Creating a model in Community Based Disaster Risk Management for informal settlements. A case of Kanyama Settlement, Lusaka - Zambia

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DECLARATION

I declare that: ***"Creating a model for Community Based Disaster Risk Management for informal settlements. A case of Kanyama, Settlement - Lusaka, Zambia"*** is my own work, that sources used or quoted have been indicated and acknowledged by means of complete references, and that this thesis was not previously submitted by me or any other person for degree qualification purposes at this or any other university.

04/12/2014

…….. ……

Signature Date

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ABSTRACT

Informal settlements provide residence to over fifty percent of the urban settlers in many developing nations. These settlements have gained notoriety as hotspots for exposing citizens to a variety of environmental hazards and disasters. Informal settlements are commonly neglected by governments that do not provide them with basic services safe water, adequate sanitation and efficient waste management systems. Furthermore, settlements are often located on fragile lands that are prone to flooding, hilly and more often than not close to heavy industries where pollution and indiscriminate waste disposal is rampant. The communities of informal settlements generally earn their livelihood with unauthorised or low-wage casual employment. This includes street vending, illegal quarrying and domestic work among other things.

Kanyama is an informal settlement located in the western direction of Lusaka, the capital of Zambia. The settlement's topographical and hydrogeological characteristic is that of a flat terrain with an impervious dolomite rock formation below it. This makes it one of the worst flood-prone areas in Lusaka. The historical profile of the settlement reveals that Kanyama was part of the Chiefdom of Chief *Mwalusaka* of the Soli tribe of which the city was name as Lusaka. The land was not suitable neither crop production nor human settlement due to the presence of rocks. However, with the increased pressure for land to settlement, Kanyama attracted immigrants from rural parts of the country and developed into an illegal settlement to become one of the biggest informal settlements in Zambia today.

Until 1996, when the government came up with a programme to upgrade informal settlements, Kanyama was an illegal settlement with no mandate from the government to offer basic services to the area. The settlement has undergone rapid urbanisation since 1991 with migrants coming from the rural parts of Zambia and other urban centres. With government following a policy of liberalising economy, companies were privatised. Privatisation led to subsequent job losses in the mines and in the state-owned companies. The Zambian economic management was diversified and developed in a haphazard manner with no physical and land use planning.

Residents of Kanyama are exposed to disaster risks, especially flooding, that is caused by the impervious dolomite rock and the lack of proper drainage. Accessing safe water is a big challenge. The members of the community depend upon hand dug shallow wells and they use pit latrines and open spaces. The settlement gets flooded nearly every rainy season. This causes outbreaks of cholera and dysentery. Flooding leads to houses collapsing or being submerged which seriously disrupts the functioning of the community. While natural hazards such as floods are largely unavoidable, they only become disasters when communities' coping mechanisms and capacities are exceeded and they cannot manage the impacts (IFRC, 2009:7). Kanyama residents have at times been so badly hit by flooding that the government, through the Disaster Management and Mitigation Unit (DMMU) had to relocate victims to safety outside Kanyama. Soon after the floods, however, the community returns to their usual flood-prone area. CARE International Zambia became involved in assisting vulnerable communities in the Kanyama settlement since 1992 by invitation of the Government of the Republic of Zambia. Interventions included provision of safe water and sanitation, solid waste management, drainage system construction and rehabilitation, capacity building of community structures and community participation in developmental programmes.

The aim of this thesis is to create a model for Community based Disaster Risk Management (CBDRM). Interventions from projects implemented by CARE International, the government through Disaster Management and Mitigation Unit (DMMU) and the role played by the community are reviewed. This research seeks to answer several research questions such as why communities at risk choose to continue living in unsafe settlements despite facing numerous hazards. Furthermore, the vulnerabilities of the settlement and the risks of being exposed to disaster in Kanyama will be analysed. A comparison between the reactive approach of the emergency response and the proactive, community based approach by CARE International Zambia is presented. The research is based on the theory that ineffective governance and the lagging in the implementation of legal frameworks and policies have contributed to the failure of government to manage disaster risks sustainably. Research shows the most effective way to manage disaster risks is to involve the community in identifying and analysing their vulnerability and capacity to carry out disaster reduction interventions.

The analysis of interventions was done by reviewing project reports by CARE and interviewing local leaders and members of the Ward Development Committees,

Resident Development Committees and Zone Development Committees (WDC, RDC and ZDC). Community members and staff involved in the implementation of these projects were also interviewed. CARE International's community based risk reduction approach had a greater impact on the community than the government's top-down approach. The model CBDRM approach puts the responsibility in the hands of community while working hand in hand with the community at risk.

The model CBDRM approach starts by empowering the community with an understanding of the conceptual framework of the management of disaster risks and hazards. The capacity of the community has to be built to understand the disaster risk management process holistically. Secondly, the profile of disaster risks and hazard has to be identified and developed. The third step is the involvement of the community in Disaster Risk Reduction (DRR) interventions. This model premises on active community participation to reduce the vulnerability and exposure to disaster risks. It involves participatory approaches in the planning and implementation of DRR activities. Lastly, the legal framework of the country has a special role in providing guidance to the entire implementation process and the evaluation of DRR intervention.

If communities develop a dependency syndrome where perpetual receivers of relief become unwilling to initiate activities on their own to improve their well-being, it may lead to failure of the community to appreciate their capacity and their own resources for intervention.

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Acronyms

ADPC	Asian Disaster Preparedness Centre
CARE	Cooperative of American Relief Everywhere
CBD	Central Business District
CBDRM	Community based Disaster Risk Management
CBE	Community based Enterprises
CDM	Comprehensive Disaster Management
CEM	Comprehensive Emergency Management
CSO	Central Statistical Office
DMMU	Disaster Management and Mitigation Unit
DMTC	Disaster Management Training Centre
DRR	Disaster Risk Reduction
DPPH	Department of Physical Planning and Housing
ECZ	Environmental Council of Zambia
GPS	Geographical Positioning System
GRZ	Government of the Republic of Zambia
HFA	Hyogo Framework for Action
IFRC	International Federation of Red Cross and Red Crescent
ISDR	International Strategy for Disaster Reduction
LCC	Lusaka City Council
LWSC	Lusaka Water and Sewerage Company
MU	Mulungushi University
NGO	Non-Governmental Organisation
OFDA	Office for Foreign Disaster Assistance
PROSPECT	Programme of Support for Poverty Elimination and Community Transformation
PPURSS	Promoting Peri-Urban Sanitation Services
PUSH	Project Urban Self-Help
RDC	Resident Development Committee
SPSS	Statistical Package for Social Sciences
SPURRZ	Strengthening Peri-Urban Risk Reduction in Zambia
UNDP	United Nations Development Programme

UNEP	United Nations Environment Programme
UNISDR	United Nations International Strategy for Disaster Reduction
USAID	United States Agency for International Development
WASH	Water Sanitation and Hygiene
WDC	Ward Development Committee
ZEMA	Zambia Environmental Management Agency

CHAPTER 1:
RESEARCH ORIENTATION AND FOCUS

1.1 INTRODUCTION

The number of people living in urban areas will account for more than 50 percent of the total population by 2020 as a result of the current rate of population growth, particularly in Africa and Asia (UN, 2012; Hunt and Watkiss, 2011). Rapid urbanisation has become a global problem faced by many developing countries. These countries do not have sufficient resources and the capacity to provide the required basic services and facilities for their people (Pelling *et al*., 2009:3). The adverse effects of rapid urbanisation have been attributed to rural to urban as well as urban to urban migration (UNFPA, 2007:1; Beall *et al*., 2010:187).

In sub-Saharan African countries, the effects of rapid urbanisation are manifested through a significant increase in the number of informal settlements. These settlements are characterised by overcrowding and spontaneous substandard construction. Consequently, government finds it very difficult to provide services such as good roads, drainage systems, safe water and adequate sanitation facilities (LCC, 2008: 25). Informal settlements have since become hotspots for disaster risks for residents in urban communities (Pelling and Wisner, 2009).

This study was initiated as a gesture of appreciation for the engagement between CARE International Zambia and Mulungushi University (MU) Disaster Management Training Centre (DMTC) where the researcher is employed (see Appendix A).

1 .2 ORIENTATION

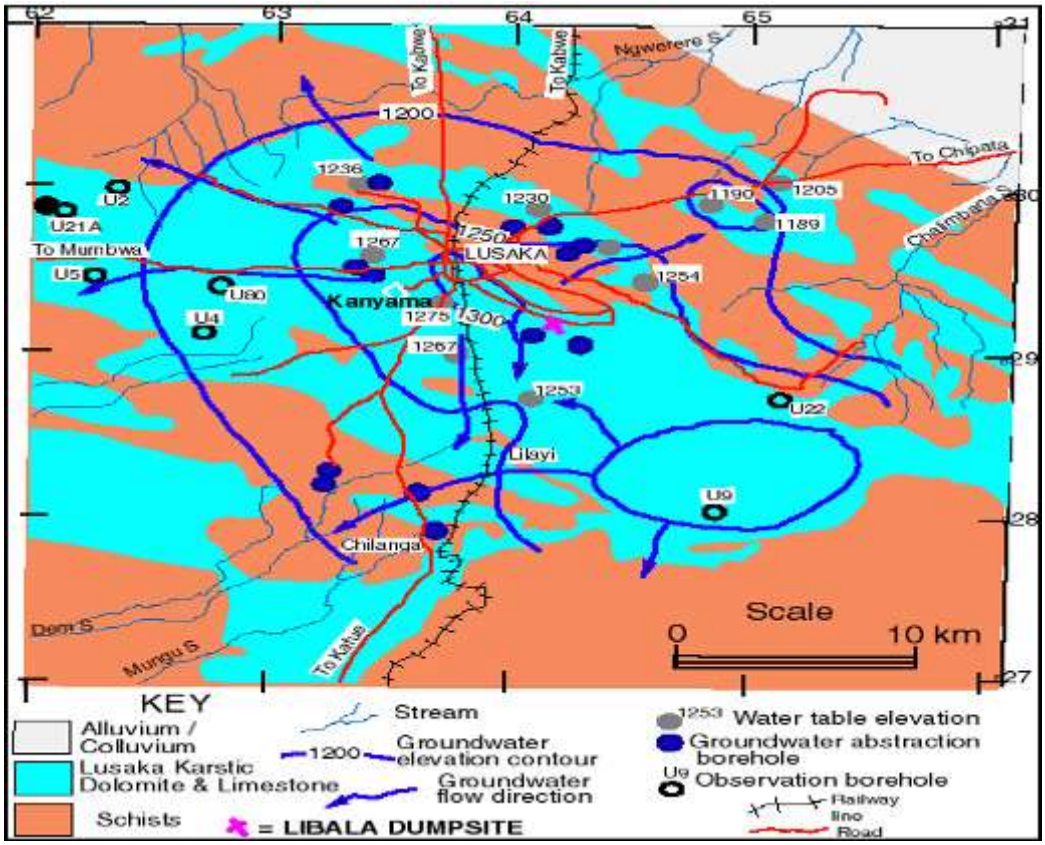
The capital city of Zambia, Lusaka, like many other developing cities today, faces the challenge of rapid population growth. These challenges include rapid urbanisation, pressure for land use, provision of basic services and haphazard general development (Pelling, 2008). The majority of the urban population of Zambia resides in low-cost areas (20 percent) and peri-urban informal settlements account for sixty percent (ECZ, 2008:117). In Zambia, the general population census is conducted

every 10 years. According to the Census of Population and Housing Reports, the population density trend of Lusaka has been on the increase. For example, 31.6 inhabitants per square kilometre in 1990 (CSO,1990), 45.1 inhabitants per square kilometre in 1990 to 63.5 persons per square kilometre in 2000, and to 100.4 persons per square kilometre in 2010 (CSO, 2011:4).

The total population of Lusaka increased from 1 084 703 in 2000 to 1 742 979 in 2010 (CSO, 2000; CSO, 2011:6). There are 37 informal settlements in and around Lusaka Central Business District (CBD). They are made up of 9 old site and service settlements and 28 squatter settlements (LCC, 2008). These are located predominantly to the north, north-west and south of the CBD.

The proposed study area is Kanyama settlement. Kanyama is a high-density informal settlement situated eight km to the south of Lusaka's CBD. It has a total of 36 834 households (CSO, 2011:41). Like many informal settlements in Lusaka, it receives little attention from the government in the provision of shelter, water, sanitation and other basic services. Residents are exposed to a number of disaster risks which include poor environmental health conditions, outbreaks of diseases and epidemics, livelihood-related risks such as unemployment, limited access to productive resources, limited access to land and space, weak social relations including crime, and finally poor environmental quality such as flooding and poor waste management (Pelling and Wisner, 2009). In Kanyama settlement, approximately 90 percent of the inhabitants rely on basic pit latrines for sanitation. This situation, combined with a lack of adequate clean water supply, the use of shallow wells, the poor drainage system and a lack of waste management, has led to significant health hazards, especially during the rainy season. Furthermore, due to a high groundwater table, Kanyama experiences flooding and its related effects, such as outbreaks of cholera nearly every rainy season (DMTC, 2011:6). Besides these challenges, the Kanyama settlement has been established in a dolomite (karst) underlain area with unconfirmed groundwater aquifers which additionally pose a huge threat that needs to be considered (see Figure 1).

Figure 1: Hydrogeological map of the study area



(Nyambe and Maseka, 2000)

Figure 1 shows the geological and hydrogeological characteristics of Kanyama settlement of Lusaka. These characteristics make Kanyama a flood-prone settlement. Nyambe and Maseka (2000) argue that because Kanyama is located in a relatively flat area, it will have stagnant pools of water during the rainy season. Flooding is attributed to rainwater draining into fissures and sinkholes in areas with less permeable rock outcrops. Groundwater circulation patterns are dominated by karstic, dolomite, limestone and schists rock outcrops. This leads to a rising of the water table and causes flooding easily.

Flooding is one of the common hazards that cause loss of life and property and causes economic setbacks, especially in developing nations (UNDP, 1999). While natural hazards such as floods are largely unavoidable, they only become disasters when communities' coping mechanisms are exceeded and they are unable to manage their impacts (IFRC, 2009:7). However, flooding is experienced on an annual basis (See section 1.3) in Kanyama and the government does not take full responsibility in addressing the root cause for the exposure. To alleviate these

challenges, the government has legal frameworks and policies in place which should help the community prepare themselves against disaster risks.

1.2.1 Legal frameworks related to disaster risk reduction in Zambia

The Zambian government is very much aware of the challenges of rapid urbanisation and the increase in informal settlements. The Town and Country Planning Act CAP 281 of 1994 and Local Government Act Cap 281 of 1991 empower local authorities. The Lusaka City council, for instance, is tasked with the responsibility of identifying suitable locations for urban development including residential areas. It is therefore illegal for one to build a house without permission from the local authority. The Local Government Act provides guidelines for the establishment of Resident Development Committees (RDC) and Ward Development Committees (WDC) whose role is to spearhead community development at local level.

Despite the aforementioned legal frameworks as well as the Town and Country Planning Act Cap 283 of 1994 (see Chapter 5) that have been put into place, the Kanyama settlement has continued to grow without any significant adherence to these provisions (ECZ, 2008). It was established as a residential area for farm workers for Mr. Potgieter, a white commercial farmer in Lusaka around the 1920s. Since then it has grown to its current state as one of the biggest informal settlements in Zambia. Furthermore, as a result of its informal status, Kanyama received little attention from the government until 1996 when the government came up with a programme for the upgrading of informal settlements. Prior to 1996, Kanyama grew without any basic services, including waste collection, drainage systems and provision of water. Lack of provision of these basic services has resulted in mountains of waste being left uncollected at market places and residents resorting to use pit latrines and shallow wells which exposes them to public health risks.

The Public Health Act Cap 295 and the Environmental Protection and Pollution Control (EPPCA) Act of 1990 were revised in 2012 and empower the Zambia Environmental Management Agency (ZEMA), formerly known as the Environmental Council of Zambia (ECZ), to issue licenses to local authorities for sustainable waste management. Additionally, the local authority, LCC, has the responsibility to prevent and control the outbreak and spread of infectious diseases and warn of hazards to

public health. It mandates the local authority to ensure that people do not dump waste indiscriminately.

The Disaster Management Act of 2013 demands the participation of key stakeholders in disaster risk reduction. The government, through local authorities and the community at risk, should work in partnership to reduce exposure to disaster risks (Van Riet and van Niekerk, 2012). If only these legal frameworks were effectively implemented, the disaster risk that Kayama is exposed to, would be a thing of the past. However, lack of financial resources, limited skilled human resources and inefficient equipment, among other requirements (LCC, 2008), make it difficult for Lusaka City Council (LCC) to reduce disaster risks in Kanyama settlement.

1.2.2 Disaster risk reduction and management in Kanyama

The government, through the Disaster Management and Mitigation Unit (DMMU), LCC and Non-Governmental Organisations (NGOs) have been implementing programmes aimed at improving the standard of living and property and assets to make Kanyama Settlement a habitable residential area. Interventions have been mainly reactive responses to alleviate flooding problems. This includes the construction of the drainage channel and the provision of relief aid, particularly water, food and tents.

On the other hand, CARE International Zambia has been an active participant in improving the standard of living of the people through provision of safe water and sanitation and drainage construction. Interventions date as far back as 1992. The approach has been proactive and bottom-up, aimed at reducing the vulnerability of the community by actively engaging communities to take responsibility for their own development.

During the drought of 1991-1993, the government of Zambia invited CARE International Zambia to help reduce the suffering of the people. The Project Urban Self-Help (PUSH I) was an emergency food-for-work (FFW) project which mobilised community labour, especially of women, in road rehabilitation, drainage, stone

pitching, and health and hygiene education campaigns. Its successor, PUSH II (1994-1997), focused on infrastructure improvement and the development of area-based organisations. A large multi-sectoral urban programme, Programme of Support for Poverty Elimination and Community Transformation (PROSPECT), was initiated by CARE International Zambia between 1998 and 2004 in 11 peri-urban settlements in Lusaka, including Kanyama settlement (Mwanamwambwa, 2011:4). Through this initiative, CARE International Zambia implemented community based water schemes operated by water trusts in respective settlements. In 2007, CARE International Zambia embarked on implementing the Promoting Peri-Urban Sanitation Services (PPURSS) project, which included the construction of 100 ecological sanitation (ecosan) toilets, construction of public fee-paying waterborne toilets/showers near markets, drainage construction, solid waste management and health and hygiene education (DMTC, 2011:14).

Overlapping the PPURSS project was the Strengthening Peri-Urban Risk Reduction in Zambia (SPURRZ) project which started in 2009. The SPURRZ project was a pilot project in peri-urban risk reduction funded by the USAID Office for Foreign Disaster Assistance (OFDA). It was intended to reduce the risk of natural hazards in Kanyama settlement through awareness raising and developing the capacity of community members to manage disasters. The interventions by CARE's SPURRZ project led to a significant reduction of the impact of flood-related risks in Kanyama settlement. Results from the Kanyama Health Centre, which is a cholera care centre, showed that, from its inception, SPURRZ has contributed to a significant reduction in cholera cases through improved sanitation (DMTC, 2011:6).

The SPURRZ project concentrated to a great extent on capacity-building of the community in disaster risk reduction activities. The Mulungushi University Disaster Management Training Centre was contracted to provide training to the community. Between 2009 and 2011, over 300 local community members were trained in disaster risk reduction and water sanitation and hygiene (WASH) (DMTC, 2011:6). The community's lack of understanding of disaster risks was identified as the root cause of exposure to disaster risks in Kanyama. Interventions by both inside and outside institutions, including the government and NGOs, aimed at reducing

community vulnerability and exposure to disaster risks, have made some impact on reducing vulnerability and exposure of the community to disaster risks (MCA, 2012).

1.2.3 Vulnerability and exposure to disaster risks

A community is more vulnerable if it is likely to be badly affected by an event beyond its control. The International Strategy for Disaster Reduction (ISDR), for example, stated that “Natural hazards by themselves do not cause disasters but it is the combination of an exposed, vulnerable and ill-prepared population or community faced by a hazardous event that results in a disaster” (ISDR, 2009:1). Disaster risks adversely affect vulnerable communities in the fragile locations of peri-urban informal settlements areas more than the communities who live in planned and formal settlements.

The United Nations Environment Programme (UNEP, 2007b) estimated that 72 percent of all Africa’s urban population will live in slum conditions by 2010. In support of this observation, Huq *et al*., (2007) notes that floods were already severely impacting cities and smaller urban centres in many African countries. Migrants from rural areas settle in peri-urban informal areas on marginal lands around cities. Usually such areas are fragile and prone to many kinds of environmental risks such as pollution, flooding and outbreaks of environmental diseases, and have limited access to water and sanitation facilities. Olaniran and Babatolu (1996) argue that poor communities are more vulnerable to disaster risks and are the primary victims of natural and anthropogenic disasters. While hazards are largely unavoidable, especially due to climate change, they only become disasters when communities’ coping mechanisms are exceeded and they are unable to manage the impacts of the hazard/disaster using local resources (IFRC, 2009:7).

Vulnerability refers to certain characteristics and circumstances of a community, a system or of assets that make it more susceptible to the damaging effects of a hazard (UNISDR, 2009). A vulnerable community is more likely to be badly affected by an event beyond its control, and members have no options for better livelihoods than the already unsafe fragile settlement. It is common to find that “in the year or so between the occurrence of a disaster and approved national reconstruction plans,

many vulnerable communities revert to coping with risks, often in the same or worse conditions than before the disaster actually struck" (Maskrey, 1998:86). The assumption on which people base their decision, is that sooner or later a particular risk will occur that they have experienced and coped with before (Blaikie *et al.*, 1994). Climate change, increased population densities and environmental degradation are worsening the impacts of natural hazards. These factors result in thousands of people losing their lives, livelihoods and property to disasters (UNISDR, 2009). Adjustments in the way we respond to DRR interventions are crucially important.

1.2.4 Community based disaster risk reduction and management

The conceptual and theoretical framework of community based disaster risk reduction is derived from a paradigm shift away from the traditional disaster management approach (Abarquez and Murshed, 2004). Disaster risk reduction and management processes now recognise the need to address underlying causes of disasters, including reducing the vulnerability of communities. The shift has prompted an emphasis away from physical control and engineering construction (structural measures) towards reducing human vulnerability through non-structural approaches (Smith, 1992). Disaster risk reduction strategies must extend beyond information provision to engaging community members in ways that facilitate their adoption of protective actions (Paton, 2006). This has also been recognised by the Hyogo Framework of Action (HFA) priority areas by making disaster risk reduction a national priority (UNISDR, 2007).

The main focus of disaster risk reduction is to build resilient communities by moving away from reactive towards proactive approaches for handling disaster risks. It emphasises what communities can do for themselves and it focuses on ways to strengthen their capacities by using resources available within the community. This is more effective than concentrating on their vulnerability to disaster or their needs in an emergency (Twigg, 2007; UNISDR, 2009).

Over the last two decades it has become apparent that top-down approaches (reactive response) to disaster risk management alone have failed to address the

specific local needs of vulnerable communities because local capacities and resources are ignored (Van Riet and Van Niekerk, 2012; Holloway *et al.,* 2008). In response to the limitations of the top-down methodology, the Community based Disaster Risk Management (CBDRM) model concept emerged as an alternative approach between the 1980s and 1990s in Southeast Asian countries (Abarquez and Murshed, 2004:1). This model provides a framework for tasks that need to take place at local level as the cultural diversity and variability of local communities require locally specific indicators to match local situations (Anderson and Woodrow, 1989:9). The approach also requires local risk-coping knowledge and practices to be adapted and applied in risk-reduction strategies (Van Riet and Van Niekerk, 2012).

Some of the processes needed to reduce vulnerability and risk are social and educational in nature. These processes include improving coping capabilities, increasing the participation of communities and civil societies, promoting partnerships and collaboration and enhancing individual and institutional capacity for change (UNEP, 2002:5). The people-centred approach focuses on how individuals and communities can understand the threats to their own survival and well-being, share that awareness with others and take actions to avoid and reduce disasters (IFRC, 2009: 39). Therefore, it is a matter of urgency to explore the role that a vulnerable community can play in interventions that aim to reduce the risks of vulnerability to disaster, especially in informal settlements.

1.3 PROBLEM STATEMENT

Almost every rainy season, Kanyama Settlement is flooded and outbreaks of cholera are common occurrences. During the 2009/2010 rainy season, DMMU in partnership with NGOs, supplied tents, water and food to victims of flooding as they have been doing during most rainy seasons. A total of 73 affected families (over 400 people) whose houses were submerged, were evacuated from Kanyama Settlement and its neighbouring informal settlements and were taken to the Independence Stadium in Lusaka (ZRCS, 2010). After the rainy season the victims invariably return to their former homes in the flood-prone Kanyama Settlement. There is always much discussion on disaster preparedness, mitigation and prevention activities through sensitisation by the government and other stakeholders when flooding occurs, but as

soon as the rainy season comes to an end all is forgotten (Nchito, 2007:539). Floods account for approximately forty percent of natural disasters and may become more frequent and severe due to climate change and global warming (Reacher *et al.,* 2004) The traditional emergency response with relief supplies and evacuations will become unsustainable in poor , informal settlements since they are deemed informal or illegal and are subsequently deprived of access to basic services, including safe water and sanitation (ECZ, 2008) by the government (Mulenga, 2003).

The Zambian government has several legal frameworks and policies in place for the development of residential areas in safe locations. The Town and Country Planning Act Cap 281; Local government Act Cap 283; Public Health Act Cap 295; Waste Management Strategy, Environmental Protection and Pollution Control Act (EPPCA) of 1990 and the Disaster Management Act of 2010. The fact that Kanyama today is disaster prone is not because there is a lack of policies, but because government regulations were not effectively followed from its inception as an informal settlement. CARE International Zambia applied disaster risk reduction interventions from the vulnerable community's perspective after realising that the focus on emergency and relief operations was not a sustainable approach (Mwanamwambwa 2010). CARE has been working in Kanyama settlement since 1992. It put in place community based interventions to reduce vulnerability to disaster risks and to improve the living conditions of the community. CARE funded the community-managed Kanyama Water Trust project to supply clean, safe water to the local community through communal water stands and household ecological sanitation (ecosan) toilets and public toilets at markets were constructed. A project on Community based Enterprises (CBEs) for waste collection was implemented as well as a community disaster risk reduction programme under SPURRZ (Strengthening Peri-Urban Risk Reduction in Zambia) that emphasised active community participation in education and early warning at local level (DMTC, 2011:6).

Interventions by CARE significantly contributed to the reduction of flood-related disaster risks, especially of cholera outbreaks. The community based SPURRZ project, which started in 2009, contributed significantly to the decline of cholera cases. During the 2008/2009 rainy season 1,357 cases were recorded, in the 2009/2010 season 1 910 cases, and in the 2010/2011 season only 7 cases were

recorded (KHC, 2011). The community was actively involved in door-to-door campaigns to sensitise people to matters concerning hygiene and sanitation prior to the rainy season.

The interventions implemented by CARE International Zambia were community managed. The challenge for CARE however, has been to source for additional funding to reduce the vulnerability of the community to flood-related disaster risks in Kanyama Settlement (Mwanamwambwa, 2011:8). Rather than remaining vulnerable, people can become capable, resilient and able to protect themselves against disaster risks (IFRC, 2009:39; Abarquez and Murshed, 2004).

CARE built the capacity of the community by providing training in disaster risk reduction. Training was offered by MU and DMTC. Disaster risk reduction (DRR) committees in all 19 zones of Kanyama Settlement were set up. The community volunteered to educate fellow community members through a door-to-door campaign. They were also willing to operate the community projects, the water trust programme and fee-paying toilets for a commission. The CARE intervention, through the community based approach, has proved effective. There is participation when the project is actively funded, but as soon as project support by CARE comes to an end the community, tend to relax their community activities.

Against the background of past community based activities regarding disaster risk management by CARE in Kanyama settlement this research intends to provide a model for community based disaster risk reduction for informal settlements. It will provide options for effectively engaging the community to participate in reducing vulnerability to disaster risks. The research is premised on the following research questions and objectives outlined below.

1.4 RESEARCH QUESTIONS

The study is premised on the following research questions:

- What is the conceptual and theoretical framework for Community based Disaster Risk Reduction and Management and how is it applied?

- What are the topographic/spatial, demographic, geological, hydro-geological and historical profiles that expose Kanyama settlement to disaster risks?
- What are the major disaster risks the community of Kanyama settlement is vulnerable to?
- Do Zambian legal frameworks and policies provide adequate attention to reducing disaster risks in urban settlements such as the Kanyama settlement?
- What interventions have been put in place to address disaster risks that affect the community in Kanyama?
- How can lessons of best practices from community based disaster risk management interventions in Kanyama be adapted to create a model for reducing disaster risks in informal settlements?
- Which of the community based disaster risk management interventions adopted by CARE International Zambia and the government can be embraced and adapted as best practice model for reducing disaster risks in informal settlements?

The research is aimed at creating a model for community based disaster risk management in informal settlements.

1.5 RESEARCH OBJECTIVES

Although the ultimate objective of this research is to create a disaster risk reduction and management model that can be used to build communities' resilience to disasters in informal settlements through a community based disaster risk reduction and management approach, the following are the explicit research objectives:

- To critically review conceptual and theoretical frameworks for community based disaster risk management and to ascertain how they may apply in the Kanyama Settlement context;
- To concisely outline the topographical/spatial, geological, hydrogeological, demographical and historical profile of Kanyama Settlement;

- To analyse major disaster risks that make the community of Kanyama settlement vulnerable;
- To evaluate existing Zambian legal frameworks and policies and their impact on disaster risk reduction and management in urban settlements and the Kanyama settlement in particular;
- To investigate interventions in place that address disaster risks affecting the community in Kanyama;
- To document and suggest an effective model of disaster risk reduction practices and interventions in Kanyama Settlement from CARE International's (Zambia) experiences; and
- To develop a model of community based disaster risk reduction and management for informal settlements based on best practices by CARE International (Zambia) and scholars.

The thrust for this research is on the role of the community in disaster risk reduction interventions at local level.

1.6 CENTRAL THEORETICAL STATEMENTS

The need to undertake this study is supported by the following preliminary theoretical statements:

- The lack of comprehensive governance and legal framework usually (top-down approach) contributes to the failure to set clear disaster risk reduction targets for communities-at-risk (Holloway, 2003; Pelling and Wisner, 2009). Disasters cannot be prevented but planning emergency measures through flood management can reduce their consequences (Andjelkovic, 2001). Furthermore, governments or nations must ensure that Disaster Risk Reduction (DRR) is a national and local priority through community participation so that local needs are met (Priority for action No.1 of the Hyogo Framework of Action (UNISDR, 2004).

- The most effective way to reduce disaster risks in informal settlements is to work with the local people to identify and analyse their vulnerability and capacities, and to develop and implement a disaster risk management action

plan which will support them in their to progress towards sustainable living (Venton and Hansford, 2006). Development efforts and strategies in CBDRM are focused on helping the poor and supporting them to become increasingly self-reliant in dealing with many of the disaster risks they face in their daily life (Allen, 2006; IFRC, 2009:59).

Having established the theoretical framework of this research, the next section looks at the methodology for conducting this research (Chapter 6).

1.7 METHODOLOGY

The qualitative research design was used in conducting this research. Research data was obtained by reviewing various sources of literature, analysing various project reports of DRR interventions, and through personal interviews (refer to Chapter 6, (And also see Appendix E) with Kanyama community members and key stakeholders.

1.7.1 Literature review

Several documents and reports were reviewed to provide background on key issues of disaster risk reduction and management in Zambia and other countries. A thorough literature review provided a framework for establishing the importance of the study and also for benchmarking the shortcomings of the top-down emergency response as well as possibilities for community participation in disaster risk reduction interventions by CARE International.

Research findings for primary literature on Kanyama (refer to Chapters 3, 4 and 5) include Zambian legal frameworks and policies patterning to development of urban settlements and peri urban areas. Particular focus is on water and sanitation, public health, land acquisition and development of residential areas, including land-use planning.

Documents reviewed under the legal framework and policies include the National Disaster Management Policy in Zambia of 2005 and the Revised Disaster Management Act of 2012; the Town and Country Planning Act, Cap 283; the Water

Policy; Local Government Act Cap 281; the Waste Management Policy, Environmental Protection and Pollution Control Act (EPPCA) No.12 of 1990.

Additionally, geological and hydrogeological information was obtained from the University of Zambia, the School of Mines and the Integrated Water Management Centre.

Information from the community was gained through interviews to investigate their perceptions of the disaster risks they face and how these have been managed.

1.7.2 Empirical investigation

The research was conducted under the following guidelines.

1.7.2.1 Research design

The research is qualitative and descriptive by design. However, quantitative information data was also collected. The research investigated the factors that contribute to community vulnerability to disaster risks in informal settlements in general and Kanyama settlement in particular (See Chapter 7). The study focused on the Kanyama Community based Disaster Risk Reduction intervention by CARE International Zambia.

1.7.2.2 Sampling

The sample for the research was randomly selected. This is because Kanyama Settlement has no defined or structured arrangements for house plans. The sampling was based on the political boundary which is the Kanyama Settlement constituency. A total of 380 households were randomly selected from the 19 zones divided in two wards, namely 11 and 12. Twenty respondents were sampled from each of the 19 zones.

1.7.2.3 Instruments

Data was collected from households using self-administered questionnaires and an interview schedule (see Appendices B, C and D) was used to conduct interviews in the community. The questionnaires gathered information on household demographics, vulnerability and capacities, health, water and sanitation, disaster risks and existing disaster risk reduction and management practices.

Participatory Rapid Assessment (PRA) tools of problem analysis, timeline, seasonal calendar, vulnerability assessment, transect walk and hazard mapping were employed.

1.7.2.4 Data collection

The research started by reviewing documented reports, policies and legal frameworks related to the provision of basic services and developmental projects that were implemented in Kanyama by the government, donor communities and NGOs.

The community members affected by disasters and hazards were also consulted at various levels of interviews. The methodology to obtain information about disaster risks in Kanyama was obtained through interviews conducted in the community using questionnaires (See section 1.7.2.3).

Focused group discussions: Respondents from 19 zones in Kanyama settlement participated in focused group discussions (see Appendix B). A total number of 6 focused group discussions consisting of 8 members were held. Issues under discussion included identifying disaster risks faced by the community and how these affect the community (see Chapter 7). Additionally, it revealed how the community participated in CARE International's projects..

Key informant interviews: Expertise information about disaster management information was obtained from four senior members of staff from CARE International Zambia, LCC, DMMU, Kanyama Health Centre, the Manager at Kayama Water Trust, Twashuka and Kanyama primary schools, faith-based organisations, NGOs and other relevant institutions working in Kanyama settlement respectively. The questions asked focused on information on disaster risks and hazards in Kanyama as well as interventions by CARE International Zambia on reducing the vulnerability of the community (Appendix C). Researchers from the Integrated Water Resources Management Centre (IWRM) provided geological and hydrogeological information.

Direct observation: Transect walks around Kanyama Settlement were undertaken with community members to assess and appreciate sources of vulnerability and

hazards in the area (inclusive of pointing out the dolomite and limestone vulnerability of the area as a serious distracting factor).

Images of the area from a Geographic Positioning System (GPS) were used for data capturing, as well as pictorial documentation of the existing physical infrastructure (MCA, 2012). The Millennium Challenge Account (MCA) project on improving water and sanitation provided data on GIS about Lusaka in general and Kanyama in particular.

1.7.2.5 Data analysis

The research is a case study and is qualitative by design. Qualitative data is presented descriptively while quantitative data representing the number of respondents who participated in personal interviews and focused group discussions is presented in the form of tables, figures, plates and images.

1.7.2.6 Limitations of the study

The study concentrated on the Kanyama community and all institutions who partnered with CARE International Zambia since 1992 in implementing disaster risk reduction intervention. It is limited to the participation of community members, government organs (DMMU), LCC, civic leaders, faith-based organisations and local leadership at zone, ward and constituency level. However, as Kanyama is an informal settlement, much of the background data has not been documented and the research therefore relies on oral sources from senior community members. The study is limited to interventions by CARE International Zambia since 1992.

1.7.2.7 Delimitations of the study

Although urban informal settlements such as Kanyama settlement experience several types of disaster risk, the study was limited to flooding and related risks because this is the most common disaster risk experienced in this informal settlement of Zambia (ZVAC, 2010).

1.7.2.8 Ethical considerations

Participation in this research was done according to the Zambian social science research guidelines under Mulungushi University. The guidelines recognise local culture and traditions, gender aspects, voluntary participation and the right to

anonymity of respondents as well as the confidentiality of key informants and experts. The privacy and reflections of/by respondents have at all times been kept confidential. The research was carried out within the guidelines of research ethics by CARE International Zambia who contracted Mulungushi University to do consultancies in disaster risk reduction (see Appendix A).

