

# “We are struggling”

Coping with chronic disaster in a changing environment

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February 2009

## Acknowledgements

This thesis would not have come into being without the many people I have met along the way. The informants and residents in Kanana showed me hospitality, gave me of their time and welcomed me into the community. The thesis is founded upon their experiences and struggles. Enkosi Kakhulu to all of my informants and people I acquainted in Kanana. I would also like to thank my two brilliant research assistants, Ntobeko and Sithembiso, who became my friends throughout the process. I will never forget our lunch at Chickenland in Gugulethu. I could not have conducted the fieldwork without you. A big thanks for all help and information to staff and students at the Environmental and Geographical Science department at UCT. A particular thank you goes to Dr. Kevin Winter, who gave me help and advice, tipped me about Kanana, and put me in touch with Ntobeko.

However, many people in Norway deserve to be mentioned as well, as you have followed me throughout the process. To the people at 'lesesalen', thank you for good company and an infinite number of (coffee) breaks. A particular thanks to those of you who pep-talked me, read drafts and gave comments in the last period before I submitted. You know who you are. To my friends, thank you for making sure that I've had a social life outside of Blindern during the process of writing. Thank you to Professor Letten F. Saugstad and *The Letten Foundation* for the funding I received. Eileen Gudbrandsen, many thanks for designing the front page of the thesis, and Ida Skivenes, thank you for making the GIS map.

To my big-brother and sister in law, Kjell Olav and Dorte, I appreciate those lovely Sunday dinners. To my parents, Ingunn and Hans Vidar, thank you for always encouraging me and believing in me, and teaching me the value of never giving up. Finally, I would like to thank Professor Karen O'Brien. You are the best supervisor anyone could wish for! I could not have done this without your suggestions, guidance and help. Working on this thesis has been a process of learning, it has been challenging and it has brought me both laughter and tears. As much as I have looked forward to submitting the thesis, it is actually with a little sadness I let it go.

Blindern, February 2009

Camilla Asperheim Nestegard

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## List of Abbreviations

AIDS	Acquired Immune Deficiency Virus
BNG	Breaking New Ground Housing Policy
CCA	Climate Change Adaptation
CMA	Cape Metropolitan Area
CORC	Community Organisation Resource Centre
DiMP	<b>Disaster Mitigation for Sustainable Livelihoods Programme</b> at University of Cape Town
DRR	Disaster Risk Reduction
ENSO	El Niño-Southern Oscillation
GEC	Global Environmental Change
GHG	Greenhouse Gases
HIV	Human Immunodeficiency Virus
IDNDR	International Decade for Natural Disaster Risk Reduction
IPCC	Intergovernmental Panel on Climate Change
LDC	Least Developed Countries
NAO	North-Atlantic Oscillation
NGO	Non Governmental Organization
SHAWCO	The University of Cape Town's <b>Students' Health and Welfare Centres Organization</b>
TB	Tuberculosis

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UCT	University of Cape Town
UNDP	United Nations Development Programme
UNHSP	United Nations Human Settlements Programme
UNISDR	United Nations International Strategy for Disaster Reduction



## Maps



Cape Metropolitan Area and peninsula. (Google Earth 9/12-2008)

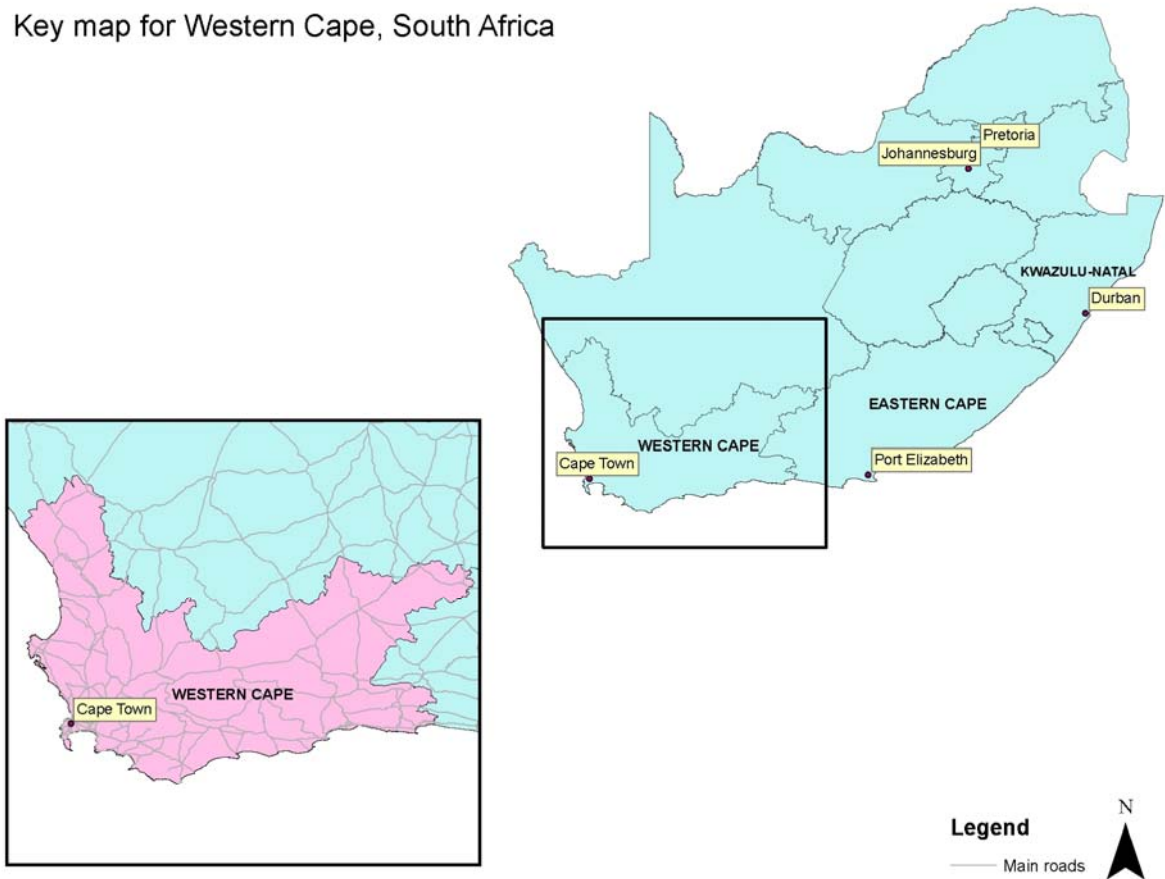


Kanana informal settlement in Gugulethu, Cape Town. (Google Earth 9/12-2008)



## South Africa and the Western Cape

Key map for Western Cape, South Africa



## 1. Introduction

Climate change has become one of the most important environmental and political challenges of this decade, and it has gained increased attention the past five years. The 2007 award of the Nobel Peace Prize to the IPCC and former vice president of the USA, Al Gore, emphasised climate changes as a concern of high importance to global peace and security. Climate change has been increasingly recognised as a political issue in both developed and developing countries, and a number of North-South equity issues have been raised. The UNDP Human Development Report (2007/2008) highlighted the importance of the links between climate change, poverty and human security, and the implications for human rights. Climate change is a part of global environmental change, and these changes do and will affect all countries and all people in the world, to a greater or lesser extent (Steffen et al. 2004).

The relationship between climate change and extreme events is uncertain, but knowledge on the links between these two is called for, to facilitate strategies to reduce vulnerability (O'Brien et al. 2008). The number of disasters has risen drastically in recent decades and what is most commonly referred to as 'natural disasters' often hits poor people in developing countries the hardest. According to DiMP (2005), international best practice view disasters as an interplay between natural or other threats and conditions of socio-economic, environmental or infrastructural vulnerability. A disaster occurs when a vulnerable household, community, city, province, business, ecosystem or physical structure is subjected to a shock or stress which it cannot withstand or cannot recover from without external assistance. A working definition of a disaster is given by the UNISDR:

A serious disruption of the functioning of a community or 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.<sup>1</sup>

They furthermore state that a disaster is a function of the risk process, and that it results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk.

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<sup>1</sup> <http://www.unisdr.org/eng/library/lib-terminology-eng%20home.htm> 16/1-2009.

The point of departure for this thesis is that disasters are socially constructed, and thereby closely influenced by vulnerability and adaptation. While natural hazards in many cases are triggers, the translation into risk and potential for disaster is contingent upon human exposure and lack of capacity to cope with negative impacts. The thesis will take a closer look at the development of critical thinking concerning the causes and effects of disasters in terms of future planning. The link between climate change and disasters is not always clear, particularly in terms of factors such as hurricane intensity or frequency, increased floods or droughts, and changes in NAO or ENSO<sup>2</sup>. The majority of occurred disasters from 1991 to 2005 was hydrometeorological, i.e. floods and wave surges, storms, droughts and related disasters.<sup>3</sup> Nevertheless, the link between climate change and extreme events caused by natural hazards is emphasised in the IPCC 2007 report, which states that the type, frequency and intensity of extreme events are expected to change as the earth's climate is changing. According to O'Brien et al. (2008), the growing recognition that there may be an increasing number of disasters linked to climate influenced events such as floods and droughts, coupled with increasing concern over the social implications of climate variability and change, calls for a deeper and broader assessment of the connections between disaster risk reduction, climate change adaptation and human security.

This thesis emphasises the perspective that a disaster is not only a catastrophe or calamitous event, but should also include the chronic events rooted in everyday hazards. The distribution of both types of risks, i.e. everyday hazards as well as shocks, stem from unequal power relations between different social classes and residential districts in the city (Pelling 2003). Pelling notes that much of the disaster literature has focused on large, catastrophic events, separated from more trivial everyday hazards. Everyday hazards or chronic disasters are felt as long-term stresses associated with exposure to conditions such as poor sanitation, unfit housing or polluted air. They are also less visible, and less newsworthy than the catastrophic events. However, chronic and catastrophic disasters are linked in many ways. In some cases, they share the root causes, especially in cities in the developing world. This thesis will provide insight into a situation that may be described as struggling with

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<sup>2</sup> North Atlantic and El-Ninõ Southern Oscillation influence temperature and precipitation patterns and thereby the occurrence of floods and droughts.

<sup>3</sup> <http://www.em-dat.net/> 16/1-2009

chronic risk and hazard, or living in a chronic disaster. The study focuses on the residents of the informal settlement of Kanana in the Cape Flats area of Cape Town, South Africa, who are considered to be vulnerable to multiple stressors. They are living in a risk-filled environment prone to hazards, where seasonal flooding represents one of them. Although the residents of Kanana are struggling with chronic disasters, many of them have developed comprehensive coping strategies. Adapting to long term climate change, however, will require more than increased coping- it calls for a decrease in the structures and processes that contribute to vulnerability to chronic disasters.

The thesis takes a holistic approach to adaptation to and coping with climate related stressors, and provides a grass-roots perspective on living with chronic disaster. A holistic approach to research on a changing environment includes research from several academic disciplines, and from both the natural and social sciences. Climate change, disaster risk reduction, vulnerability to, and coping with everyday hazards are important to examine together, because they are intrinsically linked. By examining the situation of residents in Kanana who are struggling with multiple hazards, one may identify the contributing factors to vulnerability, take action to reduce this vulnerability and develop appropriate adaptation measures. As the number and severity of floods and storms are expected to increase with climate change, it is very important not only to further develop these measures, but also to move away from the notion that vulnerability equals only exposure to risk, or is synonymous with poverty. They are closely connected, but it is important to look at them in detail, as generalizations often do not contribute to a deeper understanding of the causal mechanisms of social and human vulnerability. The causes of vulnerability to flooding are often complex, and influenced by physical and socio-economic factors, but also factors such as politics and (global) economy.

In the developing world where the majority of the global poor live, the stress on both urban and poor livelihoods is already high, and will in some cases increase with a changing climate. Nevertheless, rural and urban livelihoods face different problems and stressors, and flooding in an urban environment poses great challenges to the people that reside in slum areas. The risks that extreme weather events present, may lead to calamities and catastrophes. For poor people with high vulnerability and low adaptive capacity and resilience, such events can be particularly destructive. At the risk of generalizing, groups like 'the global poor' or slum-dwellers do face similar challenges that originate in the same

structural causes, and will benefit from achievement of goals such as ‘eradication of poverty’. By successfully addressing the causes of global inequality, the situation could improve for millions of people. This paradox clearly illustrates the distance between the top-down approach in terms of vulnerability reduction and adaptation, and the bottom up approach from the people that are concerned, trying to cope and adapt with whatever means they have.

Climate change and climate variability, as well as disaster/risk reduction serve as overarching structures in the thesis. There will always be climate variability and weather extremes that pose challenges to society. Climate variability in the context of this thesis is often manifested as extreme events such as severe winter storms with torrential rains and strong winds. It may also occur in terms of seasonal flooding which reduces quality of life, influences health, and additionally being a stressor in addition to multiple stressors making life hard for the inhabitants of such areas. It has been argued that the concept of adaptation relates as much to current climatic variability as it does to long term climatic change (Smithers & Smit 1997). According to Burton (1997), the best way to adapt to some uncertain future climate is to improve adaptation to present day climate variability, as well as reducing vulnerability to extreme events.

## 1.1 Research Objective and Thesis Statement

The objective of this thesis is to examine coping strategies and adaptive capacity in response to environmental shocks and stressors linked to climate change. Vulnerability to disasters is widely recognized to be linked to both social and biophysical conditions (Oliver-Smith 2004, Wisner et al. 2004, Pelling 2003, Smith & Ward 1998). Social characteristics in particular have received increasing attention in the hazards and vulnerability literature (Wisner et al. 2004, Adger 1999). However, in many cases, people are confronted daily with risks and hazards (for example, epidemics, crime and violence, job losses, road traffic accidents, and fire risks) that influence their capacity to adapt to larger shocks such as flooding. Addressing these chronic disasters is one way to increase the capacity to cope with environmental change, including any changes in the magnitude and frequency of extreme events. Poor people in urban environments are especially likely to be confronted by chronic disasters (Davis 2006). Drawing on fieldwork from Kanana in the Cape Flats region of Cape

Town, South Africa, I show that reducing vulnerability to flooding involves more than simply passing out blankets and plastic roof covering (i.e., immediate relief), but also addressing the underlying chronic risks and hazards of their daily life. This means not only addressing the visible and obvious impacts, but also the politics and structures that create them. This however, cannot be done without understanding how people interpret and experience these risks and hazards. The resulting data from the research provide a perspective on how it is to live with chronic risk and cope with shocks manifested as floods. The thesis also aims to examine the contextual factors that influence adaptive capacity and potential for disaster.

### *Research Questions:*

The thesis addresses individual responses to climate variability and disaster risk through the following two research questions:

*-How do selected households in an urban poor area cope with and adapt to seasonal flooding and extreme climate variability?*

*-In what way do chronic stressors influence the coping and/or adaptive capacity?*

The gathered data provide perspectives on how people live with and deal with the flood hazard and risk amongst everyday hazards and other stressors. These data may be analysed in several ways, most importantly the physical and social dimension. Vulnerability, necessarily, is an important element in terms of adaptive and coping capacity. This thesis focuses on social vulnerability to a greater extent than physical vulnerability, but the interviews and the data provide an understanding of both, and description and correlation of the two.

The research and data are based on interviews with several households in Kanana, a slum area of Cape Town. It focuses on how residents cope with seasonal flooding, and the adaptive measures they carry out. Adaptation to and coping with climate variability in an informal settlement, (i.e. slum) may take several forms, such as building dwellings on stilts or raising furniture with bricks in order prevent losses. When looking past the physical adaptations, there are other interesting aspects of adaptation that stand out and could be related to cultural, psychological, emotional and cognitive issues. A topic and data material that touches upon a broad spectrum of research interests, provide many interesting



perspectives and issues, and a challenge is to narrow it down and maintain focus. With this study, the case may have some transferability, in terms of similar situations in other urban and slum areas in South or developing countries, as areas like these face the same challenges in terms of climate change combined with development, social and political challenges.

## 1.2 Structure of Thesis

This thesis is structured in six chapters. The introductory chapter has provided an overview of the theme, research objective, thesis statement and lays the foundation for the thesis. The second chapter provides a background history and context for the research, and the case study area. The third chapter provides theoretical perspectives, in terms of literature review and conceptualisation of relevant terms and concepts. It also provides an overview of critical thinking in terms of interpretations of what constitutes a disaster, and how the perspectives have changed. In addition, the conceptual difference between coping and adaptation will be discussed. Chapter four deals with methodology and how I went about the research process. This also includes experiences and challenges with doing fieldwork in a different culture and country. The fifth chapter presents the data material and empirical results. This includes interviews and observations, as well as reflections and interpretations of the material. The sixth and final chapter will link the theoretical aspects with the empirical results, and further summarize the main findings. Lastly, it will present conclusions, as well point out future challenges and need for further research.

## 2. Background

It has been argued that current adaptations to risk and to extreme events, such as storms, might enhance adaptive capabilities to future climate changes (Burton 1997). Numerous researchers who have conducted studies on extreme events and climate variability suggest that the factors which determine responses to such events often are the same that influence the capacity to adapt to longer term climate change, especially since adaptation to climate change may involve primarily a response to a greater threat of the extremes (Grothmann & Patt 2005). This is particularly important with regard to developing countries, where climate change introduces new challenges in addition to other problems and issues that require immediate solutions. An ethical question that many ask is why focus on changes in climate perhaps not manifested until 30 or 50 years time, when there are issues that need to be addressed right now. Many people are living in dire need, and to prioritise the use of public resources for addressing future challenges could be argued to be ethically and morally wrong<sup>4</sup>. At the same time, it is very important to take into account global environmental changes, that are manifesting more often and more severe than previously. In many cases, by focusing on adaptation one may contribute to reduced vulnerability, and positive development.

South Africa is classified as a medium developed country, and ranks 125<sup>th</sup> place of 179 countries in the world in terms of economic development<sup>5</sup>. It is difficult to characterise this country as a developing country as such, but it certainly shares many of the same attributes as many of the LDCs in the world. On the one hand, South Africa is a developing country that faces challenges such as poverty, disease- particularly the HIV/AIDS pandemic, crime and corruption, all of which take up public resources. Consequently, it is difficult for the government to focus and use resources to meet problems that lie ahead in the future. On the other hand, South Africa is a developed country, with a democratically elected political leadership, and up to date infrastructure and services. Whether it is considered a developed or developing country, South Africa will nonetheless be affected by changes in climate both

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<sup>4</sup> Personal communication with Ailsa Holloway of DIMP at UCT, February 2008.

<sup>5</sup> [http://hdrstats.undp.org/2008/countries/country\\_fact\\_sheets/cty\\_fs\\_ZAF.html](http://hdrstats.undp.org/2008/countries/country_fact_sheets/cty_fs_ZAF.html) 8/2-2009

in terms of long term events such as drought and water stress, but also in terms of extreme events such as floods (Ziervogel & Taylor 2008).

## 2.1 Climate Change

The climate has been changing over thousands of years. However, the rate and magnitude of climate change is considered unprecedented in human history. Climate refers to a generalized statement of the prevailing weather conditions at a given place, based on statistics of a long period of record, including mean values and deviations, and probabilities associated with the deviations (Strahler & Strahler 1987). A variety of physical elements make up what we know as climate. Temperature and precipitation epitomise climate for many people, but there are more elements to be considered, such as winds, clouds, amount and duration of sunshine. According to the IPCC (2007), climate change is defined as any change in climate over time, due to natural variability or as a result of human activity.<sup>6</sup> The world climate is changing due to human activities. Even though there are different predictions with regard to time span and impact (scientists disagree on for instance how fast the Arctic sea-ice is melting), there is a consensus that many natural systems are affected by global and regional climate changes, particularly in terms of increasing temperatures (IPCC 2007). The increase in temperature will have widespread influences, including changes in many marine and terrestrial ecosystems, changes in some Arctic and Antarctic ecosystems, and increased glacial melting leading to increased run-off.

### 2.1.1 Impacts of Climate Change

Millions of people will be exposed to floods due to projected sea-level rise and changes in rainfall patterns, with some groups more vulnerable than others. Examples of such groups include settlements, societies and industries located in coastal and river flood plains, and those located in areas prone to extreme weather events, and particularly where rapid urbanisation is occurring. According to Ziervogel & Taylor (2008) changes in the climate

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<sup>6</sup> South Africa consists of several climatic zones, due to factors such as ocean currents, geographical extent and altitudes. Cape Town and the Western Cape has a Mediterranean climate, or a Csb climate according to the Köppen system (Robinson & Henderson-Sellers 1999). The Mediterranean climate is one of hot dry summers and cool, wet winters.

affect the nature, magnitude and frequency of a number of existing stresses experienced, while in other cases it may present completely new threats. A number of stressors are also likely to affect people that have little or no connection to climate, but which are perceived to be even more pressing. They argue that the impacts of climate change need to be understood and adapted to in the context of multiple stressors (Ziervogel & Taylor 2008).

Urbanisation is a widespread phenomenon, especially in developing countries. In many of these countries, so-called mega cities are developing. That, in many cases, leads to increased vulnerability, particularly with regard to low income families living within squatter settlements who lack resources such as access to clean water (Wisner et al. 2004). In addition to this, it is very likely that millions of people, particularly those with low adaptive capacity, will be affected by amongst other things, increased deaths, disease, and injury due to floods, storms, fires, heat waves and drought (IPCC 2007).

