advancement of safer communities and sustainable development through diverse projects. The website also provides disaster updates and reading resources.	www.adpc.net
Benfield UCL Hazard Research Centre (BUHRC)	BUHRC is Europe's leading multidisciplinary academic hazard research centre. BUHRC comprises three groups: Geological Hazards, Meteorological Hazards & Seasonal Forecasting, and Disaster Studies & Management. The website includes publications and latest news.	www.benfieldhrc.org/
Centre for Research on the Epidemiology of Disasters (CRED)	CRED promotes research, training, and information dissemination on disasters, with a special focus on public health, epidemiology, structural and socio-economic aspects. The website has an international disaster database and a bibliography database with further resources.	www.cred.be
Duryog Nivaran: South Asian Network for Disaster Risk Reduction	A research, training and advocacy network committed to promoting disaster risk reduction in South Asia at policy and community level. The website has videos, case studies and reports.	www.duryognivaran.org/
Eldis	A gateway to global development information on international development issues with an aim to share the best in development policy, practice and research. Their website has information on a wide range of topics such as climate change, HIV, migration etc.	www.eldis.ids.ac.uk
Inter-American Development Bank	Disaster Risk Management, Sustainable Development Department in the Americas and Caribbean- they are focused on environmental issues. Their website has information on finance and policy.	www.iadb.org/sds/ENV/site_2493_e.htm
Munich Re Foundation	Munich Re is a leading reinsurer that aims to minimise the risks to which people are exposed. Munich Re's website contains information on microinsurance and various international conferences.	www.munichre-foundation.org/
Preventionweb	Preventionweb is closely associated with ISDR and serves to share information and resources related to disaster risk reduction. It contains information about the Hyogo Framework and many issues related to disaster risks.	www.preventionweb.net
ProVention Consortium	ProVention is a global coalition of international organisations, governments, the private sector, civil society organisations and academic institutions dedicated to increasing the safety of vulnerable communities and to reducing the impacts of disasters in developing countries. Their website has many resources on community based work and current information on events in different countries.	www.proventionconsortium.org
Reliefweb	Reliefweb serves the information needs of the humanitarian community and is a global hub for time-critical humanitarian information on Complex Emergencies and Natural Disasters. Their website contains news updates as well as resources.	www.reliefweb.int
United Nations Development Programme, Bureau for Crisis Prevention and Recovery (BCPR)	BCPR aims to be a global centre of excellence on crisis prevention and recovery. Their website has a newsletter, recent reports, news and information on conferences.	www.undp.org/bcpr/
United Nations International Strategy for Disaster Reduction	Aims at building disaster resilient communities by promoting increased awareness of the importance of disaster reduction. Their website contains UN documents, information about the Hyogo Framework as well as awareness games for children.	www.unisdr.org/

Websites based in South Africa

Organisation	Web Link
City of Cape Town official website	www.capetown.gov.za/
Disaster Risk Management	www.capetown.gov.za/en/disasterriskmanagement
South African National Disaster Management Centre	http://sandmc.pwv.gov.za/comp/default.htm
South African Weather Services	www.weathersa.co.za
Western Cape Provincial Government	http://www.capegateway.gov.za/eng/your_gov/3576

Weathering the Storm

Participatory risk assessment for informal settlements



Zolani shivered. It had been raining since yesterday and the floor was already wet as water seeped up from the ground. Now, every winter, the water came from underneath and her mattress stayed damp for weeks...

Weathering the Storm: Participatory risk assessment for informal settlements is a facilitator's guide for helping improve conditions in informal settlements that are exposed to severe weather, flooding and recurrent fires.

The guide has also been designed to be used flexibly. Chapters 3 and 4 provide end-to-end detail on the 'nuts and bolts' of carrying out a participatory risk assessment. Chapter 5 gives specific information on flooding, fires in informal dwellings and environmental health risks. The guide ends with a glossary of key disaster risk-related terms in English, Afrikaans and isiXhosa.

The guide is accompanied by a CD version on the inside back cover. It is also accompanied by a laminated flipchart toolkit. The toolkit contains simple definitions for the terms 'hazard', 'vulnerability', 'risk' and 'disaster' in English, Afrikaans and isiXhosa.

With more than 50 full-colour photographs and illustrations, *Weathering the Storm* is a valuable resource for development and disaster risk management practitioners, trainers and managers, especially those who work in at-risk communities in South Africa.

Periperi (Partners enhancing resilience to people exposed to risks) Publications produces learning and other materials from southern Africa's 'Periperi' risk reduction network.



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