1.8 SIGNIFICANCE OF THE STUDY

The research has produced literature through the documentation of interventions on disaster risk reduction and vulnerabilities faced by communities in informal settlements, Kanyama settlement in particular. Suggestions for effective disaster risk reduction practices and interventions in Kanyama settlement by CARE International Zambia on community based disaster risk management which can be replicated in other informal settlements have been documented. This “model” empowers both vulnerable communities and organisations with skills to actively participate in preparedness planning and decision making on disaster risks that affect them. The model includes all factors such as the geological, demographic, and historical factors. Finally it is hoped that the insights posed as a “model” will influence government policy makers and NGOs to involve the community in planning, so that the focus is on preparedness and prevention rather than the common trend of post-disaster relief and rehabilitation activities.

1.9 CHAPTER LAYOUT

The research in this thesis consists of the following chapters:

In Chapter 1 the orientation, problem statement and the particular theoretical as well as methodological focus of the study are introduced through the research questions. The background of disaster risks in informal settlements, including their causes, is explained. Interventions by government, NGOs and the community that are in place to address disaster risks are outlined. Key concepts and terminologies in disaster reduction are introduced.

A theoretical approach is taken in Chapter 2. The focus is on community based disaster risk management and its significance in disaster risk reduction interventions. Key concepts in understanding community-based disaster risk reduction are

analysed. There has been a paradigm shift from a relief and emergency approach to a community-based approach that involves the community in activities that reduce disaster risk is presented as set out by the United Nations (UNISDR, 2009).

A hazard vulnerability profile of Kanyama settlement is presented in Chapter 3.The profile presents the topographical/spatial, demographical, geological and hydrogeological characteristics as well as the historical background of Kanyama. This highlights some of the underlying factors for Kanyama's exposure to flooding.

Findings regarding disaster risks and experiences of the community in Kanyama are presented in Chapter 4. The chapter gives an analysis of major disaster risks that frequently affect the community of Kanyama and explores the underlying factors that have contributed to the vulnerability and exposure of the community to these disaster risks.

The legal framework related to disaster risk management systems in Zambia is presented in Chapter 5. An analysis of how provisions of these Acts impact on the development of urban settlements is set out. Furthermore, the benefit of these Acts to communities in informal settlements is also presented.

Chapter 6 provides the methodology that was used to obtain information from the community and stakeholders regarding interventions to reduce disaster risks. The research is qualitative by design and focuses on perceptions of the community on exposure to flooding. Data was collected by primarily using interviews and desk-top reviews of project documents on developmental activities and interventions in Kanyama by the government, NGOs and donor agencies.

In Chapter 7, best lessons learnt on disaster risk management interventions in Kanyama are outlined. The focus is on analysing the participation of the community in DRR interventions in Kanyama. Focused group discussions, personal interviews and analysis of literature were conducted to evaluate DRR interventions on management and disaster risk reduction activities implemented in Kanyama settlement. These interventions included both the reactive approach of emergency supply of relief interventions and the proactive approach of community participation.

Lessons from these approaches provided best practices for DRR interventions.

The aim of this thesis to present a model for community based disaster risk management is presented in Chapter 8. The steps that were used to create the model were derived from the six chapters presented earlier. Step one is the creation of a theoretical understanding of DRR in the community, *step two* is to develop a profile of the disaster risks that the community is exposed to and step three identifies the legal framework and policies operating in the country with regards to DRR management. Lastly, step four focuses on community participation in DRR interventions as identified in the disaster and vulnerability profile of the community in step two. Activities in the CBDRRM process involve planning interventions, and the implementation, monitoring and evaluation of DRR interventions by the community. The proposed model provides insights into the procedures of engaging the community to actively participate in disaster risk reduction activities as provided in chapters 2- 6.

Chapter 9 serves as the conclusion of the research. A brief overview of the entire study on community based disaster risk reduction and management is given. Recommendations on more effective ways of engaging communities to participate in disaster risk reduction and developmental projects in informal settlements are outlined.

1.10 CONCLUSION

In Chapter 1 the key focus is on explaining the theoretical and methodological approaches underpinning the community based approach in disaster risk prevention. In the problem statement the premise for understanding the evolution of disaster risk reduction and the gap in current studies regarding community based prevention mechanisms are outlined. Thus the key research question, resulting from the shortcoming(s) as observed from research, has been identified as “which of the community based disaster risk management interventions adopted by CARE International Zambia and the government can be embraced, and adapted as best practice model for reducing disaster risks in informal settlements?” To address this and other secondary questions resulting from the primary question, some objectives were outlined. Based on this framework the researcher embarked on a study of

community based disaster risk reduction in informal settlements. Kanyama in the Lusaka region became the point of focus.

The disaster risk profile of Kanyama settlement is characterised by a lack of access to basic services of safe water and sanitation, poor roads and a weak drainage network. The geology and hydrogeological characteristics of the dolomite rock have negatively contributed to flooding and outbreaks of water related diseases. The theoretical and conceptual frameworks that are based on community participation in DRR activities have proved to be an effective approach. The chapter also provides the methodology used to analyse community based disaster reduction and management interventions in Kanyama settlement. Participatory approach was used in the form of focused group discussions and interviews. In addition, the understanding of the community based approach is brought into perspective by analysing disaster risk reduction interventions by CARE International Zambia in reducing community vulnerability.

This chapter looked at the orientation and focus of the research on disaster risk management in Kanyama informal settlement which is used as the basis for creating a model for community based disaster risk reduction and management. Chapter 2 sets out the theoretical orientation of community based disaster risk reduction and management.

CHAPTER 2
THEORETICAL ORIENTATION OF COMMUNITY BASED DISASTER RISK MANAGEMENT

2.1 INTRODUCTION

This chapter presents a critical review of the theoretical orientation of community based disaster risk management in accordance with the first objective of the study. It creates a deeper understanding of theories and models of vulnerability and exposure to disaster risks experienced in informal settlements (Kanyama settlement) presented in Chapter 1. The paradigm shift of disaster management from reactive emergency approach to proactive disaster risk reduction approach as identified by Abarquez and Murshed, (2004) is presented. An outline of key concepts related to community based disaster risk reduction and management is presented.

The chapter further highlights the importance of community participation through Participatory Rapid Appraisal (PRA) and Community Driven Development (CDD) in community mobilisation and local development. The paradigm shift in disaster management from the traditional relief and emergency response approach to the proactive risk reduction approach is also presented. The chapter concludes by highlighting community based risk reduction models as a sustainable approach of reducing disaster risks.

2.2 THEORETICAL UNDERSTANDING OF DISASTER RISKS

Disasters usually result from the interaction between the natural events that cause them and the social, political, and economic vulnerabilities that structure the lives of different groups of people (Blaikie *et al*., 1994:4 and Pielke, 2006:138). It is widely accepted that disasters today have become part of society's challenges and adversely affect the development programmes of many countries. During the Intergovernmental Panel on Climate Change (IPCC) Conference that was held in 2007, it was argued that with the advent of climate change, the frequency and intensity of weather related disasters were likely going to increase and would mostly affect the poor people in many developing nations. Those likely to be worst affected are the world's poorest countries, particularly the marginalised communities such as

Kanyama settlement, presented in Chapter 1 (Reid *et al.*, 2009). Disasters are prominent in poorer countries due to weaker governance by the government who do not prevent the exposure of people and their assets to disaster risks. The poor in most cases settle in unsafe locations on the outskirts of urban centres. The increase in exposure is due to the limited capacities of governments to come up with measures to implement DRR activities (ISDR, 2004; Twigg, 2007; Tyler, 2006). The impact of disaster losses is directly associated with the community's coping capacity. Unless the community's capacity is enhanced through local community initiatives, vulnerability to disaster risks among the marginalized will remain unresolved.

2.2.1 Community vulnerability to disasters

Disasters affect people at different levels based on their capacity and vulnerability to withstand them. According to the International Strategy for Disaster Reduction (ISDR), (2009), vulnerability refers to long-term factors and conditions that adversely affect the ability of a community to respond to, cope with or recover from the damaging effects of the occurrence of hazards or disaster events. Furthermore, Mileti, (1999) and McEntire, (2001) argue that whether one considers a community, an individual, the economy or a structure, vulnerability depends upon the coping capacity relative to the impending impact of a hazard. Generally, poverty is an underlying cause of vulnerability in most communities and informal settlements in particular. The poor are particularly vulnerable to disasters due to their already limited access to sustainable daily livelihood assets such as food security and access to basic services of shelter, water and sanitation.

The poor in urban areas are exposed to disaster risks due to factors such as increasing levels of unemployment and lower wages, higher prices of basic goods, subsequent limited food security, and residing in densely populated locations with poorly built houses on land that places them at risk (UNDP, 2013; UNISDR, 2004, p.xi). The UNHABITAT (2007) Report confirms the assertion that the poor do not intentionally take action to reduce their exposure to environmental risks. This is because they are consumed in their immediate demands for survival amidst high levels of poverty. A vulnerable community has no capacity to use local resources or get adequate support outside their locality to manage disaster risks.

Vulnerability is not only a natural phenomenon of lacking capacity, but also a result of an entire range of constantly changing biophysical, social, economic, cultural, political and even psychological factors that shape people's lives and create the environment in which they live (Twigg, 2001:6; Kizilay, 2010; Clark *et al.,* 2000). A community residing in an unsafe part of a city will always be exposed to disaster risks. Biophysical vulnerability is common in most urban settlements in developing countries due to the susceptibility of individuals, households and communities to losses of their physical environment. (UNISDR, 2002:47; UNDP, 2004:11). Due to rapid urbanization and limited capacity, migrants into urban areas find themselves settling on marginal locations such as flood prone plains and wetlands. At household level, a family's vulnerability to disaster risks can easily cause a household to spiral to new levels of destitution and poverty (Boudreau, 2009). The holistic framework of disaster risk reduction, introduced by McEntire (2001) denotes that vulnerability should not be viewed in isolation from social, cultural, economic and political realms which determine settlement patterns and impact of disasters. It is a combination of these realms that force people to settle in high density, unplanned [informal] settlements which are hazard-prone. Sensitivity and susceptibility to disaster risks are functions of one's capacity to anticipate, cope with and recover from a disaster (Thomalla *et al.*, 2006). Since the exposure to incidences of natural risks could be beyond human control, efforts must be directed towards building the capacity of the vulnerable members of the community to cope.

2.2.2 Disaster risk reduction and the community

As mentioned earlier (see section 2.2.1), vulnerability results from limited coping capacity in the community. Communities become susceptible to disaster risks because they lack the ability to use available skills and resources to manage disaster risks they are exposed to. Coping capacities therefore contribute to the reduction of disaster risks and building resilience through active participation of the affected community (UNISDR, 2009; Blakie, 1994; Mileti, 1999). Traditionally, disaster management interventions were framed as emergency approaches that overlooked the role a local community could play in reducing vulnerability (Abarquez and Murshed, 2004). During disaster events, some support institutions view vulnerable communities as victims and beneficiaries of relief supplies with no capacity to help themselves (wisner *et al*., 2007).

In assessing the coping strategies, interventions should start with the community's assets. Instead of concentrating on community problems that ought to be solved, or physical infrastructure that should be fixed, the focus should be on identifying the strengths of the local community (Schpper and Pelling, 2006). There has to be collaboration among stakeholders, the community, the government and development based organisations present in the community. Capacity can also refer to human resource development of skills, attitudes and values at both individual and community level. It goes beyond the usual training and technical assistance to the ability to deliver or implement measures better (Alsop and Kurey, 2005; Moore, 1995). Disaster risk reduction initiatives should therefore concentrate on building the capacity of the local community. However, this does not mean that technical and financial assistance should be left for the community alone to source. The government and other stakeholders should supplement efforts made by the community. It is, after all, the responsibility of the government (DMMU) to provide a safety net for its vulnerable citizens (GRZ, 2005).

Disaster stricken communities, especially those in informal settlements, receive inadequate attention from the government. However, local communities have internal social and economic structures that help them sustain their livelihood. The resources and the skills that people possess might not allow them to have more control over shaping their own future and coping with disaster risks (Abarquez and Murshed**,** 2004). Coping capacity has to do with what a community possesses locally, as well as the potential for external support. Promoting community participation - particularly among those who live in disaster prone areas and the vulnerable members - must be prioritised so that they can adapt and cope with disaster risks locally.

DRR at community level entails “the conceptual framework of elements to be considered with possibilities to minimize vulnerabilities of the people by avoiding, and limiting adverse impacts of hazards, within the broad context of sustainable development” (UNISDR, 2009). The aim is to help local vulnerable communities adapt and become resilient when disaster strikes, through disaster prevention, mitigation and preparedness. Such initiatives, if they involve the participation of the local community at inception level and during the implementation stage, can greatly help communities to manage their developmental needs.

A community is vulnerable to disaster risks if there is a high probability of occurrence of an event and its negative consequences (UNISDR, 2009). A disaster risk from the community's perspective can be defined as the probability of harmful consequences, or expected losses (lives lost, damage to property and/or the environment, livelihood lost, and the disruption of economic activities or social systems) due to the interaction between humans, hazards, and vulnerable conditions (UNISDR, 2002:24). Disaster risk reduction intervention therefore takes a multi-disciplinary approach. They recognise the importance of links between socio- economic and political interaction and hazards and the wider environment (Lewis, 1999; Wisner *et al.,* 2004; Tran and Shaw, 2007).

Disaster risks are expressed in a variety of contexts. For instance, flooding may cause damage to physical infrastructure as well as an outbreak of water borne illnesses such as diarrhoea and cholera. Exposure to disaster risks is usually associated with failure by a community to cope with particular hazardous events. Sayers *et al.,* (2002:36-38) defines risk as the probability of an event occurring, linked to its possible consequences (Dilley and Boudreau, (2001); Tobin and Montz (1997:282) and UNISDR, (2007)), on the other hand, define risk as a function of the relationship between hazards to which a household is exposed and the household's vulnerability (V) to that specific hazard (H).

Disaster Risk (R) = hazard (H) x vulnerability (V) (Wisner *et al.*, 2004).

The risk notation by Wisner *et al.,* (2004) above, views vulnerability as the determining factor in the exposure of a community to disaster risks. Risk situations normally depend on the level of social, economic or geographical status of a community (see Chapter 3 later). A poor community with limited access to economic opportunities will find themselves settled in a location that is fragile and disaster prone and normally illegally obtained. DRR interventions should focus on reducing vulnerability of communities from severe shocks and preventing hazards from becoming disasters (Christian Aid, 2009; DFID, 2006).

Vulnerability of informal settlements to hazards is a common phenomenon (Mulenga, 2003). Informal settlements become vulnerable to disaster risks by virtue of their residences located in marginal areas with geographical, topographical and

hydrogeological characteristics that make them unsafe for settlement (see Chapters 1 and 3) (Oxfam, 2007). A hazard originates from “human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage” (UNISDR, 2009; Wisner *et al*., 2007:5; SADC,2003:12). Such settlements are located on marginal lands with no proper land use planning, poor physical infrastructure such as substandard housing units with limited basic services provided (ECZ, 2008: 118). This is common in most informal settlements in developing countries (World Bank, 2001). Mitchell (2001) considers hazards to be a result of human ecological interaction that can generate a disaster. Typical examples of hazards can include: poorly constructed housing units, lack of access to safe water and sanitation facilities and marginal locations. Community vulnerability to disaster risks can be divided into three categories: physical/ material, social and attitudinal/ motivational (Anderson and Woodrow, 1990).

Physical vulnerability relates to the fact that poor people usually include those people with limited material resources to help them cope with disasters. The poor in most cases reside on marginal lands; they do not have any savings or insurance; they are in poor health, often harsh environments, directly dependent on local ecosystems services (Tyler, 2006; Prevention Consortium, 2008:9).

Social vulnerability is associated with communities that are marginalised in economic terms. People who are economically stable are more secure than the poorest when disasters occur (Oxfam, 2007).

Thirdly, attitudinal or motivational vulnerability refers to the community’s lack of confidence to adopt DRR interventions as noted by Pelling, (2007). This is the most common cause of continuous vulnerability and exposure of communities settled on marginal land or informal settlements. They usually lack confidence to sustain themselves and find lasting solutions to their problems. Despite interventions that may be in place such as evacuation to safer land, people will usually return to the risk homeland (Abarquez and Murshed, 2006; Nchito, 2007).

2.2.3 Community participation in DRR

In the context of disaster risk reduction and management, a community is understood as people living in one geographical area, in close proximity, and who share common interests, values, services and problems (Yoon, 2005; Abarquez and Murshed, 2004). They may be exposed to similar disasters and perform similar socio-economic activities to ensure their livelihood. Furthermore, a community can be a group of people affected by a disaster who can also assist each other to mitigate hazards and reduce vulnerability within their locality. In this study, a community is understood as being restricted to the geographical location of the Kanyama settlement (see Chapters 3 and 4), particularly in the context of exposure to disaster risks, as the members of the disaster affected community would have shared some common experiences of responding to disaster risks.

In addressing disaster risks, governments as well as development organizations, NGOs, both local and foreign, usually initiate interventions at community level before and after disasters happen. However, in most cases such initiatives end as soon as the external sponsors come to an end. This can be attributed to the lack of sustainability of such initiatives from outside community structures. There is a lack of partnership, participation, empowerment and ownership of local communities in the planning and implementation of such projects (Egger and Majeres, 1998). Pelling (2007) raises the concern about the community as a unit of analysis and intervention. He stresses that by focusing on majority rule in community processes, minority groups and less privileged individuals are usually left out. Unless DRR initiatives are sustained at individual and community level, it will always be difficult to reduce vulnerability and losses among the poor. It is therefore imperative to involve people at local level in decision-making on policies and strategies that should be followed for their development (ADPC, 2004; Sampath, 2001).

Lack of community participation in DRR interventions in dealing with disaster risk affecting them may at times make the community dependent on relief and emergency supplies. Community participation in DRR has of late been preferred as an effective approach to reducing exposure to disaster risks.

2.3 BACKGROUND OF COMMUNITY BASED DISASTER RISK REDUCTION AND MANAGEMENT

The history of disaster management dates as far back as around two hundred years and beyond, to when the federal government in the West (United States of America) participated in disaster activities that were related to war (Drabek, 1991; McEntire, 2007). After the Second World War, the community based disaster risk reduction model received recognition at national and local levels by planning professionals. It was called the professional model or Comprehensive Disaster Management (CDM). However, since 1945, debates on disaster research have identified some inadequacies in the Comprehensive Emergency Management (CEM), as overlooking the *social constructs* of disaster reduction (Newport and Jawahar, 2003; Trim, 2004). The difference between CEM and CDM concentrated on emergency relief operations while CDM addressed social constructs which expose communities to disaster risks.

In the mid-1980s, the comprehensive disaster management approach was perceived by many scholars as being top-down, expert-led and a technology driven approach. This approach was alleged to have failed to address community's needs and priorities of reducing vulnerabilities among the poor (Maskery, 1989). The main focus was on addressing the vulnerability of communities at the expense of the local community coping capacities. The United Nations International Decade for Natural Disaster Reduction (UN-IDNDR, 1990 - 1999) conference resolved to change this approach in disaster management from post-disaster relief and rescue to pre-disaster mitigation and preparedness efforts. This was to empower local communities, governments, NGOs and civil society organisations in the disaster management decision-making processes. Emergency relief projects are not sustainable in the long run. Ever since then, governments and NGOs have been putting tremendous efforts into reducing vulnerability by enhancing sustainability in reconstruction and rehabilitation by disaster management programmes (Shaw, Gupta and Sharma, 2003).

During the 1990s, practitioners and policy makers rapidly adopted Community based Disaster Risk Management (CBDRM) as an alternative to top-down interventionist approaches in disaster management (Heijmans**,** 2009; Allen, 2006**)**. So far, research has shown that Community based Disaster Risk Reduction Approaches (CBDRA)

yield the best results and the most trustworthy primary data to help understand the disaster risk profile of communities (Anderson and Woodrow, 1998; Abarquez and Murshed, 2004; UNDP, 2007, 2009, p. 2; Pelling and Wisner, 2009). For the purpose of this study, the terms Community based Disaster Management and Disaster Reduction Approaches (CBDRM/CBDRA) are used interchangeably as they emphasise the context of community. Disaster risk management implies a general process of addressing disaster risks while the approach is specific in terms of methodology. The aim of CBDRM is to help vulnerable communities prepare for and live with disaster risks. Currently, however, community based 'bottom-up' approaches to disaster risk reduction have become a common strategy for development at local level (Uitto and Shaw, 2006). Over the last twenty years (1994-2014) or so, 'top-down' emergency response approaches in disaster risk reduction alone have failed to address the local needs of vulnerable communities (Shaw, 2011). In whatever form a disaster occurs, it needs to be managed, and society needs to prepare for it by either reducing its impact or by recovering from it. The management of disasters in the past focused on emergency response. Emphasis was on relief and emergency supplies for disaster victims. People affected by disasters were regarded as being vulnerable and passive victims or recipients of aid and not as potential resources for development, capable of sustaining their own livelihood (Heijmans, 2009; 2004).

Currently, evidence shows that most top-down disaster risk management and response programmes have failed to address the specific local needs of vulnerable communities (Abarquez and Murshed, 2004). Programmes that ignore the potential of local knowledge, resources and capacities have in some cases even increased people's vulnerability. However, grassroots or local level strategies should be linked to appropriate top-down strategies and government interventions (Anderson and Woodrow, 1998; DFID, 2005; Fraser *et al.,* 2006). This ensures sustainability of any approach that is adopted by enabling access to knowledge from outside the community which may assist in vulnerability reduction. Successful community based DRR interventions create resilient communities**,** whilst reducing vulnerability through development projects (UNDP, 2004; UNISDR, 2004; DFID, 2005). In this regard, the use of community's capacity and resources is crucial to ensure wide acceptance,

ownership, participation and sustainability of DRR programs (Shaw *et al.,* 2011).The community is, after all, the key factor and primary beneficiary of DRR interventions.

Research conducted on the approaches used in managing disasters in the recent past has shown that disaster mitigation is becoming more and more community based (Blake *et al*., 1994; Twiggy and Bhatt, 1998;, Quarantelli, 1989; Mileti, 2001 and Shaw and Okazaki, 2003). It has become imperative to put more effort in incorporating disaster risk management aspects into the holistic development planning for communities. As Maskrey (1989) rightly points out, disaster (risk) management should not be treated as a single issue but should be incorporated into the socio-economic activities of local people. CBDRM approaches improve the position of impoverished, vulnerable, disaster-affected people by addressing the root causes of their vulnerability, and by recognising their fundamental right to participate in decisions that have an impact on their lives (UNISDR, 2005; ADPC, 2004; Li, 2002).

Within the field of DRR, community based approaches to reducing vulnerability have become increasingly popular over the past 20 years (Allen, 2006). The main goal of CBDRM is to empower people in addressing the root causes of vulnerabilities by transforming social, economic and political structures that generate inequalities and underdevelopment (Shaw and Kenji, 2004). The poor need to be helped in finding lasting solutions to challenges affecting their livelihood. This is what prompted the United Nations through the Hyogo Framework for Action (HFA) in 2005 to change the approach of addressing disaster risks to adopt the community based disaster risk reduction approach**.** In support of the community participation approach, Holloway *et al*.,2008, maintain that Community based Disaster Risk Assessment provides the best information in understanding the disaster risk profiles of the community (more on this in Chapter 3).

2.3.1 From emergency relief to community participation

During the World Conference on Disaster Reduction (UNISDR,2005) held in Kobe Japan in 2005, the Hyogo Framework for Action (HFA) 2005-2015 was adopted**.** Its main goal was to build resilience in nations and communities to cope with disasters

and subsequently achieving substantive reduction in loss of human lives by 2015 (UNISDR, 2004). The HFA outlines five areas of priorities for action as well as guiding principles and practical means for achieving disaster resilience for vulnerable communities in the context of sustainable development. These include:

i. making disaster risk reduction a national priority,
ii. knowing the risk and taking action,
iii. building understanding and awareness,
iv. reducing risk factors; and
v. being prepared and ready to act.

The main thrust of the HFA lies in identifying ways of building resilience in nations and communities to deal with disaster risks.

To achieve its goals, the HFA has recognised the shift in disaster management approaches from relief and emergencies to disaster risk reduction through community involvement. The emphasis is now on the inclusion and involvement of the exposed local communities alongside the major stakeholders and the other actors in disaster risk reduction interventions. Community based Mitigation (CBM) and Community based Disaster Preparedness (CBDP) planning have since been recognised as sustainable approaches in disaster management (Maskery, 1989; Allen, 2006). The paradigm shift in disaster management has since evolved from developing disaster resistant communities to developing disaster resilient communities (McEntire, 2005). The United Nations Centre for Regional Development (UNCRD) (2007: 3) notes that a community based disaster management approach promotes a bottom-up strategy working in harmony with a top-down one to address hazards, challenges and difficulties. The government, NGOs and the vulnerable community must meet at one point and agree on intervention on DRR. The local community must be assisted in analysing and solving their disaster problems using their local resources.

Barely a week goes by without news about a major disaster that results in death and destruction. (Oxfam, 2007). These could be natural disasters or human-made

disasters. Disasters wipe out developmental projects and slow down the pace of socioeconomic development, especially in developing countries with limited capacities (World Bank, 2001). It has been argued that disasters are a reflection of poor development planning (UNDP, 2004: 9; Pelling, 2003). The government has the responsibility to provide basic needs for the people such as infrastructure, roads, safe water and sanitation services. However, failure by governments to provide basic needs is the root cause of extreme poverty and vulnerability in least developed countries (World Bank, 2001.) The prevalence of disasters is often attributed to natural forces that are beyond human control. Climate change has been identified as a major driver of disasters facing the globe today and will likely increase, resulting in massive losses, especially in developing nations (Warner and Ore 2006; IPCC 2009; Aalst, 2007). It must be noted that disasters not only reveal underlying social, economic, political and environmental problems, but contribute to worsening them (UNEP/ISDR 2007). Disasters pose serious challenges to development by eroding well-deserved gains in terms of political, social and educational progress, including infrastructure and technological development. In most developing countries, natural disasters have constituted a heavy drag on development by undoing decades of development efforts and reverse gains in poverty reduction (Nakagawa and Shaw, 2004; Nchito, 2007; UNISDR, 2008; Schipper and Pelling, 2006).

Community based development approaches are a fundamental form of empowerment of the local community and a compelling strategy for enforcing the transmission of ideas and claims from the bottom up to the top level (Allen, 2006). The approach is now viewed as a promising tool in achieving the goals of self-reliance and self-determination which are vital for community development (Uitto and Shaw, 2006; Ayers and Huq, 2009). Research has also shown that community disaster plans yield the best results and the most trustworthy primary data in understanding the disaster risk profiles of communities (Abarquez and Murshed, 2004; UNDP, 2007; 2009, p. 2; Holloway *et al*., 2008; Pelling and Wisner, 2009). Scholars Van Riet and Van Niekerk, (2012) describe Community based Disaster Risk Assessment (CBDRA) as direct participatory actions taken by the at-risk communities aimed at applying local knowledge and experiences to analyse their own coping capacities. It involves mobilisation of local resources to develop tools

and strategies for DRR, and to find possible lasting solutions for building resilience in communities.

Table 1: Characteristics of Community based Risk Reduction Approach

▪ The focus is on the local community to increase community capacity and strengthen its resource coping strategies.
▪ It reduces vulnerable conditions and identifies the *root causes of vulnerability.*
▪ Disasters are viewed as unmanaged and unresolved problems of the development process.
▪ The community members are the key actors as well as the primary beneficiaries of various initiatives.
▪ The community participates in the whole process of disaster risk management: from situational analysis to planning and implementation.
▪ A multitude of community stakeholders are brought together to maximize the local resource base.
▪ Local organisation is linked vertically with national and international level organisations to address the complexity of vulnerability issues.
▪ The framework is dynamic and can be adapted to the prevailing situation.

(Benson *et al*., 2001; Goodyear, 2000; Tobin and Whiteford, 2002)

In summary, Van Riet and Van Niekerk (2012) argue that DRR fundamentally implies reducing the socio-political, political, environmental and economic vulnerability of a community to natural and anthropogenic hazards such as droughts, floods and fires among others. Community based disaster risk reduction transforms a community by making it safer and more resilient (Pelling, 2007). This is done by assessing and monitoring risks that a community may be exposed to. The community at-risk is actively involved in the planning and decision making process about DRR. Pelling (2007) further suggests that both communities and local authorities (government) need capacity building and resources to manage and reduce exposure to disaster

risk. This should be done through the sharing of information through raising funds to increase resources to assist with the implementation of DRR interventions (Table 1).

2.3.2 Creating a community that is disaster resilient

A resilient community is one that has the capacity to absorb forces through adaptation and a community that can maintain certain basic functions and structures during disastrous events (Twigg, 2005). However, key questions one may ask are: why is local community participation important in disaster risk reduction? What necessitated the shift from community based approaches to reactive disaster management by the governments and NGOs?

Community based disaster risk management approaches have been adopted because they aim at building resilient communities. They raise people's awareness of disaster risks, using intimate local knowledge, and they recognise pre-existing local structures, capacities and institutions (Heijmans, 2009; Wisner *et al*., 2004; Tran and Shaw, 2007). More effort has been put into incorporating disaster management aspects into the holistic development of communities. As Maskrey (1989) points out, disaster management should not be treated as a single issue, but should be incorporated into the socio-economic activities of the local people. DRR activities should therefore assist communities to avoid, lessen or transfer the adverse effects of hazards. This has to be done with activities and measures for prevention, mitigation and preparedness. These measures include various activities, projects and programmes that the communities may identify after assessing and analysing the risks that they face. The community based approach is an ongoing process aimed at reducing vulnerability to natural hazards across all levels of society and socio-economic sectors. Its effectiveness depends on the need to recognise the cardinal role of the community in economic planning and policy making. The approach supports the inclusion of local knowledge and mitigation strategies to reduce vulnerability (Baumwoll, 2008; Allen, 2006).

Building resilient communities implies concentrating the community's ability to reduce their own disaster risk. This means that those directly vulnerable to hazards are those best placed to identify solutions for risk reduction (Wisner *et al.,* 2004). However, grassroots strategies should be linked with appropriate top-down

strategies and local government interventions (Anderson and Woodrow, 1998; DFID, 2005; Fraser *et al.,* 2006). This ensures the sustainability of the approach that is adopted by the community and enables access to outside knowledge and skills that may assist in vulnerability reduction. Successful DRR activities create resilient communities whilst ensuring vulnerability is not increased through developmental efforts or other externally initiated activity (UNDP, 2004; UNISDR, 2004; DFID, 2005). This is possible only if the community at-risk actively participate in the DRR interventions.

2.3.3 Community engagement in disaster risk reduction

Community involvement is essential in the development process in general and disaster risk reduction in particular (GNDR, 2009). Nobody can understand local opportunities and constraints better than the local communities themselves (Abarquez and Murshed, 2004). Additionally, a community can be defined in several ways, but in the context of DRR, it is a group of individuals and households living in the same location and having the same hazard exposure (informal settlement status) and who share the same objectives and goals in disaster risk reduction (Morrisey 2005).

Participatory approaches are about helping people to engage actively in issues affecting them and encouraging them to learn and think for themselves in finding solutions (O'Meara, 2010; Shaw, 2011). The focus of community based DRR is the participation of the community in risk reduction interventions. So far, a full range of tools and methodologies have been developed to assist in engaging communities (Chambers, 2002; ProVention Consortium, 2006; Twigg, 2007; Maceda *et al*., 2009; Rajib, 2011). The participation of the community in disaster risk reduction has to take a holistic approach. The top-down approach by the governments and DMMU (in Chapter 1) with limited participation of the local people in finding solutions to issues affecting them, has in most cases failed to sustainably reduce vulnerability and exposure to disaster risks (Garret, 2004:1). A key aspect of community participation is the sustainability of community level initiatives of disaster reduction activities once external support is withdrawn (ADPC, 2004). Emergency responses, especially through provision of relief, have made beneficiaries become dependent on relief rather than find initiatives to increase their coping capacity. It is therefore vital to find

suitable approaches of engaging the community to actively participate in initiatives affecting their livelihoods.

Chen *et al.,* (2006) argue that through a community based participatory approach, community members would learn how to analyse their vulnerable conditions and find ways of reducing disaster risks affecting them by developing strategies for DRR. Furthermore, there is a need to establish community organisation structures responsible for implementing disaster risk management activities. Participatory approaches to development evolved throughout the 1980s and into the early 1990s with the introduction of methods such as Rapid Rural Appraisal (RRA), Participatory Action Research and Participatory Rural Appraisal (PRA) being among the prominent ones. These focused on the understanding of "inside local knowledge as a balance to the dominance of outside western scientific knowledge" (Kanji and Greenwood, 2001, 8; Duraiappah *et al.,* 2005). Participatory approaches ensure that the needs and priorities of the most vulnerable and marginalised populations of the community are met by using local expertise and resources within the community. The focus is on sharing of information through discussions and planning, involving all participants in taking initiative and influencing the direction of the process (Chambers, 1994). PRA originated from innovative methods that were developed and used by community organisers in rural areas to engage communities in reflecting on their situations and design strategies for change. Lessons gleaned from experiences with development projects show that the failure to consult local people or generate a sense of ownership amongst them results in a plethora of high-cost, inappropriate technologies and ineffective programmes which are disastrous to the community at-risk (Burkey, 1993; Walia, 2008). Since then, it has been widely accepted that local people possibly have a better understanding of the many issues affecting them than outside experts have. Chambers (2003) argues that many PRA methods were developed specifically for use by people with mixed or low levels of literacy. This is due to the fact that the most vulnerable members of society, especially in informal settlements, are more susceptible to disaster risks and have low coping capacities coupled with limited opportunities for a decent standard of living and limited access to education (Pelling, 2007). Effective disaster risk reduction activities therefore call for community participation and for recognising the vulnerability and exposure of the community to hazards and disaster risks (Egger

and Majeres, 1998; Wisner, 2005). Tenets of effective community participation are based on six key principles of community participatory approaches. These include: inclusion, equal partnership, transparency, sharing power, sharing responsibility, empowerment and cooperation in the community (Table 2).

Table 2: Key Principles of Community Participatory Approach

Inclusion	Include all or representatives of all groups who would be vulnerable to disaster risks.
Equal Partnership	Recognising that every person has a skill, ability and initiative and has equal right to participate in the process regardless of their status.
Transparency	All participants must help to create a climate conducive to open communication and to building dialogue.
Sharing Power	Authority and power must be balanced evenly between all stakeholders to avoid the domination of one party.
Sharing responsibility	Stakeholders have equal responsibility for decisions that are made, and each should have clear responsibilities within each process.
Empowerment	Participants with special skills are encouraged to take responsibility for tasks within their speciality, but should also encourage others to be involved in order to promote mutual learning and empowerment.
Cooperation	Cooperation is very important; sharing everybody's strength reduces everybody's weaknesses.

Adapted from Egger and Majeres 1998; Wisner, 2005

These principles form a basis for the sustainable development and effective implementation of community owned development interventions (Table 2). Participation entails a shift in power from the traditional developmental agents (government and NGOs) to the local communities in need of uplifting their lives and aspirations (Sandström, 1994; Sen, 2000).

2.4 COMMUNITY DEVELOPMENT THEORY

To understand the community development theory in detail, it is important to begin by examining the concept of community development. According to Smith (2006: 2), community development focuses on approaches that look at cultivating mutual aid, local networks and communal coherence while pursuing what the community members aspire to achieve. Community development therefore, denotes the process of creating conditions of economic and social progress for the whole community by active participation and reliance on the community's initiative. Community development involves the employment of community structures to address social needs and empower groups of people to develop actions to address problems collectively (Mendes, 2008:3; Minkler, 1990). Themes emphasized under this concept include democratic procedures, voluntary cooperation and self-help, the development of indigenous leadership and knowledge and education. It came as a result of outsiders and professionals having to deal too often with the symptoms and outcomes of problems in society instead of working to fix the foundation (Perkins, 2008). This was characteristic of the reactive disaster management approach (see Chapter 1, section 1.3).

Development is associated with activities undertaken that integrate political, socioeconomic, cultural and environmental factors in a process of transforming the structures of society for the benefit of the poor and the vulnerable majority. Development theory emphasises the upliftment of the standard of living of vulnerable community members. The theory focuses on empowering the community to address vulnerability issues using local knowledge (Van Aalst *et al.,* 2008; Mercer *et al*., 2009). This theory further states that there is one piece of the system on which everything else depends and that is meeting the basic needs of the community such as water and sanitation services. Strategically, it is not necessary to consider issues beyond the local capacity of a community. The underpinning of this theory is that if the pressing needs of the community are improved, the benefits will trickle down to the rest of the community.

Botes and Van Rensburg (2000), noted that "hasty technocrats" are not the only ones who are impatient. Potential beneficiaries [communities], too, want speedy,

tangible delivery. They recommend the need to realise that any intervention is for the good of the community. The need and capacity of the community to sustain disaster risk reduction interventions should be the focus of community development. Community development theory further emphasises self-help and communal support in building resilience through neighbourhood integration and through development of local capacities for problem solving. However, in the field of DRR, it is functionally interactive and interdependent. Instead of thinking about each element by itself, each must be envisioned in the context of a totality (Ogilvy, 1979).