While the IPCC has focused on long term changes in climate, the disaster risk community has focused on improving the understanding of the causes of natural disasters and on promoting action to reduce disaster impacts. This was exemplified by the International Decade for Natural Disaster Reduction (IDNDR), which was a UN initiative to address disasters. The disasters addressed by this initiative were atmospherically driven such as floods, hurricanes etc. These 'natural' disasters are considered natural in the sense that they are caused by factors that are not man-made or invented in any way. This can be compared to, for instance, the Bhopal tragedy, which was an industrial disaster (Burton 1997). Some would argue that there is no such thing as a natural disaster, and that it is only people's vulnerability that decides whether an event becomes a disaster or not (Bankoff 2004, Pelling 2003). However, the significance of natural hazards cannot be denied, in terms of being physical triggers for disastrous outcomes.

According to Schneider et al. (2007), precipitation is predicted to increase in high latitudes and together with a general intensification of rainfall events, is very likely to increase the frequency of flash floods and large are floods in many regions, especially at high latitudes. This is also likely to be exacerbated by increased glacial melting and earlier melting of snowpacks in some locations. In addition, coastal and low latitude areas are at exposed risk to coastal flooding and sea-level rise, and tropical cyclones are likely to become more intense, though this debated. Furthermore, the combination of sea level rise

and an intensification of coastal storms would cause more intense and frequent storm surges, which in turn would lead to more intense inland rainfall and stronger winds as well as coastal erosion, thus causing greater damage.

Taking a closer look at specific impacts in terms of different regions, one can see that there are similarities, but also important differences, particularly in terms of degree of vulnerability and adaptive capacity. Asia is susceptible to endemic morbidity and mortality associated with floods in some regions, due to projected changes in the hydrological cycle owing to global warming (IPCC 2007). Australia and New Zealand are projected to experience exacerbated risks from sea-level rise and an increase in the severity and frequency of storms and coastal flooding. The same is the case for small islands, which most likely will experience exacerbated inundation and storm surges and other coastal hazards, thus threatening vital supporting factors for livelihoods in the island communities (IPCC 2007). With regard to Europe, negative impacts of climate change include increased risk of inland flash floods, more frequent coastal flooding and increased erosion. In addition, an increase in the frequency of winter floods is likely, and also decreasing ground stability due to declining permafrost. Similar problems are projected for North America, where winter flooding is projected to increase (IPCC 2007).

Africa is projected to be one of the most vulnerable continents to climate change and climate variability, a situation aggravated by the interaction of multiple stressors, and low adaptive capacity, occurring at different levels. Current water stress will be further aggravated, and countries that are not experiencing water stress at the moment are at high risk of doing so in the future. There is also very high confidence that changes will occur in ecosystems, representing a threat to forest, grassland and marine ecosystems. Some changes have already been detected, particularly in Southern Africa. In coastal areas of Africa, low lying lands could be inundated as a result of climate change. This will have implications for socio-economic and physical vulnerability of coastal cities (Boko et al. 2007). Examples of such cities are Cape Town, Dakar and Lagos, all because they are situated in vulnerable locations at sea level. In parts of Southern Africa, there has been an observed change in heavy rainfall events, as well as evidence for changes in seasonality and weather extremes (Hulme 1996). Changes in extreme events, such as droughts and floods, have major implications for numerous Africans and require further attention. Floods are critical and impact on African development. Flooding is in some cases linked with ENSO events which

influence rainfall patterns in Southern Africa (Ziervogel & Taylor 2008). Moreover, complex combinations of socio-economic, political, environmental, cultural and structural factors act and interact to affect vulnerability to environmental change, including climate change and vulnerability (Boko et al. 2007).

### 2.1.2 Floods: A Background

Floods are regarded as natural hazards, and they may be slow or rapid onset, have short and long durations, be shallow or deep, and have consequences on all levels. According to Few et al. (2004), flooding is one of the most frequent and widespread of all environmental hazards, and may occur in various types and magnitudes, causing huge losses in terms of damage and disruption to economic livelihoods, businesses, infrastructure, services and public health. Furthermore, it has also been suggested that floods and wind storms have been the most common cause of natural disasters the last 100 years, on a world basis. Smith (2004) asserts that flooding is the most common environmental hazard, that owing to the widespread distribution of river floodplains and low-lying coasts, attractive to human settlement. Moreover, he points out that floods claim around 20 000 lives every year, and affect at least 20 million people on a worldwide basis, most commonly due to homelessness.

Parker (2000) describes floods as excess accumulation of water across a land surface, whereby water rises or flows over land that is not normally submerged. There are great differences across countries and regions, both in terms of cause, severity and impact. Floods may have positive impacts, such as nutrient replenishment, irrigation and recharge water reservoirs. In many regions, annual flooding sustains current levels of agriculture and residents may have different terms to distinguish beneficial floods from the destructive ones. It can also benefit economically, for e.g. labourers contracted to clear waste (Few 2003). As mentioned previously with reference to the findings of the IPCC (2007), the projected increase in floods, both coastal and inland, will vary across regions and have different causes. It is also important to emphasise that there is a great diversity within the characteristic of a flood. Some aspects of floods are measurable, such as depth, velocity of speed, extent, content, speed of onset, duration and seasonality. The temporal aspect is particularly important, in that a flood may last from an hour or less up to several months. One distinguishes between slow and rapid onset, such as a riverine flood due to a long term rainfall or a flash flood happening within hours (Few et al. 2004). Also, one can distinguish



between different kinds of floods in terms of the type of hazard that may create a subsequent inundation.

There are two main kinds of floods: river and coastal floods. River floods can occur in river valleys, on floodplains, as overspilling the natural banks or artificial embankments, or from existing stream channels. Coastal floods are caused by high tides and elevated sea level, as well as large waves due to storm surges. A third variety exists in urban areas, where flooding often results from overspilling or surface ponding, but are also often due to surcharged urban stormwater drains. In arid or semi-arid areas, where the ground surface is too hard to absorb moisture, heavy rainfall may lead to extensive flooding in flat areas. The cause of this kind of flood is in most cases due to atmospheric hazards, such as (excessively) heavy and/or prolonged rainfall. In areas where snowfall in winter is common, flooding is also common during the snow and ice melting period. Not only the melting itself, but also falling precipitation on snow and ice can contribute to this, as well as build ups of ice-jams suddenly collapsing (Smith & Ward 1998). Flooding may also cause dam failures (technological hazard) and landslides (tectonic hazard). It is estimated that many people live at risk in areas that could be affected from either dam bursts or surges of water overtopping dams, caused by for instance landslides. Accordingly, few countries have made emergency plans in case of such events (Smith 2004).

It is worth noting that floods may result from a combination of causes, such as inland flooding and storm surges which doubly afflicts areas adjacent to river mouths. The number of coastal floods is, as mentioned earlier, expected to increase due to sea-level rise. Not only may this factor heighten the sea flooding itself, but also perhaps the tide patterns, and changes in storm conditions as sea temperature is also increasing. It may also exacerbate the effect of storm surges, and with that influence the outflow of rivers during times of peak discharge (Few et al. 2004).

### 2.1.3 Types of Losses Due to Flooding

Estimating the risk and the losses of floods is complicated, as there are several factors to be considered. In terms of impact, this varies greatly between urban and rural settings, rich or poor countries, and *direct* and *indirect losses*. In many cases, the direct economic losses are regarded as the most important factor. Within both categories there are

*tangible* and *intangible* losses. Firstly, a direct tangible loss relates to direct physical damage to property. Urban flood plains in developed countries has the highest numbers in absolute terms with regard to this category, though developing countries often have very high population density and concentration of urban development in some cities. Also in rural areas, these losses can be high due to damage on crops, livestock, and agricultural infrastructure such irrigation systems. Secondly, direct intangible losses are the death rates resulting from disaster, this is also known as mortality rates (Smith & Ward 1998). An example of a country that has a very high mortality rate related to floods is China. For instance, in 1931 floods and subsequent hunger and disease killed as many as 3.7 million along the Yangtze River (Clark 1982 cited in Wisner et al. 2004). Secondary intangible losses are associated with physical and mental ill-health resulting from the disaster, this is also known as morbidity. The existing studies with regard to physical aspects are mainly from developing countries. Often, water borne disease is a big problem in the aftermath of a great flood. Mental health problems on the other hand have been researched mostly in developed countries (Smith & Ward 1998).

There are also indirect losses from floods. Primary indirect tangible losses are mainly related to a disruption of social and economic activities, and may also be called consequential losses. An example of this is disruption of communication, which may for instance affect employment a distance away from the inundated area. Furthermore, in terms of agriculture, flooding can effect future farming years ahead due to long term effects. This is highly related to the concept of resilience, because this may be reduced. Stress selling of livestock after the event or destruction of animal feed during the event leads to indirect losses. This type of loss can also be related to locations with industry, because not only will production be discontinued if the production equipment is damaged or affected, but disruption in transport will in addition affect labourers coming to work, as well as the transport of goods being delayed or prevented. Lastly, there are the indirect intangible losses resulting from floods. This is a somewhat complex category, it relates mainly to socio-economic effects of repeated and/or prolonged flooding, and the adaptations or coping strategies developed by the people that experience these situations (Smith & Ward 1998). In urban poor areas, floods cause both direct and indirect losses, and the consequences of flooding in Kanana will be further discussed in chapter five.

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## 2.2 Urban Poverty and Slums

Sub-Saharan Africa is the least urbanised continental region, but several countries are now more than 50% urbanised. However, defining urban is difficult. Cities can be defined in terms of economic functions, population density or size, or by administrative region in terms of defining all land and activities within a metropolitan district as urban (Pelling 2003). Lagos, Kinshasa or the Gauteng/Johannesburg region have become megacities, characterised by familiar problems and challenges. Many cities are highly polarised between rich and poor, especially under conditions such as rapid growth or stagnation (Simon 2007). When discussing urban poverty, it is common to use terms such as slums and squatter camps to describe areas where many of the urban poor live. But, it is of use to define such terms and specify the meaning. Squatting is the possession of land without sale or title, and ‘no-cost’ urban land has often been discussed as the magic secret of third world urbanism, a huge unplanned subsidy to the very poor (Davis 2006). The classical definition of a slum is overcrowding, poor informal housing, inadequate access to safe water and sanitation, and insecurity of tenure (UNHSP 2003, Davis 2006). According to UN-Habitat, at the present time around one billion people live in slum conditions in the developing world and it is expected that the number will grow up to 1.4 billion in 2020<sup>7</sup>.

According to Davis (2006) the Cape Flats may be described as a ‘mega-slum’. These arise when shantytowns and squatter communities merge in continuous belts of informal housing and poverty, usually on the urban periphery. Davis states that today, squatting continues primarily in low-value urban land, usually in hazardous or extremely marginal locations such as floodplains, hillsides, swamps or contaminated brownfields.

According to the Informal Settlements Handbook (2003), informal settlements are residential areas that do not comply with authority requirements for conventional or formal townships. Furthermore, they exist because urbanisation has grown faster than the ability of the government to provide land, infrastructure and homes. “Informal settlements may be viewed either as physical environments deficient of basic infrastructure and services, or as complex and changing social processes that play themselves out in intricate spatial arrangements” (Huchzermeyer 2004, 47). Such settlements are in a constant state of flux,

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<sup>7</sup> <http://hq.unhabitat.org/content.asp?cid=5714&catid=5&typeid=6&subMenuId=0> 30/5-2008

and people are moving, coming and going. There are many reasons why people move between settlements, such as social networks or employment. According to Wisner et al. (2004), the urban poor use their location as the base for organising livelihood activities, as for instance casual labour, street trading, crafts, crime, and if the structure of urban land ownership and rent means that the closest they get to an economic opportunities is a hillside slum, people will locate there regardless of the landslide risk. The case study which is considered in this thesis is not exposed to that particular hazard, but the situation is similar in terms of ‘voluntary’ exposure to risk and hazard.

### 2.2.1 Urban Environmental Degradation

Urban environmental problems are associated with both the natural and the built environment. This type of problems range from the depletion of natural resources to for instance crime related problems. Furthermore, many problems sit at the interface of the natural and social environment, such as flooding. It occurs as the result of the inadequate provision of and maintenance of drainage systems, the location of people on marginal sites, and the physical characteristics of an area (Nomdo & Coetzee 2002). Kanana and other informal settlements are examples of this, where some sites have been dumping sites or are generally located on marginal land. An important point to mention is also the access to resources in urban environments, “urban economies are highly monetized and so access to monetary income is essential for survival” (Rakodi & Lloyd-Jones 2002, 11).

Sachs (2004) assert that whereas the rural poor are often denied access to the natural resources needed for their survival, urban slum-dwellers are more physically threatened by the decay of their immediate environment. They cannot rely upon the services of nature that are essential to them as biological beings. Non-monetary goods such as clean air, water, shelter and security are less available in cities than in the countryside. Along with their lack of money, the urban poor have to contend with polluted water, unsafe housing, dirty air and a high crime-rate. They almost never have access to safe, healthy and spacious accommodation, to legally watertight rental contracts or property deeds or to dependable services and facilities; they frequently live in parts of town where the first cloudburst may trigger a mudslide. It is therefore not surprising that a close correlation can be established between income level and environmental risk (Sachs 2004). South Africa and its people provide an example of a country with great contrasts, in multiple ways.

## 2.3 A Brief History of South Africa

“South Africa is a land of stunning beauty and scenic wonder, with contrasts ranging from arid semi-desert areas to lush green forests; from flat plains to towering mountains. Socially and economically it is likewise a country of extreme contrasts, ranging from the affluence of multimillion-rand mansions to the extreme poverty of people living in shacks or under plastics, with no employment or resources of their own.” (McDonald et al. 2002, 1)

South Africa has a different history from other African countries owing to the early colonisation, and the establishment of the Cape by the Dutch as a base for the East India trading company already in 1652. The British entered Southern Africa in 1795, and took control of the Cape in order to secure the control of the sea route to Asia. They also continued the slavery that the Dutch had introduced, importing new slaves as well, to use as labour force in agriculture. The mixture of people and also of races, laid the grounds for a racialized society at the Cape (Clark & Worger 2004). By the 1860s the British settler community, the Dutch ‘Boer’ population, the African population and a group that were in between, descendants of slaves, Khoi and Europeans were composing the population of the Cape Colony. This last group that were not Europeans nor Africans, adopted the term ‘coloured’ to refer to themselves (Clark & Worger 2004).

The legacy of the country’s early history is still very much present in the contemporary South African society. In 1910, the Union of South Africa was established, based on the existing four British colonies. Following the establishment of this and preceding the institutionalisation of the infamous political system, apartheid, in 1948, a policy of racial discrimination was enforced through segregation. The institutionalised racism and segregation (and by some described as a genocide) is perhaps the part of history that is better known to people in other parts of the world. Separate development and racial segregation were the pillars of this political ideology, which was enforced by the ruling political party, the National Party, officially from 1948 to 1990. During apartheid the population was divided into categories, implemented with the Population registration Act of 1950. The categories were ‘White’, ‘Coloured’ and ‘Native’ or ‘Bantu’<sup>8</sup>. Later the category ‘Asian’ were also added, and included the Indian population living mainly in Natal (Clark & Worger 2004). The apartheid era ended in 1994 with the democratic elections and Nelson

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<sup>8</sup> Referring to the African part of the population

Mandela and ANC as president and ruling political party. The legacy of apartheid is evident in economy, politics, and in social issues. Though, in some ways it still exists, particularly in what may be described as an existing economic apartheid.

The gap between rich and poor is enormous in South Africa, and in general it is still a very unequal relationship in for example land ownership. This equality is much based in the Natives Land Act from 1913, which restricted African landownership to 7% in designated areas. This number was later increased to 13%, but the land was of poor quality and unable to sustain the needs of a growing African population (Clark & Worger 2004). In addition, laws were passed that restricted presence and living of Africans in urban areas<sup>9</sup>. In the post war years, a combination of increased job opportunities in the city due to economic growth, and drought causing devastation in the countryside, caused urban migration to boom. Africans were only able to live in designated townships and areas controlled by the municipality, and as a result of this they were forced to find shelter anywhere. This resulted in 'squatter camps' without proper water or sanitation emerging around the major industrial centres (Clark & Worger 2004). Without going into further detail, the forced removals in areas such as Sophiatown or District Six during Apartheid is also important, both in historical terms, but also to existing townships that are a direct result of these removals. Africans were also increasingly moved to ethnically defined 'homelands' or 'Bantustans', and as a result these became overcrowded and poverty-ridden areas, and in general economic disasters (Clark & Worger 2004). South Africa's urbanization rates are unprecedented in history, largely due to the previous strict control.

However, the post-apartheid political leadership has made some important achievements. A new constitution was passed, emphasising equality and prohibiting the state from discrimination. The South African government is in the process of returning property and redistributing land, but the process is rather slow. Another achievement is the provision of clean running water and connection to the national electricity grid to millions of people, something that was not offered to Africans during the previous political system and leadership (Clark & Worger 2004). Nevertheless, millions of people live in poverty, manifested in areas like the many informal settlements in Johannesburg, Durban, Cape Town

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<sup>9</sup> A pass law, Native Laws Amendment Act of 1952, stated amongst other things that an African man or woman could not remain in an urban area for longer than 72 hours without a special permit stating that they were legally employed.



and other cities. The townships as well as the informal settlements that exist in nearly every town and city in South Africa are a direct result of the apartheid politics. The lack of housing is a serious problem that presents great challenges to the government. This is particularly the case in Cape Town, due to the high urban migration from rural areas. South Africa and Cape Town are hosts to the FIFA World Cup in 2010, which involves an upgrading of for instance Cape Town International Airport, the Greenpoint Stadium, as well as upgrading of infrastructure and building activity in general, which in turn provide job opportunities.

Cape Town is located in the Western Cape Province, which according to Statistics South Africa (2007) has a population of a little over 4.8 million people. The estimated population number for the city of Cape Town is in excess of 3 million, but is projected to become approximately 5 million in the CMA by 2010. Cape Town is the legislative capital of South Africa, and the National Parliament is located in the city. The population of the city consist mainly of Cape Coloureds, Africans and white South Africans of European decent. There are also Africans from other parts of the continent, many of which are blamed for social problems such as drug trafficking, or taking away jobs allegedly leaving many South Africans unemployed<sup>10</sup>. The main languages spoken are English, isiXhosa and Afrikaans.

Cape Town has numerous townships, mostly black and coloured, and some with Cape Muslims. The townships are divided into sections and areas, and there are different types of housing in different the sections. Amongst others, there is formal housing, low-cost formal housing, semi-formal housing, back-yard dwellings, and informal dwellings. The Cape Flats is a large area consisting of numerous townships and informal settlements. These are built on sand dunes, former wetland and river estuary, and often degraded environmental settings such as rubbish dumps. Khayelitsha, meaning 'new home' is the largest of the townships on the Cape Flats, though not the oldest. An estimate of population in Khayelitsha was over 1 million people in 2003<sup>11</sup>, and it is continuing to grow. It is located in proximity to the airport, stretching towards the edge of the Cape Flats.

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<sup>10</sup> With reference to the wave of violence due to Xenophobia in 2008, where people from other African countries were attacked and in some cases killed.

<sup>11</sup> Personal communication with a community leader in Khayelitsha, involved in SHAWCO, February 2003.

Population growth in the Cape Metropolitan Area is disproportionately high among the poorer sections of the population. Most migrants to Cape Town come from impoverished rural areas or farms from which an increasing number of tenants and labourers have been evicted. The problems of urban poverty are exacerbated by the fact that the urbanization has not been paralleled by a growth in employment opportunities for unskilled workers (CORC 2006). In addition, the topography is influential of the CMA contributing to many of the poorest members of the population that live long distances from the city centre, hence have to travel long distances on poor and expensive public transport facilities. That, and high and rising property prices contribute to a reinforcing of the past racial segregation policies, forcing disadvantaged, predominantly black communities to live far from the economic centre and the decentralized nodes. The number of informal settlements has grown rapidly, and these unregulated developments are often occurring on risky, unsustainable and unsuitable sites. The informal settlements are mainly occupied by young, poorly educated and unemployed people. It can also be noted that there are about 240 informal settlements in the Cape Metropolitan Area, with approximately 500 000 dwellers (CORC 2006).

## 2.4 Breaking New Ground Housing Policy

According to Millstein (2008), Cape Town has been characterized as one of the most unequal cities in South Africa, and the city faces a major housing crisis. It is also often referred to as the shack capital of South Africa, and faces a huge housing challenge despite the efforts to provide formal housing. Racial segregation and urban sprawl has been constructed through apartheid urban planning, and the same political system also left millions of people, the majority black, in extreme poverty. “The housing crisis today is a result of the neglect of the housing situation over many years, with deep roots in apartheid’s exclusionary politics. The apartheid city was constructed to realise the ideology of separation between racial groups and functioned to uphold the particular mode of apartheid capitalist production through the worker migrant system.” (Millstein 2008, 23).