Understanding community development theory provides an input in analysing community participation in DRR activities and development planning. The theory is vital for those who intervene in community systems such as DRR initiatives. The theory typically encourages interested and concerned community members to express their views of the development which affects them (Derrick *et al.*, 1977:7). In the field of community based disaster risk reduction, the community development theory presents a logical basis for understanding the general background of community participation. Community participation should therefore not be seen as a voluntary risk but rather a desire of the community for development (Lebel *et al*., 2006). On the other hand, Mokoena (2004), came with the conclusion that community driven development (CDD) projects are a useful tool towards poverty alleviation. Its main objective is to build the capacity of the local authority simultaneously with that of the community so that the local community takes over the development process eventually. CDD inculcates the spirit of community ownership of projects and infrastructures are crucial (UNDP, 2003:114).

Participatory methods are many and vary, depending on what issue one wants to address. One size does not fit all. They take different forms, depending on the purpose one wants to use them for. They may also be applied to research, policy formulation, poverty assessment and poverty reduction activities (ADPC, 2006). Furthermore, participatory methods are effective tools for community development planning to influence the project cycle. (Pelling, 2007). Commonly used approaches include: Rapid Rural Appraisal (RRA), Participatory Rapid Appraisal (PRA), Participatory Action Research (PAR) and Appreciative Inquiry (AI). However, this study will concentrate on PRA and RRA.

RRA is the common methodology used by the government DMMU in their quick response interventions when disaster strikes a community. On the other hand, the PRA approach has been adopted by NGOs to engage local communities in DRR interventions relevant to this study (See Chapter 6). The two approaches are relevant to theoretical approaches of this study because they are commonly used in Zambia by the Disaster Managament and Mitigation Unit (DMMU) when conducting disaster risk assessments (GRZ, 2010).

2.4.1 Rapid rural appraisal

The rapid rural appraisal method is a qualitative multi-disciplinary survey methodology of analysing problems faced in a community (Pelling, 2007). It emerged in the 1970s as a cost effective way for outsiders to learn about problems communities faced. It consists of various techniques for understanding the dynamics of a community (Abarquez and Murshed, 2004). The rapid rural appraisal is guided by key principles of optimising data collection using the community as part of the data collection. It also applies the triangulation method whereby an outsider or researcher uses more than one method and source of information to cross-check answers and undertake research as part of a multi-disciplinary approach to increase the range of information collected (Van Riet and Van Niekerk, 2012). In DRR and community based approach in particular, this is vital as causes of vulnerability to disaster risks vary, depending on the biophysical, social and economic status of the community (Roos *et al.,* 2010).

The strength of this approach is that it emphasises learning as being from and with the local people themselves to build on prior knowledge (Provention, 2007). Learning is conducted directly within the source [community], benefiting from indigenous technical and social knowledge and skills. The local community is taken to be the custodian of the wisdom required and has the capacity to uplift their standard of living UNISDR, 2005). To allow for a more equitable developmental process, disadvantaged stakeholders are empowered to increase the level of knowledge, influence and control they have over their own livelihoods and over the development of research on initiatives affecting them (FAO, 2007; Van Heck, 2003). This is done by applying tools, including transect walks with the local people to appreciate the

physical environment where the community resides. Other techniques include focused group interviews, timelines, historical profiles and wealthy rankings (Protz, 2006).

Advantages of RRA include the possibility of clarifying information obtained. Assets that a local community has, provide the safety net in times when disaster strikes and are based on the experience the community have in managing disasters (Wenger *et al*., 2002). Asset mapping according to Kretzman and McKnight, (1993) is a methodology for identifying strengths of the community and to use them to solve problems in the most effective way rather than to spend time identifying problems for which there may not be adequate answers. It provides a quick, efficient and cost-effective approach for quantitative and qualitative data collection, analysis and interpretation that helps to cope with the complexity, diversity and interdependency of factors that influence various development issues (Reid *et al.,* 2005). It is also important to note that the RRA is not used in isolation but can be supplemented with other participatory tools such as the participatory rural appraisal tool (Biggs, 2008).

Communities in disaster affected areas are the first responders to disasters which befall their community (Walia, 2008). Community participation in DRR interventions is very important in effective disaster management. The Participatory Rural Appraisal enhances RRA by concentrating on the role of the community in planning and implementing DRR interventions.

2.4.2 Participatory rural appraisal

The participatory approach emerged in the 1980s after the RRA (Cornwall and Pratt, 2001; Chambers, 1997). The difference between RRA and PRA is that PRA emphasises processes that empower local people, whereas RRA is mainly seen as a means for outsiders to gather information (White and Pettit, 2004). The key elements of PRA are the methods used, and the focus is on the behaviour and attitudes of those who facilitate it (Chambers and Blackburn, 1996). Its main strength lies in the direct participation of the community in planning and problem identification, using diagrams and maps. Unlike RRA, PRA is a more holistic approach towards participatory development interventions. PRA belongs to a family of approaches, methods and tools designed to enable local people to formulate and analyse their

situation in order to plan, act, monitor and evaluate their actions (Chambers and Blackburn, 1996). Chambers (1997) recognises the fact that local people are capable of analyzing their own realities and those from outside should not dominate and lecture to them. Their role is to facilitate community development activities. In addition, PRA does not focus on transfer technology but share methods which local people can use for their own appraisal, analysis, planning action and evaluation. Outside institutions play the role of facilitators and coordinators of development programmes (Abarquez and Murshed, 2004).

The implementation of PRAs focuses on capacity building of the local community. In addressing local disaster events PRAs can empower people with knowledge and skills they require to sustain themselves, using local skills and resources (Narayan, 1996: 9-10). Aditionally, Narayan argues that PRA centres on the utilisation of results collected. In addition, PRA recognises the 'expertise of the non-expert', *that* the local people are more knowledgeable about their environment than the external experts (Chambers 1997; UNISDR, 2002). Their interests, abilities, preferences and knowledge need to be recognised and used during the entire process of uplifting their lives. Norton *et al*., (2001) speak of second generation PRAs, as the early focus on 'generating textual representations of realities of the poor to contribute to policy recommendations, gave way to a concern with creating new relationships within the policy process bridging public policy, civil society, people in poor communities and donor agencies.'

The use of PRA has helped a lot in community based disaster risk reduction activities by involving communities in the various decisions concerning their own development, including appraisal, planning, implementation, monitoring and evaluation. The 'developers' have also benefited from the interactions of PRA and the development practitioners have become more open to and respectful of local knowledge and more receptive to local priorities for research, action and policy. This has also enhanced the shift in focus by research and development oriented organisations to move away from top-down, standardised procedures towards a more open culture of learning process (Guijt and Cornwall, 1995).

Despite attempts to move away from the top-down approaches of development planning, participatory approach faces a lot of challenges. One major challenge is scaling-up, given that DRR-related community knowledge is mostly scattered, fragmented, and often not well-documented (Shaw *et al.,* 2011). There is a need for development agencies to explore partnerships between the local government, private sector, NGOs and community groups in order to upgrade indigenous knowledge systems from the current state of undocumented subjective practices to a respected body of applicable and useful knowledge (Osti, 2004).

Botes and Van Rensburg, (2000) identify key impediments to community participation in developmental activities. They pointed out that the majority of developmental projects are initiated by outsiders; thus, depending largely on development professionals for implementation and monitoring. Outsiders therefore claim to be the development experts whose role is to transfer knowledge and ideas to the vulnerable community. The community is seen as passive recipients and beneficiaries who depend on outsiders for capacity building in terms of knowledge and skills (GNDR, 2009; Hagelsteen, 2009).This leads to their [outsiders] dominance in decision making and the implementation of programmes. As a result, many development programmes end up being externally driven rather than community driven (Provention, 2007).

Although disaster risk management experts may question the capacity of local people to understand what they want and what is likely to be in their best interest (Schipper and Pelling, 2007; Chambers 2008), many local community members often do not want to participate actively in imposed interventions because of past experiences where their expectations were not fulfilled (Wenger *et al.,* 2002). This situation undervalues the input and experiences of non-professionals or the community as a whole. Community participation in disaster risk reduction focuses on the community's ability to reduce their own disaster risk by identifying those directly impacted by hazards, viewing the community as being best placed to identify solutions for risk reduction (Wisner *et al.,* 2004). However, grassroots strategies are linked with appropriate top-down strategies and local government interventions (Anderson and Woodrow, 1998; DFID, 2005; Fraser *et al.,* 2006). Critical factors to achieving a significant level of impact include the capacity of those taking actions

(facilitators and the community), the information available at the local level and funding support for adaptation initiatives (McGray *et al.*, 2007; IFRC and ProVention Consortium, 2009). This ensures the sustainability of any interventions adopted and enables access to outside knowledge which may assist in vulnerability reduction.

The emerging crisis in environmental risks and human security in African cities can be related to failure in social contracts. The contract is a much debated concept (Pelling and Dill, 2008), used to represent the balance of rights and responsibilities in society, including entitlements to basic needs which should be provided by the government. Community participation is often seen by governments as a means of legitimising the political system and as a form of social control. The state in most cases capitalises on the vulnerability of the community to win votes in the political arena. Governments, especially during the election periods, introduce a number of developmental projects in response to the needs of the populace to gain political mileage (Davidson *et al.,* 2007; Morgan, 1993,:6, in Botes and Van Rensburg, 2000). Such interventions include promises of improvements in the construction of infrastructure, provision of safe water and sanitation, including employment opportunities, as reported in the Kanyama Ward Development Committee Report (WDC, 2013). These are usually short-term promises aimed at undermining the community's abilities in governing themselves. After elections are over, the community is unfortunately left at the same level of poverty and vulnerability to disaster risks as before (Walia, 2008:69). The general focus of DRR is enhancing the skills, knowledge and capacities of local communities through community development initiatives (GNDR, 2009; Hagelsteen, 2009).

According to UNDP (2004), disaster risks are a result of failure of development in the community. The community deprived of access to basic needs will become vulnerable and exposed to disaster risks. The following section will focus on the relationship between DRR and development.

2.5 DISASTER RISK REDUCTION AND DEVELOPMENT

Several studies have shown that investments in development are jeopardised unless precautionary actions are taken towards reducing disaster risk (World Bank, 2001). Nevertheless, few developmental organisations, including governments and NGOs,

adopt a precautionary, self-sustainable approach in the design and management of projects (World Bank, 2002b:16). Moreover, only a few recognise the role of environmental management in reducing disaster risks (McEntire, 2004). Several vulnerable communities today fail to adapt to the new environment after the relocation. After disasters, victims usually return to their risk-prone locations within few months after the relocation (Nchito, 2007). This shows a failure of the systems that targets capacity-building and sustainable development for communities (Rofi *et al.,* 2006).

Disasters are deep-rooted in development planning failures (UNDP, 2004). This is the core rationale behind integrating disaster risk reduction into development. Disasters result from a complex interplay of social, environmental, political and economic factors that are strongly linked to development, and interact with hazard(s) to become disaster (s) (Lewis, 1999; Wisner *et al*., 2004; Hewitt, 2007). Successful DRR activities create resilient communities, whilst ensuring vulnerability is not increased through development efforts or other externally initiated activity (UNDP, 2004; UNISDR, 2004; DFID, 2005). The focus of DRR is based on experience at community level, for which a full range of participatory tools and methodologies have been developed (Chambers, 2002; ProVention Consortium, 2006; Twigg, 2007; Maceda *et al.,* 2009; see section 2.5.2 above). These tools help communities analyse their vulnerability and identify possible solutions to disaster risks.

McEntire, (2004) and Pelling, (2006), among the many architects of the HFA, are of the view that DRR should be integrated within the developmental context. They also state that, in many cases, increases in numbers below poverty thresholds appear in an aggregate national statistics following a disaster. Moreover, recent studies suggest that both governments and donors/NGOs tend to fund disaster emergency relief and rehabilitation by reallocating resources swiftly from long-term developmental programmes (UNDP, 2004; UNISDR, 2004; DFID, 2005). Although the impact of any such reallocation is difficult to measure as it is unrecognised in official figures, it can be expected to affect the poor disproportionately through adverse effects on poverty reduction efforts (UNEP/ISDR, 2007). High frequency hazards such as floods and drought, trigger immediate food crises and loss of shelter, but can also have longer term effects which slow down recovery periods for

the community. A natural hazard becomes a disaster when it affects a vulnerable population to the extent that they cannot cope using their own resources (NEDA, EC and UNDP, 2008). As stated in the HFA, mainstreaming DRR into development should take central stage by ensuring "considering and addressing risks emanating from natural hazards in the development planning process" (UNISDR, 2004). However, addressing disaster risk issues is always a challenge for decision makers. Policy makers, the government, should recognise the need for strong intervention following a disaster, by considering allocating enough resources to disaster preparedness (IPCC, 2007; UNDP, 2012). For instance, the impact of climate change and epidemics such as HIV/AIDS points to a future where disasters could increasingly threaten the world's economy (ISDR, 2005). Rapid urbanization will also increase community exposure to disaster risks (UNISDR, Global Assessment Report 2011).

Since disasters are recognised to be one major stumbling block in attaining development goals, DRR should be a major priority for all. There is a need to promote disaster reduction activities that can be fully understood by the local community (Abarquez and Murshed, 2004). In developmental terms, DRR represents 'the systematic development and application of policies, strategies and practices to minimise vulnerabilities, hazards and the unfolding of disaster impacts throughout a society to achieve sustainable development" (UNISDR, 2004: 3). Shaw (2003) emphasises the coordination of NGOs and voluntary organisations in post-disaster scenario, and concluded that activities are successful only if they are rooted in the people and community. Shifting communities to temporary shelters pose a threat to community links and are not sustainable.

There is a strong relationship between disasters and development. Disasters typically result in large-scale destruction of infrastructure such as roads and bridges, and affects the livelihood sectors such as industries, agriculture and natural resources which are vital for human sustenance (Collier, 1999; Cavallo and Noy, 2009). On the other hand, disasters could be viewed as opportunities for sustainable development (Shaw, 2006). After disastrous events, the "build better" concept arises. Resources, which were once scarce for preparedness, have to be found for post-disaster phase activities such as reconstruction and rehabilitation to improve

infrastructure and services (Michel, 2005; Flint and Goyder, 2006). Simultaneous projects were launched by numerous local and international organizations for housing and infrastructure repairs, for livelihood creation and for a range of other social programs. The poor, despite being the worst affected by disasters, seem to be neglected because they outnumber the rich and live in disaster-prone areas in substandard houses (UNISDR, 2004, p. xi).

The exposure of communities to disaster risks is at times caused by settling on fragile locations in the outskirts of urban centres. As noted by UNDP (2004) it is the failure by the government to provide for the developmental needs of its citizens that exposes them to disaster risks. In Zambia, the vision for disaster management is to create a safety net for the people (GRZ, 2005; see also Chapter 5).

2.6 LEGAL FRAMEWORK FOR DISASTER RISK REDUCTION

Decision makers who ignore the relationship between disasters and development do a disservice to the people who entrust them with power (GNDR, 2009). Increasingly, internationally, forward-thinking planners plan developmental projects in the context of disaster mitigation and are designing disaster recovery programmes with long term development needs in mind (Walia, 2008). Policy-makers and practitioners must assume that CBDRM approaches improve the position of impoverished, vulnerable, disaster-affected people. This is done by addressing the root causes of vulnerability and recognizing their fundamental right to participate in decisions that impact on their lives (UNISDR, 2005; ADPC, 2004; Li, 2002). Effective developmental planning cannot be achieved unless it operates within a domestically-driven vision that is generated from within the community at-risk and not imposed from outside (Dalal - Clayton *et al.,* 2003:185). The government and other developmental agents must ensure that the goal of development is to improve the livelihood of the people especially the poor who are often left behind or forgotten.

The government needs to provide guidelines to prevent people from settling in unsafe locations and provide safe water and sanitation among other basic services (GRZ, 2005). Today, many cities in the world are among the most exposed to disaster risks particularly where city authorities and the government have little presence, control, resources and/or political will to ensure basic services, food

security, respect for building codes and policing (IFRC, 2010:8). Legal frameworks in the form of policies and Acts provide guidance on development at both community and national level in such a manner that there will be no exposure to disaster risks (see Chapter 1, section 1.2.1 and Chapter 5). The failure to implement these Acts often results in increased exposure of communities to hazards and disasters. The onus is on the government to provide guidance before settlements are established. The guidance recognises major actors and their responsibility in disaster risks reducing and managing disaster risks in national and local development.

2.7 MAJOR ACTORS IN COMMUNITY BASED DISASTER RISK REDUCTION AND MANAGEMENT (CBDRRM)

There are multiple stakeholders involved in the community based disaster risk reduction and management process. Basically two broad categories are involved: the insiders and the outsiders (Torrente *et al.,* 2008). Insiders refer to those individuals, organizations and stakeholders who are located within the community while outsiders are those located outside of the community. Both groups of actors however aim at reducing community vulnerability and enhance its capacities for disaster risk management (Torrente *et al.,* 2008).

The community based disaster risk reduction and management approach is beneficial to the local community. Holloway (2007) states that well- structured community based plans adhere to six principles that subsequently benefit the community at risk. External agents come with a pool of skills and knowledge and material and financial resources. The aim of outsiders in CBDRRM is to offer sustainable solutions to alleviate the vulnerability of the community to various kinds of hazards and disaster risks.

Holloway (2007) identifies the following six principles of CBDRRM:

- Create sense of ownership;
- Build local capacity;
- Collaboration amongst different stakeholders (NGOs, academic ,government and community);
- Discourage swift campaigns and rapid drive assessment;
- Strengthen local livelihoods; and

- Participate in learning activities in the community.

The aim of community based disaster risk reduction is to create a sense of responsibility for intervention in implementing DRR activities by those who are at risk.

2.7.1 Create sense of ownership of risk

Disaster risk reduction starts with awareness creation in the community at-risk. There is a need to create a sense of ownership of the risks for the exposed community (Abarquez and Murshed, 2004; Rajiv *et al.,* 2012:1634; Pelling and Wisner, 2009). It is the community at-risk who are the victims and targets of disaster impact. Vulnerable communities often lack awareness of the disaster risks they are exposed to. For instance, in Kanyama settlement, the citizens are involved in (see Chapters 3 and 4) settling on flood-prone areas, drinking water from shallow open wells, building unsafe housing units which exposes them to risks in case of heavy rainfall (ECZ, 2000; CARE, 2011). However, residents find themselves in these precarious conditions not by choice but by circumstance. Poverty has been known as the major driving force of vulnerability to disasters (World Bank, 2001:146). Poor people settle in unplanned informal settlements on the periphery of major cities with the hope of opportunities for a decent standard of living in the city (Chibwe, 2011; Habasonda, 2012; World Bank, 2001). At times they could be aware of disaster risks but have no coping capacity and no mechanism to move to safer locations. There is a need to build local capacity in the community exposed to disaster risks (DiMP, 2005). Once the local community fully understands the disaster risks they are exposed to it is easier for them to participate in interventions from outside.

2.7.2 Build local capacity

It is essential to create awareness of the importance of building the local community's capacity to cope with disaster risks in the local community (ISDR, 2004; World Bank, 2001:146). Wisner (2005: 9) defines CBDRA as a method of self-assessment to determine coping and capacity against the impact of hazards. He states that CBDRA is about evaluating the coping capacity of a community in the face of a certain disaster or hazard. Therefore, the community at-risk must be helped with skills and knowledge about disaster risks they are exposed to. Any institution

planning DRR activities should first identify influential members and key development agent players in the community before coming up with programmes. Women, children and the aged are the most vulnerable and must as such be involved in finding solutions to disaster risk reduction issues.

UNDP (2010) views DRR as a complex, cross-cutting issue that requires an interdisciplinary and muilti-sectoral approach by bringing together the knowledge, skills and resources from different stakeholders.

2.7.3 Collaboration among stakeholders

Disaster affects people in different ways depending on their capacity and location (Wisner *et al.*, 2004; Allen, 2006). Disaster risk reduction requires a multi-sectoral approach (Perry and Liddell, 2003). All institutions and organisations working in a community must be involved in coming up with solutions. Sectors such as health, education, food security, agriculture and infrastructure development must all come on board. The community, however, takes the central stage (Holloway, 2007; Abarquez and Murshed, 2004; Anderson and Woodrow, 1998). Lack of collaboration in disaster risk reduction interventions may lead to duplication of efforts to the community. There would for instance be an oversupply of relief commodities while other essential needs are missing. One of the possible solutions is to come up with participatory initiatives which encourage community participation in DRR campaigns. Interventions done in a hurry only make the vulnerable community helpless once DRR support is withdrawn (Drinkwater, 2001). Rapid responses must be encouraged in effective DRR management.

2.7.4 Discourage swift campaigns and rapid assessments

The traditional reactive approach of disaster management encourages dependence of victim community on relief supplies rather than preparedness and sustainable development (Rajiv *et al.,* 2012:1634). When the community at-risk is fully involved chances of success will increase, and the mismanagement of resources are reduced (IFRCS, 2001). Community based disaster risk reduction makes the community part and parcel of the risk assessment and awareness campaigns (Abarquez and Murshed, 2004; UNDP, 2007; 2009: 2; Holloway *et al.,* 2008).

The next section looks at strengthening local livelihoods of the community as a way of reducing exposure to disaster risks.

2.7.5 Strengthen local livelihoods

In order to implement an effective community based disaster risk reduction project, it is essential that significant efforts are undertaken at local level (Van Riet and Van Niekerk, 2012:2) to raise the awareness of communities and ensure that an appropriate level of skills and knowledge is passed on to the people before, during and after disasters (Pelling, 2007; GNDR, 2009; Hagelsteen, 2009). A community that is adequately prepared is likely to be resilient to disaster risks in future.

After strengthening local livelihood assets, the next step is to focus on sustainability of the community by uplifting their standard of living and reducing vulnerability.

2.7.6 Sustainability and participatory approach

The challenge of DRR interventions today has been the lack of sustainability by the recipients of support. Communities in disaster-prone locations have in most cases relied on relief as part of their livelihood. After being affected by a disaster, victims in most cases still continue residing in the original disaster-prone settlements (Nchito, 2007). Community based disaster risk reduction approaches in this case focuses on making vulnerable communities become resilient. Sustainability is achieved by involving the community in assessing their exposure and vulnerability to disaster risks (Wisner, 2005).

Having analysed the major actors and interventions required to sustain DRR interventions at community level, the next section focuses on a model for community based disaster risk reduction, developed by Abequez and Murshed, 2004, as a basis for community based approach.

2.8 A MODEL FOR COMMUNITY BASED DISASTER RISK REDUCTION APPROACH

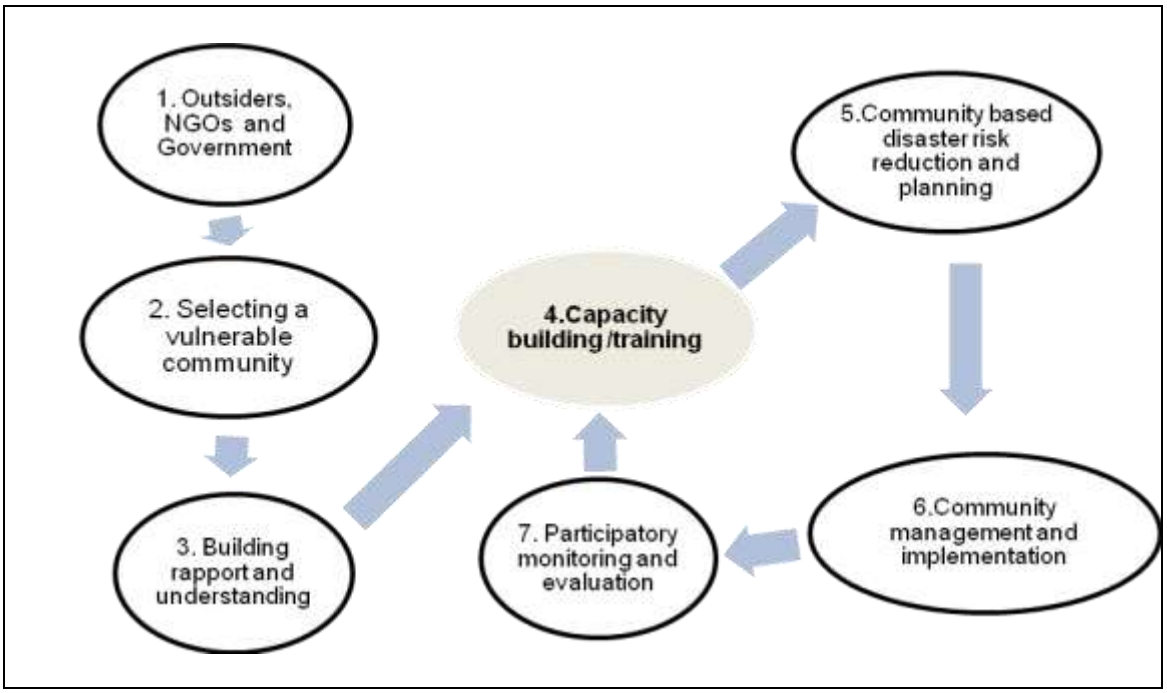
The primary cause of exposure to disaster risks is the concentration of vulnerable communities with limited resources and knowledge occupying disaster-prone locations, especially informal settlements (Hewiit, 2013). Furthermore, vulnerability of

such communities is a combination of the socio-economic, physical, environmental and geographical profiles of the community (Van Riet and Van Niekerk, 2012; Todes, 2011; see also Chapter 3). The responsibility is in the hands of the community at-risk to take action to reduce vulnerability and exposure to disaster risks. The background of disaster management approaches came as a result of the need for community participation in addressing their vulnerability and exposure to disaster risks (Twigg, 2007; See section 2.3).

The emergency reactive responses to disaster management looks at the community as victims and helpless beneficiaries of relief supply who need to take full responsibility in managing disaster risks they are exposed to (Walia, 2008). Community based DRR emphasises making the community self-reliant through raising awareness of the causes of vulnerability and understanding the root causes of their vulnerability (Allen, 2006). Development scholars and organisations have attempted to design DRR interventions aimed at assisting communities prevent and prepare against disaster risks.

This study will focus on one approach by Imelda Abarquez and Zubair Murshed (2004) of the Asian Disaster Preparedness Centre (ADPC), *Titled: Community – Based Disaster Risk Management*. The stages, starting with outsiders, form part of the comprehensive disaster management under community based disaster risk reduction. The process of the community based disaster risk reduction model follows the seven stages (Figure 2). These stages may not be conclusive but can be adapted from stage one, if applicable, depending on the level of engagement with the community.

Figure 2: A Model for Community based Disaster Risk Reduction and Management



(Adapted from Asian Disaster Preparedness Centre, ADPC, 2009:17*)*

2.8.1 Outsiders (NGOs and Government)

Outsiders (this includes the government, NGOs and agencies) start by identifying a community vulnerable to disaster risks. This could be after a disaster struck a community and a lot of destruction was caused. Through participatory methodologies (see section 2.4.2 above) (also see Chapter 5) a community is involved in analysing its vulnerability and initiating DRR interventions. The role of the outsider is basically facilitation and capacity building of the local community towards vulnerability reduction (Torrent *et al.,* 2008). They support efforts by the community to reduce vulnerabilities and to enhance community capacities in the long term. This is done through providing technical, material, financial and political support, including participatory approaches in engaging the communities. By participating in community based DRR activities, local people not only become trained to improve awareness to better prepare for disasters, but also take part in the physical construction of structures (see Chapter 4 and 6). They also benefit through participation, and gain improved knowledge (Wenger *et al*., 2002).

In Zambia for instance, NGOs such as Oxfam, Concern Worldwide, CARE International and World Vision, among others, have adopted community-led or -based approaches in disaster risk reduction. These approaches concentrate on building resilient communities. The focus is on sustainable interventions aimed at helping the community uplift standards of living and become resilient. The sustainability of interventions has to depend on identifying a vulnerable community in need of DRR interventions.

2.8.2 Selecting the vulnerable community

The criteria for identifying a vulnerable community depend on various factors other than exposure of the community to disaster risks (see Chapters 3 and 4). These factors include severity of exposure to devastating disaster risks, poverty status of the community, and readiness and willingness of the community to participate in disaster risk reduction activities (Cooke and Kothari, 2001). However, the criteria given is not exhaustive; other factors may also be considered, including the government's legal framework on services provision (see Chapter 5).

In order to encourage the participation of the community in developmental projects, a relationship has to be created between the outside institution and the community at-risk. The next section looks at building rapport and understanding with members of the community at-risk.

2.8.3 Building rapport and understanding

After the vulnerable community is identified, the next stage is to appreciate the local social relationship and background of the community. The focus is on analyzing the socio-economic status of the local people and identifying the most vulnerable members. The aim is to ensure active participation of all (see Chapter 7). Rapport building gives outside partners a clear picture of the skills level and status of and problems faced within the community (Chambers, 1997). After building rapport with the community, the next step is to build the capacity of the community in understanding disaster risk reduction management.

2.8.4 Capacity-building

Before the capacity of the community's disaster management preparedness can be built, the capacity of a community has to be assessed (See Chapter 7). Capacity is measured in terms of local resources, skills and knowledge within the community. According to Mwanamwambwa, (2009), Participatory Capacity and Vulnerability Assessment (PCVA), Participatory Needs Analysis and Assessments (PANA) are CBDRM strategies that help in the sustainability of DRR programs (White and Pettit, 2004). The participatory disaster risk assessment is conducted by the local authorities with the involvement of local people, community leaders and subject experts from outside. It is through this assessment that the community's available local resources, local knowledge, prevention, mitigation and response strategies are identified. Participatory tools are used in understanding the local capacities through training of trainers.

After the capacity of the community has been built, the actual community based disaster risk reduction planning process commences.

2.8.5 Community based risk reduction and management planning

After the capacity building stage, with vulnerabilities identified, the community - together with the outsider NGOs and government - are engaged in CBDRRM planning (Aberquez and Murshed, 2004). Local disaster risk reduction plans are formulated. The plans are community-owned, hence their implementation is localised using local resources (See Chapter 8). It is expected that the community will do the work without necessarily focusing on payment (See Chapter 7). During the process of CBDRRM other interventions include implementation and Participatory Monitoring and Evaluation (PME).

2.8.6 Community management and implementation

Community based implementation involves both structured and non-structured activities which include: early warning, community training, construction and rehabilitation of infrastructure (See Chapter 7). The community, together with the outsiders, ensures that the activities are implemented as planned. Where lapses

occur during the implementation, the outsider continues with capacity-building and closing knowledge gaps (Chambers, 2008).

2.8.7 Participatory monitoring and evaluation

The sustainability of DRR interventions depends on monitoring and evaluation of DRR interventions. The main aim of monitoring and evaluation is to provide checks and balances to ensure the sustainability of community based disaster risk reduction interventions. The community based organisation takes the responsibility for the overall implementation of the DRR activities at local level (Hagelsteen, 2009). Furthermore, PME involves the participation of key actors namely: local community, development agencies, local government and other stakeholders in measuring the progress made, and identifying necessary follow-up actions. Harmony among the stakeholders in PME is an important factor for the success of Community based Disaster Risk Reduction (See Chapter 8).

The model ensures sustainability of community based disaster risk reduction interventions by continuous capacity-building. This is done in the form of training and vulnerability assessments in relation to community based planning in disaster risk reduction (See Chapter 8). The model (Figure 2) could be used to analyse community based disaster risk reduction interventions in informal settlements by the insiders - the community - and the outsiders - the government and NGOs.

2.9 CONCLUSION

This chapter outlines the background of community based disaster risk reduction ranging from the traditional disaster management approach to disaster risk reduction. Key terms and concepts used in community based disaster risk reduction have been highlighted. These include disaster, vulnerability, hazard, resilience, risk and coping capacity, among others. The Hyogo Framework for Action has also been discussed as the result of the fact that communities have a major role to play in preventing, mitigating and responding to disasters. In addition, women and children and the elderly have been identified as the most vulnerable groups to disaster risks. Theoretically, the community based disaster risk reduction approach is a more sustainable approach in managing disaster risks. It recognises that the community

at-risk has the best knowledge and understands their vulnerability better than outsiders.

The exposure and susceptibility of a community depends on a number of factors such as environmental, social, cultural, economical and historical factors. Informal settlements in general are exposed to disaster risks mostly due to these factors. Chapter 2 created a conceptual and theoretical framework for the understanding of community based disaster risk reduction and management as responding to objective two of this research.

The proceeding chapter provides a hazard and vulnerability profile of Kanyama settlement in relation to the geographical and historical context of the settlement. As shall be seen, the vulnerability of the Kanyama settlement is due to its topographical location on the limestone (dolomite) flood-prone location of Lusaka (See Chapter 1, section 1.3). This formation, in addition to the geological and hydrogeological formation, increases chances of flooding and underground water contamination. Furthermore, the informal status of Kanyama has contributed to the inadequate provision of basic services such as safe water and adequate sanitation.

CHAPTER 3:
KANYAMA SETTLEMENT IN A GEOGRAPHICAL HISTORICAL AND DEMOGRAPHICAL CONTEXT

3.1 INTRODUCTION

This chapter provides the profile of the study area, Kanyama settlement. The profile includes the topographical/spatial, demographical, geological and hydrogeological characteristics as well as the historical background of Kanyama. The main focus is to provide sufficient geographical and historical context on the Kanyama settlement in order to pave the way towards an informed understanding of the occurrence of disasters and disaster risks in this area (to be dealt with in Chapter 4). Demographical and historical information was obtained from focused group discussions held during capacity-building workshops conducted by the researcher under Mulungushi University's CARE International project for Strengthening Peri Urban Risk Reduction in Zambia (SPURRZ), project IAG-PURRZ, Urban Hazard Risk and Vulnerability Assessment (UHVA) to evaluate the impact of CARE projects in Kanyama settlement (see Chapter 1 and Appendix I). Additionally, reports about hydrogeology, social and economic status of Lusaka in general including Kanyama settlement in particular were consulted.

The chapter does not provide an in-depth scientific background of the geology and hydrogeology of the Settlement but is limited to the basic understanding of its local geographical and hydrogeological features. Knowledge about geology of Kanyama is commercially and publicly important for understanding and managing natural hazards particularly flooding. The dolomite and marble rock formation underlying the entire city of Lusaka is the major cause of flooding in Kanyama Settlement (Nkhuwa, 1996).

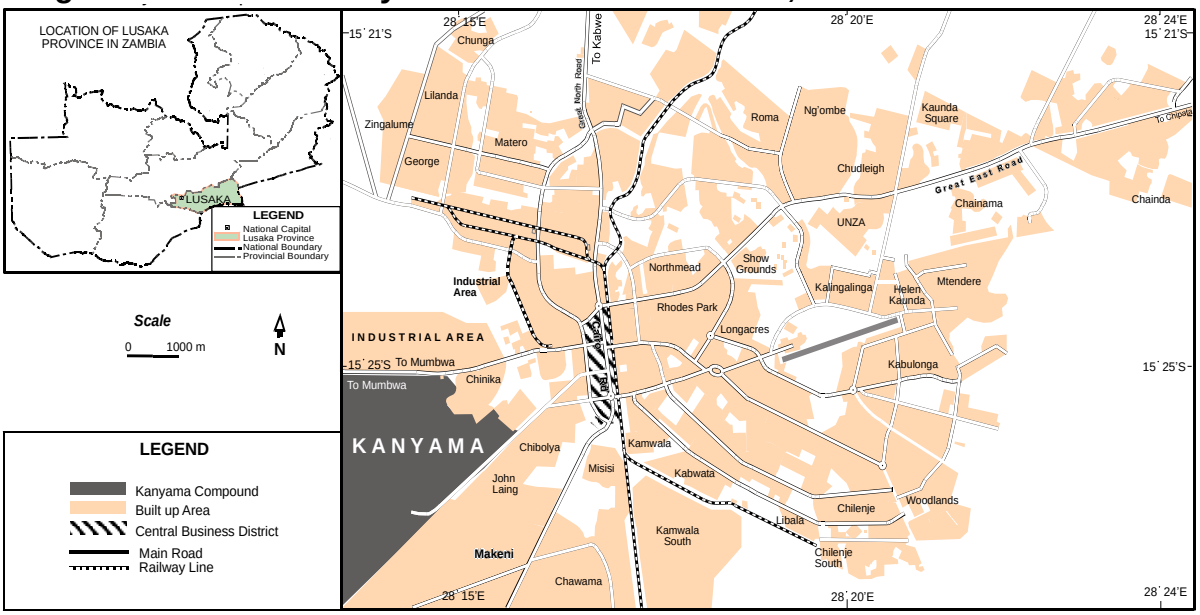
The chapter will then conclude with a historical section in which content will be provided to expose the origin of Kanyama; reasons for its development; its status as an informal settlement and its "value" as settlement in government authority circles as well as the community's economic development since its existence. How the area's demographic features contribute to disaster risks are deliberated. The profile of Kanyama settlement commences with the location of Kanyama informal

settlement in Lusaka.