One of the new priorities to emerge in Cape Town in 2004 in line with the new agenda of the national Department of Housing was the ‘eradication’ of informal settlements through upgrading (Huchzermeyer & Karam 2006). Millstein (2008) states that the N2 Gateway is a national pilot project within the housing policy called Breaking New Ground. The main aim

of the project is to target the informal settlements that are located along the N2 motorway linking the Cape Town International Airport and the city centre, and the aim was to build 22.000 housing units in two years. Houses are being built in a township area of Cape Town called Delft, and 1000 new houses were ready in December 2008. The complete N2 Gateway Housing Project will see the construction of nearly 11.000 houses in Delft, where 70% have been allocated to informal settlements, and 30% to backyard dwellers.<sup>12</sup> However, it has been a slow process, and there have been many problems along the way, in terms of allocation of houses, as well as the project being highly politicised.

This political project is of importance to the inhabitants of Kanana. Many of the informants talked about housing and the government's promises, and it was evident that it was 'hot potato'. Housing is a central issue both in terms of vulnerability, development and disaster risk science/climate change aspect. Kanana is part of the N2 gateway project along with other informal settlements such as Joe Slovo in Langa township, where phase one of the project is completed and part of the settlement has been upgraded. The re-localisation of people that live in the N2 gateway area is both a worry and a dream come true at the same time. Delft is the area where most of the new houses are and will be built. The problem is, however, that many more people lived in a set area during an informal settlement, and when low-cost formal housing is built, not all residents get one of the new flats or houses. Residents in those areas are hoping to get a house, but many people are worried that they will lose their jobs if they move to Delft. The reason is because it is regarded as very far from the city centre. There is no train station there, which is the cheapest means of travelling. That means that people will have to travel by buses and taxis, which in South African terms are much more expensive. For many people, being relocated to Delft equals losing ones job, if they do have one. However, many are also eager to get on housing lists, and get a house there. The 'Delft-evictions' received much attention last year. It can in short be summarised as illegal occupation of newly built houses in Delft, by squatters and homeless. The houses were built for residents that are part of the N2 Gateway project.

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<sup>12</sup> <http://allafrica.com/stories/200812030815.html> 10/1-2009

### *Summary*

This chapter has described climate change and impacts, and linked this to the projected impacts on Africa and South Africa. The impacts of extreme weather events, particularly in terms of floods, are related to Cape Town and the urban poor areas. This is also correlated with urbanization, and urban environmental degradation. In addition, a history and background of South Africa (including inequality) is also provided, which is the foundation for the structural vulnerabilities significantly influencing the social vulnerability of the urban poor and residents of informal settlements.

### 3. Theoretical Perspectives

Geography as a subject has traditionally been concerned with the relations between humans and their surrounding environment. Studies of the relations between humans and environment have been concerned with physical factors and attributes, but as the subject has evolved social and human aspects have gradually become more central and of course central to human geography. “Geography remains one of the few subjects dedicated to exploring the relations between humanity and nature” (Castree & Braun 2001, 1). The concept of Earth Systems Science has played a central role in the reformulation of geography, stressing the links between physical, biological and social systems in relation to large-scale issues such as climate change (Harrison et al. 2004). Nevertheless, the role of local context is considered important. Richards (in Harrison et al. 2004) asserts that

“The rhetoric of research funding priorities is today about global change and sustainability, but it is the duty of geographers continually to emphasize that communities in different places experience very unequal effects as a result of global environmental and economic changes; and that sustainability cannot be understood without proper scientific (*sensu lato*) enquiry into *both* environment and society.” (2004, 436).

Such a development in geographical thinking is beneficial, as a cross disciplinary approach between environment and society provides a broader perspective on global environmental change issues. This thesis builds upon this perspective, linking natural hazards, climate change and disasters with social vulnerability, coping and adaptation.

The interface between society and nature, and vulnerability to natural hazards, has long been considered from a physical perspective, where factors such as topography have been stressed in for instance vulnerability and risk assessments. In the academic sphere, socio-economic and human factors have been taken into consideration to a much greater extent than in other institutions, making the discourses concerning such topics much more complex. There is a clear contrast between the traditional scientific (physical) approach, which focuses very much on practical aspects and technical solutions, and the social science (social) approach which focuses on susceptibility to stress, hazard or damage. Linking and bridging these approaches is certainly beneficial to future research and development, both in academia and for policymakers that draw on research in order to facilitate adaptation and contribute to progress. However, there are many interpretations and conceptualizations of

terms in the climate change literature, which are related to different disciplines and discourses. This chapter draws on some of the existing literature to provide a theoretical framing for the thesis. First, an overview of approaches to disasters will be presented, moving on to a discussion of chronic disasters. Next, I will conceptualise the terms vulnerability and adaptation, and consider the conceptual difference between adaptation and coping. Last, the multiple stressor perspective will be considered including its importance for understanding vulnerability.

### 3.1 Disaster

According to Hewitt (1997), hazards may be classified by particular dimensions or processes of nature, technology or society as dangers. Moreover, a natural force (or hazard) is not dangerous in itself, but in relation to human activities and values. The notion of risk is according to Few et al. (2004), a function of both hazard and vulnerability, emphasising that it is shaped just as much by social processes as it is by natural forces. Hazard may be defined as a cause, and a potential threat to humans and their welfare. Moreover, risk can be defined as likely consequence, or the probability of a hazard occurring and creating loss. In addition, the terms stress and stressors are commonly used. According to Turner et al. (2003) in Gallopin (2006) hazards are threats to a system, comprised of perturbations and stress. Perturbations are described as major spikes in pressure (in other words a shock) like for instance a hurricane. Stress is defined as continuous or slowly increasing pressure.

Thus, taking a holistic view on risk, hazard and vulnerability in the context of disasters, Wisner et al. (2004) claim that the risk faced by people must be seen as a cross cutting combination of both vulnerability and hazard. Disasters are a result of the interaction of the two, there cannot be a disaster if there is a vulnerable population but no hazard, and similarly if there is a hazard but the population is not vulnerable to it. Some examples of factors that contribute to vulnerability in an urban environment are inadequate drinking water provision, inadequate garbage collection, inappropriate housing construction and location, and insufficient education and health care. Based on these definitions, hazards, particularly natural ones, are the physical conditions that constitute dangers, while risk is a combination of hazard and vulnerability. In addition, it can be argued that urban risk (and vulnerability) needs to be understood in terms of the nature of the risk, the causal

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mechanisms that shape risk events and people's response to them, and the contingent conditions that provide the context within which they occur (Nomdo & Coetzee 2002).

The notion that disasters are a result of vulnerability and hazard combined, can be traced back to Hewitt et al.'s *Interpretations of Calamity* (1983) which is considered one of the influential writings with regard to perspectives on disasters. This view is quite different from the conventional view in which disasters are caused by 'extreme' (geo)physical conditions, therefore, they are commonly referred to as natural disasters. This dominant view, which at the time was described as a paradigm or an 'academic-research consensus', attributed disaster itself to nature (Hewitt 1983). The view also favoured a technocratic approach to disaster risk reduction, which is still widely used today. Utilizing technology is not a negative thing in itself, but moving away from the 'technological-fix' to focusing on political and social structures is central in order to understand the causes of vulnerability and why disasters happen. This is valid both with regard to chronic disasters as well as calamities.

The dominant view described above has gradually been challenged, and disasters are to a much greater extent regarded as a result of social conditions and human actions, more than natural hazards or 'acts of God'. The underlying causes, or root causes of disasters, have been emphasised, particularly in academia and research communities. At the institutional level, the degree of development with regard to this viewpoint seems to be much slower, and many will still follow the technological- fix approach to both disastrous event as well as climate change. An example of this is the focus on mitigation and GHG emission cuts, as a strategy to reduce the impacts of climate change. According to Jeggle (2004) natural disasters, in terms of policies, were simply reduced to the need for coordinating a logistical exercise undertaken by international organisations and NGOs to provide emergency relief and assistance. However, policy makers have increasingly begun to focus on the causes of catastrophes, and not only mitigation in the aftermath.

An important point in this thesis is the notion of a disaster as generated mainly by the various ways social systems operate by making people vulnerable, though not denying the significance of natural hazards as triggering events (Wisner et. al 2004). According to the UNISDR (2004) there has been a continuous evolution over the last 30 years, with a shift in focus from immediate relief and short term emergency contingencies, to a 'culture of

prevention rather than reaction'. However, they do recognise the much greater need to implement protective strategies. Furthermore, they state that disaster reduction need to be implemented with a twofold aim; to enable societies to be resilient to natural hazards, and to ensure that development efforts do not increase vulnerability to such hazards. An additional point that the report makes is that disaster risk reduction needs to involve many segments of society, starting with those members of society who are most exposed to anticipated hazards. This approach represents a fine initiative and a substantial change from the former dominant view as described previously. However, it fails to take everyday risk and hazard into the equation, regarding hazards as sudden dangers with potentially catastrophic outcome. Bankoff points out that the IDNDR approach is "still very technocratic in the sense that it remains focused upon the hazard and not upon the conditions that favour the occurrence of crisis: i.e. global vulnerability- a far more holistic and encompassing concept that goes well beyond issues of physical vulnerability." (Bankoff 2004, 39).

According to Wisner et.al (2004), the key point about a disaster is not its scale, but the impact of hazard of whatever intensity on a vulnerable population. There is no international consensus or agreed definition on what specifically constitutes a disaster, so no lower limit of loss has been defined (Pelling et al. 2003). There are, however, several perspectives on what constitutes a disaster, like this definition:

"Although the terms 'natural hazard' and 'natural disasters' emphasise the role of the geophysical processes involved, these extreme events are increasingly recognized primarily as the 'triggers' of disaster, which often have a more complex origins including many social and economic factors." (Smith & Ward 1998, 19)

The physical triggers are necessary to cause a severe disaster. Earlier in time, there have been different views on disasters, like being unavoidable events where nothing can be done, and *force majeure* or 'acts of God' (Cardona 2004). Some people or groups might still have this belief. Bankoff (2004) on one hand argues that the notion that disasters are simply unavoidable extreme physical events that require purely technocratic solutions, remained the dominant paradigm within the United Nations and funding agencies like the World Bank well into the 90s. In addition, he claims that these views have not been discredited, but are still very influential at the highest levels of national and international decision making. On the other hand, there are the critics of the technocratic approach, which focus on the exposure to hazard in terms of vulnerability. That approach as a conceptual explanation considers hazards to be natural while disasters generally are not.



A different definition of disasters places the emphasis on the totality of relationships, in contrast to the mere recognition that social and economic factors are contributing factors. This definition is as follows: "...the totality of relationships in a given social situation which constitute a condition that, in combination with environmental forces, produce a disaster." (Oliver-Smith 2004, 11). This statement provides a holistic approach in discussions of disaster risk and vulnerability to disasters. There are great differences between the world's population and many different factors that influence decision making, and with that; vulnerability, adaptation and coping strategies. A common saying is that when disaster hits, the poor lose their lives while the rich lose their money. This saying is supported by the statement that "during the 1990s, 96 per cent and 99 per cent respectively of the annual average number of persons killed or affected by hazards resided outside of the US/Canada and Europe" (Walker 2000 cited in Bankoff 2004, 29).

Some of the most vulnerable populations are found in developing countries. These countries have different factors contributing to increased risk and hazard. "There is little doubt that the strongest links between vulnerability to floods and human lifestyles worldwide involve poverty." (Smith & Ward 1998, 30). An example of this link between poverty, (individual and collective) and vulnerability is inadequate planning and policies, leading to unplanned expansion of squatter housing onto flood-prone land. Urban areas in developing countries also have other problems that lead to increased risk of flooding such as inadequate infrastructure, insufficient waste disposal leading to refuse blocking drainage systems, or simply inadequate drains in the first place. Not only urban areas experience increased hazard, rural areas face risk as well. One point to keep in mind is that it is the impact on a vulnerable population, *not* the scale of a hazard that is the key point about a disaster. There are several reasons for this; the most important is perhaps related to disruption of livelihoods and the long-term effects on the victims. However, as asserted earlier, vulnerability and poverty are by no means synonyms, even though they are closely linked. According to UNISDR (2004), disasters not only affect the poor and characteristically more vulnerable countries but also those thought to be more well protected. In recent years, countries such as the US, the UK, France, Germany and Canada experienced record setting floods of such magnitude that previously accepted procedures for protection and the utility of structural barriers have had to be re-evaluated. These events might have contributed to an increased awareness of a changing climate and disaster-related

events. In developed countries, the focus remains on sudden extreme climate related events, and not on the everyday hazards and risks that are of concern in developing countries.

### 3.1.1 Everyday Risks and Chronic Disaster

Disasters are complex events that have several causal factors. Disasters not only represent calamities, such as the infamous 'Hurricane Katrina' in New Orleans of August 2005, or the tsunami that struck countries in the Indian Ocean in December 2004, killing hundreds of thousands of people. A disaster may also be small, to some perhaps insignificant, yet still have devastating consequences to the people that are being affected. According to Pelling (2003), everyday hazards or chronic disasters are felt as long term stresses associated with exposure to everyday risks such as poor sanitation, unfit housing or polluted air. Multiple risk types in urban areas include crime and violence, disease, unemployment, pollution and environmental and technological hazards. Pelling notes that everyday hazards are less visible (and less newsworthy) than catastrophic events, but, these two are linked in many ways. In some cases, catastrophic and chronic disaster share root causes, such as decaying urban infrastructure, leading to health hazard in terms of inadequate drinking water supplies, and dysfunctional drainage systems leading to floods. In addition, "daily exposure to low levels of risk can have the perverse effect of reducing people's willingness to prepare for the possibility of catastrophic disasters, as risk becomes an accepted and normalized part of everyday life" (Blaike et al. 1994 in Pelling 2003, 16). Thus, this approach shares many features with the multiple stressor approach, which will be discussed in more detail later in this chapter. This perverse effect may also be linked to the concept of self-efficacy which is further considered in the chapter concerning empirical data.

Pelling & Wisner (2008) have classified urban disaster risk (and disasters) into three categories, in order to illustrate case studies from urban Africa. They make use of the terms everyday disasters, small disasters and large disasters. An example of the first category is environmental health in an urban area of Ghana, where the hazards include communicable diseases related to poor environmental conditions, flood risk and earthquake risk. Small disasters are events such as fires in informal settlements, where residents have lost their homes and their household assets. During the period 1994-2004, approximately 41,000 informal dwellings were destroyed or damaged in Cape Town, due to fires, and 164,000

people were affected ( Pelling & Wisner 2008, 12). The last category, large disasters includes disasters such as earthquakes or floods.

However, it is the combination of hazard and the level of vulnerability that determines risk. According to Oliver-Smith (2004), vulnerability is fundamentally a political-ecological concept, and from the perspective of hazards and disasters, vulnerability is the conceptual nexus that links the relationships that people have with their environment to social forces and institutions, and the cultural values that sustain or contest them. An essential question is what exactly the term vulnerability implies. The next section will provide an overview of this.

## 3.2 Vulnerability

The physical side of vulnerability is quite obvious, for example where human settlements in flood prone areas expose people to hazard and risk. In many cases, people settle in such places because the benefits outweigh the risks. Pelling et al. (2003) highlight the relationship between global and local, where environmental hazard and human vulnerability are outcomes of progressions from root causes, such as global political economy and global climate change. In terms of flood protection, technological or structural measures have been the most common, and these are still widely used. Yet, flood control measures such as dams are also associated with risk. Failures in structural measures have in some cases lead to disasters, such as dam-failures, or the broken down levees in New Orleans under hurricane Katrina. Though, land planning, preparedness schemes and loss sharing methods have become increasingly used and prove to be effective means of risk reduction. Wisner et al. (2004) refer to what they call the paradox of flood control. Dams that are designed to reduce flood risk, may if inadequate, provide a false sense of security. A dam that suddenly fails will release a flash flood, and this has happened in developing as well as developed countries. It is however, in terms of climate change and disasters, necessary to differentiate between physical and social vulnerability.

### 3.2.1 Social Vulnerability

Few (2003) states that vulnerability is one of those terms that seem to defy consensus of usage. A part of the challenge with the use of vulnerability is its common use and familiarity in everyday language. When it is transferred in to a scientific context, scientists may well speak past each other, thinking that they have the same perceptions, yet operate with different assumptions and conceptualizations (O'Brien et al. 2004). O'Brien et al. (2004) discuss two main interpretations of the word vulnerability. The two represent different positions, in terms of what the authors refer to as an 'end-point' or a 'starting-point' for analysis.

The end-point definition describes vulnerability as a residual of climate change impacts minus adaptation. The starting-point conceptualizes vulnerability as a characteristic or state generated by multiple environmental and societal processes, but exacerbated by climate change (Kelly & Adger 2000). However, O'Brien et al. (2004) assert that the most important difference between the two interpretations is how they stand in relation to adaptation. Regarding vulnerability as an end-point assumes that adaptations and adaptive capacity determine vulnerability, while viewing it as a starting point says that vulnerability determines adaptive capacity and with that adaptations. Thus, these two definitions of vulnerability have implications for both problems and solutions to climate change related issues. The link between adaptation, adaptive capacity and vulnerability will be further discussed below.

Kelly & Adger (2000) claim that it is important to identify vulnerability in order to facilitate adaptation. They define it as the capacity of individuals and social groups to respond to, or to cope with, recover from or adapt to external stress placed on their livelihoods and well being. As Kelly and Adger (2000, 325) put it; "analysis of vulnerability provides a starting point for the determination of effective means of promoting remedial action to limit impacts by supporting coping strategies and facilitating adaptation". There is no doubt that identifying vulnerability is important to facilitate adaptation, but vulnerability in itself should be identified in order to attempt to reduce it, and not only to reduce impacts of climate change and variability. For example, to the informants that this thesis concerns, indentifying vulnerability to facilitate adaptation would still not remove the chronic risks and multiple stressors, but perhaps eliminate the perturbations that the seasonal floods

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represent. Identifying vulnerability to urban poor in developing countries need to address the structural causes that underlie this vulnerability, and thereby also reduce the risk of disaster, both chronic and calamitous.

As stated in the introduction, the IPCC Fourth Assessment Report has been given much attention, and is influential both in terms of the researchers that have contributed, but also in terms of political focus, policymaking and implementations. The IPCC (2007) definition of vulnerability, as described in the Fourth Assessment Report states that

“Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity.” (IPCC 2007, 21)

The fact that this report is influential to the extent it is, may contribute to providing a mutual understanding of the concept. Although the IPCC definition provides a common ground for identification and understanding for scientists from different disciplines, research communities and countries, it can nonetheless be ambiguous. The definition can be interpreted as a both a starting and an end point interpretation of vulnerability (O’Brien et al. 2004).

Vulnerability is by many regarded as a social product, as done by for instance Few (2003). In South Africa, many of the risky and hazardous areas are occupied by the most vulnerable, something that is firstly a result of the apartheid politics, and secondly a social product of the large scale rural-urban migration. However, some affluent residential areas are also exposed to risk, particularly wild fires that sometimes rage on Table Mountain in Cape Town. These have the potential to affects wealthy areas, and destroy houses and properties. This provides an example of poverty not being the only determining factor of level of vulnerability, at least in terms of exposure to hazard and physical vulnerability. The levels of social vulnerability in affluent residential areas are much lower, and level of resilience higher, due to socio-economic conditions. The households are most likely insured, and often have the necessary resources to cope with events such as mentioned. This is also supported by Hewitt (1997), claiming that society, rather than nature, decides who is more likely to be expose to dangerous geophysical agents, and to have weakened or no defences against them. He furthermore says that it is important to distinguish inherent weaknesses of individuals from social disadvantage. It relates to disadvantages that arise from more or less

permanent social conditions, and may be defined as structural vulnerabilities. These are associated with for instance landlessness or urban overcrowding, or lack of access to training and education. These structural vulnerabilities must be differentiated from vulnerabilities associated with hazards and risk.

The concept of vulnerability has at times been confused with the term risk. For instance, much technical literature refers to vulnerability reduction, yet most likely mean risk reduction (Cardona 2004). Likewise, numerous authors have made the mistake of referring to vulnerability when they actually mean risk. Importantly, (Cardona 2004) emphasises that it is not enough to be 'just' vulnerable; one must be vulnerable to a specific hazard e.g. one cannot simply say that women and children are vulnerable groups, as generalisations like that do not take into account either the diversity across groups, or contextual factors. Cardona (2004) argues that vulnerability represents the physical, economic, political or social susceptibility or predisposition of a community to damage in the case of a destabilizing phenomenon of a natural or anthropogenic origin. Moreover, he says that vulnerability in social groups could be understood as the reduced capacity to adapt to or adjust to a determined set of environmental circumstances. He bases that on the perception that development is as a process that involves harmony between humans and the environment.

Socio-economic vulnerability often implies poverty and inequality, and being involuntarily exposed to hazard and risk. Low adaptive capacity with regard to climate change is also a form of vulnerability, as countries with reduced or limited adaptive capacity will face huge challenges in the future. Development and settlement of coastal areas contribute to vulnerability, though in developing countries this often an exposure caused by necessity and not volition as such. Social vulnerability, disasters and climate change are intrinsically linked with regard to developing countries. However, approaches to meet the challenges that lie in the future is not an easy task to overcome. A rather early perspective in terms of the evolvement of the global environmental change field is provided by Smithers and Smit (1997):

“In some countries, especially in the developing world, longer term global climate change is simply not a priority issue given its long time horizon and inherent uncertainty. In those regions where droughts, floods, cyclones and other perturbations associated with the current climate regime bring on massive loss of life, human dislocation and suffering, the challenges of coping with today's climatic

variations do not allow the luxury of contemplating possible climatic changes several decades hence” (Chen and Kates 1994, and Glantz 1992 cited in Smithers and Smit 1997, 130).

The issue of vulnerability involves many questions and ethical dilemmas, and one barrier to reach a consensus is that researchers and politics in different countries have such different perspectives. It also refers back to the ethical and moral questions implied in development as mentioned previously. An argument to this debate is that the perspectives between north and south countries are spaced far apart, and that there needs to be a shift in orientation. With regard to adaptation, Holloway (personal communication 2008)<sup>13</sup> states that adaptation to climate change requires skilled human resources, something that Africa is in need of. Additionally, she argues that one must deal with the underlying issues of vulnerability in order to deal with the future implications of climate change. She suggests focusing on current adaptations as a means to build bridges into the future. In other words, long term planning that focus on existing challenges, yet include preparations for the uncertain future challenges.

### 3.3 Adaptation

Smit et al. (2000) has attempted to clarify and explain the meaning and use of the concept of adaptation in relation to climate change and variability. They state that as the subject of adaptation has become subject to closer and more inquiry, analysts have seen the need to distinguish types, characterize attributes and specify applications of adaptation (Smit et al. 2000). For instance, it can refer to natural or socio-economic systems, and be targeted at different climatic variables or weather events. Timing is also an important key-word, as adaptations may be anticipatory or reactive, as well as autonomous or planned. Grothmann & Patt (2005) refer to this as proactive and reactive adaptation, and public versus private adaptation, describing them as two different dimensions, namely the timing and the actors. Smit et al. (2000) ask several crucial questions; What is adaptation, adapt to what, who or what adapts and how does adaptation occur? These questions are partly answered in the following chapter, in the discussion of how the residents in Kanana informal settlement respond to climate related stressors.

Some have argued that adaptation and development are the same<sup>14</sup>. A similar conclusion has been drawn when arguing that vulnerability and poverty share the same meaning or are equivalent. It is important to emphasise that these concepts do not mean the same thing, despite them being intrinsically linked and sharing many features (Adger 1999, O'Brien et al. 2007). One might also say that by making such generalisations, the concepts are simplified to a level where the meaning is somewhat lost. By saying that adaptation and development are the same, one leaves out for instance the issue of mal-adaptation, or situations where one person's adaptation might increase another person's vulnerability. However, there are myriads of ways to use such terms, also according to academic and the everyday common use, as well as within the different academic fields. Furthermore, within the global environmental change discourse, there might be substantial differences, as for instance with regard to context, such as ecological or human adaptation. O'Brien et al. (2004) state that there are several understandings of adaptive capacity and adaptation. Adaptive capacity in a starting point interpretation refers to the present ability to cope with and respond to stressors and secure livelihoods, while the end-point definition refers to future adaptations and vulnerability to specific climate changes or events.

Vulnerability and adaptation are intrinsically linked. It is a common notion that greater adaptive capacity implies a lower degree of vulnerability, referring also to the end-point approach described previously. Smit & Wandel (2006) state that numerous definitions of adaptation are found in climate change literature. In the context of human dimensions of global change it usually refers to a process, action or outcome in a system to better cope with, manage or adjust to some changing condition, hazard, stress, risk *or opportunity* (my emphasis). It is easy to overlook the fact that for some people opportunities might arise in a changing environment, because the focus usually tends to be on the negative aspects and impacts with regard to climate change. However, the ability to realize opportunities depends also on adaptive capacity.

If a country in general has a high adaptive capacity, it does not mean that all households or individuals have the same ability (O'Brien et al. 2004). An example to

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<sup>13</sup> Conversation with Ailsa Holloway of DiMP at UCT, February 2008.

<sup>14</sup> The minister of Environment and Development, Erik Solheim, claimed this in a speech, September 2008.



illustrate different levels can be found in Kates (2000) where he highlights the great difference in levels of vulnerability that can occur within a nation, and moreover that it is highly important to focus on the global poor and not the poor nations of the world, because the two groups respectively may have different interests.

### 3.3.1 Coping and Adaptation- Not Synonymous

Coping is often referred to in relation with coping mechanisms, measures or strategies, while adaptation is often referred to in terms of adaptive capacity or adaptive strategies. However, these terms are often used as if they mean the same thing, something that at times makes the use (and understanding) quite confusing. In some contexts there is little or no difference between them, in other contexts the difference is highly accentuated (Smithers & Smit 1997). It is interesting to note a question that is posed in that article; the authors ask whether all human responses to environmental change qualify as adaptations. In the answer, they refer to earlier literature, claiming that adaptation relates to the unplanned reactive response to an event or condition which has already been experienced, distinct from 'mitigative' actions that seek to avoid negative impacts through anticipatory actions. However, this conceptualisation of terms may rather be understood as coping and adaptation respectively, based on understandings of more recent literature. Thus, Smithers & Smit have a somewhat different use of terminology than recent articles use. In terms of coping with disasters, Hewitt (1997) mentions people's capacity to respond and what they do, how well or quickly they recover, involve active responses. Coping often refer to short term measures, such as getting flood waters out of the house, providing food or drying clothes. According to the UNISDR, coping capacity is described as;

The means by which people or organizations 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<sup>15</sup>.

This definition provides a detailed description, although building resilience is related to adaptive capacity rather than coping itself. To some, coping also has a negative connotation,

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<sup>15</sup> <http://www.unisdr.org/eng/library/lib-terminology-eng%20home.htm> 16/1-2009

as the word may be somewhat negative laden. However, coping need not be regarded as a negative term, if one looks people as active agents.

Rakodi & Lloyd-Jones (2002) highlight an important aspect of the use of terminology in this context: “The concept of ‘strategy’ has the advantage of restoring agency to poor people, rather than regarding them as merely as passive victims’ (2002, 7). Wisner et al. (2004) say that coping points to people’s agency, ingenuity and abilities to help themselves individually and collectively. He furthermore suggests that it is important for outside agencies to understand these coping strategies, or else they will be undermined and create dependencies and unintended outcomes. Wisner et al. (2004) argue that “coping is the manner in which people act within the limits of existing resources and range of expectations to achieve various ends” (2004, 113). With resources, they refer to physical and social means of gaining a livelihood and access to safety. Coping according to this definition can be said to be that people do what they have to do with whatever means they have to do it. I would like to emphasise the factor of actively responding, and people as active respondents. Too often, victims of disasters or vulnerable people exposed to adverse events are regarded as passive victims, without the will or capacity to do anything. Though, while some may be in a state of inertia, particularly those living in a chronic disaster, it is important highlight this factor that many people do have resources and make do with what they have.

According to Eriksen et al. (2005) coping is a distinct component of vulnerability and understanding the dynamism of coping and vulnerability is critical to developing adaptation measures that support people as active agents. In this article, the context is with regard to climate stress and drought. It can be added that droughts are usually regarded as slow onset disasters, and can last for months or years. To continue, Eriksen et al. (2005) refer to the IPCC report of 2001 vulnerability definition, emphasising the three components exposure, sensitivity and adaptive capacity, and use that as a framework to argue that “coping capacity, in the sense of the responses that people employ to maintain well-being in the face of environmental stress, is a dimension that cannot be neglected” (2005, 288). Furthermore, they refer to Smithers and Smit (1997), arguing that coping capacity and adapting are two distinct processes, distinguished by timescale, amongst other factors.

Although the processes of coping and adaptation are distinct processes, they are also intrinsically linked (Eriksen et al. 2005). Coping refers to the actions of and activities that

place within existing structures and adaptation frequently involves changing the framework in which coping takes place (from Adger 1996). This is a central aspect in terms of discussing coping and adapting in slums or informal areas such as Kanana, due to the flux of people in and out of such settlements. According to Wisner et al. (2004), some coping strategies depend on the assumption that the event itself will follow a familiar pattern, and that earlier actions may be a reasonable guide for similar events, particularly in hazardous physical and social environments. However, there are some disasters, such as the HIV AIDS pandemic that have no familiar pattern, as it is unprecedented.

Coping strategies for adverse events consist of actions before, during and after event. Wisner et al. (2004) mention types of strategies, or mechanisms, some of which are preventive, impact minimising, diversifying income sources, development of social support networks and post event coping strategies. In addition, it is important that coping and recovery need to be differentiated. Recovery is to return to a state of well being and general security similar to that which existed before the shock or stress was experienced. Coping involves short term responses to manage the immediate event, and such responses may heighten individuals and communities level of vulnerability and hence livelihood insecurity (DiMP 2005). Hence, the most important difference between coping and adaptation is the time frame, but also the framework in terms of being able to build resilience to better withstand shocks and perturbations.

### 3.4 Multiple Stressors and Urban Livelihoods

Much of the earlier research on livelihoods as well as sustainable livelihoods has been done in a rural context. It is important to also focus future research on urban livelihoods due to the high rate of urbanization, particularly with regard to developing countries. Explosive growth of cities in developing countries presents serious challenges for national and local authorities, and intensified environmental problems due to urbanization are an important aspect of this (UNHSP 2003). As more and more people are living in urban areas, they experience multiple and different strains and stressors in their livelihoods. Urban livelihoods are different from rural in several ways. In urban environments the risks that poor people are exposed to different from rural areas. In squatter camps and informal settlements, the environmental hazards are significant, often in terms of rubbish dumps or toxic waste

contaminating the surroundings of those who live there. Health concerns are highly related to the environmental risks that many face both in terms of disease and the lack of money or access to get treatment. However, it is not only environmental concerns that pose stress. Pelling (2003) states that an urban livelihood is more commodified, as obtaining goods require money. This commodification is closely linked to that of employment. As mentioned previously, the majority of the people who live in informal settlements are poorly educated and unemployed. Obtaining food or necessary goods then is difficult without income or economic resources. Labour is often the only or main asset in terms of being able to partake in a monetized environment. Pelling furthermore notes that there is greater social fragmentation in the urban context because of residential mobility and the loss of supportive social networks. Nevertheless, many urban and rural livelihoods face multiple stressors.

Ziervogel & Taylor (2008) note in the article *Feeling Stressed*, that climate is only one of multiple stressors that people are faced with, and further “In many places, changes in the climate affect the nature, magnitude, and frequency of a number of existing stresses experienced, while in others it may present completely new threats” (2008, 34). They state that some of the stresses experienced in a rural area are water stress, both in terms of agriculture and for domestic use. The lack of jobs and income is another stressor, and health services and increasing rates of HIV/AIDS presented yet other stressors. However, they state that people find it easier to talk about the stresses they experience, rather than how they respond to them. With regard to responding to multiple stressors in an urban environment such as Kanana, Few (2003) states that other studies suggest that people do not rate flood problems as highly as might be expected. They are part of a trade off of living in urban locations, or are given low priority in comparison with daily economic concerns, and other concerns.

The commodification of urban livelihoods is important with regard to employment, and labour power as an asset or capital. There are commonly mentioned five types of capital, and the categories are: human, social and political, physical, financial and natural capital (Wisner et al. 2004, Rakodi & Lloyd-Jones 2002). The livelihoods asset model, where labour, housing, possessions, tools of the trade and social networks are key resources for households with regard to coping with vulnerability or moving out of poverty in the city. Loss of labour power can be catastrophic, and as it is difficult (more than in a rural setting) to turn to alternative sources of entitlement. In addition, damage to productive assets such as

dwelling or productive tools can cause the abandonment of a household. Housing becomes a very important element in terms of assets for the urban poor. “those people without access to safe housing will be amongst the most exposed to, and least able to cope with, shocks from environmental hazard, just as those who may have lost their housing through a disaster event will find it particularly difficult to recover” (Pelling 2003, 59). The stressors that people face in urban environments are important both in terms of vulnerability, adaptation and coping. O’Brien et al. (2004) state that “vulnerability to climate change is recognized as a state, generated not just by climate change, but by multiple processes and stressors” (2004, 15). These multiple stressors and processes influence both adaptive capacity and vulnerability, which will be illustrated in chapter five.

### *Summary*

This chapter provided a theoretical framing for the thesis. The concept of disaster and furthermore chronic disaster has been conceptualised, and linked with the multiple stressors that are associated with social and socio-economic vulnerability. Moreover, the concepts of vulnerability, adaptation and coping have been discussed, and the conceptual difference between adaptation and coping highlighted. The importance of viewing vulnerability as a starting point for addressing challenges linked to disaster risk reduction and facilitation of adaptation has been stressed throughout the chapter.

## 4. Methodological Approach

“Qualitative methods are used to address research questions that require explanation of understanding of social phenomena and their contexts. They are particularly well suited to exploring issues that hold some complexity and to studying processes that occur over time.” (Ritchie & Lewis 2003, 5)

When I first started the work with the masters thesis, it became clear to me that the topic or theme that I wanted to pursue was a very complex phenomenon that I believed necessary to examine in depth. It is extremely difficult, if not impossible to make generalisations, at least from the perspective that I wanted to do research from. And, it is certainly not desirable either. Another factor that was influential in the choice of method was that I already had some knowledge of the phenomena that I wanted to pursue further. It is important to study it in more detail, as the climate is changing and will lead to even greater exposure to potentially disastrous events, either catastrophic or chronic. The goal of this study is to achieve thorough and particular understanding and attain detailed knowledge about this specific case. It would probably have been possible to quantify some data or factors as such, but through this thesis I wanted to show some selected people’s stories, their struggles and their way of coping and adapting to the challenges they face.

Before conducting the fieldwork, I had previously lived in Cape Town for two years. During that time I was a fulltime student, and for a period of time I worked as a volunteer with a student organisation, SHAWCO. I participated in a group teaching environmental science at a local school called Thembelihle in the township Khayelitsha. Through that, via my studies at UCT and also through news etc, I became acquainted with the rains and flooding that leaves many people in despair every winter. Through DiMP and lectures given by Ailsa Holloway of UCT, I was inspired and curious to learn more about disaster risk science, particularly in Cape Town. However, I did not know a lot about it, except that there were some townships that are worse affected than others, and that people in informal settlements are particularly affected. I was also familiar with the risk of fire, and disastrous events that have taken place, such as the Joe Slovo fire in 2005. However, the impact and consequences of the flooding and winter storms was something that caught my interest because it influences many people every year, as well as being a fairly certain annual event, though to an unknown extent. For the people involved the impact may be disastrous in itself. Precisely due to this presumed difference in perspective, vulnerability, coping and impact,

qualitative method is a suitable tool to investigate a case like this. First, this chapter deals with qualitative research as method. Second, it describes the case study before moving on to data collection and methods. These are mainly observation and interviewing. Third, dilemmas and problems during the fieldwork are discussed, and last, an assessment of the quality of the data material is accounted for.

## 4.1 Qualitative Research

The characteristics of qualitative method in social research are many. Some of the most important differences from quantitative methodology are according to Thagaard (2003) that qualitative method uses analysis of text instead of numbers, it includes proximity and closeness to the informants as opposed to distance to respondents, and one has small (and often carefully chosen) selections of informants or object of study. While quantitative studies often have a linear process, qualitative methodology often goes in a cyclical process. Analysis and interpretation are activities that are ongoing throughout the research process, because the researcher will reflect and interpret the data while trying to get the overview. The research moves through different phases, and these overlap to a certain extent. The flexibility that lies in the qualitative research process can also give the researcher possibilities to change strategy during the process, and the process itself goes back and forth between theory, methodology and data (Thagaard 2003).

There is no single accepted way of doing qualitative research. The researcher's view on ontology, epistemology, goal of research, the research participants and audience for the research are amongst the factors that influence the research that is carried out. In terms of the characteristics of this method, there is a consensus that qualitative research is a naturalistic, interpretive approach concerned with the meanings which people attach to phenomena within their social worlds (Snape & Spencer 2003). Certain data collection methods have also been associated with this type of research, such as observation, in depth interviewing, group discussion and narratives. It also involves using methods of data generation that which are flexible and sensitive to the social context in which the data are produced. Close contact between the researcher and the people being studied is also a key element in the nature of the data generation. In terms of outcomes, or nature of outputs, there are several important elements. Producing detailed descriptions based on or an interpretation of the perspectives of

the participants in the social setting is one aspect, while answering 'how', 'why' and 'what is' is another. Particularly important for my research is also consideration of the influence of the researcher's perspective. In sum, the aim of qualitative research is generally to provide an in depth and interpreted understanding of the social world, by learning about people's social and material circumstances, experiences, histories and perspectives (Snape & Spencer 2003).

#### 4.1.1 The Case Study

Case study research has become very popular in many areas of social inquiry, and is also frequently used in human geography. A case study is also a term that has become popular in many settings, such as work related settings, interviews etc in terms of 'solving a case', 'working on a case' and so on. However, in academia and the *research context* it usually refers to research that investigate a few cases, often just one in considerable depth. Frequently, it implies the collection of unstructured data and qualitative analysis of these. It is sometimes argued that the aim of case study research should be to 'capture cases in their uniqueness' rather than using them as a basis for wider generalization. Some of the most important characteristics of a case study are as follows; it studies naturally occurring cases, quantification of data is not a priority, and qualitative data may be treated as superior. The information gathered about each case concerns a large number of features of each case. In addition, understanding the case study in itself may be the main concern, without any interest in theoretical interference or empirical generalization. Though, the findings can also be used as a basis for naturalistic generalization or transferability (Gomm et al. 2000). Transferability is of importance to this case study, as my assertion is that there are many similar cases, both on the regional and global level. This will be further discussed in the concluding chapter.

Case study research can also be seen not only as method, but also as a research paradigm, owing to different assumptions about how the social world can and should be studied from other underlying approaches. It can be formulated in terms of a contrast between positivism and naturalism, interpretivism and constructionism. Several methodological issues arise in the differences about the purpose and nature of the case study. Without going into further detail on this, these are generalizability, causal or narrative analysis, the nature of the theory, authenticity and authority (Gomm et al. 2000).



Generalizability however, is subject to much discussion. Natural generalization as mentioned in the previous paragraph is a term that Stake (2000) discusses; It is “arrived at by recognizing the similarities of objects and issues in and out of context and by sensing the natural covariations of happenings” (Stake 2000, 22).

## 4.2 Data Collection

After the initial decision to use qualitative research methods was made, there were two main strategies that I planned to carry out in order to collect data. These were observation and interviewing. As the area in question can be considered dangerous, there were some important challenges to overcome in order to get the required and wanted data. The first challenge was that as I am a white person, my presence was extremely obvious, as there are rarely white people in the settlement. The other factor, that I am a woman, also led to receiving attention, many times unwanted. However, these two factors were probably more influential in the interview situation than in walking around the settlement making observations.

Choosing how to position and present oneself is an important aspect of data collection in a social context like an informal settlement. The mere fact that one is a university student can in many cases give status, and explaining the fact that I had travelled halfway around the world in order to ask questions and do research in an area like that was for many people difficult to comprehend. This was both due to a lack of a basic understanding of what research is, to a lack of understanding of the motivation to do what I was doing. In addition, having the economic resources to do this, contributed to the ‘white and rich’ image that is prevalent in South Africa. In one sense though, the wealth perspective is true in a relative sense, if one compares it to the (chronic) poverty that many live in. However, I tried to be extremely sensitive about this issue, and dressed down so as to not ‘flash’ my wealth. It was also necessary to think through how I wanted to present myself. Showing knowledge in terms of language and culture was important in order to get in touch with informants. At the same time it was necessary to emphasise the role as a student and a learner, without the power to make decisions or influence local authorities in any way. According to Thagaard (2003), the personal contact that is established between researcher and informant is in itself a methodological point. The trust and credibility that is created

during the interview situation is significant in terms of the informant being able to talk openly about experiences. It is also particularly important that the researcher avoids creating distance to the informant. In my case, the distance was already there in a way, created by both history and socio-economic status. A large part of my role was to try and close this gap and appear genuine, interested, emphatic and in a learning process. At the same time, it was important to keep the role as 'only' a student, and keep the distance so as not to become too close to informants or people in the area. An exception was the household that let me park the car in their yard. We became acquainted in the way that they understood and respected what I was doing in the settlement, and expected nothing in return, despite them helping me out. On the last day I spent in the settlement, the lady in the house brought me over to some friend's house in order to meet them, while my research assistants stayed behind with the other men. On this occasion, I felt more like a friend than a researcher or a student, but it was a nice experience and contributed to the experience in total.

#### 4.2.1 Observation

Ritchie (2003) has described observation as a form of naturally occurring data, as opposed to generated data where interventions of research has been essential. There are several different approaches to study phenomena in naturally occurring settings, such as participant observation, observation, documentary analysis, discourse analysis and conversation analysis. Of these categories, I mainly used observation, which "offers the opportunity to record and analyse behaviour and interactions as they occur although not as a member of the study population" (Ritchie 2003, 35). The observations that I carried out was completely from an outsider's perspective. Though, as Ritchie (2003) furthermore states, the events, actions and experiences may then be seen through the eyes of the researcher, often without any construction on the part of those involved. This type of observation was very helpful to me, as I was then able to get information that was not influenced by anything but my interpretations of the observations themselves. It was a determining factor in choosing the people that would be candidates for the interviews, as visible alternations of the house was one important criterion, in the beginning of the interview process. Observation was an important source of information, for instance in the cases where the alternations to the dwelling were evident, but the informant not at home. Also in terms of some people working outside their dwellings, as one informant pointed out to us, 'those people you see working

outside their homes, they are preparing for winter'. Many people were busy outside their homes, preparing for the rainy season. This will be described in further detail in the analysis and discussion chapter.