3.2 THE GEOGRAPHICAL LOCATION OF KANYAMA SETTLEMENT

Kanyama is one of the 37 high density informal settlements of Zambia located in Lusaka the capital city of Zambia (Mulenga, 2003; LCC, 2008; World Bank, 2002). Geographically, it is located between 28´15ºE and 15´20ºS degrees in the Western direction of the central business district of Lusaka (Image 1 below). The settlement is surrounded by similar high-density, unplanned residential settlements. These include; Chinika, Chibolya and John Laing on the southern part while on the south west is Makeni (planned settlement) a low density smallholder's residential area. To the northern direction is Chinika industrial area.

Image 1: Location of Kanyama settlement in Lusaka, Zambia



(Greater Lusaka, Surveyor General, Lusaka 1:50,000, 2009 updated by Chalila, 2012)

The growth of Kanyama settlement is therefore restricted to the existing neighbourhood boundaries of informal settlements and industries. The development of housing infrastructure is largely informal in nature without following standard building regulations (Town and County Planning Act, Cap 283). According to the Ministry of Health (2000) Report, 69 percent of housing units in Zambia do not meet the housing standard while only 31 percent meet the minimum required standard.

3.3 TOPOGRAPHICAL FEATURES OF KANYAMA SETTLEMENT

In general, the topography or landscape of Lusaka and Kanyama in particular, consists of plateau from south and west at an altitude of 1,200 metres above the sea level, also the flat-topped hills lying in the north and east of at about 1,300 metres above sea level (Mulenga *et al*., 2003: 1; Bäumle and Nkhoma, 2008: 2; Grönwall *et al.*, 2010). Further, Kanyama is located on the Lusaka plateau which stretch 70 km long and 10 km wide over the lower ridge of the city (Nkhuwa, 1996; UNHABITAT, 2006).

The physical geographical features of Kanyama mainly consist of the Cheta formation (Nkhoma and Bäumle, 2008). The topography and morphology have been greatly influenced by the underlying geology. Generally, the Lusaka terrain comprises of both the plateau in the north and the valley to the west where Kanyama settlement is situated. The topographical location of being both flat and valley has contributed to the challenges for growth and development of the settlement, including flooding. This topographical landscape hinders the effective draining and infiltration of water, especially during the rainy season (UNHABITAT, 2006). The drainage of Kanyama mainly relies on seepage and evaporation to get rid of excess storm-water (Schmidt, 2001). The implication is that in case of a heavy down pour, the surface remains flooded for a long time. It is a common scenario during the rainy seasons to find pools of stagnant water in most informal settlements of Lusaka and Kanyama being the worst hit (LCC, 2010; Grönwall *et al*., 2010).

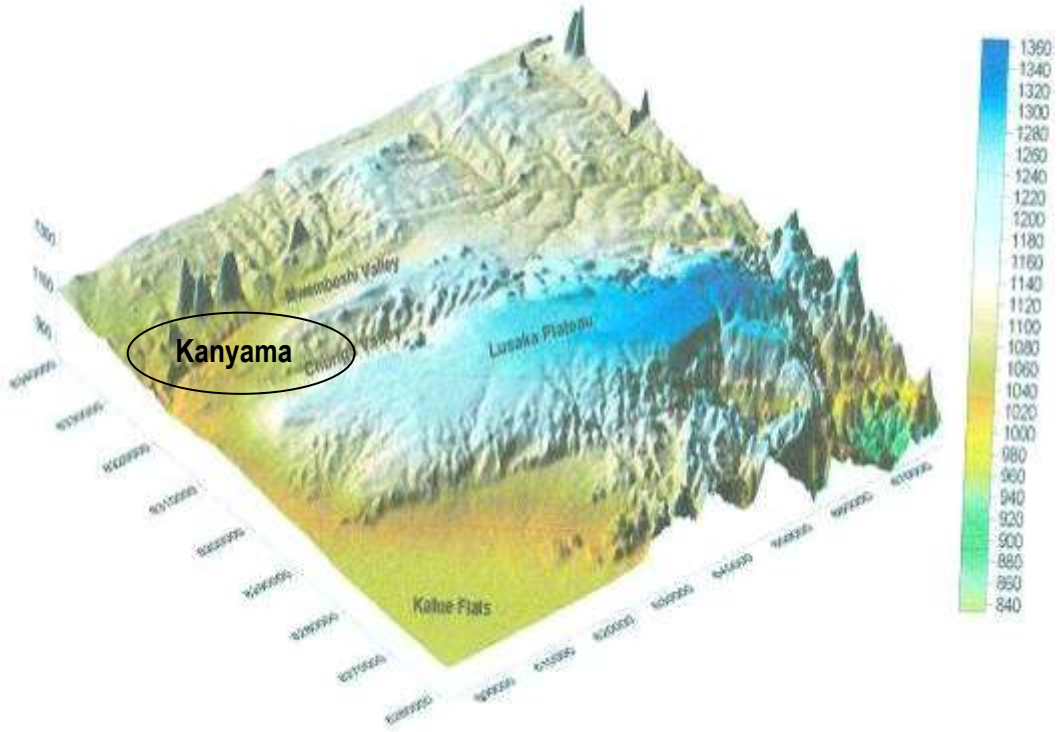
The initial land use plan for Lusaka was designed so that the northern plateau was reserved for urban development because it was suitable land for urban development for offices and residential development. The land on the western side of Lusaka is generally flat, shallow and with much rock outcrops (Williams *et al*., 1984 in Mhlanga, 2003: 4). This is the area where most informal settlements are located including Kanyama, Chibolya, John Laing, Misisi, Chawama (LCC, 2000). High cost residential areas and government offices are located on the higher ground part of the city also known as the Ridgeway. The location provides residences for the high class citizens of the city. The drainage system of Lusaka generally creates geological and environmental problems resulting from too much water failing to percolate during the

rainy season (UNHABITAT, 2000). The central part of Lusaka is generally on a low level area. This makes draining of water, especially during the rainy season, to be very slow. The area lack surface streams and drainage network is poor. To the south and east of Lusaka, the land rises gently to a ridge of resistant schist leading to water from the higher ground flowing into the residential areas which leads to flooding in Kanyama (Schmidt, 2001).

Geologically, the dolomite and limestone formations are part of the main body of the elongated plateau are characterised by a flat landscape (Nkhuwa, 2003).The Pleistocene uplift and subsequent erosion formed the present drainage system of Lusaka.

The topography of Kanyama settlement is part of the Lusaka plateau which forms part of the watershed flowing westward between Chunga and Mwembeshi valleys (Image 2).

Image 2: General topography of Lusaka showing Kanyama



(Bäumle and Kang'omba, 2009)

The Lusaka plateau covers the biggest part of Lusaka urban with a radius of 20 Km (Mpamba *et al.,* 2009). Lusaka is predominantly a flat level area, characterised by limestone carbonate rocks and dolomite formation as shall be seen later under the section on geology and hydrogeology (see Chapter 3, section 3.4.2). The drainage system comprises of mostly surface streams, cracks and fissures in the carbonate rocks including the headwaters of the Ngwerere, Mwembeshi and Chunga valleys which reach inside its northern edge (Image 2) (Bäumle and Kang'omba, 2009). To the south and east of Lusaka, the land rises gently to a ridge of resistant schist, and water from the higher ground flows into the locality of Kanyama and adds to the drainage problems. The dolomite and the quartzite rocks are both prominent surface and underground features on the Lusaka plateau and pose a larger variety of environmental risks to groundwater than any terrain (Ford and William, 1989). Water aquifers under karst formation are very sensitive to contamination by any waste which may be disposed onto the surface (Museteka and Bäumle, 2009; Mpamba, 2008). Karst easily gets infiltrated by rain water from the surface into underground water bodies or aquifers. The karst formation, therefore, is the major contributor to contamination of underground water in Lusaka and Kanyama in particular. The Lusaka Dolomite (Marble) aquifer has an average aquifer thickness of 18 m and contributes to the rising of the water table (Mpamba, 2005; DWA, 2008; Schmidt, 2001). Groundwater circulation patterns in the Lusaka aquifer is mainly controlled by the water base level due to the less permeable schist surrounding it. Karst has the best groundwater potential to support the entire city of Lusaka (Nkhuwa, 1996; Grönwall *et al.,* 2010).

In Kanyama settlement, 50.5 percent of the community depend on water from shallow wells and 81 percent depend on pit latrines for sanitation (DMTC, 2011) (Also see Appendices B and D). There is a great risk of underground water pollution due to the proximity of the water source and sanitation facilities of pit latrines. Much of underground water contains polluting matter in individual water sources especially human waste (coliforms). A study on water and sanitation revealed that most people in Kanyama are exposed to various risks due to consuming of contaminated water from shallow wells located close to pit latrines as proven by outbreaks of diarrhoea and gastric intestinal diseases (Nkhuwa, 1993; Nyambe and Maseka, 2000). These water risks are predominantly a result of lack of control and enforcement of land-use

planning regulations by the Lusaka City Council (see Chapter 1, section 1.2.1). In addition, most of the community members lack knowledge on hygiene. The Lusaka City Council planning department seems not to have adequate easy solutions to environmental risks associated with karst formation.

The solution lies in substantial expenditure in structural measures of engineering or alternatively change land-use from rezoning informal haphazard residential areas to planned settlements (Nchito, 2009). It is evident that LCC, historically, has had no capacity to overcome the hydrogeological and topographical challenges of Kanyama and the other informal residential areas of Lusaka (LCC, 2008; Mulenga, 2003:12; George, 1967). Unless there is political will and institutional control on land use (Town and County Planning Act Cap 283) as well as provision of basic services, the exposure of the community to environmental disaster risks will continue (Nchito, 2009: 541). Alternative solutions lie in assisting the community to become prepared and adapt to disaster risks in their location. Incidences of flooding in Kanyama are not new, the area have been experiencing floods as early as the 1900s (Nchito, 2009; LCC, 2008; George,1967).

As such, Kanyama and the surrounding settlements are flood-prone hotspots. The IPCC, Report (2007) revealed that the impact of climate change will lead to an increase in frequency of rainfall and will be felt mostly in informal settlements.

The type of livelihood for the community plays a significant role in understanding the vulnerability of the community to disaster risks (Appendices B,C,D and F). Informal livelihood activities in Kanyama include petty trading and quarrying which have greatly contributed to the vulnerability to flooding. Quarrying activities of stone-crushing, sand-mining and block-making takes place in many locations within Kanyama settlement (World Bank, 2002; Mulenga, 2003; Sinkala, 2004). These activities have left the landscape of Kanyama ravaged by numerous ditches and sinkholes (Images 3) (Bäumle and Kang'omba, 2009, Mpamba *et al*., 2008). These ditches enhance the stagnation of water during the rainy season and become breeding grounds for mosquitoes. Furthermore, residents dump their domestic waste in these sinkholes which remain uncollected for a long time (this will be seen later in Chapter 4) creating environmental risks such as diarrhoeal diseases outbreaks.

Kanyama, being an informal settlement, receives little attention from the Lusaka City Council in terms of waste collection. It is common to find heaps of uncollected garbage in many places in the settlement.

Image 3: Sinkholes and fractures in Kanyama settlement

(Bäumle and Kang'omba, 2010)

The other cause of flooding in Kanyama is attributed to slow percolation of water due to the impermeability and hardness of the land surface. Rapid population increase and concentration of housing units, paved surfaces and roads enhance the hardening of the ground surface in high density informal settlements (Mulenga *et al.,* 2010; Marshak, 2001). The argument is that the concentration of housing units leads to hardening of the surface while increasing the area for water collection from the roofs. The result of these is an increase in the amount of water trapped from the rain as well as the slow rate of percolation of water. This is the water which remains stagnant on the surface as urban floods. Scholars (Saravanan *et al*., 2006; Gerlach and Franceys, 2009) have argued that higher chances of underground water pollution are mostly due to the high population density in informal settlements coupled with poor water and sanitation facilities. Limited space leaves no option for residents to locate o hand dug well away from pit latrines. According to the World Health Organisation (WHO), the standard distance between the location of a pit latrine and groundwater source should be at least 60 metres apart. However, limited

space in informal settlements makes it impossible for residents to comply with the prescribed standard distances between water and sanitation facilities. The situation has resulted into the recurrence of outbreaks of cholera and diarrhoea illnesses (Sinkala *et al.,* 2004).

The other factor influencing Kanyama's exposure to disaster risks associated with flooding is the underground geological and hydrogeological formation on which Kanyama settlement rests.

3.3 GEOLOGICAL AND HYDROGEOLOGICAL PERSPECTIVE OF KANYAMA SETTLEMENT

The geological and hydrogeological formation of Lusaka is mostly under the influence of limestone referred to as dolomite (ECZ, 2008; Nkhuwa,1996).

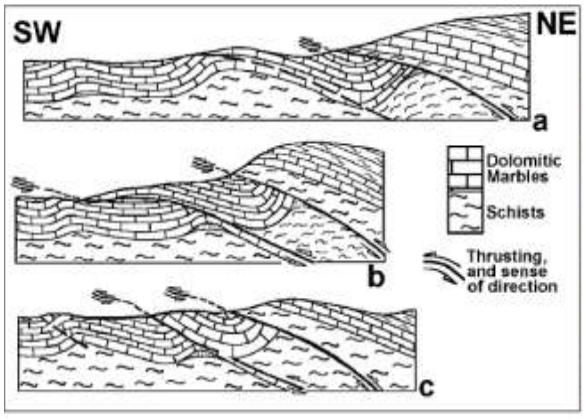
3.3.1 Geology of Kanyama settlement

The rock formation underlying Kanyama consists of schist mixed with quartzite coupled with thick and widespread series of marble (limestone) (Nkhuwa, 2009). Marble, commonly known as Lusaka Dolomite or Lusaka Limestone, underlie the Lusaka plateau (Bäumle and Kang'omba, 2010: 26). Kanyama settlement is built on marble rock formation generally referred to as Lusaka Dolomite (Nkhuwa, 2009). The nature of this underlying rock makes the hydrogeological formation of Kanyama negatively affect the physical infrastructure development of housing, water and sanitation (Nyambe, 2000). The network of fissures, often referred to as Karst, are hollows or have been filled with soil due to degradation. This terrain forms the groundwater table which is usually very shallow, although the system of underground channels and cavities filters slowly. In turn it decreases the amount of pollutants that would occur through natural filtration. Karst aquifers are very sensitive to underground contamination and pollution (Ford and Williams, 1989). Studies have shown that soils on the Lusaka dolomite have 76mm hr^{-1} infiltration capacity and recharge rate is high (Maseka, 1994; Nkhuwa, 1996). The speedy percolation of water into the underground streams indicates the aquifer's susceptibility to contamination. The geology of Lusaka plays a bigger role in the flooding situation facing Kanyama.

The geology of Lusaka district comprises mostly of marble (limestone) and underlies the entire city of Lusaka. The formation of marble originates from phases of thrust folding in the earth crust. The composition of the baseline rock system consists of crystalline of granite rock (Pre Katanga basement), the Chunga formation of the quartz muscovite biotite schist and quartzite, the Cheta formation that contains dolomite with a larger part comprising of marble limestone and lastly the Lusaka dolomite formation of master sedimentary carbonate rocks (Nkhoma and Bäumle, 2008; Mpamba, 2005).

The underlying marble is predisposed to differential dissolution during the rainy season (Nkhuwa, 1996). It has the characteristic of having channels and fissures which allows water to easily percolate into the aquifers with high chances of being contaminated with faecal matter. The maximum thickness of the marble layer is about 250m below the surface. Results from hydrogeological assessments indicated that the permeability of aquifers on the top part of the surface range from 0-25m (Mulenga *et al*., 2008; Mpamba, 2005: 31; Nkhuwa, 1996).The development of the geology of Lusaka was due to the repeated over thrusting of the SE – NW formation (Image 4a). This was due to the tectonic movement leading to the formation of joints (Nkhuwa, 1996).

Image 4a: Schematic model of repeated thrusting



(Modified by Nkhuwa, 1996)

4b: Developed conduits and solution channels

Lastly, Image 4b, shows the pictorial representation of the dolomites and their conduits. This is a common scenario in Kanyama settlement resulting from mainly anthropogenic activities mostly quarrying and block making. The evidence of the

karst and dolomite is seen in the formation of land surface features including sinkholes and lineaments distributed around open spaces of Lusaka. The Department of Water Affairs Report states that the dolomite formation has a lower porosity and permeability capacity due to fewer fissures than that of limestone (DWA, 2008). In the similar way, karstic levels are under free water table conditions (Hoyer *et al*., 1978; Schmidt, 2001). The presence of dolomite and limestone has contributed to the flooding situation of Kanyama informal settlement due to the high rate of recharge (Maseka and Nyambe, 1999). In relation to recharge and the rise of water table, increase in precipitation due to climate change greatly contributes to the rise of the water table. Heath, Parker and Weatherhead, (2010) revealed in their study of informal settlements of Lusaka that the increase in precipitation will exacerbate the current environmental hazards in Kanyama, especially flooding, which will lead to contamination of drinking water and collapsing of pit latrines. In addition to geology, hydrogeology plays an equally significant role in understanding disaster risks associated with Kanyama settlement.

3.3.2 The hydrogeology of Kanyama settlement

Hydrogeology is a science of the movement and reaction of rock and soils underground (Marshak, 2001; Grönwall *et al.*, 2010, Mpamba, 1996). Kanyama settlement and indeed the entire city of Lusaka as mentioned earlier, is located on dolomite rocks that form the main body of the elongated plateau (see Section 3.4). In general, Lusaka has a considerable amount of underground water resources in its limestone/dolomite aquifers, capable of providing the entire city with adequate water throughout the year (Mulenga *et al.,* 2010; Lusaka District Situation Analysis (DSA) Report, 2009). However, the challenge has been the lack of capacity of the local authority to supply water to residents in densely populated informal settlements (see Chapter 1, section 1.2). The rapid increase in population, coupled with increased construction of buildings, disrupts and prevents the percolation of water due to hardness of the surface forcing the runoff water to be stagnant or flow over the surface (Mulenga *et al.,* 2010; Nkhuwa, 2009: 445). Any considerable amount of rainfall directly recharges the groundwater aquifers during the rainy season raising the water table at a fast pace. Schmidt (2001), notes that karst aquifer has been

described as being highly permeable due to the prevalence of dissolution cavities and conduits and raises the underground water levels very fast.

Mulenga *et al*., (2010), observed that underground water accounts for about 60 percent share of the source of water for the majority in informal settlements of Lusaka. The quality of water is therefore questionable considering the geology alluded to earlier. This is the time when most informal settlements such as Kanyama experience outbreaks of water-borne illnesses, in particular cholera, due to faecal transmission (Nkhuwa, 2009: 445; Heath, Parker and Weatherhead, 2009). Efforts have been made by LCC to provide safe water to residents of Lusaka but the challenge has been the high demand in densely populated informal settlements (UNDP, 2013). In addition to demand, haphazard construction of housing units provides a challenge on positioning of pipes in and construction of drainage channels in Kanyama. The other challenge, however, has been the presence of the limestone and dolomite overburden which is susceptible to flooding (Bäumle and Kang'omba, 2010; Nkhuwa, 2009). In some areas of Kanyama, the dolomite rock is relatively near the surface and would require blasting which may be either too expensive or a danger to the already weak housing units nearby. It is said that '*water is life'* and plays a significant role in our livelihoods.

3.4 WATER AND SANITATION IN KANYAMA SETTLEMENT

Kanyama settlement being an informal settlement does not get adequate basic services including water and sanitation from LCC (Appendix C). This is true as reflected by the number of households depending on hand-dug wells. The major source of domestic water in Kanyama is ground water for the majority (90 percent) accessed from either hand dug shallow wells or boreholes from the Kanyama Water Trust (DMTC, 2011). According to Mpamba, (2008, De Waele, Nyambe *et al*., 2004; Münch and Mayumbelo, 2007; JICA, 2009) non availability of sanitation facilities, and the close proximity of septic tanks, pit latrines and nearby commercial farms contribute to the rapid rising of the water table in Kanyama (Mpamba, 2008). Consequently, groundwater becomes easily polluted due to surface water which flows towards Lusaka and the low-lying informal settlements (Grönwall *et al.,* 2010). The limestone and dolomite rock formation provides an aquifer from which Lusaka

obtains its water supply. The surface and groundwater is highly contaminated due to the proximity of wells to pit latrines (see Section 3.3). Poor waste management, especially during the rainy season, often result into outbreaks of water-borne illnesses, mainly cholera, typhoid and dysentery due to faecal transmission and industrial waste near Kanyama (Sinkala *et al*., 2004; Nyambe and Maseka, 2000; Kampeshi, 2003; Bäumle and Museteka, 2008).

There has been uncontrolled borehole drilling which has a detrimental effect on the groundwater resource. Access to safe and clean water has always been a big challenge facing the people of Kanyama. The major source of water is from communal taps (49.5%) dotted around the entire Kanyama settlement (CARE, 2011). The water and sanitation challenges can be addressed by developing water safety plans as a priority to reduce the risks to water supply by establishing a framework for managing the risks to drinking water from catchment to consumer (Bantram, 2009). The Kanyama Water Trust is a community based water scheme in charge of supplying water to the residents of Kanyama, using water kiosks or water stand taps (see Chapter 4). The Water Trust was set up with funding from Department of Foreign International Development (DFID) through CARE International in partnership with Lusaka Water and Sewerage Company, the LCC and the WDC. It has been estimated that in Lusaka, between 80,000 and 350,000m^3 water is drawn daily from private boreholes and dug wells, for domestic and other purposes in Lusaka (De Waele and Nyambe *et al.*, 2004; LCC and ECZ 2008).

About 49.5 percent of residents in Kanyama do not have access to individual connections to reticulated water supply systems while 90 percent depend on pit latrines for their sanitation (DMTC, 2011: 14). The challenge in accessing water from the communal water stand taps is that they are usually congested. Women and children have to endure long queues and struggle over water. Moreover, water is only supplied intermittently for two hours in the morning and another two hours in the afternoon. This situation forces people to go for cheaper and unsafe water sources like shallow wells in the backyard.

The water table in Kanyama is at extremely shallow depths ranging from 0.5 to 30 metres below the surface (Nkhuwa, 2003a; Nyambe *et al*., 2004; Münch and Mayumbelo, 2007; Nkhuwa *et al.,* 2008). This makes it cheaper and easier for the local community to dig wells although it's not safe. On average water is accessed at a depth of between 6m and 15m. Observations from some wells indicate that in a long-term there has been a decline in leaving shallow wells dry during the dry season (JICA, 2009). The main disaster risk in accessing water is the contamination of water by faecal matter from pit latrines (Campership, 2003; Bäumle and Kang'omba, 2009). Groundwater taken from shallow wells normally originates from local precipitation that seeps rapidly through the land surface. At some places, these taps are very limited in capacity and poorly maintained due to lack of resources and also extensively vandalised from the community members (IUCN and SIDA, 2004). Not all hope is lost; the government in partnership with NGOs such as CARE International, has been working on initiatives to improve access to water and sanitation in Kanyama by treating water as well as introducing underground, contamination-free ecological toilets.

3.5 HISTORICAL PROFILE OF KANYAMA SETTLEMENT

Having looked at the challenges facing Kanyama settlement one wonders how people decided to settle in such a flood prone Kanyama settlement. In order to fully appreciate the status of a settlement, it is important to understand the history behind its establishment.

3.5.1 The founding of Kanyama informal settlement

Kanyama, being an old informal settlement, has its history mainly rooted in oral traditional literature. The following information was obtained through participatory consultative discussion by CARE International Zambia Regional Northern Region Director, Ms. Cathlyn Mwanamwambwa, and Ward Development Committee members and Zone Leaders during the DRR training Workshop on community based disaster risk reduction held in 2012 by DMTC (Also see Chapter 7, section 7.4.6.3; Appendix D). The history of Kanyama settlement dates as far back as the 1920s with Lusaka as a village led by Chief *Mwalusaka* after whom Lusaka, the capital city of Zambia, was named. In the 1920s, a hunter by the name Fosholo Chinyama from

the North Western Province of Zambia settled on today's Kanyama settlement. Part of Kanyama's settlement by then was a farm owned by a white farmer by the name of Mr. Potgieter. The farmer grew maize and kept some cattle. The area had good grazing land due to the wetland nature of the terrain. In addition, part of the area had a lot of wild animals. Mr. Potgieter is said to be one of the white contractors who were constructing the railway line from the Copperbelt to Livingstone in 1905. When the project ended, Potgieter remained behind and started farming in today's Kanyama area extending up to Makeni small holder area (see Image 1 above) (DMTC, 2011)

At the time, Kanyama was all bush with a small village with a number of houses for farm workers and some local villagers (Nchito, 2009). People from all over the 'town' (Lusaka) used to buy game meat (*nyama*) from Mr. Fosholo Chinyama. The place became famous for the meat hence the area came to be known as Kanyama ('*piece of meat*'). Kanyama started growing with people coming to settle in the area following the abundance of game meat.. Others came into the settlement in search of employment opportunities at Mr. Potgieter's farm as labourers. In 1935, Lusaka was designated as the administrative capital of the then Northern Rhodesia (DMTC, 2011). It thus grew rapidly as it now had infrastructure development enhanced. Offices, schools, roads and other facilities were constructed. The population continued to increase steadily. Interestingly, during the colonial era, migrants from other parts of the country were not allowed to come into the city with their families. A pass was given and they were allocated single quarters.

Prior to Zambia's independence in 1964, Kanyama was the hive of political activities between the then African National Congress (ANC) and United Nations Independence Party (UNIP) which eventually became the first ruling party at independence in 1964 (Chisola, 2012). Politics played a leading role in terms of land administration. Land was distributed on political lines mainly by Ward Councillors without following any building guidelines and standard requirements for infrastructure development. Houses were built in haphazard way without any approval from the local authority (Mulenga, 2003). The settlement grew rapidly despite having no basic services including roads, drainages and water services provided. Therefore, vulnerability to disaster risks did not start recently in Kanyama. In 1978 for instance,

Kanyama was hit by the worst floods popularly known as '*Kanyama disaster'* (Baptist Times, 1978). Hundreds of housing units were demolished and residents evacuated to Kuomboka in Chawama on the other part of Lusaka. Ten years later, in 1988 Kanyama was again hit by floods and an outbreak of cholera and diarrhoea (LCC, 2008; DMTC, 2011).Of late outbreaks of water borne diseases have become common every rainy season. Looking at the past occurrences of flooding, a trend can be established that devastating floods occurs almost every after 10 years. The question one may ask is how Kanyama settlement was established as a settlement in Lusaka.

3.5.2 Kanyama as an informal settlement

The UNISDR 2009 Global Report on disaster risk reduction revealed that by 2008, half of the world's population was living in urban areas and by 2010 , 73 percent of the population in the largest cities in developing countries were living in 'slum' informal settlement arrangements (UNEP, 2007; World Bank, 2002; ECZ, 2008). Urban poverty has been on the rise in Zambia from an estimated 4 percent of the urban population in 1974 (ILO, 1977) to 26 percent in 1991 (CSO, 1992), 46 percent in 1996 to 56 percent in 1998 (Central Statistical Office 1997 and 1999). The Living Conditions Survey for 2006/2010 stated that the latest poverty levels in Zambia was around 60 and 64 percent respectively (CSO, 2010; Seshamani, 2000). The majority of urban poor live in unauthorised and unplanned informal settlements (Mulenga, 2003; Nchito, 2009). Their livelihood largely depends on informal income generation activities (65 percent) while 35 percent work in the formal sector. On the other hand, (CSO: 2004 in ECZ, 2008; Lusaka District Development Report, 2006), the informal sector represents 81 percent of the labour force. Major income generating activities include trading (56 per cent) on the streets of Lusaka, casual work in industries as well as domestic work. Mulenga *et al*, (2010) argue that the majority (81 percent) of the residents in informal settlements are either unskilled or semi-skilled (ECZ, 2008).

Since early 1980, self-employment has been the main livelihood pattern characterised by low capital input and low returns (Hansen, 1980). It must be noted that the economic situation of Kanyama to date has not changed much since the observation by Hansen. High poverty levels and exposure to environmental disaster risks associated with informal settlements negatively retards the development of

residents in informal settlements. Settlers in Kanyama include those retired from formal sectors including privatised government companies. Mulenga *et al*., (2000) points out that the female residents of the slums of Lusaka have, for example, been involved in quarrying, crushing stones for construction and block-making business since the late 1980s. They have since been joined by youths and children in the stone-crushing sector and making cement blocks for sale (DMTC, 2011). Unemployment, easy markets, poverty and a lack of communication and coordination between the regulating authorities are some of the main reasons for the increase in illegal quarrying in Lusaka. Stagnant water, due to inadequate control of storm water and drainage has contributed to the proliferation of mosquitoes ultimately causing malaria (MCA, 2012).

Attempts to upgrade informal settlements in Zambia started as far back as 1973. (Mulenga, 2003). The government of Zambia obtained a loan from the World Bank to upgrade squatter settlements in Lusaka (Mulenga, 2003). The process included providing basic amenities including piped water, road and drainage construction, security lighting, schools and health service facilities, community centres. In addition, the upgrading included giving security tenure on ownership of land in informal settlements (UNHABITAT Report, 2000). Lack of land tenure in informal settlements has contributed to lack of improvement of houses as they could be demolished at any time without notice. This makes the value and building standard of housing units to be of low quality and risks in times of disaster situations (WDC, 2012).

The government, through the World Bank Loan, embarked on a developmental programme aimed at upgrading 35 informal settlements (UNHABITAT, 2007; World Bank, 2002). However, challenges of rapid population increase and geographical characteristics of Kanyama hindered progress on the upgrading project. Population increase resulted in a rapid increase in the construction of substandard housing units on limited land, lack of waste management services, provision of safe water and sanitation services, drainages occurred faster than the intended upgrading project (Heath, Parker and Weatherhead, 2010; Mulenga, 2003). In order to improve the livelihood of the people in Kanyama, the government, through the LCC, partnered with CARE International, Lusaka Water and Sewerage Company (LWSC) and the community through the Resident Development Committees (RDCs) to improve the

standard of living of the people. Projects include provision of water through boe holes connected to water stand taps that can easily be accessed within the community (JICA, 2001). Residents form committees to collect money on behalf of the company LWSC. The company only provides technical and administrative support. In Kanyama this initiative was being facilitated by CARE International through the creation of the Kanyama Water Trust (Mwanamwabwa and Kayaga 2009) (See also Chapter 7, section 7.4.4.1).

Traditionally, the local municipality has not been actively involved in service provision. Their effort has been restricted to land allocation and responding to crisis (LCC, 2008). These settlements were seen as areas of problems rather than in need of services (Mulenga *et al.,* 2010). Secondly, the location on the outskirts of the town deprived them of basic services including water and sanitation services. Kanyama, being an informal settlement, has its history mainly rooted in oral traditional literature. Despite this constraint, the history and development, in the context of modern day development of Lusaka has been associated with environmental crises like floods and outbreak of water-borne diseases annually which requires some critical understanding and analysis (LCC, 2008).

On the political scene Kanyama played a key role in determining the political landscape of Zambia. Communally, people shared the little food they had with those in need. Water and sanitation facilities were communally constructed in most cases and every member of the community was free to have access. For instance (shallow) hand-dug wells, dug and maintained by members in the neighbourhood, as perceived by Smith, (2002), are examples of community participation activities that bring about development in the local community as they originated from local initiatives. People with different skills participated in community development activities for the benefit of the entire community. The power of community cohesion lies in community participation in community activities as agitated for by PRA (See Chapter 2) (Chamber, 2008). PRA belongs to a family of approaches, methods and tools designed to enable local people to formulate and analyse their situation in order to plan, act, monitor and evaluate their actions (Chambers and Blackburn, 1996). In 1960, Zambia's struggle for independence heightened with the African National Congress party and the United Nation Independence Party (UNIP) in the fore front.

On 24th October, in 1964, Zambia obtained independence from the British government (Chisola, 2012).

After independence, Zambia became one of the most industrialised countries in Southern Africa with copper being the largest foreign exchange earner (World Bank, 2002).The boom in copper prices led to an expansion of the urban economy between 1960 and 1970. The Zambian government invested a lot in industrial development (ECZ, 2000). The growth of the mining and industrial sectors resulted into the creation of employment opportunities in Lusaka and the Copperbelt. Lusaka attracted many people from the country side in search of employment. As a result, informal settlements, including Kanyama, become the destination for the migrants who were mostly unskilled. Kanyama became one of the most densely populated settlements, accounting for 60 percent of the population of Lusaka (ECZ, 2008; UNEP, 2007). However, the status of being an informal settlement was still maintained with no basic services being provided. The spirit of community based participation in developmental issues continued (CARE, 2011) although to a limited extent Residents were able to organize themselves through the government structures of RDCs which are political structures at local government administration and community level. Communities by themselves are able to draw on tangible and hidden assets that can help to reduce disaster risks (Wenger *et al.,* 2002). Further, it is important to understand the role of the community in developmental projects because increased community participation creates a better chance of continuous maintenance of public facilities in the future (Chambers, 1997).

Kanyama has two (2) wards sub-divided into 19 zones managed by the local community through RDCs (WDC, 2010; CSO, 2011). The committees (RDCs) are involved in the identification and implementation of community needs. Some community-led projects included work on road construction where women were engaged to work in exchange for food supplies. In 2009, CARE International started a community based disaster risk reduction project, Strengthening Peri Urban Risk Reduction in Zambia (SPURRZ) (see Chapter 7, section 7.4.5). The project was based on the community development approach through Community based Risk Analysis (CRA), community-organized information systems and community-led Disaster Risk Reduction (DRR) actions aimed at reducing risk to flood hazards

among the poorest populations (CARE, 2009). Through this programme, community based enterprises were formed to be in charge of waste collection and Neighbourhood Health Committees (NHCs) worked on information dissemination on water and sanitation education. The latest project was the formation of community based disaster risk reduction committees involved in door-to-door campaigns sensitising members on awareness of disaster risks affecting them (DMTC, 2011). The theoretical background of these projects was the recognition by Chambers, (1997) that local people are capable of analyzing their own realities and only need limited support and guidance on development from outsiders (Reid *et al*., 2005).

Community based Enterprises (CBE) are involved with waste collection with the support from CARE international in 1996 (DMTC, 2011). An outstanding community development project has been the Kanyama Water Trust project which was funded by the European Union in partnership with LCC and Lusaka Water and Sewerage Company and the Kanyama community (see Chapter 7, section 7.4.4). Overall, community development (See Chapter 2) in Kanyama has been successful in so far as that the community has been actively participating in developmental projects aimed at improving their livelihood. Further, community development initiatives have allowed a more equitable developmental process for the disadvantaged stakeholders by empowering them with knowledge to become more self-reliant (Allen, 2006; IFRC, 2009: 59; Van Heck, 2003).

Informal settlements are characterised by high population density (ECZ, 2008). Rapid population growth puts pressure on limited space for construction of housing units. Local authorities face a challenge of providing basic services to cater due to increased demand (LCC, 2008).

3.6. DEMOGRAPHICAL CHARACTERISTICS OF KANYAMA

Kanyama is one of the most densely populated informal settlements in Lusaka. The population of Lusaka for the 2010 census was 1.7 million (CSO, 2011: 13; Brinkhoff, 2010) (also see Chapter 1, section 1.3). The growth of the Lusaka and most other informal settlements has been attributed to the immigration from the country side to the capital city in search of opportunities for a better life. Records indicate that Lusaka had the highest annual population growth rate of 4.7 percent, the highest in

the country from 2000 – 2010 (CSO, 2010: 4). As indicated earlier in Chapter 1, the population density of Lusaka has continued to increase uncontrollably from 45.1 persons per square kilometre in 1990 to 63.5 persons per square kilometre in 2000 while the latest figures for 2010 is 100.4 persons per square kilometre. In general, the total population of Lusaka increased from 1, 084, 703 in 2000 to 1, 742, 979 in 2010 (CSO, 2000; CSO, 2011:6). It is interesting to note that this population is largely found in informal settlement dotted around the outskirts of city of Lusaka. Kanyama in particular has a total of 78,995 households (CSO, 2011). The increase in population adds pressure on basic service delivery, land use and development in general (Pelling, 2008).

Like many parts of Zambia, Kanyama has a young and dependant population with 46 percent of the population being under the age of 15 (GRZ, 2011: 146). Statistics showed that the child dependency ratio was 91 dependants against 100 persons in the productive age group to look after them.