Thagaard (2003) also mentions observation as a data collection method where the researcher is present in the same sphere that the informants are, and systematically observe how they behave. It is however important to decide which role the researcher will take on, to participate or only observe, if the observation is open or hidden, and what influence the presence of the researcher has on the results of the study. It is also challenging but important for the researcher to reach an understanding of or insight in the informants' situation. It is likewise important for the researcher to establish trust in relation to the informants. By using oneself as an instrument, it is possible to establish a good relation and contact with the informants. The relation between informant and researcher is significant with regard to the quality of the material. Furthermore, the relationship between the informant and the researcher is characterized both by proximity and distance. Proximity, because it is important that the researcher gets an understanding of the informant's experience and/or situation. Distance, because the academic platform of the researcher represents a basic difference, and that he or she comes from a different place or environment than the objects of study.

In my case, the observations were clearly very visible, as I was walking around the settlement with my two assistants. It was neither possible, nor desirable to conduct hidden observations. However, my being in the area did not, to my knowledge, affect the daily life and activities in the area. The informants carried on with whatever they were doing, some were curious and wondered what I was doing there, and some did not care. Doing this type of observation provided useful in several ways. Firstly, it provided an overview of the area, the general conditions in terms of housing, water access, population and closeness to wetland or pond, something that was important with regard to the research questions. Secondly, not only did it give me an overview of the area and the context, but it also gave people in the settlement a chance to get used to me and who I was, and why I was there. That in turn may have influenced the access to informants, and a 'demystification' of my person. However, I experienced reactions that were unexpected, such as one person (not an informant) that said something like 'this is the first time we see a white lady in our settlement, God has blessed us today'. This role as a saviour was something that I tried to

avoid at all costs, and was very careful so not to raise any kind of expectations at all while being there. That meant not giving anything, such as food or money, even though some people begged me to help them. That was personally very hard, as I could have afforded it, and knew that many people were struggling to survive. But, the problem then would have been that if I gave to one or a few people, I would have to give to everyone. In addition, the expectations would have been raised even more, and people would perhaps have talked to me with a hidden motif, and then become disappointed when there was no help to receive. In some cases with a few informants, I have a suspicion that this happened anyway, that they wanted to talk to us with the hope of receiving something at the end of the talk. There were no obvious signs of disappointment at the end of the interviews, even though some people tried to use me as a 'job-provider', either assuming that I made use of maids, and then tried to convince me to give them work as a domestic, or asking what my father's profession was and try to influence me to have him employ them.

Coming in to the community and settlement required planning and preparations. This both in terms of practical considerations, but also in terms of the research itself. Firstly, it would have been very difficult for me to go alone into the community. I therefore made use of a translator due to this, in addition to the language aspect. Secondly, public transportation was not a practical possibility, and private transportation was required. Thirdly, I needed to take carefully into account the presentation of myself, as my being there would get much attention. It was very important to me that after the initial 'surprise' of seeing me (a white woman, an outsider), the role as a student firstly and researcher secondly became clear. Most people assumed that I was from the public administration or 'from the government' as it was most commonly put. This role was quite uncomfortable, but at the same time there was no way around this as long as I had chosen to do research in this area and on this topic. Though, when I was in the settlement, the only thing I could do to partly get rid of this presumed role was to talk to people and explain my situation.

#### 4.2.2 Interviews

In terms of data collection methods, interviews and focus groups or group discussions are ways in which data can be generated. Generated methods involve re-construction, in the sense that some or many factors involve re-telling and re-processing. The experience or event amongst others, is re-processed and verbally recounted by the study participants.

Generated data gives insight into people's beliefs and behaviours, and importantly an understanding of the meaning that they attach to them (Ritchie 2003). The data that I collected in this research involves both re-telling of events and reconstructions of the situations that informants have experienced. I did not make use of focus groups, but some of the interview situations somehow functioned as a group interview, where there were other people present and commented on the issues we talked about. The interviews that were conducted were usually carried out with one informant answering the questions, some times it took place more like a conversation, this varied from person to person. In some cases, there were several people present, in others, it was the informant only. The most common situation however was that one person was interviewed and one or several people were present listening to the conversation and making comments.

The purpose of an interview is to get full and detailed information of how other people perceive their life situations or livelihoods. However, there are different opinions of what the interview data actually represent. On one hand, there is the positivistic perspective that regards the informant's account which accurately reflects the actual event or experience. On the other hand, there is the constructivist standpoint, in which the experiences in the 'outer world' cannot be conveyed in the interview situation, and that the descriptions are created then and there. These are bound by the context created in relation to the relationship developed between informant and researcher (Thagaard 2003). However, Thagaard states that it is possible to have a position in between these two, both as descriptions of events, but also as a reflection of how the informant understands own experiences and how the informant perceives the researcher. This can also be linked to the question of whether or not the informant is telling the truth, modifying it or consciously adding or subtracting elements from the story. One must have a certain level of confidence in the informant, but at the same time have a critical approach. However, this will be further discussed with regard to dilemmas and problems.

A qualitative interview may be carried out in different ways, and can be structured or un-structured. There may also be different types of questions, such as objective and subjective, main questions, follow-ups or probes (Hesselberg 1998, Thagaard 2003, Rubin & Rubin 2005). In this research, the interview guide starts out with objective questions, such as practical information; age, place of origin, number of people in household etc. The guide then moves on to questions about the dwelling and reflections concerning making alterations

to it. It then moves on to experiences with rains and flooding, personal experiences on how the informant coped with this type of event. Lastly, the informant was able to add information or ask questions. As the field work was conducted in late summer/early fall, it was a good chance to ask the informants whether they had started to prepare for winter. This was originally not a question in the guide, but the interpreter used it as a way to round up the interview. The interviews were based on semi-structured interview guide, but with room for alterations depending on the informant's account of events and story. It was also a point to have open questions in the sense that I wanted to hear the informant's stories and experiences, and also have the flexibility to let them talk. In many cases, much other useful information could be gathered from their telling, and also from 'chit chat' after the interview.

The two research assistants that were with me at all times were very helpful, and it would have been very difficult to carry out research for me, as a very obvious outsider, without them. Though, the fact that I speak basic isiXhosa and that I am quite familiar with culture and customs really benefited me. Initially when getting in touch with possible informants, I was able to convey the message that I was a student and what I was doing there, in basic terms in their mother tongue. This signalled that I had some knowledge, and that I was genuinely interested in their situation. In turn, that made people more positively interested in talking to me. Instead of having the role of an outsider inspecting and observing and to an extent judging, I was trying to convey friendliness and curiousness, and a genuine interest. It is my impression that I succeeded in this, as during the later visits, some people greeted me like an old acquaintance, even though I could not remember to have seen them previously. The household where we parked the car also had a key role in gaining access to at least some of the community. Through them, and particularly the lady in the house, I got informants as well as some information about the settlement, and a talk with one community leader.

#### 4.2.3 Use of Interpreter

In terms of the practical aspects of the field work, I had made the decision that I wanted to conduct the interviews in the local language before the actual research process started. Most people do speak English to varying degrees, but it is often easier to express oneself in the mother tongue, both in linguistic terms but also with regard to cultural differences. Another

factor was that having an interpreter could also function as an icebreaker, both in front of and during the interview situation. I did not really know how to go about getting a reliable and skilful person to do this, but a former lecturer of mine at UCT connected me with one of his students<sup>16</sup>. This worked out to be a very good match, and it turned into a friendship as the research process evolved. Having a research assistant (or two) is very helpful and has many positive traits, but it may also have some negative implications. Hesselberg (1998) claims that the interpreter needs to be sociable/companionable, achieves contact easily with the informants, and that he is likeable. It is also an advantage if the person knows the local situation. I was very fortunate with my interpreter, because he was both an academic, studying for a post graduate degree, but he was also a native isiXhosa speaker from the Eastern Cape, and had previously lived in an informal dwelling before his family got a government provided house. Hence, he had the preconditions to understand the focus of my research and project, but also the cultural and socio-economic background to identify with the informants. That is certainly a factor that strengthens the data collection and the quality of the data material.

There were several choices to be made in terms of practical decisions. With regard to the interviews, one was whether to use a digital recorder or not. I decided not to use one. The main reason for this was that I would have had to get someone to transcribe all the interviews from isiXhosa to English, in addition to using an interpreter. In addition, I did not know what to expect in terms of the interview settings, and it turned out that quite a few were conducted outside in an environment with many disturbances, with outsiders at times being a source of disruption. However, it is a possibility that the quality of the data may have been weakened as a result. By using notes and not recording the interviews, many details were most likely lost. In addition, I missed out on many things during the interview due to the language barrier. This aspect of data will be discussed later in this chapter. As mentioned, I made use of two research assistants; one was a post graduate student and the other a graduate student. During the first interviews, the interpreter translated continually to me, but it became very broken up and the flow in the interview was lost to some extent. A solution was then to make more use of the second assistant, who initially wanted to just 'tag along' to experience the research process, but became an active part of it. Though, having

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<sup>16</sup> It can be noted that the research assistants were paid on an hourly rate decided upon before the data collection started.

two assistants worked out very well, because it increased my personal safety, as well as making the interview situation more fluent. The interview was then conducted by the interpreter speaking with the informant in the local language, while I was following the conversation closely and the other assistant translated simultaneously, so that I could ask questions or make comments. I also made notes during the interview, as well as the translator making notes and comments on the interview-form.

According to Hesselberg (1998), it is very important for the researcher to be in control, and for the interpreter to understand that the only job is to merely translate. This was a bit of a problem during the research. As the interpreter was very likeable and talkative, the interviews sometimes turned into conversations about topics that were completely irrelevant to the research, and it was difficult to break up these conversations. This was frustrating at times, and made me feel a loss of control of the interview situation. At the same time, I did not want to jeopardize the good relationship and cooperation that existed, and decided to overlook this and take it as part of the package of doing fieldwork in such a different setting and culture.

### 4.3 Dilemmas and Ethical Problems

As abstract as the term research is, in some cases the interpreter that worked for me, presented it as 'homework' for school. This was an oversimplification, but in some settings it made more sense than to explain the foundations of research and how that could help people in the settlement. Many had expectations of concrete results, and asked at the end of the interview 'how will this help us?'. This touches upon an ethical research dilemma, and it is somewhat difficult to justify that one receives much, without giving anything back then and there. Hesselberg (1998) mentions examples of how it is possible to contribute (preferably) after the research process has ended, in terms of organizing projects or giving data to public administration that may contribute positively to the community. The issue of reciprocity is also addressed by Lewis (2003), who asserts that it is important to be aware of the constraints of the researcher role in considering issues of reciprocity. It is important to maintain objectivity, neutrality and some distance. However, it may also be appropriate to reciprocate with a small cash payment, report of the key findings, while donations to charity might be more appropriate in other cases. In this case though, I did not find it right to give



cash or food to the participants. Firstly in order to avoid or exaggerate expectations, secondly because I did not want to get informants for the 'wrong reasons'. It was difficult to assess the degree of need of the informants. If I were to give something concrete in return, I would risk that it was too small or too little, considering the impression of me as a 'rich' person. On the other hand, I could have given too much, strengthening that same impression. Hopefully, my project will instead benefit ongoing research in the region, and contribute to an increased understanding of these people's situation viewed from an outsider's perspective.

There are three ethical principles with regard to the research process (Thagaard 2003). First, notifying the informants about what the research involved and getting them to agree that they were willingly subject to participate as informants was one issue. Second, it includes the principle of confidentiality, and the consequences of having participated in a research project. Following these three principles proved to be rather challenging. The informants that were interviewed were informed about what I was doing and what I wanted to find out. They were asked if we could interview them, and were further informed about confidentiality. All the informants were told that their names would not be used or showed to anyone. With regard to the consequences of having participated in the research process, I told them that UCT would get the finished thesis and perhaps the municipality, if it was of interest to them. There are not really individual consequences of participating as an informant in this study, as the informants are all anonymous and none of them have a particular role in the project, except from the informant 'Boss model', his story is further elaborated on shortly in the following chapter. However, as mentioned earlier, explaining the foundations of research is somewhat complicated, emphasising that this is not related to personal resources or capacities of the informants, but rather that the foundation or preconditions were missing. This is probably also linked to the situation, where immediate needs were prioritised, and thinking far into the future was simply a luxury not available to some informants. It was challenging to convey what the project involved and the consequences of having contributed, when there would be no immediate positive effects.

As mentioned in previous paragraphs, my presence in the area raised expectations in many ways. I have already discussed some of the actual problems this presented, and how I chose to deal with them. Though, in relation to the data and information that could be gathered from both observation and interviews, one particularly important aspect is the

responses from the informants. It is possible that some informants believed that I was affiliated with the government, and hoped that they would put them on a list or get a house quicker if they talked to me. Some asked if I could provide them with jobs, food or help them in general. There were several offers to work as maids and domestic aids. These issues usually came up nearing the end or after the interviews, and I sometimes perceived it as an attempt to get something in return for the interview. In retrospect, information concerning this should perhaps have been emphasised to an even greater extent before the interview started, but that could also have lead to a negative vibe and setting. Though, the responses that the informants give may be influenced by how they wish to present themselves for the researcher. On one hand, they might want to give a good impression. On the other hand, the informants may wish to emphasise problematic aspects of their lives, and convince the researcher of a difficult life situation.

Another important issue is the question of integrity, and protecting the integrity of the informant. The questions that were asked and the interviews did not touch upon personal, sensitive topics to the extent that a different study, for instance a study concerning HIV and sexual relations would have. Nevertheless, it is important to keep in mind that the life situations of the informants were difficult, and poverty and associated problems is a sensitive issued in itself. However, I tried to be sensitive when making the questions, so that the informant would not be forced into answering things that could be felt or experienced as humiliating. On one occasion, an informant ended the interview very abruptly, and it was a bit puzzling then and there. Afterwards, I realised that he had talked about a sensitive issue regarding alleged corruption in the community, and I concluded that he felt that he had said too much, and perhaps regretted this. As a result, the interview came to quite a sudden stop.

There were notable differences in the informants' answers, and the way they described their situations. An important question that is particularly relevant to qualitative interviewing is whether or not the informant is saying what he or she thinks is correct or proper. Thagaard (2003) asks whether the informant says what he or she *believes* that the researcher wants to hear. This presents possible dilemmas in terms of the informants and their responses. It is also important to keep in mind that the informants may have motives that may cause them to modify the truth, tell the partial truth, or deliberately say things that are not true. According to Thagaard (2003), the researcher can meet these challenges by meeting the informants with an 'open mind'. This can be done by preventing that the

researchers own values influence the interview situation. However, this demands that the researcher is both objective and subjective at the same time which is a bit of a dichotomy. He or she must both try to avoid distance and create a good interview situation and being emphatic, while keeping a critical perspective and continuously assessing the interview and the informant's responses. In my case, I tried to meet the informants with an open mind and let that guide the interview situation, and then assessed the interviews afterwards with the research assistants. At times, they had caught some things, both said and unsaid, that I did not catch and it was very useful to have someone to discuss such aspects with.

There were certain practical problems associated with doing fieldwork in an informal settlement. The timing of the interviews in the day was of importance. Most of the interviews were conducted very early in the morning and on the weekends, and a couple of times in the late afternoon on weekdays. The first interview of the day was usually conducted at approximately 9 am, and the last around 15-16 in the afternoon. This was mainly because of personal safety, but also in order to avoid people gathering around me or in the interview situations. This did happen a few times, and felt quite uncomfortable. It did not scare me, but it was unwanted attention. It may also be added that I never spent time in the settlement after it became dark mostly due to the high crime and violence rates. The use of alcohol (and drugs) is prevalent, and it was important to be in the settlement at times when the 'intoxication' levels were lower. Particularly on weekends, many people were drinking the whole day, and thus in the afternoons, this was very obvious. Poverty and alcoholism is closely linked, and the correlations between these two will be discussed in more detail in the following chapter.

## 4.4 Assessing the Quality of the Data

There are different ways to assess the quality of the data, in terms of methodology, collection and practical considerations. Credibility and conformability<sup>17</sup> are common terms with regard to assessing the quality of data in qualitative research, credibility tied to the development of data, and conformability to the interpretation of results or findings.

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<sup>17</sup> Conformability referring to the term 'bekreftbarhet' and credibility referring to 'troverdighet', translated from Norwegian in Thagaard (2003).

Throughout the process, it is important to distinguish the data and the researcher's interpretation of the data apart (Seale 1999 in Thagaard 2003). There are several phases of the interpretation and analysis of the data, before starting the data collection, during fieldwork, and when analysing the data. By reflecting in depth on challenges that I would meet by doing fieldwork in a different culture and a setting such as Kanana, I was well prepared. During the collection of data, a factor that may have caused a weakening of the data is the use of interpreter. By hearing most of the data through him, the data has already been interpreted once, and will be interpreted a second time by the researcher, in this case myself. However, using an interpreter also strengthens the material, as one gets detailed information, provided by the informant in their mother tongue. The social background of the interpreter is also of significance, as informants may feel more comfortable with the situation, thus speak freely and openly. Hence, through being aware of this factor while assessing and analysing the collected data, weaknesses are avoided to the extent that it is possible.

An important issue to take note of with regard to credibility of the data is that the research is carried out in a trustworthy manner. Thagaard (2003) states that arguing credibility involves that the researcher reflects on the context of the data collection, and how the relations with the informants may influence the information that the researcher gathers. As stated, this was carefully considered, and as such, the interviews were carried out continuously reflecting upon this issue. Interpretation of the resulting data, in terms of validity, is dependent on a critical approach on the researchers side, as well as whether the project's result is confirmable in existing and other research (Thagaard 2003). She furthermore notes that in qualitative research, a particularly significant element is to develop an understanding of the studied phenomenon, and it is the interpretation of data that constitutes the foundation for transferability. Further, it is the theoretical understanding of the research project that may be put into a wider context. This involves a recontextualisation. However, the transferability of this case study and thesis is further discussed in the conclusion.

### *Summary*

The research is founded on a qualitative approach and method, in order to get as detailed and descriptive information as possible. The usefulness of having culture and language skills has

most likely influenced the data collection, contributing to a strengthening of data credibility. I have tried to make the research process as transparent as possible and meet people with an open mind. I have also tried to protect the integrity of the informants as much as possible, and draw a distinction between what they stated and did, and my own interpretations of observations and interviews. In this chapter, I have also identified factors that that have contributed to credibility and conformability of the data material, but also factors that may have weakened the material. However, by pointing these out, I have showed that I am aware of these factors, which should influence the interpretation and analysis of the data material positively.

## 5. Empirical Results

*“Our government neglects us”* (Informant 19).

The quotation above was expressed by one of the informants, and reflects the opinion and reaction of many of the informants. Yet, the majority of informants in this case study do respond to stressors, despite waiting for the government to take action and improve their livelihoods. The informants in this case study exhibit both physical and more important social vulnerability, facing multiple hazards and risks, manifested as stressors and shocks. They live in an extremely degraded urban environment, with no sanitation and no solid waste management, i.e. a generally polluted environment. Firstly in this chapter, an overview of the causes of flood and significant incidents in Cape Town are described, before moving on to a detailed overview of Kanana. Next, the informants and gathered data from the interviews and observations will be described and discussed, with the theoretical perspectives as a framing. Moreover, the findings will be linked to specific aspects of living with multiple stressors, in a state that is best described as chronic disaster. It is important to note, however, that there were differences among the informants. Some were better off than others, and this seemed to correlate with how long they had stayed in the settlement, with the best locations being the oldest. Newcomers were in many cases marginalised with even poorer locations. Personal capacities also seemed to determine coping and adaptation. One informant in particular exhibited a high level of self-efficacy, and this informant will be portrayed in detail. The linkages with the presented theoretical aspects and the main findings of significance will follow in the next chapter, which also includes concluding comments.

### 5.1 Flooding in Cape Town

Within the Cape Town area, most flood incidents occur when storm water runoff flow rates exceed the capacity of the storm water system. In informal settlements, and other marginal land on the Cape Flats, flooding is often related to a combination of runoff and groundwater ingress. This accumulates inside dwellings where floors are lower than surrounding ground, as well as ground depressions. This is due to the water table in the areas, which is generally

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high. Often, the floodwaters do not recede for many days or weeks, which have a significant impact on the affected communities (DiMP 2005).

The Western Cape and Cape Town have experienced several severe storms and flooding, particularly in the wet winter season. There are records of great floods up to over 100 years back in Cape Town. The Western Cape is a winter rainfall area and receives most of its rain between May and August. The DiMP 'August 2004 Severe Storm Post Flood Assessment' report provides important and useful information as to illustrate physical and social conditions into a localised setting, and thereby place the above mentioned themes into context. For example, on the 5<sup>th</sup> of August 2004 a severe storm resulted in widespread and serious flooding in several areas of Cape Town, amongst them Gugulethu. Persistent rain over the next 4 days resulted in significant flooding in many informal areas across the Cape Flats. The rainfall on the 9<sup>th</sup> of August was not that significant from a hydrological point of view, but it resulted in significant flooding in most of the informal settlements across the municipal area. The worst affected settlements were located in Langa, Gugulethu/Nyanga, Khayelitsha and Sommerset West. The assessment report was intended to show the relationship between the physical hazard process and social vulnerability. Some of the conclusions that were reached were that socio-economic conditions were found to exacerbate the impact of the flooding. In addition, the impact of the flood on the health of informal residents was of concern, and there is evidence that this is a relationship that requires further study (DiMP 2005). The health aspects will be discussed further below, as this was of particular worry to many of the informants.