According to the City Planning Department of the LCC, the city has not revised the City's Master Plan since 2008. The development of residential areas has since been very slow and characterised by illegal construction on undesignated locations around the city. The Environmental Council of Zambia, now the Zambia Environmental Management Agency, has observed that the lack of a master plan resulted in an increase in illegal quarrying and increase of informal settlements including Kanyama, Misisi, George and others in the outskirts of the city (ECZ, 2008). Due to high population density and increased human activities, the land surface has been paved and hardened. Illegal quarrying takes place in many locations. These activities pose serious environmental hazards namely flooding, accumulation of waste, limited access to safe water and sanitation facilities and a shortage of safe and habitable accommodation (Heath, Parker and Weatherhead, 2010). Furthermore, the onset of the rainy season increases the amount of runoff water trapped on the surface which then infiltrates the ground to become ground water (Marshak, 2001)(Also see section 3.4 above). The land surface is usually hard due to the high population density and the presence of rocks coupled with illegal stone crushing and sand mining. The trenches store stagnant water. Huq *et al.,* (2007) argued that floods already have severe impacts on cities, smaller urban centres and rural areas in many African

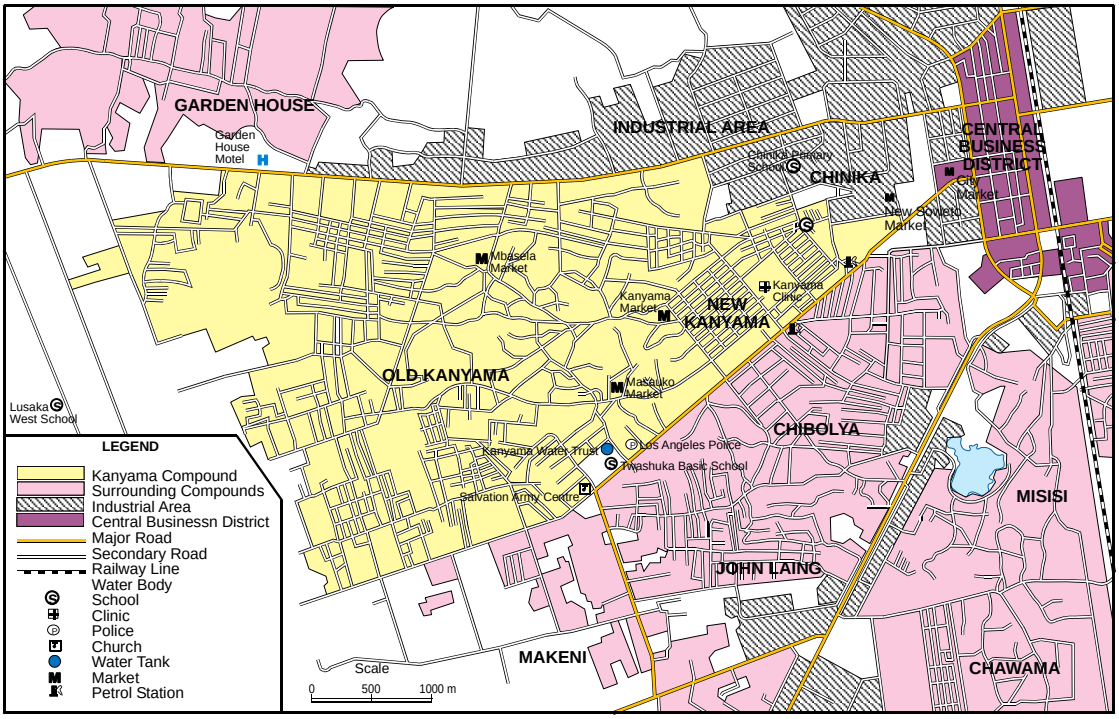
countries; for instance, floods in Mozambique in 2000 displaced around 4000 people in Maputo and crippled transport networks.

As was noted in Chapter 2, disasters are a result of failure of developmental planning on the part of the government (UNDP, 2009; World Bank, 2001). The following section highlights governance situation of Kanyama as an informal settlement in Lusaka.

3.7 GOVERNANCE OF KANYAMA INFORMAL SETTLEMENT

Politically, Kanyama settlement is divided into two (2) wards; 10 and 11 respectively (Lusaka District Report, 2006). Implementation of effective land-use planning guidelines has been a challenge primarily due to political interference. Little attention has been paid to providing access roads, drainage channels and standard regulations for housing units. The evolution of Kanyama as a settlement has greatly influenced the developmental pattern and haphazard layout of housing units with the exception of New Kanyama (Figure 3).

Figure 3: Layout of Kanyama settlement socio-economic features



(Greater Lusaka Surveyor General, Lusaka (1:50, 000), 2009, updated by Chalila, 2013).

Old Kanyama was the first location to be occupied; later the settlement grew towards what is now called New Kanyama. A veteran resident and WDC Secretary of

Kanyama, Mr. Bright Sigundu, reported that, in 1991, the government demolished houses in old Kanyama as it encroached on the land for industrial development. The decision was later reversed and victims were given back land but this time with planned layout (Figure 3). Houses constructed thereafter were now built in accordance with the building regulations of Town and Country Planning Act, Cap 283 (See Chapter 5).

In New Kanyama, bigger plots were allocated for residential development for communities whose houses were demolished (Figure 3). In this part of the location signs of drainage and roads exist. Despite it being densely populated, Kanyama has only one government clinic and two primary schools (LCC, 2000; LCC, 2008; WDC, 2008). The community experiences serious challenges in accessing these facilities. For instance, a parent from the school selection committee at Twashuka Primary School revealed that in 2012 the school had 1500 applications for places to start the first grade against only 140 available positions as reported by Mr. Banda, a teacher at Twashuka Primary School in 2013. A lottery method was applied to select pupils for admission. In addition, limited access to primary education implies that a huge number of children will always remain on the streets unable to find sustainable livelihoods.

The Kanyama Health Centre is overwhelmed by large numbers of patients everyday as revealed during the interview with Mr. Tembo, the Principal Environmental Health Technologist at Kanyama Health Centre, in 2013. He stated further that the health centre caters for a population of over 400,000 within Kanyama and surrounding informal settlements. High population density is one of the factors that have contributed to the vulnerability of the community to a variety of disaster risks and hazards.

The governance system plays a significant role in the decision making process and development of the country. Presidential and parliamentary elections are held every five years while at local government level; Ward Councillors are elected every three years (Chisola, 2012). The responsibilities of the ward councillors include supervision of development projects within their wards and implementing the government in power's manifesto. Councillors are part of the LCC and the government through the Department of Physical Planning and Housing (DPPH)

established through the Act of parliament (Town and Country Planning Act Cap 283 of the Laws of Zambia) (see also Chapter 5). The Act empowers the local authority to manage and administer land to potential developers. Anyone intending to develop a house must first apply to the LCC and Lusaka Planning Authority to be permitted to develop the piece of Land (plot allocated). The Act empowers local authorities to plan and give permission to would-be developers. Furthermore, it provides guidelines for the local authority to monitor all physical infrastructure development within the district.

Table 3 below gives an inventory of land use in relation to the percentage of the total area of Lusaka by the year 2000. However, not much has changed in terms of land use in Lusaka ever since.

Table 3: Land use Inventory of Lusaka

Land use	**Area (%)**
Administration	0.34
Airport	0.51
Cemetery	0.58
Central Business District	59
Cultivation and plantation	9.4
Industrial	1.82
Informal settlements	10.49
Proposed Housing	3.42
Residential	11.38
Small Holdings	9.98
Sport and recreation	0.94
Un utilisation of land	49.05
Total	**100**

(Lusaka Integrated Development Plan, 2001)

According to LCC District Profile, (2000), Kanyama experiences a variety of environmental challenges associated with development. Among these include: rapid population growth, high levels of urbanization, unemployment and limited land for residential areas. The scenario has overwhelmed the capacity of LCC to provide basic services to the community (LCC, 2008). Historically, political influence has contributed to the rapid growth of informal settlements in most urban centres of Zambia. Since independence, Councillors from the government in power often

allocate land to would- be developers which is not even their mandate. The Town and County Planning Act CAP 283 does not make provision to prevent illegally allocating land to appease their political cadres (see Chapter 5). In most cases the allocation does not take into consideration the suitability of the land for habitation. The example is Kanyama settlement which has developed to be the largest informal settlement in Zambia without any regulation from the relevant authorities (Heath, Parker and Weatherhead, 2010; Mulenga, 2009; World Bank, 2002).

Due to high population densities, which in other words attract a high voter turnout, prospective political parties target informal settlements as a source of votes by promising basic goods and services once voted into office. Unfortunately, upon assuming power, such areas do not see any benefits of the promises as leaders (Members of Parliament) only appear during the next election period. It is common knowledge that Councillors in Zambia are not as well remunerated as their counterpart MPs. As a result, they turn to empower themselves with incentives by engaging in illegal activities including illegal allocation of residential plots on unsafe land (WDC, 2013). In Kanyama informal settlement, population growth has been the major factor contributing to the uncontrollable growth and this is the situation in other informal settlements country-wide. This poses a great challenge for Lusaka City Council to provide basic services due to limited capacity and inadequate resources (LCC, 2008).

3.8 CHALLENGES OF URBANIZATION

Rapid urbanisation puts pressure on local authorities to supply basic services and in most developing nations. People migrate to urban areas in pursuit of a perceived better life which includes employment opportunities despite them not having the right capacity to meet urban opportunities (ECZ, 2008). The biggest challenge they face in urban areas is access to decent shelter.

3.8.1 Housing infrastructure in Kanyama

The rapid population growth of Lusaka has brought challenges for the government to provide basic services to informal settlements. As the urban population increases, so does the struggle for the poor over land in the informal settlements of Lusaka (Nchito, 2009). The type of housing infrastructure provides a reflection of the socio-

economic status of a community (ZDHS, 2007). The location of residential settlements is usually challenged by the cost of construction material, shortage of land and the geological setup. The records further indicate that 16 percent of housing units in formal settlements of Lusaka use earth and sand for the floor while 35 percent use cement. Additionally, 45 percent of these households live in single bedroom houses. Furthermore, the survey revealed that, on average, each household has about six occupants. From inception, Lusaka as the capital city of Zambia, was never intended to be a permanent settlement for the local workers. Emphasis was mainly on the infrastructural development of housing units for expatriates and senior workers in the well-planned residential areas of Kabulonga, Woodlands, and Avondale while Libala, Kawama and Chilenje belong to the middle class, among others, according to the Lusaka State of the Environment Report (LSOE, 2008).

The other challenge for the growth of Lusaka as a whole has been the lack of a holistic land-use master plan (UNHABITAT, 2011). Developmental of planning was based on the top-down approach in providing services to some residential areas while leaving others out. When the policy changed for everyone to pay, the majority of the poor could not afford. These are the people found in informal settlements and who largely depend on unsafe sources for water and sanitation. Thus, in 1991, the government enacted the Local Government Act Cap 281 (see Chapter 5) aimed at decentralising the provision services into the hands of the local authorities (World Bank, 2002). The challenge has been that of limited resources allocated for the implementation.

The other challenge has continued to be the lack of political will on the part of the public leaders, Ward councillors and Members of Parliament (MPs). Traditionally, political parties held much power at local level especially in informal settlements. Section leaders, especially from the ruling political parties, have always disturbed the work of the local authority the Planning Department, by allocating land through corruption and appeasement of would-be developers according to Mr. Zulu, Director of Planning at Lusaka City Council, 2012. Land for residential plots has been allocated even on land unsafe for residential location. Locations such as wetland, high water table locations, near sewer sites and industrial locations with high levels

of pollution have been turned into residential settlements, Kanyama and Garden settlements are examples of such locations.

High poverty levels and inadequate implementation of the housing policy have contributed to the growth of informal settlements too (CSO, 2010). A study by the World Bank in 2000 revealed that residents of informal settlements in Zambia spend about 90 percent of their income on food alone. This implies that, even if services were provided at a minimal fee, the majority have no capacity and ability to pay. Thus they have limited options to afford a decent accommodation and end up with sub standard housing units in informal settlements. It is common to discover that most housing units in informal settlement are made on the self-help housing basis using unconventional building materials (Mulenga, 2003). The focus of the government is to improve the standard of living for the people.

Flooding in Kanyama has been attributed to either non-availability of drainage facilities or blockage of those which exist. Limited space and non-availability of waste collection services contribute to indiscriminate disposal waste in drainage channels. It was heard during focused group discussions that, after heavy downpour, most of the waste, including plastics, block the drainage system. According to the Assistant Public Relations Manager at LCC, the blockage of drainage system is the major cause of flooding in Kanyama. He blamed the citizens and argued that it is the community members themselves who disturb the flow of water hence that ends up as flooding (Habeenzu, 2013).

Economic prospects attract people to migrate from rural areas to urban areas. However, the situation usually does not turn out as expected to most rural – urban migrants (ECZ, 2008; See also section 3.9 above). Challenges in economic development at national level have contributed to a variety of challenges facing urban centres like Lusaka as will be presented.

3.9 THE SOCIO-ECONOMIC BACKGROUND OF KANYAMA INFORMAL SETTLEMENTS IN LUSAKA

At the time of independence in 1964, Zambia had a strong economic standing among other countries both within the sub region and abroad (World Bank, 2002).

From the early 1980s until the 1990s, copper prices dropped drastically forcing the country to change the direction of its economic growth leading to the Fifth National Development Plan (FNDP) (GRZ, 2010: 114; World Bank, 2002). At that time, mining companies incurred huge losses. The decline in the copper mining sector greatly affected the livelihood of most urban dwellers. Most of the mines in the Copperbelt Province closed down resulting in loss of employment for the majority of the workers. This increased poverty levels and lead to migration of many people, mostly to Lusaka, in search of alternative employment (Poverty Reduction Strategy Paper (PRSP) 2002 to 2004). The other effect of the closure of the mines was the increase in the number of street kids. In addition, retrenched and retired parents could no longer provide basic needs for their children. Children had no option but to fend for themselves through begging on the streets. These were part of the factors that contributed to the swelling of the population in informal settlements of Lusaka.

The economy of Lusaka is somewhat more diversified than many towns in the countryside. It only provides formal employment to a small proportion of the labour force. The informal sector's economy accounts for approximately 90 percent of employment in the economy of Lusaka (World Bank, 2002; CSO: 2010). Formal economic activities include manufacturing, finance, transport and retail industries. The Integrated Development Plan for Lusaka, for example, put the number of people in formal employment in Lusaka at 120,233 or 35 percent of the labour force (V3 Consulting Engineers, 2000). The majority (65 percent) of the city's labour force, therefore, earns their livelihood from informal economic activities, which predominantly consist of unregistered and unregulated small-scale non-agricultural economic activities. These range from petty trading, metal fabrication, stone crushing, domestic work employment (maids and garden boys) and carpentry. The prominent type of informal livelihood activity is street vending and small scale trading. UNHABITAT, (2000) reported that only nine percent (9 percent) of Lusaka's population was engaged in formal employment. The other major factor was that the local economy was drifting towards the private sector and self- employment.

According to the UNHABITAT Report (2000), the transition Zambia's political system made from a one-party state to a multi-party democracy in 1991 marked the beginning of a period of economic reforms and structural adjustment. The three-year

Structural Adjustment Program (SAP) was adopted in 1992 with the aim of stabilising the economy and reversing its general decline (GRZ, 2010). SAP was an economic development strategy which encouraged developing nations to shift the responsibility of running business from the government to the private sector.

The Southern African Regional Poverty Network (SARPN) Report, 2008, revealed that 71 percent of the population in Zambia lived in extreme poverty, twice as many as in urban areas. A number of state owned companies, including mines on the Copperbelt, were privatised. These companies had initially employed many people. The new owners of the companies down-sized the labour force by about half, leaving thousands of the employees unemployed (Poverty Reduction Strategy Paper (PRSP) 2002 to 2004). However, most of the privatised companies did not last more than five years. They eventually closed, leaving even the few that survived, lose employment too. This situation has made Lusaka, being the central administrative centre of the country, become the only hope for the livelihood of many. Unfortunately all the hopes were futile, as those who migrated ended up joining their retrenched colleagues, earning their livelihood in the informal sector of the economy and residing in congested informal residential areas. By 1995, Lusaka had a total of 37 informal settlements spread around the outskirts of the entire city of Lusaka. Among these settlements, Kanyama was the largest and continues to be the most populated informal settlement in the country (World Bank, 2002; Granowall, 2010: 48).

According to the interview with the Acting Director of Planning of City Planning Department at Lusaka City Council, the master plan of Lusaka has not been revised since 2000 (See Appendix C). The development of residential areas in planned areas has been very slow, while, on the other hand, illegal construction of houses in undesignated locations like Kanyama settlement has been rapid. The Environmental Council of Zambia, a regulatory body of ensuring environmental management issues are adhered to, argued that lack of a master plan for Lusaka had contributed to the increase in illegal quarrying and the increase of informal settlements including Kanyama, Misisi, George and others on the outskirts of the city (ECZ, 2008). Lack of sustainable sources of livelihood and inadequate housing policy have led to urban growth being absorbed mostly into informal settlements. In many instances most of the residents have neither the land tenure to their housing structures nor basic

services provided. These settlements are located mostly to the north, northwest, and south of the CBD of Lusaka (World Bank, 2002).

The challenges of governance issues as highlighted above shows that socio-economic limitation has greatly increased, and continues to increase, the vulnerability of the residents to various disaster risks. It must also be noted that the geological and hydrogeological location of Kanyama has equally contributed to this exposure.

3.10 CONCLUSION

This chapter provided an overview of exposure of Kanyama settlement to disaster risks, particularly relating to flooding, in relation to objective two, of this research. The objective is to concisely outline the topographical/spatial, geological, hydrogeological, demographical and historical profile of Kanyama settlement (see Chapter 1, section 1.6). Flooding is attributed to many factors - either geographically or geologically. Geographically, the background of the location of Kanyama settlement on the low lying location has a bearing on its exposure to flooding. Geologically, the dolomite and marble/limestone underlie the entire city of Lusaka, Kanyama included. The porous character makes water percolate easily and after reaching the water table easily comes up as flood water. In addition, this makes contamination of underground water easy. The hydrogeological characteristics of the Lusaka dolomite and marble formation have a low percolation rate. The consequence is that of stagnation of water and underground water contamination. Furthermore, with the topography disfigured by human activities by means of quarrying, block-making, leaving ditches or sinkholes all over the settlement. Kanyama is located on a low-lying area western part of the city. It is from the direction of Kanyama settlement that the entire city of Lusaka drains its flood water. From a demographical point of view, the high population density, poverty and uncoordinated planning of housing units have resulted in increased illegal land allocation.

Kanyama settlement has been exposed and vulnerable to disaster risks associated with flooding for a long time. Chapter 4 will show how the community of Kanyama

have been exposed disaster risks emanating from the geographical and geological orientation presented in this chapter.

CHAPTER 4
EXPERIENCES OF DISASTER RISKS IN KANYAMA SETTLEMENT

4.1 INTRODUCTION

The focus of chapter four is to highlight disaster risk reduction interventions affecting the community in Kanyama informal settlement. It will commence by analysing major disaster risks due to the informal settlement profile discussed previously in Chapter 3. These factors have greatly contributed to the vulnerability and exposure of the community to disaster risks, particularly flooding and its related effects in Kanyama and Lusaka in general. The aim of the chapter is to analyse major disaster risks affecting the community of Kanyama settlement (See Chapter 1, section 1.5).

4.2 UNDERSTANDING DISASTER RISKS IN KANYAMA SETTLEMENT

Kanyama settlement, as discussed earlier (see Chapter 3), started as a residential area for farm workers (DMTC, 2011; LCC, 2007) before becoming a formalised settlement (Appendix A and D). In 1996, the government, through the LCC, upgraded Kanyama from an informal squatter settlement status into a legalised formal settlement. This is how the government, later through LCC and other NGOs, started getting involved in providing basic services. Services provided included: safe water and sanitation facilities, roads and drainage channels, schools and health care facilities and most of all regulated land-use planning. It is because of the informal settlement background that the livelihood of the community depends heavily on informal sector economical activities (DMTC, 2011). These include: vending, trading, carpentry, quarrying and domestic casual work (Lusaka SOE Report, 2008; CARE, 2010; CSO, 2010). These activities do not adequately translate into sustainable livelihoods to afford other basic life necessities such as a decent standard of living with basic services, including access to safe water and sanitation. Kanyama is one of the most densely populated settlements in Lusaka with a total of 79,995 households (CSO, 2011:21). The majority of the population is young people and women (51 percent) and this is the group which is most vulnerable to disaster risks. Water and sanitation facilities are below standard, with over 70 percent depending on open shallow wells and 60 percent with poor access to proper sanitation, depending on pit

latrines (ECZ, 2008; DMTC, 2011; Mulenga, 2002; Mwanamwambwa *et al*., 2007). Apart from poor water and sanitation, the community is exposed to a variety of hazards on an annual basis.

Kanyama settlement today is susceptible to flooding which leads to underground water contamination. As was highlighted in Chapter 3, community members dispose their waste in the sinkholes which eventually seeps down to cause contamination. It was mentioned at the focus group discussion that there is limited space for dumping waste and that LCC does not collect waste, not even at markets. This was given as the reason why people make use of any free space available for waste disposal (Appendix D). Nkhuwa (1996), notes that groundwater is as susceptible to contamination by solid waste as surface water due to the concentration of impurities (Nkhuwa, 1996). Urbanisation and economic policies have also contributed to the rapid growth of informal settlements with settlers building sub-standard housing units in a haphazard manner. The government has been slow in the provision of basic services due to the informal background of Kanyama which lead to legal complications from the onset as an illegal residential settlement (see Chapter 5). According to WDC members, the community has relied on water from hand dug shallow wells, and on pit latrines for sanitation, since Kanyama came into existence. The chapter, therefore, focuses on analyzing disaster risks and hazards prevalent in Kanyama settlement and their impact on the community.

4.2.1 Urban flooding in Kanyama settlement

Floods account for approximately 40 percent of natural disasters experienced in the world today and may become more frequent and severe due to climate change and global warming (Reacher *et al.*, 2004). In most African cities, flooding has become more frequent and affects the urban poor most severely (Douglas, 2008; Heath, Parker and Whitherhead, 2010). It increases the vulnerability of communities in informal settlements who, in most cases, depend on water from unsafe water sources and also have inadequate sanitation facilities. Focused group discussions and Community based DRR training have revealed that flooding in Kanyama (see Appendix D) can be attributed to many factors - including those presented in Chapter 3 - in addition to the following:

- Increased occupancy in flood-prone areas due to the presence of the dolomite rock;
- Inadequate maintenance of flood defences such as drainages;
- Increased urbanisation in catchments;
- Ineffective land zoning and building regulations resulting in substandard houses;
- Illegal quarrying that causes ditches; and
- a community with high poverty levels and unsustainable livelihoods.

(LCC and ECZ, 2008; DMTC, 2011; LCC, 2008)

These are some of the major underlying causes of flooding in most parts of Kanyama. Common disaster risks associated with flooding include: outbreaks of cholera and diarrhoea; collapsing of houses; loss of lives and property and roads that have become impassable. In some cases the victims who are worst affected are evacuated to higher grounds at schools and football stadium, for safety (see Chapter 1). Flooding in Kanyama seems to be a recurring that affect residents on an annual basis with no sustainable solutions in place. It is not necessarily caused by heavy rainfall and extreme climatic events. It is often associated with inefficient land-use planning and poverty. Urbanisation aggravates flooding by restricting the flow of flood waters, by covering large parts of the ground with roofs, roads and pavements, by obstructing sections of natural channels, and by building drains that ensure that water moves to rivers more rapidly than it would under natural conditions. Rapid population growth in Kanyama settlement, characterised by the construction of unregulated shelters by poor people in unsafe 'slum' locations (Diagne, 2007; Gaye *et at*., 2001), has reduced the infiltration of rainfall up to six times the normal rate. Basically speaking, urban flooding is mostly due to uncoordinated land use planning that blocks the free- fall of water (ActionAid, 2006; Heath *et al.,* 2002).

Flooding has been identified as the major disaster risk affecting the entire settlement (LCC, 2012 and 2008; DMTC, 2011). The hydrogeological formation of the impervious dolomite rock mentioned in Chapter 3 is one of the major causes of flooding. After a down-pour, the impervious nature of dolomite rock makes the percolation slow, leaving pools of water stagnant on the surface. In Kanyama, the major source of water and access to sanitation depends on shallow wells

constructed close to pit latrines (UNHABITAT, 2002; Nkhuwa, 2006). Some shallow wells are constructed physically while some are a result of ditches left from illegal quarrying (See Chapter 3). After a heavy down-pour, shallow wells get flooded, carrying along uncollected waste and mixes with human waste from pit latrines (MCA, 2012; DMTC, 2011). Residents have no option but to rely on the same contaminated water from shallow wells for domestic use. Lack of access to safe water and inadequate sanitation facilities have exposed the community to environmental risks, including constant outbreaks of water-borne diseases, primarily cholera, typhoid and dysentery (MCA, LCC, 2012; KHC, 2013). Furthermore, indiscriminate solid waste disposal, coupled with lack of proper waste disposal facilities, continues to increase the accumulation of waste around Kanyama.

Flooding is part and parcel of Kanyama Settlement's history (See Chapter 3). Some outstanding reference cases include the famous Kanyama disaster of 1978 (Baptist Times, 1978) which resulted in people being resettled in a new settlement within the city of Lusaka. Huq *et al.,* (2007) argues that flooding is the most common disaster risk affecting 73 percent of the urban population in urban centres in most developing nations. As explained in Chapter 3, the magnitude, speed of onset and duration of the flood is influenced by factors such as topography, land use and urbanization, hydrogeological and geological features. These continue to be the main challenges facing the community in Kanyama.

Despite flooding being a permanent hazard in Kanyama, the community has, surprisingly enough continued living there. Cholera, diarrhoea and disruption of normal living conditions through flooding have become part of the community every rainy season. The government of Zambia, through the Disaster Management and Mitigation Unit (DMMU), has from time to time advised the residents to vacate flood-prone areas before the rainy seasons, but people opt to maintain their original locations (ZVAC, 2010; Nchito, 2007). The decision is mainly due to limited capacity and resources to meet their livelihood needs and the move to start a new life elsewhere is a challenge (WDC, 2013). Several factors contribute to flood risk in Kanyama, some are geographical, while others are social in nature (See Chapter 3). For instance, the community of Kanyama has capitalised on the geological formation

of limestone by engaging in quarrying and block- making to earn a living. The subsequent section looks at quarrying in Kanyama settlement.

4.2.1.1 Illegal Quarrying

The hydrogeology of Lusaka is characterised by the dolomite and limestone rock formation. Dolomite does not only affect contamination through seepage of water underground but reduces the permeability as well (Nkhuwa, 1996). The rock basement makes it difficult and expensive to construct storm drains. The impermeable surface and lack of proper storm drains in Kanyama settlements have greatly contributed to the pools of water that remain standing. In Kanyama, like in many informal settlements in Lusaka, land-use planning has been compromised by political leadership leading to the haphazard development of residential sites (LCC, 2010).

The presence of the dolomite rock in Kanyama has not just brought about the challenge of flooding, but has also created an opportunity for residents to earn a living. The majority, mostly women, are involved in stone-crushing (DMTC, 2011). Quarrying has also been another major contributor to flooding and underground water contamination. Ditches left after quarrying pose a great threat to Kanyama community. The gullies have become dumpsites for domestic waste and provide the reactant for chemical reactions leading to the contamination of water and becoming breading grounds for vermin (see Chapter 3, image 3). In addition, the pools of water that collect in gullies remain stagnant and then also become breeding grounds for mosquitoes.

Flooding is one of the major disaster risks affecting Kanyama yearly, according to the Deputy Minister in the Office of the Vice President Harry Kalaba, (Lusaka Times 6th January, 2013). He states that the problem of flooding has been experienced in Kanyama for a long time.

4.2.1.2 Experience of flooding in Kanyama

The history of flooding in Kanyama dates as far back as 1978 when the famous “Kanyama disaster flood” (Plate 1a) occurred. The flood left 11 people dead, 900 injured and affected 30,000 people in Kanyama, according to the Office of U.S

Foreign Disaster Assistance Agency for International Development "Disaster Summary Report" (OFDA, 1979). It caused great damage to property, displacing thousands to Kuomboka in Chawama- another informal settlement. The devastating floods were declared a national disaster and the government had to evacuate families to the neighbouring township Chawama.

Plate 1a: Kanyama Floods -1978

(Baptist Press (BP) 1978; Nyambe, 2001)

Plate 1b: Evacuation of Kanyama Flood Victims-2010

(Lusaka Times, 2010)

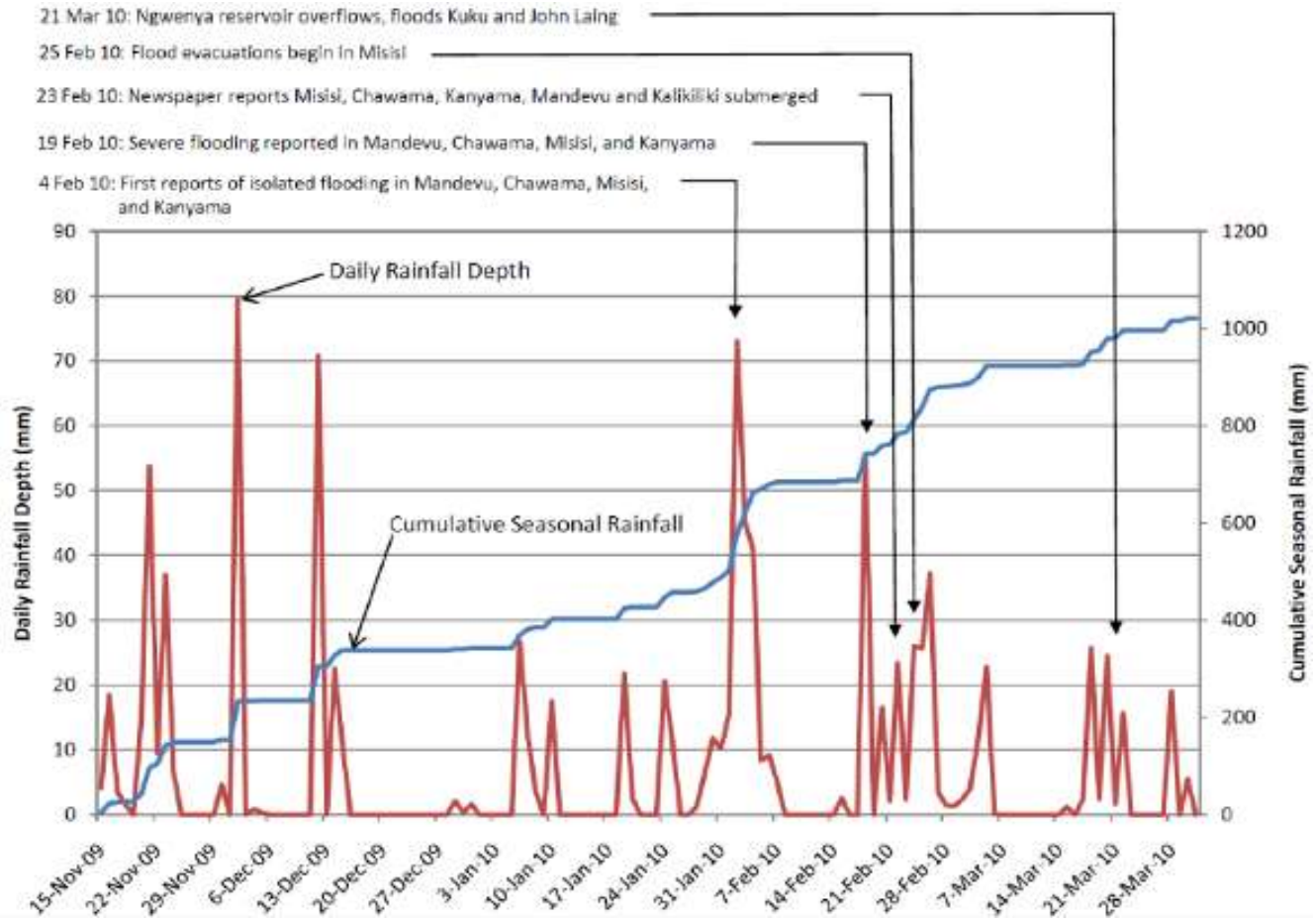
Flooding continues to affect Kanyama residents (Plate 1b). Veteran resident of Kanyama, Mr. Kambeu, reported this during the interviews, and by using the PRA tool of time line or historical profile, it was revealed that floods follow a pattern of 10 years (Mwanamwambwa, 2010). As mentioned earlier, the Kanyama Disaster of 1978 caused a lot of damage. In 1988 another devastating flood was experienced then, in 1998 and the latest was during the 2008/2009 rainy season when floods disrupted the school calendar for three months, leaving schools closed (UNOCHA, 2009; Lusaka Times, 2010; Mulwanda, 2012). The 2009-2010 floods had 200 families evacuating (Plate 1b) to the Independence Stadium, some people drowned and some children were swept away by the heavy rains (Post Newspaper, 19th February, 2010).

The Zambia Vulnerability Assessment Committee (ZVAC) Rapid Assessment Report (2010) in Chisola (2012: 16) revealed that 565 houses were completely damaged and 8,423 partially waterlogged. The only health facility, Kanyama Health Centre, was also not spared by the devastating flooding. Five of the local schools were closed due to flooding. In some incidences, school-going children had to take off their shoes to wade through dirty floodwater, making them vulnerable to contracting

water-borne illnesses such as bilharzia, typhoid and cholera. Roads were all flooded, with some being washed away, remaining impassable (Lusaka Times, 2010; Kabange, 2010; Daka, 2011; Chisola, 2012). The impact of flooding has continued causing havoc in Kanyama.

Figure 4 below gives an overall analysis of the impact of flooding in relation to precipitation in Lusaka during the 1999/2010 rainy season ,as reported in the media. The analysis of the time between November 2009 and March 2010 shows incidences of disasters experienced in prominent informal settlements of Lusaka according to the daily rainfall depth. These range from overflows of water reservoirs, submerging of housing units, the evacuation of victims and flooding cases experienced.

Figure 4: Precipitation and flooding timeline for the 2009/2010 rainy season for Lusaka



(United States Army Corps of Engineers (2011): Drainage Investment Master Plan for Lusaka, Zambia

During the peak of the rainy season in February of 2010, flooding news in Lusaka made headlines in the media. The Post Newspaper, Home News of Monday, February, 25, 2013 carried an item titled “Floods Wreak havoc in Kanyama Compound”. On the other hand, this created an opportunity for traders who had to abandon their usual merchandise, in preference to hot-selling gumboots. Emergency responses for years have relied much on relief and physical interventions. The government has come to the aid of flood victims through construction of temporary shelters and centres to relocate victims but these are neglected soon after the disaster (Nchito, 2007; Smith, 1992). Part of the blame for exposure and vulnerability to disasters in Kanyama is the lack of commitment by the government and other stakeholders to come up with lasting solutions to urban flooding.

4.2.2 Rapid urbanisation amid high poverty levels in Kanyama

Kanyama is one of the most densely populated informal settlements in Lusaka. It has a population density of 104 persons per square kilometre which is constantly on the increase (CSO, 2011) (Also see Chapter 3). Population statistics for Lusaka show that 70 percent of the population reside in the 37 informal settlements (Mulenga *et al.,* 2002; UNHABITAT, 2007) (Also see Chapter 1). These are areas which have been neglected by the local authorities in the provision of basic services. The latest Zambian Census of Population and Housing of 2010 (CSO, 2011) indicates that the Kanyama population stood at 366,170 at the time. The government obtained a loan from the World Bank to upgrade informal settlements such as Kanyama settlement. The areas are also referred to as “improvement areas based on this project. Development in Kanyama has been spearheaded by community members themselves through Resident Development Communities (RDCs) and Ward Development Committees (WDCs) UN-HABITAT, (2007).

The growth of Kanyama as an informal settlement is attributed to high migration into Lusaka from other parts of Zambia as well as a high birth rate (CSO, 1996; KHC, 2013). Statistics at Kanyama Health Centre indicated that between 25 and 30 babies are delivered at the health facility on a daily basis. Early pregnancies among school age girls have reached alarming levels.

People are attracted to Kanyama settlement due to its proximity of 4.5 km for the CBD and industrial area of Lusaka (Chisola, 2012). The main city market, Soweto, is less than a thirty minutes walk from Kanyama. Residents do not need to spend money for transport for their income generating ventures. There is also the Chinika Industrial area which has the potential to offer employment. The high population density also offers a market for various kinds of goods and services one may need for daily living.

Most migrants from the countryside leave the rural set-up with the hope of economic opportunities, higher education and wages and possibilities of employment in the city, as stated earlier (LCC and ECZ, 2008:12). However, economic opportunities are not a reality for the majority as they find themselves in informal settlements, living in deplorable conditions. Rapid urbanisation, despite business opportunities, creates serious challenges if not properly planned for by the government.

4.2.3 Poverty in Kanyama

The Living Condition Monitoring Survey Report of 2010 indicates that the average poverty levels in Zambia were at 89 percent in 2008. In addition, urban poverty was increasing at a faster rate - mostly in peri-urban or informal settlements where the majority of the poor reside. In Kanyama settlement, poverty has been identified as one of the major factors contributing to the vulnerability of the community to disaster risks, especially flooding (Chibuye, 2011; Mulenga, 2010:9). Urban poverty is diverse and relative to define. In Kanyama, poverty basically refers to limited access to a decent standard of living, safe water and sanitation. People migrating from rural parts of Zambia have found themselves in unsafe informal settlements such as Kanyama, residing in disaster-prone areas in, usually crowded, makeshift houses which increase their vulnerability (See Chapter 3, section 3.7). Urbanization worsens flooding by reducing the permeability of ground water surfaces and increasing runoff rates (Parker, 1999).

According to UNISDR (2009), a community is more vulnerable if it is likely to be badly affected by an event beyond its control. Furthermore, “natural hazards by themselves do not cause disasters – it is the combination of an exposed, vulnerable and ill prepared population or community with a hazard event that results in a

disaster" (ISDR, 2009:1). It is surprising to note that despite the unsuitable environmental conditions Kanyama residents are exposed to, efforts by the government and other responsible institutions to rescue the situation do not seem to be accorded the urgency it deserves. It is noted that lack of proper drainage systems, poor hygiene, water and sanitation prevail in these informal settlements.

High poverty levels in Kanyama community can be clearly seen in the general appearance of residents and surrounding environment. "Poverty is not only limited to income but also affects access to social services" (Gordon, 2002: 59). Poor people and poor communities are frequently the primary victims of natural disasters, in part because they are priced out of the more disaster-proof areas and live in crowded, makeshift houses (Oriola, 1994 and Babatolu, 1997). Kanyama has a complex tenure situation based on the Town and Country Planning Act, Cap 283 and Public Health Act Cap 295 of the laws of Zambia (See Chapter 5) which leads to houses being constructed without any approval from the government. Residents have no right of title to their property (Diagne, 2007: 555). The low-income residential areas (informal settlements) and rural areas in Zambia represent 80.3 percent of people living in extreme poverty conditions (CSO, 2012: 179). Such high poverty levels limit their capacity to build standard housing units that are safe to live in. Lack of money makes it hard for them to afford land in planned residential areas where the local authority provides basic services.

The poor are the most exposed to disaster risks because when disaster strikes, they are left with no safety nets apart from their life and their main asset, their labour. Disasters also destroy poor households' natural, physical, and social assets, and disrupt social assistance programmes. Floods cannot be prevented but planning emergency measures through flood management can often reduce their disastrous consequences (Andjelkovic, 2001). Even though poverty and vulnerability may worsen the impact of floods on the community, people have indigenous knowledge and skills of coping strategies to adapt to flood situations in their locality. The onus is on decision-makers, the government and the community members themselves to work towards reducing the impact of flood related risks, by taking DRR initiatives.

Generally, poverty levels are high with an average of 80.3 percent of the population living below the poverty line or on less than a dollar per day in informal settlements (CSO, 2010). Extreme poverty is prevalent in urban informal settlements. Informal settlements account for 72 percent of the urban population (CSO, 2010; UNEP, 2007; Mulenga, *et al*., 2010). The majority of these citizens are classified as being either skilled or unskilled and are mostly engaged in informal sector sources of livelihood (UNHABITAT, 2007). Livelihood sources include trading, vending, domestic work and temporary or piece work usually with a daily wage (Hansen, 1980 quoted in Mulenga *et al*., 2010). The majority of the residents in Kanyama trace their origin back to rural parts of Zambia or urban areas along the railway in search of a better life in the capital city Lusaka. These people usually migrate from rural areas to Lusaka in search of a better life. Agriculture production no longer sustains the rural population due to unreliable rainfall patterns, especially with the advent of climate change. The economic policy of structuring the economy (SAP) in 1991 resulted in massive losses of jobs due to the privatisation of state-owned companies (ECZ, 2008:1) including the mines (see Chapter 3, section 3.9). Retrenched workers migrate to Lusaka and live in self-help housing areas of informal settlements, including Kanyama, which are generally unsafe.

Quarrying is another livelihood activity in Kanyama. Geologically, the presence of the limestone and dolomite basement overlying Kanyama provides a resource for the local people. Quarrying, though illegal, has become a prominent source of livelihood for both men and women in Kanyama (UNHABITAT, 2002: 22; DMTC, 2011). Women and children can be seen in most quarry sites of Kanyama breaking stones for the construction sector while their male folk are usually involved in the more physical work of breaking the bulky rocks from the original dolomite basement. The rapid increase in population in Lusaka has contributed to the increase in demand for shelter. Due to quarrying, huge ditches have been left, posing an environmental risk as it collects water during the rainy season or when they are used as waste disposal sites by the residents.

Rapid urbanisation is one of the factors that have contributed to the vulnerability of the community. Lack of up-to-date national development plans have resulted in uncoordinated and disorderly development, leading to the growth of informal

settlements in most major urban centres in Zambia (ECZ, 2008:128). In Lusaka, Kanyama has a complex land tenure system that is not in accordance with the Town and Country Planning Act Cap 283 of the laws of Zambia. Residents have been constructing houses without the approval of the LCC. Most residents have no title of ownership for their housing units. In other words, they are illegal developers (Diagne, 2007: 555; Wood, 2000). Kanyama has been occupied by people belonging to the low income bracket (CSO, 2010; Diagne, 2007) with limited resources to build proper quality housing units. Prominent features of Kanyama as an informal settlement include having self-help housing units constructed without authority (Rakondi, 1996 cited in Mulenga, *et al.,* 2010: 6). Furthermore, Kanyama lacks essential basic services such as access to clean water, proper sanitation, a good road network, proper drainage systems and waste management systems.

4.2.4 Water and sanitation challenges in Kanyama settlement

In general, the entire city of Lusaka relies heavily on both surface and underground water sources. The LWSC is mandated to supply water and offer sanitation facilities to the entire city. The company supplies approximately between 200,000m^3 and 220,000m^3 water per day. However, only 800,000m^3 is accessed from private boreholes and hand-dug shallow wells (UNHABITAT, 2007). On the other hand, De Waele and Nyambe *et al*., (2004) noted that between approximately 80,000 and 350,000m^3 water is drawn daily from private boreholes and hand-dug wells for domestic and other purposes in Lusaka. Lack of provision of safe water and sanitation in Kanyama has exposed the local community to disaster risks of water-borne illnesses including cholera and diarrhoea.

The sanitation situation in Kanyama consists of on-site pit latrines constructed between 4 and 6 metres deep (Münch and Mayumbelo, 2007). The National Water and Sanitation Company Report (NWASCO, 2009) stated that in Lusaka, during the period of 2008/2009, only 17 percent of the households served by the LWSC had access to adequate sanitation. This implies that the majority (83 percent) are at risk of contracting water-borne illnesses. Pit latrines account for over 81 percent of the sanitation facility in Kanyama (World Bank, 2002; DMTC, 2011). These latrines are constructed by simply digging a hole in the ground, and the house is usually of used empty packaging materials including plastic and sacks. The type of pit latrines that

are used, have a depth of about 4-5 metres. The toilet pit has no lining to prevent underground water contamination. Underground water contamination is a given due to the proximity of the toilets to shallow wells. To avoid flooding, the toilet house is usually raised from the foundation. Non-raised pit latrines usually get flooded during the rainy season and high concentrations of pathogens infiltrate the aquifers, contaminating the groundwater (Mulenga *et al*., 2010). This is evident in the high rate of reported cholera death cases, mostly where access to safe water and good sanitation is poor.

In addition, only three percent of the population have no access to pit latrines. They either depend on their neighbours or practice open defecation (UNHABITAT, 2007). The few houses with pit latrines are located very close to the shallow wells with high risk of contamination (Maseka and Nyambe, 2000). The ratio of people per latrine is very high. Field work interviews revealed that as many as 20 people use one pit latrine. Children are usually excluded from using pit latrines, they simply defecate carelessly outside. Flooding, coupled with the high water table, has resulted in the overflowing of water in both latrines and shallow wells. In the rainy season, latrines collapse and while the water forms shallow wells, it mixes with the faecal matter from the overflow (Heather, Parker and Wetherhead, 2000; Nkhuwa, 1996). As many people share toilets, most toilets get filed up within a short time - on average - one year. Land is scarce, making it difficult to find space for digging other pit latrines. Chances of water contamination, due to the mix of shallow wells and pit latrines, continue to expose the community to water-borne diseases, especially cholera (Sinkala *et al.,* 2004).

The study by Sasaki and Suzuki, *et al*., (2009) reveals that the poor state of sanitation facilities in Lusaka's informal settlements greatly contributes to outbreaks of cholera and diarrhoea. The first outbreak of cholera in Zambia was reported in 1977/1978 and then again in 1982/1983 (WHO, 2011). Cases of cholera occur annually, affecting mostly residents of peri-urban informal settlements. In Lusaka, cases of cholera are reported every year in settlements on the western side of the city, including Kanyama, Chibolya, and Chawama.. These are settlements where over 70 percent of the inhabitants have poor access to safe water and sanitation services (CSO, 2000, 2010). The community basically depends on water from open

shallow wells for water supply and pit latrines for their sanitation (DMTC, 2011, CRED, 2009).

Another study on water and sanitation was done by Nyambe, (2004). The research reveals that accessing safe water in Kanyama has always been a challenge due to the geological formation (Nkhuwa, 2000) (See also section 3.4). In addition to the geological formation, the water and sanitation risks the community are exposed to are further due to informal human habitation on unsafe land, coupled with indiscriminate disposal of waste that affects the quality of the groundwater. The findings further confirm that lack of access to safe water; inadequate sanitation and indiscriminate waste disposal expose the community to water-related risks. Efforts by major stakeholders by means of public awareness campaigns and a focus on health and hygiene education resulted in reduced incidences of outbreaks of water-borne diseases, such as cholera, and improvements in general health conditions.

To help reduce vulnerability, the Water and Sanitation to the Urban Poor Project (WSUP, 2010) was launched to improve access to water and sanitation in two peri-urban informal settlements of Lusaka, namely Kanyama and Chazanga. Communal stand taps, often referred to as kiosks, were installed at various locations in the settlements and managed by the community through local water committees known as Water Trust. Lusaka Water and Sewerage Company (LWSC), in partnership with the Lusaka City Council (LCC), offer technical support to the management and operations of the water trusts. It must be noted here that the organisation and mobilisation was done with support from CARE International Zambia. Furthermore, credit goes to all stakeholders, especially CARE International Zambia, for mobilising the community based organisation to actively participate in local community development, LCC for approving projects according to the local Government Act Cap 281, Town and Country Planning Act Cap 283 and other legal frameworks and policies to be presented in Chapter 5. The water utility company LCC offers technical support on water supply at the Kanyama Water Trust.

The water supplied is obtained from the borehole located within Kanyama settlement. However, due to the high population density, the demand for water in Kanyama is very high. To provide adequate water to the entire city of Lusaka, the

water utility company (LWSC) needed to pump 400,000m^3/day in 2008 (Lusaka City Council and Environmental Council of Zambia, 2008). This demand is far too high for the water company to manage. The company mostly concentrates on supplying to planned settlements of the city. Where they supply water in informal settlements, the supply is usually erratic. In Kanyama, LWSC supplies water through RDC and WDC (UNHABITAT, 2007). This delivery approach is community-based in nature and attempts to empower the local community to take charge of accessing water. Stand pipes or kiosks are water points where members of the community pay for water. All the stand pipes are metered and members of the community pay for water consumption. The charges are based on the water consumption rate classified according to the housing category based on the type of the house. In 2008, a monthly rate charge of K8000 or equivalent of US$ 1.71 was charged monthly, irrespective of the quantity of water one consumed. As for communal taps, water is supplied in 20 litre containers at a fee of 20 Ngwee per 20 litre container (an equivalent of about 30 cents in United States of American currency). The aim of charging is basically for the purpose of cost subsidisation and to instil responsibility on the part of the community (Dagdeviren, 2008).

However, the supply of water from communal taps does not meet the high daily demand for the commodity. Some households, due to poverty, cannot afford to pay for the commodity. These then rather opt for alternative, unsafe water sources including hand-dug shallow wells. Furthermore, power supply outages make the pumping of water by the water company unreliable. According to Mr. Burton Mukomba, SPURRZ Project Manager from CARE 22 water kiosks established by CARE fall far short of the high demand and leads to congestion (Plates 2a & b). Residents have to wait for hours to access water. Unsafe water sources become an option. Children and particularly the girl child are deprived of the opportunity of going to school but are kept busy at the kiosk to access the commodity of life. This has contributed to most of girls and women being illiterate and hence they cannot find sustainable income and do not understand the importance of family planning, hygiene and public health.

Plates 2a &b: Women and children at the water kiosk

(Phiri, 2012)

Research conducted by the World Health Organisation, based on available rainfall and epidemic data in collaboration with the Ministry of Health, indicates that there is a relation between the outbreak of cholera and the rainy season (WHO, 2011). Cases of cholera are usually reported between the onset of the rainy season in October/November and April/May when the season ends. During the 2008/2009 rainy season, for instance, over 400 cases of cholera were recorded at the Kanyama cholera treatment centre alone. During the 2008/2009 rain season 107 lives were lost in Lusaka due to the cholera outbreak. Furthermore, between January and 28th March, 2010, Lusaka in general recorded a total of 4464 cases and 73 deaths. These were mostly from the informal settlements of George, Chibolya, Misisi and Kanyama (Post News, 2010; KHC, 2013). In addition to the challenges of accessing safe water, poor waste management is another disaster risk the community is exposed to.

4.2.5 Indiscriminate solid waste management

Kanyama as an upgraded informal settlement still lags behind in terms of waste management services provided by LCC. Historical waste is a term used to refer to heaps of uncollected waste that are left for a long time before final disposal (LCC, 2008). It is the responsibility of the LCC who is mandated to construct and maintain the drainages and manage garbage (Local Government Cap 281; Public Health, Cap 295). The local authority, however, does not have adequate resources to provide these basic services to informal settlements. These settlements were only upgraded to formalised settlements in 1996 (LCC, 2008). In general, the LCC only manages to

collect 15 percent of domestic waste generated in the entire city of Lusaka (UNHABITAT, 2007). However, what is the role of the community in relation to waste management in Kanyama?

4.2.5.1 Community participation in waste management

Waste is generated by the residents and therefore it has to be their responsibility to find solutions for managing it. In Kanyama, disaster risks associated with waste are caused by the residents themselves. Residents dispose waste indiscriminately, literally on every piece of available land. Sinkholes and drainage channels are not spared. When asked why they do this, the reason given is that the council (LCC) does not provide bins for waste collection and that land is limited for digging rubbish pits. The only option is public space, available drainage channels and roads. CARE, in partnership with the LCC, came up with the community based waste management approach to help the community take responsibility. Community based Enterprises (CBEs) are local entrepreneurs who manage waste for a fee.

CBEs were introduced in Kanyama with the support from CARE International Zambia to help LCC to collect waste at household level. Additionally, CBEs are local community solid waste management business initiatives established within the structures of the Resident Development Committees (RDC) or Neighbourhood Health Committees (NHC) (UN-HABITAT,2007; Mulenga *et al*., 2002; Care; 2011). Under this arrangement, CBEs were to be involved as primary collectors of waste from door to door and then dump the waste at the collection containers provided by LCC as secondary collection points from where the waste is taken up to the final disposal point, namely the landfill. Waste management by-laws by the LCC, especially the Public Health Act Cap 295 (see Chapter 5)(ECZ, 2004) empowers the local authority (Lusaka City Council) and the municipal waste management unit was established to manage waste in the city. Where resources are inadequate, the local authority is allowed to subcontract or franchise these services to the private waste management enterprises.

In order to manage the situation, the LCC has contracted the services of CBE to collect garbage in small bags from community members at a fee. Due to poverty and at times, a bad attitude, not all community members are willing to pay for the

services of waste management. In many instances there is indiscriminate disposal of waste from households and business houses that then block the drainage systems. This has been cited as one of the major causes of frequent flooding during the rainy season in Kanyama.

Waste management systems are inadequate and where they do exist, are poor and pose a great risk to the public. The inadequacy and non-availability of solid waste management services has compromised the public health in Kanyama. Ditches left from quarrying, collect water and become breeding grounds for mosquitoes. Moreover, the same stagnant water is at times used as domestic water sources. In addition, disused quarry pits become solid waste disposal sites for the majority who cannot afford to pay for waste collection (ECZ, 2000). This state of affairs leads to the contamination of land and water resources through the accumulation of plastic and other types of waste (ECZ, 2008). Solid waste is indiscriminately disposed on road sides, in drainage channels and any open spaces. Such poor waste management practices lead to blockage of drains, pollution of water, leading to outbreaks of diseases (Sinkala, 2002; ECZ, 2008; UNHABITAT, 2002). Evidence of poor solid waste management is manifested by mountains of uncollected garbage found in backyards, market places and other open public spaces. The garbage provides breeding grounds for mosquitoes, cockroaches, rats, maggots and speed up the spread of diseases. Groundwater in Kanyama is at risk due to lack of proper water and sanitation and poor waste management.

Efforts have been made by the local authority to reduce the disaster risks associated with poor waste management. The LCC Waste Management Unit has placed waste disposal $9m^3$ containers at Kanyama and Mbasela markets respectively (ECZ, 2000). However, these containers are not adequate to cater for the ever-increasing population, both at the market as well as with the domestic waste generated. Containers filled with waste remain uncollected (Plate 3) for weeks, posing a health risk to community members. It is common to find mountains of uncollected garbage decay that become maggot-infested, subsequently becoming breeding grounds for pests such as rodents, cockroaches, and flies (UNHABITAT, 2007). During the rainy season, water falls on these heaps of waste, resulting in water pollution. Plate 3

shows heaps of uncollected waste that have been left uncollected by the LCC but still the community keeps on dumping waste.

Plate 3: Heaps of uncollected waste at the market in Kanyama

(Fieldwork data, 2012)

The failure to manage waste in Kanyama is attributed not only to lack of resources (LCC, 2008) but also to lack of political will by the government.

4.2.6 Lack of political will

The mushrooming of informal settlements in Lusaka poses a challenge to the growth of the city. There are many factors at play as to why these settlements are on the increase. Under the Local Government Act Cap 281 and Town and Country Planning Act Cap 283 it is the responsibility of the local authority to plan for the development of residential areas and provide basic services, including water and sanitation, roads and drainage systems and markets. However, this mandate is not fully adhered to, due to lack of political will. The government transferred the responsibility of providing municipal services to LCC. The local authority embarked on the upgrading of Kanyama and other informal settlements in 2006.

The sum of US$ 4million was allocated for rehabilitation and construction of drainage systems in Kanyama (Chisola, 2012). The local authority, however, only accounted for US$2 million. The remaining US$ 2million could not be accounted for and drainage works were not completed. The issue of misappropriation of public funds is common, especially for developmental projects meant for the less privileged in society. Despite the intention being good, the poor are left even more vulnerable than before. Their problems are not given the attention it deserves. The ever-

increasing need for resources for LCC (Mulenga *et al.,* 2010; LCC, 2008) contributes to the misapplication of funds meant for developmental projects. Corruption and theft are also other factors that lead to poor workmanship on projects. The vulnerable community is not –usually consulted during the planning of the projects and are not given an opportunity to participate during the implementation.

Non-Governmental actors, CARE international, has established its presence in alleviating poverty and reducing vulnerability more than the government itself. Flooding in Kanyama has become a campaign tool for politicians. When floods occur, the LCC willingly spends huge sums of money providing relief items such as food, safe water and evacuating victims for safety. However, these measures are just short term and soon after the rainy season the community is forgotten (WDC, 2013; Nchito 2007).

Kanyama has received very little attention in terms of the provision of basic services due to its status as an informal settlement (LSOE, LCC, 2008). With its high population density, Kanyama is one settlement in Lusaka with the highest number of voters (CSO, 2011). The area therefore attracts political interest from aspiring candidates. Politicians target Kanyama and other informal settlements for votes (WDC, 2013). Common promises which are made every election period include improving water and sanitation, drainage systems, roads and health centres and schools. Members of Parliament and councillors are elected but no significant improvement is done for the livelihoods of the community.

On the political scene, the representation of Kanyama by the government in power always attracts the attention of both the residents and political leaders (Daka, 2011; Habasonda, 2011). Residents find the impetus to vote during an election with the hope of finding a government that will provide lasting solutions to their vulnerability to disaster risks. As disclosed by a voter from Kanyama settlement during the 2011 general elections, “I voted for the current MP because I’m confident that, should PF emerge victorious, the MP, being a member of the winning team, will be able to bring positive development to Kanyama” (Mwape, 2011). It is from this background that politics play a very important role in the life of the majority of the poor in society.

4.3 CONCLUSION

Kanyama settlement has been exposed to disaster risks and hazards, particularly flooding, as far back as the 1920s when the area was just a village. The presence of dolomite and limestone continues to exacerbate the vulnerability of the community (see Chapter 3). Flooding has been identified as the most common disaster risk affecting the community. Uncoordinated urban development planning on the part of the government, coupled with rapid urbanisation, including high poverty levels have left Kanyama undeveloped. Furthermore, the community members have limited options for obtaining a decent standard of living. The major livelihood activities include informal sector activities, which includes quarrying, vending, trading, domestic work and casual work - all of which do not offer sustainable livelihood. The informal settlement status implies limited provision of safe water and sanitation services. The majority have to depend on pit latrines for sanitation and open shallow wells for domestic water supply. This has contributed to contamination of both the groundwater and the surface water, making the community vulnerable to water borne-diseases, especially cholera and diarrhoea.

To help reduce the exposure of the community in Kanyama, the LCC embarked on a project of upgrading Kanyama settlement in 1996. The upgrading process was implemented in corroboration with support from donors, NGOs, CARE International Zambia, Lusaka District Commissioner's Office and the Kanyama community itself among other stakeholders. Measures included providing safe water and sanitation facilities, designing a new drainage system.

This chapter responded to the third objective of this study by analysing disaster risks Kanyama community experiences. The proceeding Chapter five will focus on establishing the role of the government in reducing exposure to disaster risks in urban settlements like Kanyama. Key issues to be discussed will include policies and legal frameworks relating to disaster risk reduction and establishment of settlements.

CHAPTER 5:
LEGAL FRAMEWORK AND POLICY FOR DISASTER RISK REDUCTION AND MANAGEMENT IN ZAMBIA

5.1 INTRODUCTION

Informal settlements, by nature, have limited access to the provision of basic services including access to water and sanitation from the government. The previous Chapters 3 and 4 presented the vulnerabilities to disaster risks commonly experienced in informal settlements in general and Kanyama in particular. In this Chapter, the focus is on legal frameworks associated with disaster risks in Kanyama. These include: Water and Sanitation Act Cap 28 of 1997, Local Government Act Cap 281 of 1991, Environmental Protection and Pollution Control Act (EPPCA) No.12 of 1990, Public Health Act Cap 295 of 1996, Town and Country Planning Act Cap 283 of 1994, Disaster Management Act No. 13 of 2010 and the National Housing Act Cap 246 of 1996. According to Mulenga, (2003) (Also see Chapter 4, section 4.2), poor implementation of these Acts and policies has greatly contributed to the exposure and vulnerability of the residents of Kanyama.

The vision for disaster management in Zambia is to create a *'safety net'* for the protection of the citizenry, their assets and the environment, against disasters, through a pro-active, community based, developmental and multi-sectoral approach (GRZ, 2005). Kanyama settlement has been vulnerable to disaster risks of flooding since its establishment in the 1920s as discussed earlier (See Chapters 3; and section 4.2.1.2). After Zambia attained its independence in 1964, the government made efforts to reduce the exposure of the community to disaster risks in Zambia. The government established the Disaster Management and Mitigation Unit (DMMU) in 1994 to oversee the disaster management interventions in the country (GRZ, 2005). In a bid to realise this vision, the government has put in place policies and legal frameworks (ECZ, 2008) to provide checks and balances concerning the establishment of habitable residential settlements with full provision of basic services by the local authorities. Despite having these frameworks in place, the challenges of unplanned settlements continue to grow around urban centres in Zambia.

The intention of discussing these policies and legal frameworks is to establish the impact of the approved Acts and the actions taken - up to the time of writing -on reducing risks regarding the place of focus: Kanyama. Another focuspoint, when discussing the policies, is to deliberate on possible guidelines to ensure that communities' basic needs of water, shelter and to achieve sustainable development are met. The challenge in Zambia is that the government's bureaucratic processes are tedious and, coupled with limited resources, implementation of policies take long (LCC, 2008). The implementation at community level (in this instance Kanyama informal settlement) is the responsibility of the local authority, LCC (Local Government Act Cap 281 of 1991). However, informal settlements by nature are neglected due to their informal or illegal background (see Chapter 3, section 3.5). Under the Local Government Act, the local government ensures that all settlements are planned or become formal settlements. With the increased challenges of rapid urbanisation and population growth, the government has no choice but to legalise informal settlements through the upgrading programme (JICA, 2001).

A programme to upgrade informal settlements entails that local authorities take the responsibility for providing basic services in the community, most importantly safe water and sanitation, roads and drainage channels among others. LCC is mandated by the Local Government Act Cap 281 of 1991 with the responsibility to provide basic services to planned settlements or to subcontract through franchise contractors to provide these services which include providing water and sanitation as well as waste management.

5.2 ADDRESSING WATER SHORTAGE AND A LACK OF CLEAN WATER

Over the years, Zambia has developed a number of policies and strategies for reducing disaster risks and exposure to disaster risks in the communities. In addition, the government strives to provide basic services to all its citizens. Water is the most important need of humanity. Accessing safe water and sanitation is one of the greatest challenges facing Kanyama informal settlement (See chapter 4, section 4.2.4; CARE, 2011). Although CARE International Zambia provides safe water at Kanyama Water Trust's (KWT) water kiosks at a fee (See Chapter 7, section 7.4.4.1) it is unfortunate that, due to high poverty levels, the majority of residents in Kanyama

cannot afford to pay for safe water. This results in the use of unprotected shallow wells to access water. Furthermore, these shallow wells pose a health hazard to the community due to their close proximity to pit latrines. In addition, the presence of the dolomite rock leads to the flooding of latrines, contaminating the water even further (Nyambe and Maseka, 2000) (Also see Chapter 4, section 4.2.4).

5.2.1 A concise review of Kanyama's early water predicaments

Kanyama settlement, being an informal settlement, enjoys a fair share of environmental hazards and challenges. Typical of informal settlements, high population density is a characteristic of this settlement. Like in many informal settlements, rapid population growth poses a challenge to the government to provide basic services (Mulenga, 2003) (also see Chapter 3). The basic services include provision of safe water and sanitation, good roads and health care facilities, among others. In Kanyama these needs are not adequately addressed. People rely on water from open hand-dug shallow wells which, in most cases, are highly contaminated (see Chapters 3 and 4). As for sanitation, the community relies on pit latrines sunk around the settlement; open defacation is also common, particularly among children (DMTC, 2011).

The challenges faced by LCC in addressing the water shortage and access to safe water have been attributed to the geological, demographical, hydrogeological and historical profile of Kanyama (see Chapter 3). The background of the establishment of Kanyama as an informal settlement entails lack of proper land-use, inadequate planning of housing units, no access to roads and an insufficient drainage network to mitigate flooding. Furthermore, the informal status implies that the local government, through local authorities, pays limited attention to providing basic services, including water, to the residents until such settlements are upgraded or regularised as planned settlements (Simposya, 2008; Mulenga, 2003). Demographically, the settlement is one of the most densely populated areas in Lusaka and Zambia in general (CSO, 2011). Being informal, the majority of the residents rely on informal livelihood activities which in most cases fall short of meeting their daily livelihood requirements. This puts pressure on the government to supply water to meet the demand of the ever-growing population (see Chapter 3). Geologically, the presence of the dolomite rock slows down the percolation rate of water during the rainy season, leading not

only to flooding, but also to the contamination of open shallow wells (Nyambe *et al.,* 2004) (also see Chapter 3, section 3.3).

Water is not just unsafe but also inadequate for the majority of the people in Kanyama settlement (Mwanamwambwa, 2010). High population density, coupled with the informal status of Kanyama, has compounded the accessibility to and affordability of safe water and sanitation. Until 1996, the LWSC and LCC had no obligation to supply water to residents of Kanyama until 1996 due to its illegal status during that period. In 1996, the government embarked on the upgrading of informal settlements in formal settlements. Under the Town and Country planning Act Cap 283 of 1994 it is a requirement that LCC provide basic services, including water and sanitation, roads and drainage channels. As a result of the challenges outlined above, the community is exposed to a variety of disaster risks, especially those associated with water, particularly flooding and outbreaks of water-borne illnesses (See Chapter 1, section 1.6; Chapter 4, section 4.2). The shortage of water and access to safe water results in outbreaks of water-borne diseases, including cholera and diarrhoea, experienced annually in Kanyama.(See Chapter 4 section 4.2.4).

In a bid to improve service delivery to the rapid growing population in urban centres, the government decided to decentralise the service delivery system to empower local government institutions such as the LCC in 1996 (Mulenga, 2003). Several acts thereafter were adopted to compliment the government's intention in this regard and to reduce risks pertaining to water.

5.2.2 Water and Sanitation Act No. 28 of 1997

The Water and Sanitation Act No. 28 of 1997, together with subsequent other statutory instruments (Water Policy, Make Zambia Clean and Health Campaign of 2002; Environmental Management Act of 2011) recognise the need for having regulatory instruments, structures and procedures for providing safe water and sanitation to settlements in place. Under the Water Supply and Sanitation Act, the government established the National Water Supply Council (NWSCO) to provide for the establishment of water supply and sanitation utilities to supply efficient and sustainable water and sanitation services. Part III section of the Act states that:

> "..a Local Authority shall provide water and sanitation services to areas falling under its jurisdiction and further provide protection of groundwater from pollution".

The Act implies that the LCC has the responsibility to supply water to the residents of Kanyama since it has been recognised under the Upgrading of Settlements Programme (JICA, 2000; Mulenga, 2003). The Act led to the compilation of the National Water Supply and Sanitation Council (NWASCO, 2010) Annual Report. The Act, in turn, leads to the formation of water and sanitation utility companies in all the provinces of Zambia. For instance, the Lusaka Water and Sewerage Company (LWSC) was established in 1998 under the Companies Act, Cap 388 and amended in 2011 to provide these services to the entire Lusaka district.

Under Part III Clause 10, the Water Supply and Sanitation Act states that:

> "Notwithstanding any other law to the contrary and subject to other provisions of this Act, a Local Authority shall provide water supply and sanitation services to the area falling under its jurisdiction except where that person has the capacity to provide water for his/her own needs".

In terms of access to these services, LWSC service provisions catered for around 34 percent of the total population of the Lusaka district (NWASCO, 2010). The supply has since increased to 65 percent coverage by 2006. This includes upgraded informal settlements such as Kanyama. In a broader perspective, the government developed National Development Plans. These are five year development plans to improve the standard of living of the people. The implementation of the Sixth National Development Plan (SNDP, 2012-2017) is in progress. In this plan there is a chapter on the water and sanitation sector. The goal in this sector is "to achieve [a] 75 percent accessibility to reliable safe water and 60 percent adequate sanitation by 2015 in order to enhance economic growth and improve the quality of life" (Millennium Challenge Cooperation Account, Project Report, 2012). The Lusaka Millennium Challenge project allocates funding for the upgrading of water supply and sanitation infrastructure in both upgraded informal settlements and existing informal settlements of Lusaka. The focus is to help reduce the challenges of accessing water and sanitation for the community of the Kanyama settlement and other informal settlements in Lusaka who depend on shallow wells and pit latrines that are exposed

to flooding during the rainy season (MCA, 2012) (Also see Chapter 4 section 4.2.4). The local authority has limited capacity to adequately provide water and sanitation services. Clause 10 of the Act states that, “the local authority may contract any person or other service provider to do so’’ (ECZ, 2008). LCC, through LWSC, partnered with CARE International to provide water and sanitation services through the Kanyama Water Trust (Mwanamwambwa and Kayaga, 2009) (also see Chapter 7, section 7.4.4.1). The partnership between CARE and LCC through LWSC has reduced the challenges of the community in accessing water and sanitation services. The partnership focused on strengthening the capacity of the Kanyama community to manage, mitigate and adapt to disasters, particularly flooding in peri-urban areas of Lusaka. Generally, in Zambia, flooding has been identified as one of the leading disaster risks (ZVAC, 2010).In this partnership arrangement, the government of Zambia allowed CARE International Zambia to implement projects aimed at reducing the impact of flooding in peri-urban centres including Kanyama settlement (See Chapter 7, section 7.4).

The Peri-Urban Sanitation Services (PPURSS) implemented in 2008 (See Chapter 7, section 7.4.5) saw the construction of improved pit latrines, commonly referred to as ‘ecosan’, the short form for ecological sanitation. These were necessitated by limited space for the digging of traditional pit latrines in informal settlements (Nyambe *et al.,* 2010). Other projects included the construction of public fee-paying toilets/showers at markets, CBE’s solid waste management and Water and Sanitation Hygiene Education (WASHE). It is generally accepted that women are the most vulnerable when it comes to issues related to exposure to disaster risks associated with water and sanitation (UNISDR, 2009). Traditionally they have the duty and responsibility to provide adequate water and sanitation to the family (Neumayer and Pluemper, 2007).

5.2.3 Environmental Protection and Pollution Control Act No.12 of 1990 (Revised as the Environmental Management Act of No.12 of 2011)

Water pollution and underground water contamination has been a major problem in most informal settlements (LSOE, 2008; ECZ, 2000). Limited space in Kanyama and other informal settlements always poses a danger of underground water contamination from pit latrines and shallow water wells and uncollected waste

(Kangomba and Bäumle, 2010; LCC, 2008). Zambia, like many developing countries, faces the challenge of meeting the Millennium Development Goals (MDG) (UN, MDG Report, 2007) of access to safe water and sanitation (Water Aid, 2012). Statistics show that 56 percent of Zambia's population do not have access to safe water supplies while almost 90 percent of the population have no access to satisfactory sanitation (National Policy of Environment, 2007:9).

The Environmental Prevention and Pollution Control Act (EPPCA) No. 12 of 1991 was enacted to provide for the protection of the environment and control of pollution. The Environmental Council of Zambia (ECZ) was established to implement this Act. Later, in 2011, the Environmental Management Act was enacted that led to the changing of ECZ to Zambia Environmental Management Agency (ZEMA). The act empowers local authorities to dispose of waste in designated locations and landfills. ZEMA is a statutory institution under the Ministry of Local Government and Environmental Protection (MLEP) as the parent ministry. ZEMA has the mandate to protect the public from all forms of pollution, especially water and air pollution.

Part IV section 22 of the EPPCA prohibits the discharge of any pollutant into the aquatic environment. In section 24 it states that "…no person may discharge or supply any poisonous, toxic, erotic, obnoxious or any matter to the aquatic environment contravening the pollution Control Standard established by ZEMA". In Kanyama settlement the underground water contamination is compromised due to excessive use of pit latrines and water wells. This leads to ZEMA having limited options to reinforce the regulation. In-house air pollution is yet another health hazard in Kanyama. The local authority does not provide water and sanitation services due to a lack of adequate resources and capacity (LCC, 2008). Charcoal is the major source of energy for domestic use. Although electricity is provided, not many can afford it due to high poverty levels (Chibuye, 2011). Sinkala *et al.,* (2010) attributes cholera and diarrhoea outbreaks in Lusaka's informal settlements to poor waste management and sanitation.

5.2.4 Constraints in implementing the Acts

Zambian laws stipulate that it is the responsibility of the government to provide basic services to its citizens. However, despite extensive labour and the implementation of

the aforementioned Acts (as discussed in sections 5.1 above) such as the Water and Sanitation Act of 1993, which allowed for the establishment of the water utility company LWSC, informal settlements like Kanyama have not benefited (see Chapter 3, section, 3.4).

Another constraint is the difficulty in the laying of water pipes due to the underlying dolomite rock formation (CARE, 2011; Chapters 3 and 7). The drilling and blasting process is a very expensive venture. This has been the experience of CARE International Zambia under the PROSPECT project (see Chapter 7, section 7.4.3).

Poverty is yet another limitation on the efficiency of the implementation of the Act as a means to develop as well as improve alternative ways to provide water. So the status quo is maintained as most of the residents continue to use unsafe water from shallow wells rather than buying the commodity from the water kiosks provided by CARE International. Water from shallow wells is contaminated due to the close proximity of water sources to pit latrines and the indiscriminate disposal of waste (Nkhuwa, 1996). The EPPCA, the Water and Sanitation Act and the National Policy on Environment make provision for the need for a clean environment where waste is disposed of at designated sites but this is never the case. High population density in Kanyama leaves limited space for waste collection and disposal. The SPURRZ Project Report indicated that about 90 percent of housing units in Kanyama have no access to safe water but depend on shallow wells for their domestic supply and only 103 pit latrines are safe for proper sanitation (Field data, 2013).

5.2.5 The impact of the Acts on the current status of Kanyama

Acts concerned with addressing water access have contributed to the community having improved access to safe water. The establishment of the Kanyama Water Trust under the PROSPECT project by CARE was aimed at providing safe water (see Chapter 7, section 7.4.3; Mwanamwambwa and Kayaga, 2009). The project is a partnership between LWASC, LCC and the community of Kanyama. This project also serves as a source of income to the water attendants operating at water kiosks. Community participation is attributed to be the reason behind the success of the Kanyama Water Trust.