## 5.2 Kanana

Kanana is located in Gugulethu Township, between the N2 motorway, the informal settlements Barcelona and New Rest, and low cost formal housing in Gugulethu. Cape Town International Airport is located in close proximity to the settlement, on the other side of the N2. The name of the settlement refers to the biblical country of Canaan that flows with milk and honey. People first started moving onto the land in 1990, and most of the residents were previously living in the Gugulethu and Nyanga Hostels. According to the *Profiles of the Informal Settlements within Cape Town Metropole* (CORC 2006) Kanana has a population of about 10 000 people in 3000 households (i.e. 3,33 people per household).. The land in

Kanana belongs to the city council, and the residents do not have title deeds. There are 3000 shacks that have been erected and built with zinc, plastic sails and planks. Each shack has been divided into a maximum of 3 rooms, and there is no space for bigger shacks to be built because the plot sizes are too small.

There are public toilets that have been put up, but they often get blocked up and are rarely used. Public taps have been installed. There are no electricity poles, but residents are able to access illegal electricity. There are no sportsfields or playgrounds in the community. However, the children are able to utilize the recreational facilities in Nyanga or Gugulethu. There are no schools or day care facilities and children attend day-care, primary school and high school in Nyanga or Gugulethu. There are no health care facilities in Kanana, but they are easy to access in Gugulethu or Nyanga. There are a lot of traditional healers in this community. There are no public facilities, no political officers, or SANCO. Nonetheless, there are community leaders and independent committees. The taxi ranks in Nyanga and Gugulethu are easy to access, and the closes train station is Nyanga Junction. Most people use taxis<sup>18</sup> as their main mode of public transport, and some use the train to get to town and to work in the mornings. A single journey to Cape Town costs R12. (CORC 2006).

The residents of Kanana are part of the N2 Gateway project, which is under considerable discussion between the city of Cape Town and the communities. Some very anxious residents do not want to relocate to the 'Airport Road', i.e. Delft. The settlement has been around for the past 16 years and the residents are keen to see development happening. They want houses, and are willing to participate where necessary in order to see their community happy and satisfied (CORC 2006). According to the newspaper *The Mail and Guardian*, Mayor Helen Zille stated that Kanana was on the top of the relocation-list, and described the informal settlement as "a swamp in Gugulethu".<sup>19</sup>

Gugulethu and Kanana are located within what is referred to as the Salt River catchment area. This is substantially developed, and includes residential (formal/informal), commercial, industrial and institutional use. The development has taken place over the last

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<sup>18</sup> A (minibus) taxi in South Africa refers to a mode of public transport, and is a toyota hi-ace or similar to a mini-bus, usually carrying around 18 passengers or more, plus the driver and a person that collects the taxi fare.

<sup>19</sup> <http://www.mg.co.za/article/2007-05-23-cape-town-unveils-housingupgrade-plan-28/1-2009>



fifty years, and large components of the storm-water management infrastructure have been designed according to outdated standards. There were also wetlands that covered much of the catchment area, and there are remnants of these present, but they are to a very little extent connected to existing rivers (DiMP 2005).

### 5.3 The Data

I conducted interviews with residents in the informal settlement of Kanana, including the area that is referred to as the Waterfront. Through the interviews, I have tried to capture the essence of a part of life in an area such as this- in particular how some of the residents are coping with and adapting to stressors, including seasonal flooding. Though, as many of the residents are aware of, the periods where there is little or no flood-risk is still not a time for relaxation. In the hot and dry summer, the inhabitants live with constant fire risk, as well as other stressors like crime, poverty, health concerns, unemployment and other social and developmental issues. Health issues are significant; both with regard to the fact that slums rarely have adequate systems of sanitation, rubbish removal, and access to clean water, but also in terms of various disease and illnesses. South Africa is burdened with the HIV/AIDS pandemic, and the Western Cape Province has very high tuberculosis (TB) rates on top of that. A weakened immune system makes affected people susceptible to TB, and this combined with the damp and cold conditions in winter may have devastating results. It is said that Kanana has the highest TB rate of all the informal settlements in the Cape Town area.

The fieldwork and interviews that I have done are very much a result of a bottom up approach, and seeing things “through the lens of an informal settlement dweller”- as much as it is possible for a person with a background like myself (a white woman from Norway, coming from a completely different socio-economic background). I chose to go out to areas that many advised me not to go to, as hardly any white people go to such areas- except for tourists on organized tours that visit townships and settlements that are regarded as good and safe. The advice was given to me because areas such as Kanana are regarded as (very) dangerous and unsafe, not only to me but to the people that live there as well. It would be extremely obvious that I was an outsider in the community, something that could jeopardize my personal safety. Some believed that I would not be able to do research in an informal

settlement, others mentioned the possibility of going once and having basically one shot at doing the project. However, going out several times and making acquaintances proved to be successful.

In total I conducted 26 interviews with informants all living in Kanana, Gugulethu. The interviews took place in March and April 2008, during the dry summer period. There were few signs of flooding or inundation at this point, although it was clear that rubbish and debris was obstructing channels and streams. In some places you could see evidence of ponding, and wastewater and greywater dams. The wetland, or what is sometimes referred to as 'vlei', was evident, and located particularly in the area bordering New Rest and the N2. According to DiMP (2005) the water level in the vlei in summer gives an indication of the water table in the dry season, something that is of significance with regard to the potential for ponding, seeping<sup>20</sup> and flooding. Although it was not really causing any problems at that point, they would most likely cause problems in the winter season. There was quite a lot of building activity very close to the vlei, with new dwellings being constructed on land not really suitable for building. The settlement is inhabited by people that live in informal dwellings, often referred to as shacks<sup>21</sup>. They are in most cases made from planks, plastic and corrugated iron, and only a few have windows. The standard is of varying degree, from one roomed ones with soil as flooring, to dwellings with two or more rooms with wooden or carpeted floors. The majority of residents in the settlement are of the Xhosa people, coming from the Eastern Cape. The isiXhosa word for shack/informal dwelling is *Ityotyombe*, which means something like "temporary house". Nevertheless, these dwellings are people's homes and have value in several ways, despite the derogatory terms that are sometimes used to describe them.

The fact that the research was conducted during the dry season could be both an advantage and a drawback at the same time, though this is touched upon in the methodology chapter as well. It was an advantage because it made my role as a researcher easier, and people were willing to talk about their situation, without being in a desperate or very stressful situation. i.e. not in desperate need of help, except for the everyday stressors like

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<sup>20</sup> Ponding refers to rain that lies or stands on the ground or surface for days or weeks, seeping refers to water that continually percolates up to the ground surface. (DiMP 2008)

<sup>21</sup> It can be noted that to some, the term shack bears a negative connotation and may be regarded as derogatory.

poverty, crime, disease and so on. Another point was that my being in that area already attracted much attention, and during a particularly stressful period it might have drawn even more attention, as some perhaps would have perceived me as a representative from the public administration, providing emergency relief or assistance. However, not being there in winter season was also a drawback because it would have increased my understanding of the situation and the problems to have seen the flooding and the area in the winter season through personal experience.

The majority of informants in the 26 interviews that were conducted were male. However, in the situations where the informant was male, there were often women present. Only a few of the people that were interviewed were alone. There were children running around, curious neighbours coming or stopping by, and family members, often in the extended family, present or being in close proximity. The majority of the interviewees originally came from the Eastern Cape and only four of the informants came from the Western Cape or other places. There were no informants from other African countries, even though there are squatters and slum-dwellers in Cape Town from other African countries. They seem to cluster in newer settlements than Kanana, although there is a lack of more detailed information on this. The size of the households in which the informants belonged to varied from one to five and up. However, most of the informants lived with three people or more. The size of the dwellings also varied, though most dwellings do not have more than three rooms due to the plot size. Almost half of the informants were living in a 1-room dwelling. It is possible that there are 'local' trends also, as the best areas of Kanana were built upon first. As a result, the residents who settled early got the best locations and as the settlement has become more dense and populated, the smallest dwellings were built on the least favourable locations.

The Waterfront is an area that is particularly exposed to flooding, hence not as favourable as other parts of Kanana. Out of the people that were interviewed, nine lived at the Waterfront. The people that I spoke with that lived there all emphasised the name and the location. The first times at the research site, the name caused a bit of confusion, because it seemed like the area was not actually a part of Kanana. Later it was established that it was in fact a part, and that due to the amounts of water there in the rainy season/winter, it earned its name justly. The name of course has reference to the quite recently developed area of Cape Town harbour which is the proper Waterfront. It is indeed very upmarket with exclusive

shopping areas, the V&A Waterfront Hotel and shopping-mall, as well as residential flats that the average South African can only dream of. It has posh restaurants, jazz bars and other attractions, and is in general an expensive place, attracting both tourists and locals. The two places sharing the same name stand in stark contrast, something that is also reflected in the name of the settlement Kanana. Why the residents choose to give such names to settlements and areas that often are the complete opposite could be discussed. One possibility is that it is irony, as some settlements have names like 'Beverly Hills'. Another possibility is that it is to make a statement, like the name of the settlement 'Never Never'. Kanana in itself is also the ultimate paradoxical name for a slum, and it almost has a mocking tone about it. Photos that illustrate the difference between the two Waterfronts are displayed on the next page.



A spaza at Waterfront, Kanana. (Photo: Camilla A. Nestegard)



The Waterfront, Kanana informal settlement, Cape Town (Photo: Camilla A. Nestegard)



The V&A Waterfront, Cape Town. (Photo: V&A Waterfront)

However, the abundance of water in winter does not seem to interfere with the water quality in the communal taps. All but one of the informants responded that they have access to clean water, something that is very positive. Unfortunately, I did not investigate further what kind of infrastructure exists in terms of pipes and where the water comes from. I assume that the water comes from the same source as the formal parts of Gugulethu. In my understanding there are no restrictions in terms of limited supply per household<sup>22</sup>, i.e. no privatization. There were varying perceptions on access to water, and all but one informant were satisfied with the quality. One problem was, however, waiting in long queues to get water. One informant described it as “*the queues are sometimes endless*” (Informant 17). As far as my knowledge goes, there were no cholera outbreaks, due to poor water quality from these public taps<sup>23</sup>. The informant that complained about the quality of the water receives particular attention in this chapter, due to his uniqueness. He is described in the following section.

### 5.3.1 “The Boss Model”

One informant significantly stood out from the other residents that I spoke with in Kanana. He will be referred to as the ‘Boss model’. The name originates in him saying that he had in fact been doing some modelling for the clothing company Boss. There was no reason to doubt this either, as he was an exceptionally good looking man. The informant was quite young- somewhere in his mid 20s. He and his family were originally from the Eastern Cape, and his mother and little sister lived permanently in the dwelling in Kanana. He stated that he lived partly there in the informal settlement, and partly in Bantry Bay, which is one of the most affluent and upmarket areas to live in Cape Town. The most peculiar thing about him was that he showed a somewhat different level of consciousness around the situation of living in an informal settlement, and the interview with him felt a little surreal. At the time we were talking, he went into the lounge and put on a Pavarotti cd, with the song Ave Maria. The contrast between that and the surroundings with shebeens<sup>24</sup> and Kwaito music pumping out loudly was astonishing. Kwaito music originated in Johannesburg in the early 1990s, and

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<sup>22</sup> This with reference to the current water-pricing and availability issues in SA.

<sup>23</sup> Cholera outbreaks have been reported in other parts of South Africa

<sup>24</sup> A shebeen is a drinking establishment, located in black townships.

is a hugely popular genre. It is closely connected to the black political struggle, culture and identity. It is often referred to as township or ghetto music, and reflects urban contemporary life in the 'new post-apartheid South Africa'. In other words, the difference in music showed much more than just that, it mirrored a contrast and a difference between him and the community that was striking.

The Boss model's reflections concerning personal capacities and resources, as well as perspective on other people that reside in areas like Kanana made him stand out. During the interview, he mentioned practical issues in the settlement such as water and electricity. The water taps are broken time and again, and the electricity also gets damaged. He was the only informant who claimed that the water was not clean. Instead of drinking water from the communal taps, he would buy bottled still water. He furthermore said that he did not like the environment in Kanana, and stated that there are flies and illnesses. The dwelling he lived in seemed to be in a very good condition, with a sort of a veranda in front of the house, and a fence that demarcated the property towards the road. It also had a fence around the house. We did look into the living room, which was carefully decorated. It had a carpet floor, coffee table, cupboard, couch, and it was very clean. Compared to other interviews that were done in different households, the contrast was stark. For example, in a dwelling where one interview was conducted, the place was infested with flies, and there was a strong smell of urine. This informant stated that he was waiting for the council to help him, and that he was hoping to get a house from the government. He furthermore said that he wanted a dwelling on stilts, but that he could not afford it, and neither had the necessary knowledge to build such a dwelling. The informant who inhabited that dwelling stood as a complete opposite to the Boss model, both in terms of attitude and capacities.

The Boss model argued that many people are sitting back waiting for the government to do something. This is supported by the fact that some of the people that I talked with, including the informant mentioned above, stated that they were waiting for something to happen and did not take any measures because of that. This confirms the Boss model's statement. In his words, "these people are not willing to do anything". However, explaining the lack of initiative as a lack of will might well be jumping to conclusions. The lack of motivation or drive to do something could be explained in terms of low self-efficacy, or a state of resignation. For the individuals or households that are experiencing hardship and strained livelihoods, the feeling of hopelessness and lack of belief that they can take control

of their own situation, may have taken over. The Boss model on the other hand shows very high self-efficacy. He claimed that he made up his mind before he left the Eastern Cape, to make a plan for himself. He also stated that in his opinion, the majority is lacking potential, to what he calls – plan, focus and prepare. In his opinion, adapting (in the context of preparing for winter and making alternations to dwellings) is a question of personal resources.

*It goes straight to your potential, if you have potential to plan and get focused then you are likely to succeed. Some people do not care as the majority drinks alcohol. They are just happy that they have shelter and they don't take the initiative to develop it further. The majority is lacking the potential to plan, focus and prepare. People do not have goals. People go to the shebeens, spending the money on beer. (The Boss model)*

He also stated that when the government promised them, the inhabitants of informal settlements, houses, (referring to the housing backlog and housing policies discussed previously) they did not mean that people should fold their arms and wait until they are provided. He also did not see why the people should not be able to do things for themselves, and asserted that “they simply wait for the government to do things for them”. There are several reasons why people do not take action the same way as the Boss model has done. Some people have stated that is expensive to buy building materials, and many of the residents are living in dire need. Knowledge and capacity to build are other influencing factors. An estimated cost of building materials is approximately 10 rand per pallet when one informant purchased this. In comparison, a loaf of bread is approximately 7-8 rand, and a litre of milk about 9 rand. Building materials may then represent a considerable cost to many individuals.

The dwelling that the Boss model lived in was already built when they came to Kanana, and they had bought it from someone. The house was located in an area that did not seem to be particularly problematic in winter, although he stated that it was built on pallets, and this and the veranda helped prevent water and sand coming into the house. As such, he did not need to worry so much about shocks in terms of flooding, but the everyday hazards to a greater extent. At the end of the interview, the Boss model said that he wants to move his mother and sister away from the informal settlement. He stated that he does not want to sell the house, but rather give it away to someone that is desperate or in dire need. The Boss model had been invited to take part in the street committee (executive committee), but he did



not wish to participate. In fact, he was trying to keep his distance to people and the community. In his own words, he did not associate with people there, in order to avoid crime and corruption. Many of the residents frequent the numerous sheebens regularly, spending their money on beer. He himself did not do that, and preferred to keep to himself.

## 5.4 Responding to Stress

The residents in an informal settlement are living with multiple stressors, and in many cases chronic disasters. This can be characterised a combination of daily stressors, as well as shocks and perturbations, manifested as torrential rains and flooding in this case. In other settlements, the fire risk is very high and presents a lurking danger particularly in the summer season. Some settlements experience a combination of these, and may face fire-risk in summer and flood-risk in winter, adding to already exiting stresses and hazards.

With regard to the types of adaptation and coping strategies, it was quite impressive to see the kind of measures that were taken. It was also surprising, because the research revealed a lot more than what was expected to be found before going to the field site. It was known that some dwellings were raised with a simple form of stilts, but other measures that were taken were unexpected. Some were planned adaptations, and some were put into action during the heavy rains. There were examples of both proactive and reactive adaptations that were presented in the theory chapter. Additionally, there were a few very interesting points worth noting. Firstly, each person/household seemed to primarily fend for themselves. One person's adaptation did in one case lead to a greater problem for a neighbour in the next door dwelling, but this was not seen as a problem by the informant that had taken that measure. This informant stated that he fought with his neighbour due to an adaptation measure that he had made, which in turn had lead the water down to the neighbours dwelling, causing water to stand in front of her house. Although his neighbour tried to hold him responsible, he argued that it was not his problem.

Secondly, adaptations did not always lead to an improvement in the situation. Although it fixed one problem, another came into being. An example of this is a dwelling located in the Waterfront area, and the informant that lived there stated that the dwelling was previously on stilts. However, the pond that accumulated underneath lead to an unfortunate mosquito problem. As a result, the owner of that dwelling chose to take the stilts away and

rather pour sand on the ground to raise the level of the dwelling, in order to escape the water, thus avoiding still standing water and the mosquito problem underneath.

Thirdly, many of the respondents applied a mixture of adaptation strategies. Many of these required both knowledge, labour and economic resources. However, there were also examples of combining coping and adaptive measures. One example of applying this was to dig a hole with flooring over in one part of the dwelling, and raise the other part with pallets. Another option was to pack the ground with sand, and cement on top, and then raise the furniture with bricks if the water was on its way into the dwelling. However, in terms of time perspective, most solutions would last only a season or a few years, and would then require being re-done. This was also the case with building a dwelling on stilts, some informants said that they had chosen not to do this alternation, as they were told that the stilt material would rot after a while, and that they would have to buy new materials and change this after a certain time. An interesting point worth noting here is that the timeframe is to some of the informants likely to be influential, in terms of future or long-term planning. Investing money and time in an adaptation that would last for many years seems pointless if a person or household are not planning to stay in the settlement for that long. For many of them, economic resources are already absent or stretched to the limit, and focusing on short terms solutions (coping) might be a “conscious choice” rather than an option.

One informant said that he (and other people) were not planning to stay permanently in the area, and therefore took no adaptive measures. He told us that when he came, with his family, they were not planning to be in Kanana for long, maybe just for 1 to 3 years. They have been in Gugulethu for 15 years, but it is not clear how long they have stayed at the Waterfront in Kanana. The situation had become permanent, but they were hoping to be relocated soon and to be provided with a house. As the government has promised them a house, he was not asking other residents in Waterfront/Kanana with houses on stilts for guidance or help, because he was expecting the government to do something. He added that the government only has made empty promises (Informant 23). This informant has experienced flooding and damages due to the lack of adaptive measures. ‘Everything got damaged’ and they had to try to repair it after the rains. They did not have the money to replace the damaged things, and thus fixed the damaged things themselves. The respondent is not working, and is not prepared for winter as he has no money to purchase necessary

materials. He said that 'we will just wait for the governmental plastic', i.e. the plastic sheets to cover the roofs that are handed out during heavy rains in winter.

Additionally, migrating is also a way of responding to stress or stressors. The situation in South Africa is, as mentioned previously in the paper, particular because of the legacy of apartheid. Most of the migrants that come to informal settlements in Cape Town are from the Eastern Cape, including the former Bantustan homelands of Transkei and Ciskei. Many of the informants said that the reason why they came to Kanana was that it was too crowded in their previous place of habitation. Some had married and got children, and needed a place of their own. Some had stayed in hostels, with flush toilets and hot water, but had to move out due to lack of space. Some decided to seek independence from parents. One informant said that he had no choice but to move there. In contrast to these push-effects, there are also pull-factors. Some of the informants responded that they had family in Kanana, and that had brought them there. Some also moved there because of the space, because there is more space in Kanana. The proximity between the dwellings is greater, and here the aspect of fire risk also comes in. This is discussed elsewhere in the chapter. One informant also said that the reason why he came to Kanana was to be closer to the train-station. There were also seven respondents that had other reasons for coming. However, many of the informants had lived elsewhere in Cape Town before coming to Kanana, in various townships and informal settlements. A point to be made here is that Cape Town has both rural-urban migration as well as urban-urban migration. The flux in informal settlements is great, and people move between these for different reasons.

## 5.5 Coping Measures

As described previously, coping measures refer to short term immediate responses and rarely to lasting solutions. However, many of the coping strategies that were observed in Kanana relied on the events following previous patterns, thus earlier measures functioned as guidelines, as noted by Wisner et al. (2004). Coping responses could include getting food, drying clothes, getting clean water, removing the water from the dwelling, providing a (dry) place to sleep, protecting furniture and belongings and other immediate requirements. The coping aspect of flooding also includes aid from the government, which contributes to existing measures, although it is more immediate relief and a help to cope in the immediate

aftermath of an event. The informants reported that aid included distribution of plastic to cover roofs, as well as distributing grey blankets, and also providing food. It was mentioned by several of the informants that the help they received was given during the rains, and not before. Some of the informants noted that the plastic to put on top of the roofs did not really help, as the water came from underneath. In other cases the plastic did help to prevent water leaking from the heavy rains. Some informants also reported that it was possible to go to the community hall if the situation was too bad to stay in the dwelling.

Measures that residents take on their own initiatives strengthen their role as active agents, with capacities to reduce impacts. Examples of these measures are to put bricks under the furniture, to put beer crates under furniture such as beds, and in general to raise inventory from the ground to prevent damage. With regard to measures outside the dwellings, some put beer crates, concrete slabs, and other objects to step on in front of house in order to be able to walk to and from their dwelling. It was also stated that some people go to family or relatives elsewhere to sleep and escape the water when the situation becomes too bad in Kanana. Though, some of the residents said that they did not have big problems due to flooding, and would only take measures such as raising furniture with bricks during the worst times. One informant in particular noted that the preparations they took were sufficient to cope during the winter season, but they were still experiencing stress in terms of children suffering from poor health in winter, as well as using money every year to upgrade existing adaptations, which in this case were changing of pallets in front of dwelling, and buying new carpets (or linoleum) that were on top of a cemented floor, as this was always damp.

Coping with unemployment may lead to new business initiatives by those who are affected. Several types of income generating activities were observed in a number of households and places, apart from formal employment. These were small scale businesses, and most likely part of the informal economy. Examples of these include barbershops, fruit and vegetable stands, and businesses providing telephones to make phone calls, almost like a privatised phone booth. In addition, such businesses often provide sale of airtime for mobile phones. In one dwelling, there was a small shoe-shop where they produced sandals from old rubber. There were also businesses related to cooking and sale of food.

I encountered three different types of businesses in this sector during my fieldwork, and interviewed one of the households operating a small-scale business. In the first case, a woman bought fish, and cooked and prepared the fish at her dwelling, before going to a stand by the road to sell her products. I wanted to interview her, but due to the preparations, she did not have the time to talk to me. It can be noted that the sanitary conditions surrounding this business were far from satisfactory. Her dwelling was located right next to the vlei, and an area that was used as a toilet by what seemed to be many people. There were flies everywhere, also surrounding the food. Nevertheless, it was a strategy to generate an income for the household. The second business was run by a woman who prepared sheep heads for sale, by boiling them and then burning the skin off, and further preparing them for consumption. The third business was a household where the lady of the household made ginger beer and prepared chickenfeet<sup>25</sup> for sale. This is not an unusual activity, and both are regarded as traditional food and drink. An important factor for her to have a business is the sufficient space that they had in Kanana. Her dwelling was quite large, with a small yard outside, and she stated that the space allowed her to have a business. Where she lived previously there was no space for her business.

Women were in charge of these businesses, and women are also in some cases responsible for running shebeens. It can be noted that many of the female informants were very capable and taking initiatives, a few of them single women with children. Although the role of gender in businesses is very interesting, I did not have the opportunity to pursue this further. One household that was interviewed told me about the shebeen across the road, and how the lady that was running it was respected by the frequenters. Having a shebeen in ones dwelling or lounge is not uncommon, and it is also an income generating activity. In addition, there are also small shops called *spazas*, that sell bread, beverages, detergent and other things. It is like a regular shop, but also probably part of the informal economy. Some people do have cows, goats, sheep or chickens, for own consumption or for sale. Another income generating activity directly related to the winter rains and floods, is selling pallets and material to use as stilts. Several of the informants said that they bought the necessary building material in the settlement, from someone who sells building materials.

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<sup>25</sup> Regarded as 'black township food', usually eaten by the African populations in SA

### 5.5.1 Alcohol Use and Abuse

Many countries that have extensive poverty and marginalized groups, experience social and developmental problems due to excessive use or abuse of alcohol. This is also the case in South Africa, and it leads to drunk driving, homicides, (domestic) violence and social problems in general. Excessive use of alcohol is also associated with poverty in South Africa<sup>26</sup>. It is easy to access and purchase alcoholic beverages, both in terms of licensed and unlicensed shops and bars. In many places, especially in poor regions, townships and settlements, many people also drink homebrew. In some cases, these homemade mixtures may actually be lethal, and there are brews using ingredients such as old bread and acid from car batteries as ingredients to make beer-like alcoholic beverages. Other times it is 'regular' homebrew, often made in plastic barrels and suitable for human consumption. The most common brew is a beer called 'Umquombothi'. It is made from millet, and commonly found in South Africa.

There are several links between poverty and alcohol abuse, and it is important to include this topic in reference to coping with risks and hazards. Some of the informants talked about this, including how some people spend money on alcohol instead of using it on other needed goods (this was, for example mentioned by the Boss model). In the informal settlements (and probably elsewhere), consuming alcohol is commonly referred to as enjoyment, people are '*enjoying themselves*'. Analysing this term, it is possible that it symbolises a break from the struggles of everyday life, or it may be a term that has no double meaning at all, but simply refers to nothing more and nothing less than enjoyment. Nevertheless, whether it is social drinking or used primarily as a coping strategy, it is abundant. The enjoyment is particularly obvious on the afternoons or weekends, and applies to both genders and all ages. In terms of practical issues around doing research in an informal settlement, the widespread use of alcohol was a major reason for conducting the interviews as early as possible in the days, because it made it difficult in the afternoons and early evenings as many people became bothersome at those times.

It has been claimed that alcohol consumption is a coping response to stress, and living with multiple stress factors like many people do in an informal settlement cause them

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<sup>26</sup> [http://www.agirn.org/documents/Poverty\\_chronic\\_diseases\\_SA\\_2001.pdf](http://www.agirn.org/documents/Poverty_chronic_diseases_SA_2001.pdf) 5/2-2009

to drink, or become problem drinkers<sup>27</sup>. The simplistic conclusion can be drawn that poverty and alcohol abuse in some cases are mutually reinforcing. It constitutes a simple logic, in the sense that a person drinks alcohol due to stress or multiple stressors, thereby losing out economically, in some cases decreasing chances of employment. This again causes more stress, again spending money on alcohol, thus ending up in a negative spiral. The use or abuse of alcohol can lead to some people having reduced coping skills and thereby a lower level of adaptive capacity. By drinking alcohol as a coping strategy, a short or long term one, social vulnerability is reinforced. Drinking to cope, some people continue the existing poverty and strained livelihoods that they are experiencing<sup>28</sup>. Nevertheless, there are usually winners and losers in all contexts. A different aspect of this link between poverty and alcohol is the owners of the shebeens in informal settlements. Having a shebeen, or brewing beer and selling it, are income generating activities. In this sense, one person's coping strategy or social adaptation measure indirectly leads to another person having a higher chance of increasing social vulnerability. According to DiMP (2008) the use of alcohol in informal settlements has also been associated with higher fire-risk, as people returning from shebeens attempt to cook, and often fall asleep from burning candles or paraffin stoves. In addition, high levels of alcohol consumption reduce levels of individual responsibility around open flames. In relation to this, it can be noted that awareness of fire-risk is touched upon later in this chapter.

## 5.6 Adaptive Strategies

As stated in the introduction, the first main research question aimed to find out how informants cope with and adapt to seasonal flooding as well as (extreme) climate variability. The coping aspects were discussed above, and this section focuses on the longer term strategies, i.e. adaptive strategies. Nevertheless, it may be discussed whether some of the measures are coping qualify as adaptive measures, due to whether or not the measures are planned or carried out as an immediate response. According to the definition presented in the theory chapter, adaptation is a fundamentally different process than coping, and includes

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<sup>27</sup> [http://www.chronicpoverty.org/pdfs/CPRC-UG\\_PolicyBrief1\(2007\).pdf](http://www.chronicpoverty.org/pdfs/CPRC-UG_PolicyBrief1(2007).pdf) 5/2-2009

<sup>28</sup> [http://www.chronicpoverty.org/pdfs/CPRC-UG\\_PolicyBrief1\(2007\).pdf](http://www.chronicpoverty.org/pdfs/CPRC-UG_PolicyBrief1(2007).pdf) 5/2-2009

adapting to climate variability and also climate change. Adaptations carried out by informants in this case may then best be described as anticipatory and proactive. These measures taken by informants point to long-term strategies and measures designed to improve well being over long time periods. Furthermore, the informants that had invested resources, both personal and economic, in adaptive measures seemed to have fewer problems with regard to winter rains and flooding. However, the temporal aspect may also be discussed, as long term in this context refers to one or a few years, and not decades. Adaptation on a policy level refers to a longer time period, and involves adapting to climate change and variability.

Adaptive strategies in Kanana were often linked to how long residents were planning to stay in the settlement. Although this was not a question in the interview guide, listening to informants and residents, it could be gathered that many people viewed staying there as only temporary, at least at the beginning of the stay. As one person (not an interviewed informant) indirectly said: “*You go from hero to zero*”. He characterized the situation he was in, as he had moved from KwaZulu-Natal<sup>29</sup> to Cape Town. His experience was that he was caught in the settlement, without having the possibility to move or go somewhere else. Nevertheless, there are numerous examples of measures that were taken by informants in terms of flood protection and prevention. In fact, there were many more measures and strategies applied than what was expected to be found.

Some of the informants had theories concerning the causes of flooding and accumulation of water, such as the airport (on the other side of the motorway) being responsible for the abundance of water in the area. To what extent this is influential or not is merely speculation, as the causes of flooding on the Cape Flats have been described previously in this paper. The majority of the informants replied that prevention was the main reason for making alterations to the house or to the ‘foundation’. An interesting social aspect with the various coping strategies and adaptations that are being used, is where people get the knowledge and the ideas to carry out these measures. About half of the informants that have applied adaptation measures replied that it was their own idea, and that they thought of it themselves. The other half replied that they got ideas from other people. These ideas were

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<sup>29</sup> KwaZulu-Natal is the region with the highest number of people living below the poverty line in South Africa, and additionally it has the highest HIV/AIDS prevalence.



acquired by talking to them, getting help from family or just observing other people and homes. Putting sand on the ground is also a strategy that requires a bit of planning and labour, and in some cases it is also a question of economy. The informants reported different strategies in order to get sand. Some took sand from the outside of the fence right next to the motorway N2, even though they were aware of the illegality in that action. Some residents had also put plastic and cement on top of the sand in order to prevent water from coming from the ground.

### 5.6.1 Combination of Measures

Informant number 18 was a woman who lived alone in the Waterfront area. She was originally from the Eastern Cape, and had lived in Cape Town for seven years and in two other informal settlements before moving to Kanana. She had lived in Kanana for four years and moved there due to social networks, as her friends and family also lived there. From the outside, one could not see that the dwelling was modified in any way, but inside there were quite obvious adaptations. It was a one-roomed dwelling, which was divided into two parts. The bedroom part had a slightly raised floor that separated it from the kitchen area. The kitchen part had a deep hole (approximately 60 cm) dug underneath the floor with planks covering it, and it was further covered with a carpet. The other half of the dwelling where the bed was located was approximately 20cm higher. There was no hole underneath this part, but there were pallets underneath the flooring, with planks on top. In addition, her fridge was raised with wooden blocks, and she would also put pallets outside the dwelling to step on during the heavy rains in winter. She did get help from a friend in order to carry out these prevention measurements. Her friend, who was an artisan, helped her with making drawings and structuring the house the way it is. She was a very determined woman, and stated that she had done all that she could do in terms of preparing for winter to come. It can also be mentioned that she did not work at the moment, and the main source of income was economic support from her parents, who lived in the Eastern Cape. Some of her adaptation measures are illustrated in the two following pictures:



Refrigerator raised with bricks. (Photo: Camilla A. Nestegard)



Two different types of flooring, kitchen in front and bedroom in the back.  
(Photo: Camilla A. Nestegard)

### 5.6.2 Dwellings on Stilts

In the Waterfront area, there were several dwellings on stilts, and four of the informants that were interviewed lived in a stilt dwelling. Building such a dwelling requires planning as well as the economic resources to provide the material. It is also labour intensive and requires skill to construct. In total, four informants lived in dwellings on stilts, standing from the

ground. One informant lived in a dwelling that had previously been on stilts, but had been lowered again. One informant, who will be referred to as ‘The Carpenter’, presents an example of living in and constructing a dwelling on stilts. This informant was a carpenter, and had designed and built the dwelling according to the conditions on the site. He had no options but to move to Kanana, and the only available plot was at Waterfront. Before he built the house, he stated that he made an assessment of the plot. There was a furrow there, full with stagnant water. Accordingly, he removed the grass so that the water drained and the sun could dry out the land. He then drew the plans for the house, bought poles, and built the house. It was the only dwelling in the area with a ‘pyramid’ style roof, and the carpenter asserted that he had done all his best to improve it (the plot and dwelling) for human habitation. The following photo illustrates the dwelling:



Dwelling on stilts. (Photo: Camilla A. Nestegard)

The Carpenter brought up an issue that is linked to the wider issue of social learning. He claimed that he had a conversation with his neighbour and drew plans for a house on stilts for him. When the neighbour had enough money, the Carpenter provided the drawings, and helped him build a house on stilts. In contrast, when I spoke with the lady of the neighbouring household, she the Carpenter had copied her idea. She said that she and her husband were the first to build a dwelling of that kind at the Waterfront, and that it was her idea originally. The Carpenter also mentioned that other people had copied the stilt-idea from him. Who is right or wrong in this case is not really relevant, it is more important to

highlight that cooperation seemed to be lacking, even between neighbours. However, the Carpenter had a sensible account of planning and building, as well as carpentry skills, and his dwelling was in good condition. He had not experienced any problems due to flooding, because the floor was sufficiently raised. However, he stated that the water stagnated underneath and in front of the house, and it had a bothersome smell. When the area in front of the dwelling was full of water, they put beer crates to step on.

### 5.6.3 Other Strategies

Many of the informants stated that putting sand on the ground was a way of preventing the water from standing inside the dwellings. In fact, over half of the informants stated that they had used sand, or sand and cement to prevent flood water inside the dwelling. One informant stated that he had used leftover building materials and rubble to level the ground before building on the plot. In many cases, informants covered the sand with cement, and put linoleum or carpets on top. The Boss model was mentioned as an example of an individual with personal resources and a high level of self efficacy. There were also other informants that exhibited this will and capacity to make the best out of their life situations, despite the struggles and challenges. One informant described himself as a soldier, “*ready to fight the water every time*” (Informant 6).

Another informant was quite new in the settlement and she had only lived there for one year, including one winter season. During the winter, she had experienced several losses due to flooding, monetary losses in terms of damaged furniture and interior, as well as experiencing health problems. She was looking for ideas to protect the dwelling from the water. She had seen adaptations made by other people, and she had considered to use pallets to raise the floor, or cementing the floor. However, she was worried that the wooden pallets would rot. In addition, she stated that she did not know how to go about it, and wanted to contact ‘an expert’ in order to help her. The economy was also an issue, as she considered the pallets to be expensive. When she was interviewed, she had not done any preparations for winter, because she was not in the financial situation to do so. Though, she was planning ahead and was prepared to invest in adaptation measures in order to prevent further losses.

One informant was in the process of preparing for winter at the time when he was interviewed. He was building a wooden walk-way from the entrance to the dwelling and



across the yard. He stated that in winter, there is water everywhere, and he used to have pallets in the yard. Though, as he considered them too expensive, he chose to build a walkway made from planks instead. He stated that it will also rot, but that it will be cheaper to replace. A photo of the walkway follows:



Wooden walkway. (Photo: Camilla A. Nestegard)

This informant said that he got the ideas to carry out adaptive strategies from the place where he worked. Colleagues taught him how to prevent and deal with the water problem. However, he was very interested in talking about other issues in the settlement, particularly crime and sanitary conditions. He was about to dig a hole to be used as a toilet next to the dwelling, but he was despairing because of the close proximity, and the kitchen would be very close to the pit latrine. He moreover said that relieving oneself in private was a question of dignity. The household could go elsewhere in Kanana and use a bucket system toilet, or break the concrete slabs in the fence between the dwelling and the N2. Further, he said that they had no choice but to go right next to the motorway, despite all the cars passing by. Crime was a barrier to relieving oneself outside at night. The informant stated that even grown men could not walk alone, due to the high number of robbers with guns and knives.

## 5.7 Health Aspects

*“The children are suffering.”* (Informant 16)

*“Most people get diagnosed with TB”.* (Informant 3)

These quotes illustrate the perspective of some informants on the health impacts resulting from living with poor environmental conditions. Many of informants mentioned the hazards in the informal settlement influencing health and health risks, and eight of the informants reported disease and poor health as a result of flooding and damp conditions in winter. Flu and colds, respiratory disease, infections and tuberculosis were mentioned in particular by the informants. Several also reported rashes and skin conditions linked to the degraded environment. Few (2003) points out that one of the most significant, but difficult to quantify, effects of flooding is the impact on health. He furthermore refers to a study conducted in poor areas in Manila, the Philippines, where it is suggested that floods expose people to respiratory infections, skin allergies and gastro-intestinal illnesses. These types of disease are the same as mentioned by the informants in Kanana. The DiMP (2005) report referred to previously in this chapter also states that health concerns related to impacts of flooding requires further studies. These types of impacts or losses linked to floods, is what is described as secondary intangible losses, as well as indirect intangible losses. Both categories refer to impacts that are linked with ill-health and socio-economic effects of flooding.

The closest and most accessible clinic that the residents of Kanana could use was referred to as *“the graveyard”* by one resident in Kanana. Hardly anyone mentioned HIV and AIDS when talking about the health aspects linked with living in Kanana. Though, several of the informants talked about TB and other infectious diseases<sup>30</sup>. Whether the lack of mentioning HIV/AIDS is due to the stigma surrounding the disease or due to other reasons is unknown. Though, there is a stigma surrounding being HIV positive, and many people do not get tested out of fear, despite numerous health services and clinics that offer free testing. Many of the informants and other people that we talked to were very aware of

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<sup>30</sup> It can be noted that the TB bacteria is in some cases resistant, and one may be susceptible to get TB despite vaccinations. I was advised to avoid spending too much time inside dwellings, so to avoid becoming infected. Personal communication with Kevin Winter, February 2008.

the health risk associated with living in a slum area like an informal settlement, without proper sanitation and little or no access to toilets. One person mentioned that there had been doctors there and given them information concerning a kind of bacteria in the air, coming from the bucket system toilets, and probably also other places in the open where people relieve themselves. This particular airborne bacterium makes people sick, especially children. This corresponds with many of the informants stating that the children often have stomach related illnesses, sore tummies and diarrhoea.

The frustration concerning the health and disease situation, especially with regard to the lack of sanitation can be illustrated with these quotes:

*“The bucket system for example was supposed to be eradicated before the end of 2007, but it did not happen. The government promised us now and again that they will eradicate the bucket system in 2008. Our children are suffering from diarrhoea. There is one doctor that told me that the reason that they have diarrhoea is because of a bacterial infection from these toilets.”* (Informant 19).

These quotes also reflect the quotation at the beginning of the chapter, considering the government’s role in providing adequate sanitary conditions, as well as a feeling of being neglected in general. Not only is it a question of dignity, but it is also of significance to public health aspects. One other informant stated that they had access to a bucket system toilet that they shared with another household, so that seven people in total used the toilet. It was not always emptied on time, and she stated that there were small worms crawling around on the toilet, and that she had to brush them off when she was finished (Informant 9). In addition, the smell of sewage was very strong, and on hot days she stated that the smell of sewage permeated the air.

These pictures illustrate the sanitary conditions:



A locked up bucket-system toilet. A dug pit used as toilet, right next to dwelling.  
(Photos: Camilla A. Nestegard)

Poor sanitary conditions were also observed elsewhere in the settlement. Located at one edge of the settlement was a building that consisted of flats. It was located right next to the road separating Kanana from the blocks of flats/low cost formal housing in Gugulethu. There had obviously been electricity and flush toilets previously, but those facilities were no longer in use. At the time of the visit, the building was completely dilapidated, and the people living there were, in my interpretation, squatting. Due to the lack of functioning flush toilets, the residents there used the bucket system toilets instead. The building itself was completely dark as there was no electricity connected, and it was only the daylight that lit up parts of the corridors. It shaped like a circle with a courtyard in the middle. It consisted of three floors, and had two main staircases. The courtyard was very heated by the sun, and some of the residents there explained that the pipes were broken so that sewage actually came up in the middle and stagnated there, giving off an unbelievable stench. There was nothing the residents in this building could do, in other words no adaptive strategies that could improve the conditions there.



## 5.8 Risk Awareness

Most of the informants expressed that they were aware of the hazards and risks associated with living in an informal settlement. Several of the informants stated that they had left children behind in the Eastern Cape, as they did not want to expose them to the situation and the environment that Kanana presents. One informant said that his two children could not stay there, in an informal dwelling with the dampness inside. Another informant has made the same choice; she had two boys but did not want to bring them to Kanana and Cape Town, as she was worried that they would become sick there. In addition to the flood risk and health risks mentioned, some of the informants mentioned fire risk as an important stressor.