Due to the contamination of water in Kanyama, mostly caused by pit-latrines, extensive attention was paid to affordable sanitation services in which CARE assisted. The next section provides a general overview of efforts to respond to sanitation.

5.3 ATTENDING TO PROPER SANITATION SERVICES

Government has also put acts into place in an effort to meet the needs of the country's people for sanitation and waste management. The community of Kanyama Settlement has depended on shallow wells and pit latrines since its establishment (CARE, 2011) (also see Chapter 3, section 3.4; Chapter 4). Consumption of contaminated water has resulted in the community experiencing frequent outbreaks of water-borne illnesses (see Chapter 1, section 1.6) since its inception and growth as an informal settlement.

Interventions to improve sanitation have been put into place by the government through LCC and CARE International Zambia (see Chapter 7). In partnership with the community, the PPURSS project has been involved in constructing ecosan toilets and communal public toilets at markets in Kanyama. These toilets do not pose any danger to underground water sources. CARE International Zambia focused on addressing adolescent girls on sanitation, health and hygiene education by implementing a project Integrating Adolescent Girls in DRR (IAG-PURRZ). It targeted girls in basic schools in Kanyama by training them in water testing, hygiene and sanitation. The University of Zambia's School of Mines and its Integrated Water Resource Management Centre were involved in training the girls. CARE International procured the water testing kit (See Chapter 7, section 7.4.6). The project aimed at checking levels of contamination of ground water seeing that the majority of the citizens depend on pit latrines for sanitation (CARE's IAG-PURRZ Project Manager).

The government secured funding from the USA, under the Millennium Challenges Account Cooperation (MCA) for the upgrading of informal settlements in 2012. The funding is being used to upgrade the entire city of Lusaka-particularly access to water and sanitation- and the redesigning of informal settlements are among the interventions planned (MCA, 2012). The project is being implemented in partnership

with LCC. After sanitation, the other challenge is the indiscriminate accumulation of waste in informal settlements.

5.3.1 Waste Management Statutory Instrument No. 71 of 1993

The Zambian government has over the years come up with legal frameworks to provide guidelines on managing waste in the country. However, these guidelines do not specifically deal with solid waste management but are related to other environmental challenges (ECZ, 2008). There is no direct policy that deals specifically with waste management. The government instituted the Waste Management Statutory Instrument No. 71 of 1993 to provide for control over the transportation of waste and the management of waste disposal sites. It provides guidelines for transporting waste or operating waste disposal sites for local authorities and other partners on condition that they meet the conditions and standards of the Environmental Protection and Pollution Control Act No.12 of 1990 under which the Zambia Environmental Management Agency (ZEMA) falls. Informal settlements like Kanyama Settlement in peri-urban areas are the worst affected by poor waste management challenges. Waste blocks drainage channels which then leads to flooding (Kabungo and Lifuka, 2009) (see also Chapter 4, section 4.2.5; Image 4b).

In 2004, the government came up with the Solid Waste Management Strategy (ECZ, 2004) to focus on critical waste management problems. Poor waste management threatens the public health of people, especially in high-density informal settlements. The development of this strategy was due to the realisation of the challenges of waste management in Zambia which includes the following:

- Littering, uncollected garbage, and indiscriminate dumping of waste;
- Improper handling of hazardous wastes;
- Exposure to health hazards due to indiscriminate disposal of waste; and
- Low standards of operational disposal sites (apart from the Chunga Landfill).

The operational, legal and regulatory framework of this strategy is supported by other legislations: the Environmental Protection and Pollution Control Act No. 12 of 1990 (EPPCA), amended in 1999, and the latest Environmental Management Act of

2011, the Local Government Act of 1991 Cap 281 and the Public Health Act, Cap 295. They all provide guidelines for all the aspects of handling waste such as the licensing, collection, transportation, treatment and disposal of waste in safe ways. The Local government Act Cap 281 further allows local authorities (LCC) to formulate by-laws and regulations in their areas of jurisdiction on handling waste. According to this act, the Kanyama community, who are the generators of domestic waste, should be made to pay for the service of waste collection and disposal.

The Waste Management Strategy (ECZ, 2004) strives to ensure:

- The right of the citizens to live in a clean environment;
- Reduction of the volume of waste requiring disposal and maximising the economic value of waste; and
- Development and adoption of environmentally sound treatment and disposal facilities/practices in sanitation management.

CARE International Zambia, in an attempt to fulfil these strategies, embarked on projects of waste management and collection through Community Based Enterprises (CBEs) in Kanyama settlement and other peri-urban areas of Lusaka. The aim of introducing these CBEs was to contribute to waste collection at community level on behalf of the Lusaka City Council. The introduction of CBEs has not only contributed to the reduction of waste in Kanyama Settlement but has also created employment opportunities. It must be noted further that CBEs carry out primary collections while LCC provides secondary collection facilities (Kabungo and Lifuka, 2009). In 2010, CARE adopted an environmentally-friendly technology of waste management and sanitation through the biogas project (CARE, 2013).

A number of factors hinder the provision of adequate sanitation services. The Water Aid Zambia (2008) Report indicated that the Zambian government was not meeting its 2008 commitment to spend at least 5 percent of the Gross Domestic Product (GDP) on sanitation and hygiene, thereby preventing the water utility companies from either upgrading existing service networks to cope with the ever increasing demand or investing in new infrastructural development (NWASCO, 2010). The other hindrance is due to lack of coordination in the planning of the development of residential areas. In most cases utility companies are not consulted in the

developmental planning of new residential areas. These areas eventually need to be provided with water and sanitation facilities including waste collection services. The situation has resulted in huge challenges in creating a clean environment for communities.

Although it is the mandate of the LCC to provide water and sanitation services, the local authority has limited capacity and resources to do so (MLGH, 2008; ECZ, 2008). This challenge is manifested in heaps of uncollected solid waste that create environmental health hazards (See Chapter 4). To address this challenge, the government approved the Waste Management Statutory Instrument No. 17 of 1993, to provide guidelines on waste management.

This statutory instrument does not only focus on waste collection, but also involves the sensitisation of the community to sustainable waste management practices (Kabungo, 2009). Managing waste is a big challenge facing informal settlements of Zambia (ECZ, 2008). One of the underlying causes is lack of proper land-use planning for residential settlements (Mulenga, 2003). In safeguarding the public health of the people, the Public Health Act of 1996 was enacted to focus on improving the health of the people in the country and residential areas in particular.

5.3.2 Public Health Act Cap 295 of 1996

The aim of the Public Health Act Cap 295 of 1996 is to ensure that there is a clean and hygienic environment in Zambia (ECZ, 2004).. In Part ix of the Public Health Act, emphasis is placed on access to adequate sanitation for communities. In doing so, the Act gives local authorities (LCC) the responsibility to prevent and control the outbreak and spread of infectious diseases or exposure of the communities to health hazards.

The Act further ensures that hygiene standards are observed at all times on food consumed by the public. The other aspect of the act is waste management. It prohibits people and institutions from dumping waste indiscriminately and corrects any action that creates a nuisance, including street vending. However, all this has no impact or significance for informal settlements like Kanyama which receives limited support from the central government. Additionally, Section 16 of the Public Health

Act of 1996 describes the duty of the local authority to prevent or remedy danger to health arising from unsuitable dwellings.

Other guidelines are for the local authority to ensure that there is no pollution of water supplies and no selling of contaminated food stuffs. Areas of interest include discouraging unsafe water sources, ensuring that shallow wells be covered and keeping surroundings tidy all the time (Part xii sections 85, 86 87). For instance, food residues and industrial waste products such as biscuits and cooking oils have ended up at markets in Kanyama. These pose a health hazard to the people. These health concerns are a common worry for most informal settlements like Kanyama. They have an adverse impact on the health of the community.

The above legal frameworks are all aimed at improving and preserving the living conditions and environment in residential areas of Zambia. However, due to the limited capacities and resources of both the government and local authorities, policies are not fully implemented (UNHABITAT, 2007; UNISDR, 2009; LCC, 2008). The community on the other hand has a limited capacity to construct safe housing on legalised land. The government came up with a policy on housing to ensure access to safe accommodation for its citizens.

5.3.3 Constraints in implementing proper sanitation Acts

Despite having the Public Health Act in place with all its good intentions, the implementation of this Act has been a challenge. Rapid population growth in informal settlements (Kanyama) with its hazardous characteristics (see Chapter 4) threatens the public health of the community. High population density does not match sanitation facilities (see Chapter 4).

High poverty levels cause residents to be unable to afford the cost of paying for safe water at the Water Trust (DMTC, 2011). The community ends up depending on shallow wells. Waste management is yet another challenge.

Limited access to space and the high cost of waste collection services, increase indiscriminate waste disposal, including disposing waste in a few existing drainage channels. This increases public health hazards.

The government has not yet provided adequate medical facilities (there is only one health centre). The community has limited access to health facilities in cases of outbreaks of water-borne diseases. This makes the implementation of public health education a big challenge. Staff at the health facility is also inadequate (KHT, 2013).

5.3.4 Impact of sanitation Acts in Kanyama

Public health and sanitation has been a major challenge in Kanyama. Lack of proper toilets, the use of mostly pit latrines and open defecation, referred to as “flying toilets” have been some of the challenges faced as revealed during interviews (see Chapter 4; Appendix B and D). The government, through LCC and CARE, recognised the problem and came up with projects to provide sanitation facilities, starting with public facilities at markets (DMTC, 2011) (See Chapter 7, section 7.4.5). A public toilet managed by community members was constructed at the Mbasela Market

CARE and LCC have been working on reducing underground water contamination by providing water through the Kanyama Water Trust (KWT) (See Chapter 7, section 7.4.4.1). The water project has contributed to a reduction in the consumption of contaminated water and reduced the chances of underground pollution. With this Act, LCC monitors and ensures the community in Kanyama has access to clean water and sanitation.

At Kanyama Health Centre, the Neighbourhood Health Committee (NHC) has been established in the community (see Chapter 4). The committee has assisted in sensitising community members to issues of hygiene, sanitation and water treatments such as boiling water and chlorine distribution. This committee worked in collaboration with the personnel at the Kanyama Health Centre in sensitisation and awareness creation activities (see Chapter 7). Despite efforts in improving access to proper sanitation facilities and services in Kanyama, availability of safe housing units is yet another challenge in the informal settlement.

5.4 HOUSING PROVISION: BETWEEN IDEAL AND REALITY

Kanyama, being an informal settlement, is characterised by poor housing units made of sub-standard construction material (see Chapter 4, section 4.2.2). The National Housing Policy of 1996 was enacted to ensure that housing units are constructed

according to the required standard. The policy led to the establishment of the National Housing Authority mandated with the sole responsibility of managing all housing concerns in Zambia. Local authorities have the full responsibility of ensuring that any housing unit constructed meets the standard. As part of the Town and Country Planning Act Cap 283 of 1994, building permission has to be given for one to commence with the erecting of a house. The land-use planning and allocation is the responsibility of the government through the local authority (LCC) in this case. Local authorities have a Physical Planning Department whose responsibility is to identify suitable locations for the establishment of residential areas. It follows that only approved locations are permissible for allocation to the general public.

Land available for development of residential housing units has to be advertised according to the Town and Country Planning Act (See section 5.4.1) which allows people to apply for land and permission. The Act does not allow construction on unsafe locations such as Kanyama, a flood-prone location. Having presented the legal framework for housing development, the reality for Kanyama is the opposite.

According to focussed group discussions and interviews during CARE's Urban Vulnerability Assessment Study, Kanyama evolved from being a village, then private property as a farm, later as an informal settlement (See Chapter 3, section 3.5). Furthermore, the historical background has had a huge impact on the allocation of land and type of housing units constructed. Even during the colonial era, the country had plenty of land apart from the land occupied by the mining industries and commercial farmers. Under the traditional leadership of Chief *Mwalusaka*, people settled and built their houses on any available space allocated by the chief (see Chapter 3). Later, when the land was acquired by Mr Potgieter, people were attracted for employment as farm labourers. After Zambia gained independence in 1964, the trend in the allocation of land is that it becomes a privilege of and for political leadership. Land was allocated by Councillors without the authority of the local authority and without guidelines (See Chapter 4).

Houses have been constructed on unsafe land including over sewer pipes, near industries and flood-prone locations (WDC, 2013). There are no standard building guidelines followed during the construction process.

5.4.1 The Town and Country Planning Act Cap 283 of 1994

The Town and County Planning Act Cap 283 of 1994 in Zambian Law provides guidelines for the construction of physical infrastructural developments in districts. The Act empowers local authorities to appoint planning authorities whose main responsibilities include: approval of land-use plans, subdivision of land, planning-permission for the construction of housing units and repossession of undeveloped land. The Lusaka Planning Authority in this case is the only mandated institution to give permission for the construction of housing units in residential areas in Lusaka. This has not been the case for the Kanyama settlement.

The LCC also has the mandate and responsibility for the construction of drainages and roads in Kanyama Settlement. Furthermore, the Act provides for physical planning and control over the development of residential and physical infrastructure in all districts in Zambia. The poor implementation of the Town and Country Planning Act Cap 283 by the government has contributed to the mushrooming of informal settlements in Zambia (Mulenga, 2003).

The first Lusaka City Development Plan was issued in 1956 and later amended in 1965 and 1991. However, according to the Town and Country Planning Act, Development Plans have to be reviewed every five years (LSOE, 2008:4; Mulenga, 2003). Delays in the reviewing of these plans have resulted in increasing cases of encroachments on both private and public land meant for other future developmental projects. The land-use map of Lusaka indicates that a large part of the city has been invaded by unplanned settlements mostly towards the north, north-west and south of the CBD (LSOE, 2008) (Also see Chapter 4, Figure 3). On the eastern side of the CBD lies planned formal residential settlements.

In Kanyama settlement, the services delivery system is of two kinds: the informal (unplanned) land acquisition and formal (planned) land acquisition. Informal land delivery mostly happened before the settlement was upgraded in 1996 whilst an informal settlement was basically illegally taking place by political cadres before 1996 (WDC, 2013; Resnick, 2011). In the formal land delivery system, the local authority LCC has plans for available land before any construction is allowed (LSOE, 2008: 26; UNHABITAT, 2007). The background of Kanyama informal settlement can

be attributed partially to poor planning and lack of development control on the part of LCC (Chapter 3, section 3.6; Diagne, 2007). In 1931, the origin of Lusaka as an administrative centre of the British government meant that the focus was on developing areas for government workers, neglecting those for local people (local Zambians) (Mulenga, 2003) (also see Chapter 4;). Disaster risks, including flooding, would have been avoided if the LCC took appropriate measures in planning for the settlement after the departure of Potgieter (CARE, 2011). Even further back in time, after the 1978 'Kanyama Disaster' which paralysed the entire settlement by floods, no serious measures were taken, apart from evacuating families every time floods became severe (Baptist Press, 1978) (also see Chapter 4, section 4.2.1.2).

The inadequate implementation of the Town and Country Planning Act has greatly contributed to the haphazard growth in Kanyama. The settlement is now known for being a hazard-prone location for flooding, cholera outbreaks, unsafe water, poor sanitation and poor waste management. In addition, poor housing units have been constructed, on unsafe locations around the city of Lusaka. For instance, Kanyama settlement is located on the flood prone limestone rock formation (Nkhuwa, 1996) (also see Chapter 3). Poor housing infrastructure is one of the major hazards that residents of Kanyama and other informal settlements face.

5.4.2 The coming of National Housing Act Cap 246 of 1996

Lack of safe housing is a common characteristic of informal settlements (Mulenga, 2003). Houses are usually constructed of substandard materials unable to withstand environmental hazards such as heavy storms and downpours (Nchito, 2007). The Housing policy emphasises the importance of habitable shelter (GRZ, 1996:1). Under the National Housing Act Cap 246, it is the sole responsibility of the National Housing Authority (NHA) to construct houses for the public to procure. However, the cost of constructing standard housing units is beyond the reach of the majority of Zambians, especially in informal settlements (Mulenga, 2003).

The housing policy demands for the construction of safe and habitable housing units in the country. The implementation of the policy collaborates with the Town and Country Planning Act Cap 283 of 1994, the Water and Sanitation strategy of 2004 and the Environmental Protection and Pollution Control Act of 1990.

The policy is aimed at supplementing the Town and Country Planning Act Cap 283 of 1994 (See section 5.3.2 above). The Policy ensures that people reside in healthy living environments and strengthens existing strategies to mitigate impacts associated with poor housing structures. It is surprising that Kanyama settlement and other informal settlements countrywide keeps on expanding in an unplanned manner without serious commitment from the government to intervene and stop the development of substandard housing units (UNHABITAT, 2007). If only the government, through LCC, followed this regulation, the exposure of the community to disaster risks of flooding and the use of water from shallow wells and pit latrines in Kanyama would not have occurred. However, the community as well has a role to play in following the right procedures on land acquisition according to the Town and Country Planning Act. Poverty and limited access to resources greatly contributes to an increased number of unsafe and inhabitable residences (Turnbull, Sterrett and Hilleboe, 2013).

The unsafe conditions in the informal settlements of Lusaka have largely been the result of the lack of political will on the part of government and the community at large to ensure a safe living environment. The vision of the Sixth National Development Plan (SNDP, 2011) is of a Zambia with, “planned settlements with adequate, affordable and quality housing by 2030.” The strategy for achieving this vision requires harmonising the Town and Country Act Cap 283 and the Housing (Statutory and Improvement) Areas Act Cap 194 that commenced in 2007. As presented in Chapter 4, Kanyama’s vulnerability to disaster risks is a result of its status as an informal residential area. It receives little attention in terms of the availability of safe housing units. However, the Housing (Statutory and Improvement Areas) Act Cap 294 was enacted to allow for LCC to declare some unplanned settlements.

The Act led to the revision of the National Housing Policy of 1996. At the time of this thesis, the revised National Housing Policy was in the process of being launched. It is a requirement that settlements have full support from local authorities in terms of provision of basic services and a safe living environment.

5.4.3 Constraints of implementing housing Acts

Preceding sections have provided legal frameworks associated with exposure of residents of the Kanyama settlement to disaster risks. It has been established that the Town and Country Planning Act Cap 283 is a key policy with regards to the planning for the establishment of residential areas in Zambia. However, there are many reasons for the continued increase of urban centres countrywide. The study reveals that informal settlements receive little attention from the government firstly due to their illegal background and secondly because of the limited capacity of the local authority to meet basic needs (LCC, 2008; LSOE, 2009).

Despite having the Town and Country Planning Act, Cap 283 in place, the rapid growth of population and urbanisation has contributed to the mushrooming of informal settlements (Mulenga, 2008; ECZ, 2000; LSOE, 2008:26). Key factors contributing to challenges of enforcing efficient land delivery system in Kanyama are the following:

- Lusaka is not big enough o cater for the rapid population growth;
- Lack of serviced land coupled with the LCC lack of capacity to provide basic services coupled with ever-increasing demand (LCC, 2008);
- Speculation on land especially among the rich who hold large chunks of safe land for residential at the expense of the majority of the poor in informal settlements (UNEP, 2007).This results in land encroachment;
- Complex and uncoordinated procedures in land allocation and political influence in land allocation;
- Inadequacy and inefficiency of human resources and institutions which are subsequently incapable of effective land-use planning; and
- Delays in issuance of titles or tenure of land due to bureaucratic procedures lead to the increase in squatter settlements and encroachments.

The challenges stated above are some of the major factors that contribute` to the uncontrolled growth of informal settlements in urban centres such as Kanyama settlement.

The challenges faced by informal settlements are mainly due to limited access to suitable land and poor land administration. The upgrading process requires a lot of

capital injection for it to succeed. Despite the Act being well intended, this policy had its share of challenges for people in informal settlement like Kanyama to access funding to build better houses after flooding. The first point is that Kanyama location is an unsafe location due to its hydrogeological make-up (Since the settlement has been established, it is difficult to apply the Town and Country planning Act Cap 283 to build adequate roads and drainage channels due to the high density of housing units already constructed).

Political interference plays a role and has for a long time influenced the allocation of land in a haphazard manner (Renwick, 2011). High poverty levels make it difficult for the community to afford to build houses which are safer and can adapt to flooding in Kanyama.

Residents in Kanyama have continued constructing housing units without approval from the local authority as set out in the Town and Country Planning Act. CARE's (2011) SPURRZ Project Report indicated that about 90 percent of housing units in Kanyama have no access to safe water but depend on shallow wells for their domestic supply and only 103 pit latrines are safe for proper sanitation (WDC, 2013) (Also see Chapter 7 section 7.4.6).

5.4.4 The impact of the housing Acts on the present status of Kanyama

The establishment of Kanyama as an informal settlement has been largely affected by the poor implementation of Acts related to land-use planning system by the LCC (LSOE, 2008; LCC, 2008; UNHABITAT, 2000). Houses have been constructed on illegally acquired land, built with substandard materials, entire settlements have no proper drainage network and no coordinated water and sanitation (Water and Sanitation Strategy and Public Health Act Cap 295; see Chapter 4) provided.

On the other hand, Acts such as the Town and Country planning Act is being implemented through the upgrading of informal settlements. The government has secured funding and formed the Millennium Challenge Account Cooperation to upgrade Kanyama and Chibolya, among other informal settlements in Lusaka (MCA, 2012). In addition, part of Kanyama was demolished to literally pave the way to the upgrading of the settlement (See Image 4 in Chapter 4).

The upgrading of the status of Kanyama from informal settlement has seen an increase in service delivery. LCC partnered with CARE International Zambia to construct Kanyama's main drainage channel and roads to ensure that the community can access safe water from water stands. The other impact of the Town and Country Planning Act is a reduction in the cases of cholera and diarrhoea outbreaks.

5.5 PREVENTION OF DISASTERS IN KANYAMA

The aim of this study is to focus on disaster risks that Kanyama settlement's community is facing and to explore how these risks can be mitigated (see Chapter 4). Kanyama has been exposed to disaster risks for a long time due to its profile (Chapter 3). The focus of preventing disasters in Kanyama is premised on the central theoretical statement of community participation and emphasis on a bottom-up approach rather than the top-down, emergency response to disaster risk reduction (See Chapter 1; section 1.9).

Flooding in Kanyama is the major hazard that the community has to deal with every year during the rainy season. The impact is usually noticeable through outbreaks of diarrhoeal diseases including cholera (Chapter 4). The other impact is the contamination of drinking water that is usually obtained from open shallow wells located close to pit latrines. Uncollected waste also provides a breeding ground for vectors and the blocking of the few existing drainage channels worsens the flooding situation. Whenever there is a flood, the government of Zambia, through the DMMU and LCC, has come to the rescue of the community with emergency relief services (See Chapter 1, section 1.6). In the worst cases, victims have been evacuated for safety to football grounds. Soon after the rainy season, victims return to Kanyama settlement and continue with their lives in the flood-prone settlement (Nchito, 2007; Chapter 1). Disaster risks and floods have been experienced in Kanyama for a long time, for instance the famous Kanyama disaster of 1978; 2008 and 2010 which resulted in huge losses of property and lives. In this era of climate change a sustainable solution is important. People have limited resources and options for relocating and would rather remain in the flood-prone area.

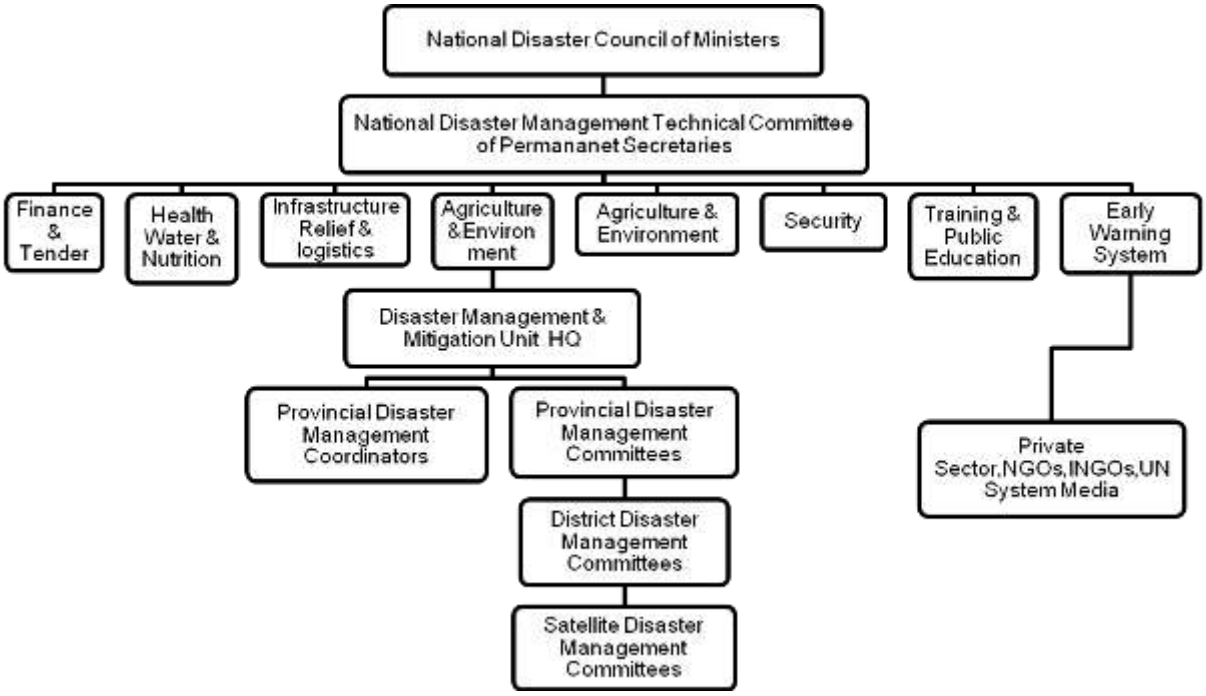
The paradigm shift to a community- centred disaster risk management approach as explained in this research offers a lasting solution. CARE International Zambia has

been working in Zambia using the bottom-up approach as opposed to the top-down response (Chapter 7). Under CARE projects, community development and participation (See Chapter 2) have been emphasised. Projects implemented have focused on poverty reduction, safe water and sanitation, waste management and drainage construction. All these projects were community-based and managed and aimed at reducing community exposure to disaster risks.

5.5.1 Revised disaster management Act No.13 of 2010

In Zambia, the management of disasters and disaster risks traces its history from the traditional 'fire fighting' emergency and relief approach (GRZ, 2005) (Also see Chapter 2). The Hyogo Framework for Action in 2005 was aimed at building resilience of nations and communities to disasters (UNISDR, 2005). The conference came up with an action plan for disaster risk reduction for member countries. Zambia being a signatory of the UN, adopted a comprehensive approach in addressing disaster risks by enacting the National Disaster Management Policy in 2005 to provide guidelines for disaster management and risk reduction in the country. Furthermore, during the same year, the Disaster Management Operational Manual was also developed to implement the policy. The policy spells out the roles and responsibilities of stakeholders in disaster management in the country. The Disaster Management and Mitigation Unit (DMMU was established in 1992 with the mandate for disaster management in Zambia. The unit operates under the Office of the Vice President. The Vice president is the Chair for the National Disaster Management Committee (GRZ, 2005). The Zambian Disaster Management System Structure is presented in Figure 5 below:

Figure 5: Organisational structure of disaster management in Zambia



(Adapted from GRZ, 2005)

The organisational structure (Figure 5) shows the relationship of various levels of Zambian institutions and the links from the satellite through to the district, provincial and national level in the Office of the Vice President.

The organisational structure of the Disaster Management System starts with the Republican Vice President as the Chair, deputised by the Minister of Defence. The Vice President superintends over the National Disaster Management Committee. This is a committee of Ministers and other organisations such as the United Nations Resident Coordinator and a Church Representative from Faith Based Organisations. The committee's main functions include:

- Recommending disaster management policy direction to the National Disaster Management Committees;
- Overall co-ordination of the implementation of the decisions of the National Disaster Management Committee; and
- Supervising the work of the DMMU in the preparation, monitoring and regular reviewing of national disaster management plans and policy guidance over disaster management issues in the country.

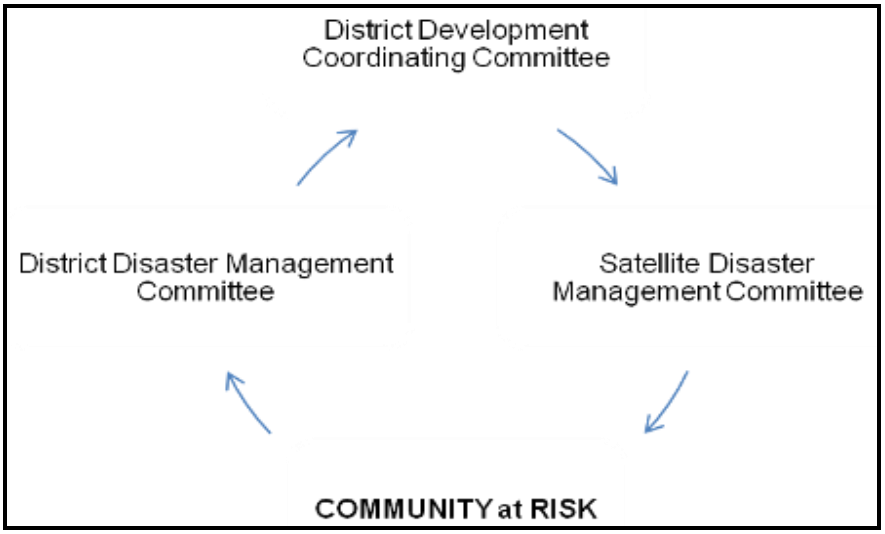
The next level is the Committee of Permanent Secretaries. This is a group of technocrats whose mandate is to plan and implement the disaster management policy. These come from key ministries relevant to disaster management. Among these ministries are: Health, Defence, Home Affairs, Local Government and Housing, Agriculture, Education, Finance.

The subcommittees of technocrats from line ministries with relevance to disaster management include:

- Health, Water and Nutrition;
- Infrastructure and Relief and Logistics;
- Agriculture and Environment;
- Security;
- Training and Public Education; and
- Early Warning System.

The major responsibilities of these ministries are to spearhead disaster risk prevention and preparedness throughout the country. Sub-committees are in charge of vulnerability and risk assessments and come up with mitigation and early-warning measures (GRZ, 2005).

Figure 6: Reporting system of Satellite Disaster Management Committee



(Adapted from GRZ, 2005)

At community level, Satellite Disaster Management Committees (SDMC) (Figure 6) are established to coordinate disaster risk reduction activities at community level. The composition of the SDMC include: local leadership representatives such as councillors, local men and women, FBOs representatives, youth, community development workers and public service workers within the community. The main role of SDMC is to coordinate DRR activities. Roles may include conducting risk assessments. The local community is better placed to administer DRR activities within their community. Structures are in place to implement disaster management protocol from the community at satellite level through to the district, province and finally to the Office of the Vice President through the DMMU for quick administrative response (See section 5.5.4).

The overall responsibility of the office of the Vice President is to supervise the management of DRR interventions in the country. It coordinates operations with government ministries, international organisations and NGOs in responding to DRR interventions. The centralised command has its own challenges with distance and time needed for relief to reach the country-side. The government has decentralised some of the functions by opening a regional coordinator's office in all the provinces of Zambia (GRZ, 2010).

The mandate of DMMU is to oversee and implement the Disaster Management Act of Zambia. The unit used to be headed by the National Coordinator until the Act was revised in 2010. The National Coordinator is at the level of the Permanent Secretary heading the unit.

The mission of DMMU is:

> "to establish and provide for the maintenance and operation of a system for the anticipation, preparedness, prevention, coordination, mitigation and management of disaster situations and the organisation of relief and recovery from disasters; establish the National Disaster Management and Mitigation Unit and provide for its powers and functions; provide for the declaration of disasters; establish the National Disaster Relief Trust Fund; provide for the responsibilities and involvement of the members of the public in disaster management; and provide for matters connected with, or incidental to, the foregoing" (GRZ, 2005).

To realise this mission, DMMU is mandated to perform the following functions:

- Coordinate all disaster management activities in Zambia through mobilising emergency relief from the central government, individuals and NGOs;
- Distribute relief items to the victims of disasters e.g. tents, food, water through provincial, district and satellite disaster management committees;
- Conduct vulnerability and risk assessments ; and
- Conduct early warning for disaster risks.

The Unit (DMMU) performs the role of coordinating DRR activities through both government and partners who mostly include NGOs, Faith Based Organisations and others. The structure of DMMU close to the community starts at provincial level with the Provincial Disaster Management Committee (PDMC). It consists of heads of government departments in line-ministries mentioned earlier at provincial level and other stakeholders including NGOs representatives.

DMMU's main functions include:

- preparing and consolidating provincial disaster management plans;
- acting as clearing house for information related to early warning;
- monitoring the preparation and implementation of district disaster management plans and evaluating their impact;
- participating in Risk Analysis and Vulnerability Assessments; and
- mobilising provincial resources for implementation of mitigation, prevention, preparedness and response activities.

In relation to the above functions, DMMU has Kanyama on its top flood-prone areas in Lusaka (DMMU, 2013). Preparedness plans are mobilised through the DDMC, NHC, DRR committees among other community-based institutions. The legal framework and policies on environmental management are aimed at allowing the support of other stakeholders in disaster risk reduction in Zambia.

The government does not implement these policies alone but partner with both local and international nongovernmental organisations with similar mandates. The government alone cannot reach out to all vulnerable communities. The government

has therefore been collaborating with partners on DRR interventions (GRZ, 2005). DMMU has enjoyed a cordial relationship with United Nations agencies and NGOs, in particular CARE International, in disaster risk reduction initiatives as will be presented in detail in the next chapter (CARE, 2011) (also see Chapter 6). Some areas of coordination include flooding, water resources management in river water basins, working with schools and local communities in community based intervention activities in the country. As for the focus of this research, Lusaka and Kanyama in particular, initiatives targeted the vulnerable communities in peri-urban areas and informal settlements (CARE, 2011; LCC, 2008).

The implementation of the gender policy which emphasises the role of women in DRR has also not been adequately covered. Women are on the frontline of DRR intervention but few are in decision-making positions at community level (UNISDR, 2009), WDC and RDC. Research findings shows that the WDC and RDC committees in Kanyama had only two women in each of the committees respectively (CARE, 2011).

Lack of adequate financial and material resources and human personnel is a challenge for LCC (Kabungo and Lifuka, 2009; LCC, 2008). It has become a challenge for the LCC to fulfil the implementation of the policy on clean environment for all (Public Health Act Cap 295; Water and sanitation and waste management). Heaps of uncollected solid waste keep on growing at markets and other public places (CARE, 2011; LCC, 2003).

Local leadership in DRR interventions is very important at local level. Due to limited capacity, LCC has decentralised service delivery by allowing the participation of the community in managing community-oriented projects.

5.5.2 Local Government Act Cap 281 of 1991

The Local Government Act Cap 281 of 1991 provides for the governance system at local level through local authorities. It provides for the decentralisation of powers of administration from the central government to the local authority and then people at grass root level. LCC is mandated by this law to plan and provide basic services to

residents of Lusaka district. The Act further provides for integrated three-tier local administration systems and stipulates functions, work and powers of the local government. Under this Act, together with the Environmental Protection and Pollution Control Act (EPPCA), No.12 of 1990, LCC is obliged either directly or indirectly to provide water and sanitation services, drainages, waste collection and management and roads to the community and has powers to impose fees and charge for these services. LCC, through partnership with CARE International Zambia, embarked on projects including the Kanyama Water Trust as will be seen later in Chapter 7. The community-managed Water Trust supply water to the many parts of Kanyama Settlement in a community-based approach as will be presented in Chapter 5.

Secondly, the Local Government Act provides for the establishment of local authorities for the purpose of local governance. WDCs in Kanyama were established to facilitate development at local level. Thirdly, it empowers local authorities to make regulations such as by-laws to set standards and guidelines for the provision of municipal services in planned residential areas. These services include physical or land-use planning for development in the city and waste management, safe water and sanitation services.

Where the general policy appears inadequate for the needs of the local authority, the local authority may amend laws or make their own laws and by-laws (Town and Country Planning Act Cap 283 of 1994). For example the LCC has made laws to charge anybody found indiscriminately disposing waste on the streets.

Today, many local authorities in Zambia are faced with challenges in implementing government legislation due to limited capacity and limited budgeting by government and irregular payment by local residents for services, particularly water and sanitation (LCC, 2008; Mulenga, 2003). The evidence of this is seen in the mountains of uncollected waste around markets and streets, posing a health hazard to the general public. On the other hand, there is too much pressure on the local government (Lusaka City Council) to provide basic services (ECZ, 2008:114). As was observed by Chisola (2012), residents in Kanyama have set all their hopes on politicians to deliver them from flooding which affects their settlement every year (Mwanamwambwa, 2010; Zulu, 2011, Lusaka Times, 29th February, 2012).