Several of the informants mention the risk of fire, and one informant in particular has moved from Langa in order to avoid that specific risk. He claimed that it is safer in Kanana, because it is not as crowded there as in Langa. He also mentioned that there is more space between the dwellings in Kanana, and as a result the fire-risk is not as high. Another informant said that he wanted to wait until the rains started before he bought plastic to cover the roof. *“If I cover it now, it will be damaged by the sun, and if there is a house burning, it (the plastic) can also easily catch fire”* (Informant 26). This awareness of fire-risk is perhaps related to the Joe Slovo fire in May 2005, a disaster that destroyed approximately 3000 informal dwellings and left 12 000 people homeless<sup>31</sup>.

It is also worth noting one informant’s perspective regarding which people are vulnerable and prone to disasters. The first informant that was interviewed had the opinion that the people that have not made any adaptations to their dwellings are the ones that normally appear on TV during the bad rains and winter floods. Another informant mentioned that he did not become sick, because he had adapted to the environment. He stated that it is the newcomers that become sick. Though, these are theories of why people struggle, and they also provide a perspective on how some informants reflect upon people in similar situations as themselves.

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<sup>31</sup> [http://en.wikipedia.org/wiki/N2\\_Gateway](http://en.wikipedia.org/wiki/N2_Gateway) 15/2-2009

## 5.9 Barriers to Adaptation

*“For many people it is a financial issue, because they are jobless”* (Informant 21).

One can ask what the reasons are for the lack of adaptations, or insufficient coping measures. There are different explanations, and this thesis provides some insights, although by no means does it aim to make generalised conclusions regarding this question. However, the informants were asked what they thought about other people’s adaptations, or lack of adaptations. Economic resources is a clear factor, also due to unemployment, as stated by the informant above. Many people cannot afford to buy materials, sand, or whatever they need in order to prevent floodwaters and damage to dwelling and interior. Several times it was stated by the informants that buying materials was expensive. The history of South Africa has been introduced in the background chapter, also providing an understanding of the history of inequality, including the existing economic apartheid. According to Adger (1999), “poverty is an important aspect of vulnerability, because of its direct association with access to resources which affects both baseline vulnerability and coping from the impacts of extreme events” (1999, 252).

A few people claimed that it was the lack of knowledge that was a reason for not making adaptations, and two people mentioned laziness as a reason. A possible lack of knowledge is interesting to regard cooperation between residents. Most of the informants fended for themselves, and only one reported that he worked with his neighbour in order to dig a trench to lead the water away from the dwellings. Some informants mentioned that other people might not experience flooding, therefore there was perhaps no need to make adaptations. One person also mentioned that being a woman (living alone) also might be a barrier to adaptation. However, informant 18, described earlier, showed that this was not a barrier to her, as she had acted and carried out adaptive strategies that increased her capacity to respond to flooding. One informant mentioned that maybe people have low ceilings in the dwelling, and as such, there is no room to raise furniture, cupboards etc with bricks. In addition, it was also stated that one cannot know where the water will leak in from the roof before it starts to rain. Only then can one identify the problematic areas and take action, at least in terms of preventing heavy or torrential rains to leak in. Another suggestion is that people fail to make adaptations because of the lack of infrastructure in the settlement, as there are no roads to for the trucks to bring sand to peoples dwellings.

### *Summary*

This chapter has discussed the empirical data collected during the fieldwork in Kanana informal settlement. It provides perspectives, actions and descriptions of the informants, on how it is to live in an informal settlement, and what responses they carry out to meet the stressors that they are faced with. Coping with and adapting to flooding is the main focus, but just as important are the linkages with the other risks and stressors. The Boss model was discussed as an example of an individual with personal resources, yet the findings reveal that most of the informants are active agents, and not stuck in inertia. The range of coping measures and adaptive strategies show that informants make the most of individual resources and capacities, to meet both the everyday stressors and the shocks manifested as floods in winter. However, the health aspects discussed show that these conditions are results of collective inequality, and that it is difficult for the informants to do anything about that situation, except cope by digging pit latrines or using the bucket system toilets. Moreover, individual poverty stands out as a clear and most important barrier to adaptation. Though, the empirical findings show that many of the informants are reflecting upon issues associated with living in hazardous conditions, and that they do what they can to improve their livelihoods. They are struggling, both in a positive way by adapting to the extent possible, but also in a negative sense by experiencing stress such as adverse health impacts.

## **6. Analysis and Conclusions**

This chapter will provide an analysis of the linkages between the theoretical perspectives and the empirical results, and present the main findings based on the empirical data collected through fieldwork and qualitative interviews. It will also present conclusions and point to aspects that require further research.

### **6.1 Relating Theory and Data**

The data collected during the fieldwork lead to several findings and results that are important to highlight. I would like to emphasise three major points: 1) the link between poverty and social vulnerability; 2) the importance of multiple stressors and the notion of chronic risks and disaster, and 3) the role of informants as active agents in adapting to seasonal flooding while coping with chronic risks. The informants in the case study live in a hazardous environment, and they are physically very vulnerable due to the location and site of the settlement itself. Risk is a result of hazard and vulnerability combined, and disasters are a result of interactions between vulnerability and hazard. With regard to flooding in Kanana, the hazard is linked to remains of wetlands and a high water table. In addition, there is a lack of sufficient drainage possibilities, often due to rubbish and debris obstructing channels and culverts. Social vulnerability is most obviously manifested by the informal dwellings, many of poor quality and unable to withstand floodwater. These factors together increase the flood risk to the informants in this case study. The outcome of extreme climate variability is thus an urban flood disaster to the people affected.

The first main point that I would like to emphasise are the linkages between poverty, inequality and vulnerability. As discussed, vulnerability and poverty are intrinsically linked. The informants in this case study are exposed to stressors due to the environment they live in, caused mainly by inequality as a result of political history. The inequality is thus a result of what was described as structural vulnerabilities. On the individual level, lack of financial resources is clearly both a daily stressor and an important hindrance to adaptation. Financially, many of the informants are unable to respond in a desirable manner, and they continue to live with flood risk of varying degree. As stated, vulnerability and poverty are

not synonymous, yet the empirical findings show that lack of financial resources is an important constraint both to preventing and reducing impacts of flooding. This lack of coping measures and adaptive capacity increases the likelihood of adverse health impacts, which again may influence a person's ability to work or get employment, increasing social vulnerability. Moreover, the importance of unemployment is directly linked to that of poverty, as urban livelihoods are commodified, and as such constrains the possibility of buying materials or goods needed for adaptive and preventive measures. However, income generating activities that were part of the informal economy were observed and recognized as responses to unemployment.

Social vulnerability has been stressed in this thesis, both in terms of defining a starting point in order to facilitate adaptation and enhance coping capacities, but also as a starting point in order to address the underlying causes of vulnerability. The informants that were interviewed showed varying degrees of vulnerability, but they were all vulnerable in some sense, particularly with regard to the health risks. The risks that may cause adverse health impacts are extremely difficult to address on an individual level, and the onus rests on the public administration to improve infrastructure and sanitary conditions. Social vulnerability is also linked to individual poverty, as the residents and informants that live in Kanana come to or stay in the settlement because they had 'no choice', as it was stated.

The second main point is the importance of different types of multiple stressors on urban livelihoods. These have been identified, and the most important are; polluted environment and environmental hazards, the commodification of urban livelihoods directly linked with unemployment and labour, health risks and concerns, and social fragmentation, as well as significant flood risk. The informants in the case study are living with everyday risks, characterised as a chronic disaster by Pelling (2003), yet at danger of shocks such as flood disasters (and fires). Flooding exacerbates the effects of the everyday stressors, particularly in terms of health impacts. In order to reduce impacts, the stressors need to be addressed to the extent possible, and not merely with emergency responses and immediate relief.

The third main point is that informants exhibit a role of active agents in adapting to and coping with seasonal flooding, while coping with chronic risks. As mentioned, Pelling (2003) suggested that the low level of everyday risks could have the effect of reducing

people's willingness to prepare for the possibility of catastrophic disasters. However, the informants in this case study did in most cases show initiative and capacities to prevent possible disastrous outcomes of flooding. The Boss model was used as an example, in terms of being an individual with a high level of self efficacy and personal resources. Also, he focused on self awareness and being able to stay focused and to plan ahead, instead of falling into a state of resignation and waiting for help. The Boss model represents an example of awareness surrounding social issues such as alcoholism, and also corruption, but so did some of the other informants.

Adaptive capacity referred to as a starting point by O'Brien et al. (2004) pointed to the present ability to cope with and respond to stressors and secure livelihoods. All but three informants stated that they had made some form of adaptation such as stilts, pallets, sand/cement or a combination of measures. The temporal frame was of importance, and most of the adaptations were anticipatory, like building a dwelling on stilts, or investing money in materials to prepare for winter and flood risk. Some were also reactive, like putting beer cases or concrete slabs to walk on outside the dwellings, although this latter response is rather a coping strategy than an adaptive strategy. The most important point to highlight is that the informants that exhibited higher adaptive capacity were also less vulnerable to shocks. Nevertheless, other stressors such as unemployment, queuing to get water, and hazards impacting health and personal safety were still of concern.

The title of the thesis also illustrates how the residents in Kanana experience life in an informal settlement and in contemporary South Africa. 'We are struggling' can be interpreted in several ways. The first and perhaps most likely interpretation bears connotations of hardship, struggling to make ends meet, and to meet every day as a new battle. On the contrary, 'we are struggling' could also imply active responses and capacity to cope with difficult conditions, and living in an environment that poses adversity and challenges on an everyday basis. The notion of struggling thus implies both the role as victim, but also as an active agent, influencing his or her own life situation to the best extent possible.

### 6.1.1 Transferability of the Case Study

As stated, the number of people living in poor urban environments and slum conditions is increasing, and many people experience similar daily stressors in addition to climate related shocks. The findings and understandings gathered from this case study may be transferable because the case study, according to Thagaard (2003), investigates an empirical limited unit, and has a more generalised purpose than descriptive studies that are based on several methods. Hence, case studies are linked to research projects that are particularly pointed to knowledge that goes beyond the unit that is researched. Thagaard (2003) additionally emphasises the importance of conducting a case study in a manner that will provide a basis for transferability. The case study that this thesis concerns provides specific and detailed knowledge of how informants cope with chronic disasters. Nevertheless, slum conditions and (chronic) poverty are conditions that exist in numerous urban areas in developing countries. Combining specific knowledge from a local context with general knowledge could then contribute to an increased understanding of how people in similar situations cope with and adapt to climate variability and change in the context of living with multiple chronic stressors.

Natural generalization was mentioned in chapter four, and involves recognizing the similarities of objects and issues in and out of context (Stake 2000). In an urban livelihood, labour and housing are regarded by many as two of the most important assets. This is significant with regard to slums and this case study, as informal dwellings and concerns regarding unemployment are two aspects that stand out when looking at the empirical data. Although described as shacks etc, the informal dwellings are people's homes, and represent an important asset, in some cases the most important asset in an urban livelihood. Damage by flooding (or fire) may be devastating, and be felt like a disaster to the household or person affected. Thus, it is important to address the notion of chronic disaster and flood disasters as closely correlated with regard to residents in slums or urban poor environments where residents experience the same risk types. One may therefore use natural generalization as a means of recognizing similarities between this case study and a case study conducted in a similar context.

## 6.2 Conclusions

The research objective of this thesis was to examine coping strategies and adaptive capacity in response to environmental shocks and stressors linked to climate variability and climate change. In order to do this, it was necessary to provide a background for the research and case study, both in terms of overarching structures as well as a theoretical framework, and furthermore point to findings in the empirical data. The social characteristics of vulnerability have been stressed throughout the thesis, and particularly the concept of chronic disasters and multiple stressors, which are intrinsically linked. The main research questions have been examined, drawing on fieldwork from the informal settlement of Kanana in Cape Town, South Africa. Empirical findings are based on selected households and informants experiences and struggles.

The informants show multiple ways of responding to and coping with seasonal flooding and extreme climate variability. The collected data show that majority of the informants act within their capacities to carry out adaptive measures to prevent impacts and possible devastation. The capacities are manifested as planning and carrying out adaptive strategies in terms of alternating dwellings and using existing economic resources in order to prevent floodwaters from destroying their dwellings, which are assets of major importance. However, the research also shows that other stressors influence the livelihoods, particularly with regard to unemployment, and health impacts due to lacking or unsatisfactory sanitary conditions. The most important stressor and constraint to adaptations and coping capacity is poverty, as the lack of financial resources represented a major barrier to adaptation in a commodified urban context.

The notion of chronic disasters has been referred to frequently in this thesis, and through the empirical findings I have shown examples of how some households experience this. The influence of multiple stressors increase vulnerability of households, and is linked to inequality and vulnerability. Structural vulnerabilities shaped by the history of inequality are of importance when discussing people that are in the same situations as the informants in this case study. The situation that many of them are in, is a product of social conditions, as pointed out by Hewitt (1997). Crime and violence is a stressor that influences in various ways, although not particularly discussed in the thesis. Nonetheless, the importance of not



being able to access a toilet in the middle of the night due to crime is definitely a point worth noting.

As stated previously, Pelling et al. (2003) assert that while physical phenomena are necessary to produce a natural hazard, the translation into risk and potential for disaster is contingent upon human exposure and lack of capacity to cope with negative impacts that exposure possibly brings to individuals or human systems. In other words, a pivotal point is the degree of vulnerability and the degree of adaptive capacity. Accordingly, in order to reduce the risk of disasters, vulnerability must be addressed, as hazards in many cases are difficult to control. However, reducing social vulnerability requires an understanding of how people experience and interpret risks and hazards. This case study has provided detailed information on how selected informants and households do cope with chronic stressors and adapt within their capacities.

### *Constraints to adaptation*

There are constraints to adaptation on several levels, institutional, national, local and individual. An important question that was raised in this thesis was how developing countries can approach the challenges related to impacts of environmental and climate change. To address these challenges on a larger scale, it is necessary to point to issues such as the 'brain drain' that affects many developing countries. Human capital flight has dire consequences in many ways, for example regarding public health aspects due to the lack of doctors. The lack of knowledge was also pointed out by one informant, who stated that "*We have a problem in Africa because we lack information*" (Informant 19). In addition, the distance between developing and developed countries is of importance, both in terms of approach to future challenges, but also with regard to development in general. As development is often equated with economic growth, sustainable development is in many cases an oxymoron. An example of this is that developed countries outsource polluting production activities due to laxer legislation in developing countries. This increases economic opportunities at the same time as degrading the environment.

Many developing countries do not have a strong enough political and economic authority in global governance to influence decisions that directly affect both the causes and effects of global environmental change. In addition, developing countries also face challenges that are pressing, such as South Africa with the HIV/AIDS pandemic, a

substantial poor population, insufficient public resources, and very high crime and violence rates. However, South Africa is, as stated, in many ways both a developing and a developed country. It has renowned research institutions, and one way of increasing the capacity to address future challenges related to environmental and climate change, would be to prevent human capital flight.

Barriers to adaptation are also evident on local and individual levels. As this thesis has emphasised, poverty is one of the most important constraints to *individual* adaptation in developing countries, and this has also been shown and reiterated through the case study of Kanana informal settlement. This may be linked to human security related challenges, such as urban food security. In urban environments, there are additionally little or no opportunities to draw on natural resources for food and for survival for the poorest of the population, let alone to face challenges such as increased risk due to extreme events. According to Adger (1999) inequality affects vulnerability directly through constraining the options of households and individuals when faced with external shock and indirectly through links to poverty and other factors.

Some questions can nevertheless be raised with regard to the findings of this thesis, such as why people exhibit different levels of social vulnerability when they are equally exposed to hazard and risk. Some people sit back and wait, while others take matters into their own hands, thus increasing resilience. It is very important to highlight that most of the informants in this case study are capable, motivated, and make the best out of their situation. They use whatever they have and do what they *can* do. They are not victims as such, yet they are living in a hazardous and risky environment, determined by structural, socio-economic and socio-political conditions. On the one hand they are victims of collective poverty and inequality, on the other hand they are active agents coping, adapting and getting by.

### *The way forward*

Adger (2001) claims that mitigation is an activity that must take place at the global scale in order to be effective. He argues that adaptation, by contrast, can take place at a number of scales, from local to global, addressing climate related problems at that particular level and making use of capacities available to that group of actors. IPCC (2007) states that adaptation will be necessary to address impacts resulting from the warming which is already

unavoidable due to past emissions. Although there has been a shift in focus from technical solutions and the technocratic paradigm to a socio-economic focus in a vulnerability perspective, this shift of focus needs to translate to an even greater extent from the research communities and on to the institutional level. The focus must be pointed towards vulnerability reduction, as well as relating this to disaster risk reduction. Thus, as the number of extreme events such as floods is expected to increase, there is not only a need to develop adequate adaptation measures, but to identify and attempt to eradicate the root causes of vulnerability.

Several argue that the global economy contributes to inequality and thereby vulnerability, as well as sustaining the already existing unequal relationship (Bankoff 2004, Wisner et al. 2004). This relationship needs to be addressed in the context of global environmental change, and not only with regard to politics, economy or development. Climate change will affect all humans regardless of stage of development, level of vulnerability and adaptive capacity, on a global down to a local and individual level. The impacts will in many cases be directly linked to human rights and human security, in terms of basic needs such as food and clean water, but also rights such as access to health care and the right to education. Urban livelihoods are also likely to experience increased stress as a result of the financial crisis, for example in terms of rising food prices or increased transportation costs. Moreover, increased urbanization combined with projected sea level rise that affects low-lying urban areas, presents challenges that doubly afflict such cities. This requires research and cooperation from both the natural and social sciences, as it is related both to further predictions regarding sea level rise, but also migration patterns and causes of urbanization.

It is particularly important to focus much of the attention to those who are most vulnerable, and exhibit the lowest adaptive capacity. But, describing people as vulnerable is not sufficient with regard to assessing and developing appropriate measures in order to reduce vulnerability and facilitate adaptation. One must differentiate between different interpretations of vulnerability in order to avoid miscommunication. The link between disaster risk reduction and adaptation to extreme events related to a changing climate requires further attention, particularly in terms of addressing the social and socio-economic factors that influence both vulnerability and adaptive capacity. As pointed out by O'Brien et al. (2008), improved coordination between disaster risk reduction strategies and climate

change adaptation is needed. The IPCC will hold a Scoping Meeting in Oslo, Norway in March 2009, bringing together the two communities working with climate change adaptation and disaster risk reduction. This represents an important step in the right direction, in terms of linking research and practitioner communities and developing common frameworks for future research and action. However, the underlying issues of social vulnerability still need to be addressed and investigated within the context of multiple stressors. As this thesis makes clear, it is not only the extreme events that receive media attention that are a concern; people are struggling with chronic risks every day, and these “everyday disasters” must also be addressed.

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## **Enclosures**

### List of informants and date of interview

Informant 1, male. 1/3-2008.

Informant 2, female. 1/3-2008

Informant 3, male. 1/3-2008

Informant 4, female. 1/3-2008

Informant 5, male. 1/3-2008

Informant 6, male. 8/3-2008

Informant 7, male. 8/3-2008

Informant 8, female. 8/3-2008

Informant 9, female. 8/3-2008

Informant 10, male. 8/3-2008.

Informant 11, female. 9/3-2008

Informant 12, female. 9/3-2008

Informant 13, female. 9/3-2008

Informant 14, male. 'The Carpenter' 9/3-2008

Informant 15, male. 9/3-2008

Informant 16, male. 9/3-2008

Informant 17, male. 10/3-2008

Informant 18, female. 10/3-2008

Informant 19, male. 10/3-2008

Informant 20, male. 15/3-2008

Informant 21, male. 15/3-2008

Informant 22, female. 15/3-2008

Informant 23, male. 15/3-2008

Informant 24, male. 'The Boss model'. 16/3-2008

Informant 25, female. 3/4-2008.

Informant 26, male. 3/4-2008

# Interviewguide

## Interview Guide

**Households** (preferably head of household as respondent)

Location, date.....

1. Name.....
2. Age.....
3. Male/Female
4. Place of birth.....
5. Place of present residence.....
6. Number of people in household  
.....  
.....  
.....
7. Type of dwelling.....
8. Type of area and ground, wetland, dryland, sand?  
.....
9. Is the dwelling on stilts/raised? .....
10. What access does the household have to clean water?  
.....  
.....

11. How long have you lived here, and why did you come here?

.....  
.....

12. What is the main source of income in the household?

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.....  
.....  
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13. Why did you choose to raise your dwelling from the ground? (build it on stilts)

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.....  
.....  
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14. How long have you lived in the dwelling as it is now, and what is different from earlier?

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.....  
.....

15. Where did you learn it from, or get the idea from?

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.....  
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.....  
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16. In your opinion, why do you think that there are few people that have built their dwellings the way you have?

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17. Have you ever experienced damage on dwelling, property or health issues due to heavy rains, floods or winter storms? Please explain what happened:

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18. If damage was experienced, how did you cope afterwards? Savings? Insurance? Help from local government, organisations, family, friends, neighbours?

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19. If household was affected by rains or flood, what chances did you have to prepare before it happened?

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20. Did you have economic losses due to this type of event? If yes, why?

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21. Is there anything you would like to add or talk about in relation to the above?

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