At community level, the Local Government Act Cap 281 empowers councillors to be agents of development on behalf of the government. RDCs are voluntary-based non-partisan local community leadership structures managed by community members (Hedley and Sanderson, 2000; Local Government Act No.22 of 1991. Membership of RDCs and WDCs is through local community elections. However, political interference, especially from the ruling party, plays a significant role in influencing the functioning of RDCs and WDCs. It was reported during the research that when the Patriotic Front (PF) came into power after the general elections in 2011, all RDCs and WDCs were dissolved based on the assumption that they belonged to the previous ruling party, the Movement for Multi-Party Democracy (MMD). New membership, consisting of party cadres from the new ruling party (PF) become new leaders in RDCs and WDCs. The change of membership disrupts the implementation of developmental programmes. The understanding is that members of RDC and WDC have a strong loyalty to the ruling party (LCC, 2008; Mulenga, 2010) hence when their party loses, they have to be removed. The Kanyama constituency has two wards, namely ward 10 and 11 with a total of 19 resident development zones managed by RDCs and WDCs respectively (CSO, 2010; DMTC, 2011).

The Lusaka City Council works in partnership with Community based Organisations (CBOs) which are local organisations such as NHC, DRR Committees as well as local and international NGOs to implement developmental programmes in the community (UNHABITAT, 2007; Lusaka District Profile, 2008:11). CARE International has been one of the leading partners working with LCC in peri-urban area development in Lusaka. These community based initiatives are coordinated by RDCs and the Council (District Urban Profile Report, 2008). The Local Government Act gives the City Council the responsibility to be in charge of all developmental activities at local level through the leadership of area based organisations highlighted later (Chapter 7, section 7.4.2). Responsibilities of RDC and WDC in partnership with the Lusaka City Council include:

- establishing and maintaining sanitation and drainage systems to facilitate the removal of garbage and effluent; and

- prohibiting and controlling the use of land and erection of buildings in the interest of public health at community level (See http://www.mcaz.gov.zm, accessed 07/08/2014).

Ward Development Committees on the other hand operate under the umbrella of the ward councillor. The LCC partnered with CBOs and NGOs to improve the provision of water and sanitation services in Kanyama in 1996 (see Chapter 6). RDCs identify local service needs in Kanyama, and then the LCC set up area-based committees at council level to address them (Hedley and Sanderson, 2000:2; UNHABITAT, 2000).

5.5.2.1 Ward Development Committees (WDC)

Under the Local Government Act, Cap 281 of 1991, WDCs, previously known as Area Development Committees (ADCs), have the responsibility of spearheading development projects at local level. WDCs are established as non- partisan institutions and operate within the community. However, political influence plays a major role in the formation of these committees as mentioned earlier. WDC formation has strong links with the ruling party of the particular time (Resnick, 2011). The area Councillor is an ex-officio member of the WDC. The leadership is assumed by election with the mandate to undertake the following responsibilities:

- To create formal, unbiased, communication channels as well as cooperation partnerships between the community and LCC through advising and making recommendations to the ward; and

- To serve as a mobilising agent for community action within the ward e.g. ensuring active participation in campaigns to develop ward development plans that include water and sanitation sensitisation programmes and implementing by-laws at community level (LCC, 2003:21).

Therefore, a WDC is a sub-district local government structure which is legally constituted by the LCC (Joseph Ngoma, Interim WDC Chairperson, 2013). Local community leadership structures only provide leadership on issues related to governance and community mobilisation. The physical planning aspects of

residential areas are the responsibility of LCC, as enshrined in the Town and Country Planning Act, Cap 283 of 1994.

The absence of proper land use planning for residential areas is aggravated by poor service delivery by the government. Unplanned areas face numerous challenges in terms of waste collection, accessing water and sanitation facilities (see Chapter 4). Indiscriminate waste disposal and collection by LCC remains a challenge for the community.

5.5.3 Constraints of implementing the disaster management Acts

Disaster management process has had an emergency response and relief focus since its inception (See Chapter 2, section 2.3.1).The implementation of Disaster Management Act No. 13 of 2011 is a challenge for both the community at risk as the institution responding to disasters which includes the government.

The first constraint is due to more pressing developmental needs on the part of the government. It is difficult to allocate funds and resources when the community is not faced with a disaster (see Chapter 1, section1.6). The implementation of the Act is more at policy level from top to bottom, with very little attempt to assist the community at-risk to find lasting solutions.

Secondly, rapid population increases and urbanisation have resulted in the rapid growth of informal (illegal) settlements in unsafe locations (UNHABITAT, 2007). The demands for accessing safe water, sanitation and safe accommodation have become a challenge for the government and the community.

Despite the establishment of structures for disaster management from national to community level, there is no budget allocation for DRR interventions (DMMU, 2013). The majority of interventions are done by NGOs, CARE International, in particular (see Chapter 7).

5.5.4 The impact of the Disaster Management Act no. 13 of 2011 in Kanyama

The implementation of the Disaster Management Act in Kanyama has not benefited the community fully. Kanyama experiences flooding, and its related risks of cholera and diarrhoeal outbreaks, yearly. The government (DMMU) through the Act assists the victims by providing safety-nets through relief supplies, such as tents, during evacuations (See Chapter 1, section 1.6). However, soon after the rainy season, the victims are left to fend for themselves when they go back to their flood-prone Kanyama (Nchito, 2007). The following year they are faced with the same exposure to flood risks. The government has been responding to floods in Kanyama since the settlement was established (see Chapter 4).

5.6 GENDER ISSUES IN DISASTER RISK MANAGEMENT

According to UN Secretary General Ban-Ki Moon (2012), “the potential of woman in disaster risk reduction interventions are not fully utilised worldwide.” He further argues that women are natural leaders and we need their full engagement.

5.6.1 Gender policy of 2000

Disasters affect both men and women differently. In developing nations where poverty levels are high, women are more vulnerable to natural disasters than men because of socially constructed gender roles and behaviours that affect access to resources (UNISDR, 2009). Generally speaking, women and girls are more vulnerable to disasters that affect the livelihood of the community because of socially constructed gendered roles and behaviours that affect their status in the community (Pelling, 1998). The responsibilities of the women in the community include: water collection, sanitation, hygiene and cooking and the general welfare of the household..

According to Forbes-Biggs and Van Niekerk, (2011), there is scanty information in Africa concerning the inclusion of adolescent girls and women in the process of disaster risk reduction. In most cultures and traditions, females are assigned certain social roles and responsibilities that expose them to risks of being affected by water-

borne diseases. They can be described as both victims and drivers of community disaster risks.

In the disaster management process (see Chapter 7) of floods in Kanyama for instance, women work hard during the post-disaster phase by ensuring the safety and health of the family. They ensure that flood-water is mopped, they look for clean water and when there is an outbreak of diseases like cholera they take children to the clinic. These activities place them at a higher risk of contracting diseases (WHO/GWH, 2005).

The government of Zambia recognised the important role women play in disaster risk reduction. CARE International recognised the role of women in development by engaging them in The For-Work-Project under the Peri-Urban Self Help projects (PUSH I & II) and appointing them in the running of the Water Trust as water vendors (see Chapter 7).

The Gender policy can help empower women to actively participate in disaster risk reduction activities by mainstreaming gender in all DRR interventions. There is a need to mainstream the role of women in disaster risk reduction interventions (ISDR, 2005). The National Gender Policy (GRZ, 2005) has stipulated resolutions to resolve problems associated with the provision of safe and clean water, and good sanitation, which affect more women than men. They are namely to:

- promote and encourage the participation of women in decision making process;
- promote partnership between women and men in the provision of water and sanitation;
- ensure use of gender-friendly technology in water supply and sanitation to all members of the community especially persons with disabilities;
- devise a mechanism to ensure that water and sanitation facilities provide affordable, clean, and safe water through a regulator; and
- establish investment mechanisms to ensure that water reticulation systems take into account issues of hygiene and prevention of water-borne diseases.

The above measures also apply to informal settlements like Kanyama where the provision of water is inadequate. Furthermore, the policy states that in all water committees in peri- urban areas, 50 percent of the members should be women (LCC, 2012) as a way of promoting the participation of women in developmental activities in peri-urban areas.

To ensure that there is equal representation of men and women during the implementation of any project (water, sanitation or drainage projects by CARE International) (see Chapter 7), the GIDD needs to be consulted at the project design level to identify opportunities to ensure that the interests of men and women in peri-urban areas are equitably represented (LCC, 2012; Garret, 2008).

In the WDCs, it is a standard requirement that all committees should have 50 percent women members; however, in Kanyama settlement, the composition of WDCs are mostly dominated by the male folk (Cheelo, 2012). This also applies to Zone Development Committees within Kanyama wards (see Chapter 7, section 7.4.2). These guidelines are gender-inclusive initiatives developed by community-based NGO, CARE International Zambia, to get closer to the community when implementing community projects such as the Kanyama Water Trust and Integrating Adolescent Girls (IAG) in disaster risk reduction in Zambia (IAG-PURRZ) (Mwanamwambwa, 2013). These projects have helped to build and institutionalise gender equality messages at community level. For instance, over 80 percent of the water kiosks vendors in the Kanyama Water Trust are female (Cheelo, 2013).

The IAG-PURRZ project's main focus is on empowering school-going girls with skills to reduce vulnerability to disaster risks in the community (CARE, 2013). The details of this project will be discussed in Chapter 7, section 7.4.7.

5.7 THE IMPACT OF THE ACTS: THE CURRENT STATUS OF KANYAMA

The Zambian government has Acts in place aimed at creating safe conditions for the establishment of residential areas in the country. The constraints of implementing these policies were discussed in section 5.3.4. Most of these Acts have, however, been ignored as a result of political pressure in a bid to promote illegality in search of votes (Chisola, 2012). However, the government has made strides in the upliftment

of the living standards of the people who reside in informal settlements. The Local Government Act Cap 281 of 1991 has led to the establishment of local development leadership structures at community level such as the area-based organisations WDC/RDC (See Chapter 7, section 7.4.2). Their mandate is to spearhead local development at community level. The establishment of wards, even in informal settlements, have brought issues to the attention of the government who has subsequently started to provide basic services, including water, roads, drainage channels, schools and health facilities.

In 1996, with the support of the Japanese International Cooperation Agency (JICA), informal settlements have been upgraded to formal settlement status (LSOE, 2010; ECZ, 2000). The upgrades are supported by the Town and Country Planning Act Cap 283 of 1994. It has allowed the Lusaka City Council to take development to informal settlements in Kanyama in Lusaka. Furthermore, the Local Authority, LCC, controls the further development of housing units that meet the standards for safe housing. Initially land allocation was done by political cadres in a haphazard manner to win political favour. The Act allows only the local authority to be in charge of planning and allocating land for any future development in Kanyama.

Accessing safe water and sanitation is the major challenge for Kanyama. The Water and Sanitation Act, Public Health Act Cap 295 of 1996 has provided checks and balances for accessing safe water and sanitation in Kanyama. As a preventive measure against the outbreak of water-borne diseases, the Lusaka City Council, in partnership with CARE International, worked with other NGOs in providing Chlorine for treating water. As will be revealed in Chapter 6, CARE International Zambia has been working in Kanyama settlement in providing safe water and sanitation, reducing poverty and managing disaster risk reduction projects (see section 6.2) since 1992. The Waste Management Statutory Instrument No.71 of 2010, Environmental Protection and Pollution Control Act of 1991 (revised in 2010) have allowed the LCC to establish Community based Enterprises (CBEs) to participate in waste collection.

CBEs were mobilised and trained by CARE International Zambia to be in charge of waste collection in Kanyama. The community is charged a fee for waste collection from door-to-door. The Gender Policy of 2000 recognises the need to involve women

in decision-making and participation in developmental issues in order to meet their developmental needs. The water kiosks or stand taps have employed women as water vendors to collect water levies from the community.

Lastly, Kanyama settlement is located on dolomite rock making the area experience floods on an annual basis (see Chapter 3 section 3.4). The Disaster Management Act of 2010 has taken note of the paradigm shift in disaster management (UNISDR, 2009) (Chapter 2, section 2.3.1) from a reactive to a proactive focus to DRR. The Act has allowed DMMU to focus on creating a safety net for all citizens and their property. The Lusaka District Disaster Management Committee (DDMC) and Satellite Disaster Management Committee (SDMC) at ward or community level are mandated to coordinate disaster risk reduction interventions in Kanyama. These committees use an interdisciplinary approach in co-opting various sectors including health, community development, education, police, business community and Faith Based Organisations (FBOs).

DMMU, LCC and CARE International Zambia have been involved in creating community DRR awareness interventions (see Chapter 7, section 7.2). Neighbourhood Health Committees and DRR committees have been established in Kanyama to sensitise fellow community members on the need for hygiene and waste management and sanitation.

The impact has been positive where the community have been actively involved in DRR interventions such as water treatment at water kiosks. However, due to limited resources by LCC (LCC, 2008) and the government's other pressing needs, they take a reactive approach to disaster management in Kanyama. On the other hand, an emphasis on community participation by CARE International has made the community realise their own responsibility in creating a safe environment.

5.8 CONCLUSION

Chapter five responds to objective four of the research which aimed at evaluating the existing Zambian legal frameworks and policies and their impact on disaster risk reduction and management in urban settlements and Kanyama settlement in

particular. Disaster risk management in Zambia is by law the responsibility of the government under the office of the Vice President. Informal settlements are exposed to hazards of floods, limited access to safe water and sanitation, inadequate waste management and unsafe housing among other risks. The government has put various legal frameworks, Acts, instruments and strategies in place to provide guidelines on reducing exposure of communities to disaster risks into place. The Kanyama informal settlement is the point of focus. Key areas of concentration of the Acts discussed include: addressing access to safe water and water shortage, attending to proper sanitation services and housing provisions in Kanyama and gender in DRR. Lastly, issues related to disaster management were addressed.

The government through LCC is expected by the laws of Zambia to provide basic services in Kanyama. Despite the government policies and laws in place with good intentions, implementation of these have always been a challenge. Informal settlements are too vast and densely populated, making it difficult for LCC to provide water and sanitation services. The hydrogeological formation of Lusaka leads to flooding and contamination of water sources. A key issue is the lack of resources by the government to allocate to DRR interventions amidst pressing developmental demand. This has contributed to the reactive response approach of providing relief to disaster victims. The community on the other hand has already settled on unsafe location with limited services provided by the government. High poverty levels make it unaffordable for the people to access safe water supplied by CARE, hence they rely on unsafe shallow wells.

The aforementioned Acts have had a significant impact on the status of Kanyama so far making the community more sensitive to exposure to disaster risks. Community participation is important for local development by WDCs/SDMCs under the Local Government Act. Partnership in delivery of basic services has encouraged partners to assist both the government and the community. The upgrading programme of informal settlements under the Town and Country Planning Act appears to be progressive and should be of continuous value in future.

In Chapter 6 the detailed methodology used in collecting data on disaster risk related activities and the compilation of data for this research will be presented. The methodology was basically qualitative by design. It focuses on the perception people

have of disaster risks and previous interventions. The data is basically perceptions of residents and of the officials who work for the various institutions whose aim is to uplift the standard of living of the community.

CHAPTER 6:
RESEARCH METHODOLOGY

6.1 INTRODUCTION

In the previous Chapters 1-5, the background of disaster risks in Kanyama is presented. The conceptual and theoretical framework of DRR and factors that contribute to disaster risks are presented in Chapter two. Chapter three outlines the factors underlying the exposure of Kanyama to disaster risks. These include: historical, geological, hydrogeological and demographical factors. Furthermore, Chapter four outlines the disaster risks the community is exposed to. These are associated with factors presented in Chapter three. The role of the government system, whether at local or national level, is to make policies and enact guidelines to ensure the community are exposed to safe habitable conditions. This is presented in Chapter 5. The intention of this chapter is to provide an overview of the methods that were used to investigate DRR intervention in Kanyama to meet the general objective of proposing a model for disaster risk reduction.

The information represented in this chapter was obtained through the researcher's engagement with CARE International Zambia in DRR interventions in Kanyama (see Chapter 1 and appendices I, II, III and IV). The Participatory Approach (PRA) (See Chapter 2) was used during workshops on community based disaster risk reduction interventions. The workshop attracted participants including members of the Ward Development Committees (WDC), zone leaders, personnel from Kanyama Health Centre, teachers and members from Faith Based Organisations (FBO).

As pointed out in Chapter 2, PRA and Community Driven Development represents an effective way of addressing community problems as the emphasis is on the participation of the community (Shaw, 2008). Some of the PRA tools to gather primary data about Kanyama settlement for this thesis are shown in Table 3 below. Most of the information in this research is a result of the researcher's experience with DRR activities obtained by working with CARE on community DRR projects (See Chapters 1 and 7, Also appendix I).

6.2 RESEARCH DESIGN

The study uses qualitative research design because it is aimed at establishing the perception of the Kanyama community regarding disasters and DRR interventions from outside the community (Anderson, 2012). In general, qualitative research generates rich, detailed and valid (process) data that contributes to an in-depth understanding of a community problem. The design is further based on the Community Driven Development (CDD) and Participatory Rapid Appraisal (PRA) methodology for engaging the community (See Chapter 2) (Chambers, 2000). The researcher embarked on this research upon getting involved in DRR's partnership with CARE International Zambia with Mulungushi University DMTC (Chapter 1) (also see Appendix I).

6.3 METHODOLOGY

The process of collecting primary data from community members of Kanyama was done through personal interviews and group activities at the workshops conducted during DRR training (See Chapter 7) as part of the consultancy on Urban Vulnerability Assessment (URVA) of CARE DRR projects (DMTC, 2011) (Also see Chapter 1). Literature on reports about disaster risks in Kanyama were also consulted as a way of triangulating information to verify some of the perceptions the community have about DRR in Kanyama.

6.3.1 Sampling of community respondents

The sample for the research was randomly selected from Kanyama settlement. The settlement is a high-density residential area (CSO, 2011) with people who live in similar vulnerable conditions of exposure to disaster risks, specifically flooding (See Chapter 3-4). This is because Kanyama settlement has no defined location plan of housing units. The sampling is based on the political boundary which is the Kanyama Constituency.

A total of 380 households selected from the 19 zones divided in two wards, 11 and 12 respectively, participated in the research by means of personal interviews(CSO, 2011) (Also see Chapter I).

Key informants were selected purposively to represent their institutions. They include: staff from the Lusaka City Council, the Kanyama Water Trust, CARE International Zambia, Kanyama Health Centre and Twashuka and Kanyama Primary schools respectively as well as the Disaster Management and Mitigation Unit (DMMU).

6.4 DATA COLLECTION METHODS

The research employed two types of questionnaires, namely self-administered and interview guide (See Appendix B, C and D). Self-administered because most of the community members in Kanyama have low literacy skills due to the informal status of the settlement as previously discussed (See Chapter 3). Interview guides (see Appendix C) were used to collect information from stakeholders: staff from Lusaka City Council, Kanyama Water Trust, Kanyama Health Centre and Twashuka and Kanyama Primary schools respectively.

6.4.1 Personal Interviews

The Participatory Approach (PRA) was used to engage households in the community in data collection as it is an effective way of collecting data which involves active participation of the community (see Appendix A,C and D) to share their perceptions of the disasters, hazards and interventions experienced in Kanyama (Shaw, 2008; Chambers, 2008) (Also see Chapter I).

Questionnaires used for personal interviews covered the following main topics (See Appendix C):

- Household demographics
- Livelihood sources
- Health, Water and Sanitation
- Perceptions of disaster risks
- Access to information , early warning and education
- Identification of disaster-prone areas and vulnerable members of the community
- Capacity of houses to withstand disaster risks
- Existing disaster risk reduction and management practices.

6.4.2 Focused Group Discussions

In order to triangulate information obtained through personal interviews, FGD cross-check respondents (see Appendix B) were purposively selected from the 19 zones to participate in focused group discussions (See Chapter 1, section 1.7.2.4).

The focus of the discussions was to gain in-depth knowledge of community perceptions of disaster risk experiences in Kanyama (See also Chapter 4). Unlike personal or individual interviews, which aim to obtain individual attitudes, beliefs and feelings, FGD brings forth a multiplicity of perceptions and emotional processes within a group context (Bless & Higson-Smith,1995:113).

As pointed out in Chapter 2, some of the PRA tools to gather primary data about Kanyama settlement for this thesis are shown in Table 4 below. This was during the DRR training on community based DRR contact under the Strengthening Peri Urban Risk Reduction Project by MU's DMTC in 2012 (see Chapter 7 ; Appendix A).

In the Focused Group Discussions the following issues were covered (See Appendix B):

- The historical background of Kanyama
- Livelihood options such as major occupations
- Challenges being faced by community in accessing basic needs
- Common hazards being experienced, their causes and magnitude
- Local disaster coping strategies
- DRR interventions by CARE and other institutions

Key Informant Interviews covered the following topics (See Appendix B):

- Identifying disaster risks
- Changes, if any, in the magnitude of disaster risks
- The impact of disaster risks on the community
- What interventions are in place and need to be put in place to reduce disaster losses.

Direct Observation – Transect walks were undertaken around Kanyama to assess and appreciate the vulnerability of the community and the hazards the community is exposed to in Kanyama.

During one of the training sessions under CARE Projects SPURRZ, IAG-PURRZ (See Chapter 7), details of interventions about disaster risks of Kanyama were analysed using PRA tools (Table 4).

Table 4: Participatory Tools used for data collection of disaster risks and hazards in Kanyama

No.	PRA Tools	Expected research finding/ Research Chapter
1	Problem tree:	To identify root causes of major problems/ disaster risks and effects that need to be prioritised. ***(Chapters 3,4&5)***
2	Historical Profile:	To collect relevant information about past events in order to help local people to be more aware of the changes that occurred in their community. ***(Chapter 3,4&7)***
3	Hazard map:	To create a spatial overview of the main features of the community to identify hazards and risks. ***(Chapter 3 &4)***
4	Transect walk:	To obtain a picture of zones of danger, sites of evacuation, land use zones, and seek problems and opportunities in disaster management. ***(Chapter 7)***
5	Seasonal calendar:	To identify seasons of stress, vulnerability, hardships and assess what people do during these periods and what the community can do to manage the risks. (***Chapter 8)***
6	Livelihoods analysis:	To understand methods of ensuring livelihoods of the community and DRR planning. ***(Chapter 8)***

(Field data: 2012)

6.4.3 Secondary data

Desktop reviews of evaluation reports on projects implemented in Kanyama by LCC and international organisations such as the Japanese International Cooperation Agency (JICA), CARE International Zambia and others have been reviewed. Reports reviewed include:

- Evaluation Report “Urban Hazard and Vulnerability Assessment” (UHVRA) 2011 by the Disaster Management Training Centre, Mulungushi University;

- Final Report on "Assessment of drainage systems in 7 flood-prone areas in the City of Lusaka, namely: Kamwala, South, Kamwala, Kabwata Site and Service, Misisi, Kanyama, Makeni and Kalikiliki" (Programme Urban Self Help);
- Final Evaluation of the Promoting Peri-Urban Sanitation Services (PPURSS) Project (CARE/LCC/LWSC;
- Final Evaluation of the Promoting Peri-Urban Sanitation Services (PPURSS) Project. (CARE/LCC/LWSC, 2010);
- Impact of drainage networks on cholera outbreaks in Lusaka, Zambia (Sasaki, *et al.,* 2009);
- Lusaka's annual Cholera disaster: Practical steps for a more effective response (MSF, 2010);
- The Study on Environmental Improvement of Unplanned Urban Settlements in Lusaka; Final Report (JICA, 2001);
- Environmental and Social Impact Assessment for the proposed Construction and Rehabilitation of Surface Drainage Systems Report for Lusaka City Council, Lusaka, Zambia;
- Lusaka State of the Environment (LSOE) Report, 2008 – Environmental Council of Zambia; and
- Global Network For Disaster Reduction 2010 and 2012, Views From the Frontline VFL Survey Reports.

6.5 DATA ANALYSIS

After the data was collected, it was descriptively analysed and presented as lessons of DRR interventions in Chapter 7. The findings of the research show DRR projects implemented in Kanyama by CARE International Zambia by 1992 and 2013 (See Chapter 7).

The respondents who are residents of Kanyama settlement shared their perceptions of how DRR projects have benefited them, particularly with regards to water and sanitation. In addition, the information forms the background for creating a model for disaster risk reduction as presented in Chapter 8.

6.6 CONCLUSION

The chapter outlines the procedure of data collection used in the analysis of DRR interventions in Kanyama. CARE International Zambia has greatly contributed to reducing the community's vulnerability to disaster risks. Factors which influence disaster risks in Kanyama such as its geological and hydrogeological formation are represented in Chapter 3. Furthermore, the experiences of disaster risks in Kanyama are reflected in Chapter 4. Information on the legal framework compiled from interviews with key informants from CARE, Lusaka City Council and Kanyama Water Trust as well as DRR interventions by CARE in Kanyama who has been working on improving water and sanitation, drainage and community awareness on DRR activities are presented in Chapter 7. The information is further verified by analysing reports of DRR projects implemented in Kanyama.

Lastly, a model is developed by picking on "best lessons on DRR interventions" presented in Chapter 8. This chapter responds to the objective on methodology used in data collection. The next Chapter will present lessons on DRR interventions implemented in Kanyama by CARE to reduce exposure and vulnerability.

CHAPTER 7

LESSONS LEARNT FROM COMMUNITY PARTICIPATION IN DRR INTERVENTIONS IN KANYAMA

7.1 INTRODUCTION

It is the responsibility of the community that is exposed to disaster risks to deal with disasters when they occur as disasters affect their livelihoods directly. As noted by Walia (2008), communities in high-risk are the real sufferers and the first responders to disasters. Informal settlements face numerous challenges in reducing vulnerability and exposure to disaster risks, and coping with hazards in their communities (See Chapters 3 and 4). This chapter draws attention to some major lessons learnt from DRR interventions implemented in Kanyama settlement. These include interventions regarding flooding that were implemented by the Disaster Management and Mitigation Unit (DMMU), Non-Governmental Organisations, and CARE International Lessons learnt about DRR interventions presented here are a response to disaster risks affecting the Kanyama community as presented in Chapter 4. These include limited access to safe water and inadequate sanitation, waste management, high poverty levels and a lack of drainage systems, among others. In addition, the perception of the community towards these DRR interventions is discussed. The study focuses more on the disaster risks associated with flooding (refer to Chapters 1 and 4). Later on, these lessons learnt from DRR interventions form the base for creating a model for community based disaster risk reduction and management in informal settlements presented in Chapter 8.

Kanyama settlement is being upgraded from informal settlement status to a planned residential area (LSOE, 2009). The informal settlement status means that the area receives less attention from the government to provide basic services. The flood-prone condition of Kanyama has been attributed to the geological formation of the Lusaka dolomite rock formation, and the socioeconomic as well as the demographical profile (see Chapters 3 and 4). The effects of these are manifested through flooding and its related risks of diseases, outbreaks of cholera and diarrhoea, the destruction of property as well as death.

The government and NGOs have come to the rescue of the community through the provision relief of food items and water when the community experiences floods. These interventions are sometimes short-term emergency responses and not sustainable. On the other hand, long-term measures include the construction of the drainage network, waste management, the provision of clean water and sanitation, among other interventions. The aim of this Chapter is to outline lessons learnt from experiences with DRR interventions in Kanyama settlement.

7.2 DRR INTERVENTIONS IN KANYAMA SETTLEMENT

Although it is the responsibility of the central government to plan for suitable locations for residential areas and to provide basic services to all the citizens (GNDR, 2009; UNISDR, 2009), the private sector is also allowed to plan for suitable locations and to provide basic services. This is made possible by legal frameworks that allows them to supplement government efforts in DRR as presented in Chapter 5 (Local Government Act Cap 283 of 1994; EPPCA No.12 of 1990). As noted by LCC, (2008) and Kabungo and Lifuka (2009), the Lusaka City Council has limited capacity and resources to adequately provide all residents in the city with basic services, including water and sanitation services.

In most cases, the government, through the DMMU and other organisations, have responded to disaster risks and hazards associated with flooding in Kanyama and other informal settlements by providing relief assistance in terms of food, water and temporary shelter (see Chapter 4). Additionally, other government institutions, such as the Kanyama Health Centre, provide medical assistance to victims of water-borne illnesses and injuries by distributing chlorine for treating water, and training community Neighbourhood Health Committees (NHC) as reported by the Environment Health Technologist of KHC. Despite government support, Nchito (2007) noted that the community always prefer to remain in their flood prone settlement because they have limited options for safety.

While the government takes short-term emergency response approach, Nongovernmental Organisations, on the other hand, focus more on reducing the vulnerability of the community and their exposure to flooding (Mwanamwambwa,

2008; CARE, 2011). CARE International Zambia has greatly contributed to reducing vulnerability and exposure since 1992 (CARE, 2010). The interventions by CARE focused on community participation to reduce exposure to flooding. This Chapter outlines DRR "best lessons learnt" in responding to disaster risks and hazards. The focus is on analysing both the community based, bottom-up, proactive approach as well as the reactive top-bottom interventions.

7.3 GOVERNMENT DRR INTERVENTIONS IN KANYAMA SETTLEMENT

The government's position on DRR for Kanyama is in line with resolutions of the Hyogo Framework for Action (HFA) of 2005, to make disaster risk reduction a priority at both national and local level (UNISDR, 2009). In 2005, following the resolutions of the HFA, the Disaster Management and Mitigation Unit (DMMU) was reenergised through strengthening its operation from national level to community level by means of Satellite Disaster Management Committees (SDMC) (See Chapter 5). Kanyama settlement is a Satellite Disaster Management Committee (SDMC) area for administrative management of disasters. Administratively, Ward Development Committees operate with SDMC in carrying out DRR responsibilities in Kanyama.

The government has made advances in implementing the Hyogo Framework for Action guidelines For instance, the operations of DMMU have now been decentralised (Banda, 2013). The position of Regional Coordinator has been established in all 10 provinces of Zambia and the coordinator has the sole responsibility of coordinating multi-sectoral committees at provincial and district level.

The Regional Coordinator (DDMU) works with government departments and with NGOs at both district and community level. Responses to the floods of 2009/2010 in Kanyama (see Chapter 4) was handled expediently through the coordination of various specialities, including health personnel, teachers, Community Development Officers and members of Faith Based Organisations, among others (WDC, 2013). The government provided emergency assistance to victims of flooding in Kanyama settlement by working with SDMCs. However, the interventions by the government were top-down in nature. WDC members reported that little consultation was done

before, during or after relief operations such as the evacuation of community members to the Independence Stadium (See Chapter 1).

Although the central government's (DMMU) approach is generally centralised, DRR response reaches out to community structures through Satellite Disaster Management Committees. The challenge however, is the slow process and bureaucratic nature of government interventions. On the positive side, however, the government has a bigger mandate to coordinate and offer guidance to stakeholders through legal frameworks and policies discussed in Chapter 5, but the support is mostly short-term and focused on emergency. This is not a sustainable way to reduce vulnerability and exposure in the community. Short term DRR efforts leave the community with limited options. After the disaster they then return to their previous vulnerable living conditions (Nchito, 2007). Ward Development Committees and Resident Development Committees work at community level and are charged with the responsibility of local development as stated in the Local Government Act, 281, 1991.

The government has put in tremendous effort to find lasting solutions to flooding in Kanyama. The government embarked on a programme of upgrading informal settlements in 1996 (Mulenga, 2003). Under this programme, Lusaka City Council in partnership with NGOs implemented the following interventions:

- Construction of drainage channels through the settlement;
- Construction of Kanyama Health Centre and Twashuka Primary School;
- Construction of roads;
- Construction of a Police post; and
- Land use planning for the construction of housing units (see Chapter 4)

These interventions are important in reducing the vulnerability and exposure of the community to disaster risks faced by the community. However, not all of the above interventions have been implemented successfully. The major challenge for successful implementation has been the LCC's lack of adequate resources (LCC, 2008). Lessons from the participatory approach tool of historical timeline and focused group discussion reveal that lack of proper drainage systems and

haphazard construction of housing units contributed to the famous Kanyama disaster of 1978 (see Chapter 4) which resulted in deaths and relocation of some people.

A WDC committee member reported that, as a result of floods in 1991, the government demolished houses to pave way for planned and standard construction of housing units. Although the demolition exercise did not sit well with the community, benefits have since been appreciated by the community residing in old Kanyama (see Chapter 3, Image 1) which is no longer at risk of flooding. Roads and drainage channels were constructed and sizeable plots allocated for construction of better housing units. Generally speaking, it depends on the political will of the government to convince the community to understand expected benefits from intended interventions that could make them support efforts from outside.

Accessing land is the main challenge facing allocation of land for the development of residential housing units in peri urban settlements (Mulenga, 2003). Rapid urbanisation and inadequate rainfall in the countryside lead to an increase in the demand for urban land (UNEP, 2007). Kanyama informal settlement is under pressure due to its proximity to the CBD of Lusaka and the Chinika Industrial Area where citizens come to search for employment and income-generating activities respectively (see Chapter 3). The research shows that the population of Kanyama is continuously on the increase. This is made visible by the rapid increase in the construction of high density substandard housing units in the area (see Chapter 1; CSO, 2000; CSO, 2010). The government has to work hard to improve the drainage, water and sanitation for the Kanyama settlement.

The community of Kanyama, and other informal settlements in Lusaka, depend on informal sources of income such as street vending, trading and domestic work in high cost areas across town. Limited resources have contributed to poor access to land and the construction of substandard housing units. The settlement has limited supply of safe water by Kanyama. The community has limited options and therefore depend on unsafe water sources from shallow wells (Borouge, 2012). Nongovernmental Organisations like CARE International Zambia realised this concern and subsequently constructed a bore hole to supply water under the HUZA project in 1994 (Phiri, 2013).

When Zambia experienced a severe drought for three years from 1992 to 1995, the government sought assistance from the World Food Programme (WFP) (Mwanamwambwa, 2010). The government invited CARE International Zambia to facilitate the distribution of relief maize. This marked the beginning of the partnership between the government and NGOs in the development of informal settlements (Mwanamwambwa, 2012). The invitation by the government instilled confidence and trust in NGOs. Government departments alone are not well- placed to implement projects associated with vulnerability reduction in the community. The government has numerous responsibilities in meeting the developmental needs of the citizens and its resources are inadequate to help communities prepare themselves against disaster risk (LCC, 2008).

Research findings also indicate that DRR interventions by the government have largely been reactive, for example helping flood victims move to safer areas (see Chapter 1). Some community members have become dependent on the government's response in addressing their vulnerability to floods annually and do not make any effort to find their own permanent solutions to resolve their exposure to disaster risks.

Unlike the government's approach of responding to disaster risks, CARE International took the responsibility of working with members of the community at risk to implement DRR interventions. The subsequent sections will focus on lessons learnt from the role that CARE International played in the Kanyama l settlement. Lessons from both CARE's experiences and government interventions are presented to supplement one another.

7.4 LESSONS FROM COMMUNITY BASED DRR INTERVENTIONS: A CASE OF CARE INTERNATIONAL ZAMBIA

CARE International first came to Zambia in 1992 after being invited by the government to assist with the distribution of relief maize when the country faced drought. Since then, CARE has been working in Kanyama and other peri-urban informal settlements countrywide (Mwanamwambwa, 2008). The focus of this section is to explore aspects of community participation in DRR interventions in Kanyama settlement and compare it to the government's approach as presented

previously. According to the WDC Chairperson CARE has contributed greatly to DRR Interventions in Kanyama. The focus of this section will be on the projects that were implemented from 1992 to 2013 (See Table 5) when the study was conducted. The government is in charge of ensuring safety and sustainable livelihoods for its citizens according to the vision of the GRZ, 2005, Disaster Management Policy.. Partnership with other stakeholders is recognised.

CARE's DRR Interventions in Kanyama settlement, focused on addressing the following key issues related to disaster risk reduction:

- Improving food security for droughts;
- Water supply and sanitation;
- Poverty alleviation;
- Disaster risk reduction;
- Public health; and
- Education and gender issues.

Findings of field work research (See Chapter 4) show that these key issues are the underlying causes of the vulnerability of the Kanyama community to disaster risks, particularly flooding. Table 5 shows six of CARE's programmes that were implemented in Kanyama informal settlement between 1992 and 2013. These projects were implemented through funding that was sourced by CARE International as well as in partnership with the government (Mwanamwambwa, 2013; Mukomba, 2012). The community participated actively through the contribution of human labour or through committees.

Table 5: Summary of CARE's interventions in Kanyama settlement 1992-2013

PROJECT	PROJECT INTERVENTIONS
PUSH I	**Peri urban Self Help 1992- 1994** ▪ Emergency relief programme providing food -for-work (FFW) for road and drainage rehabilitation works in exchange for community labour ▪
PUSH II	**Peri Urban Self Help 1994-1997** ▪ Strengthening operations of Area Based Organisations (ABO) ,capacity building training and community empowerment
PROSPECTS	**Programme of Support for Poverty Elimination and Community Transformation 1998-2004** ▪ Strengthening community institutions, micro finance, water and sanitation and establishment of Kanyama Water Trust
PPURSS	**Promoting Peri urban Sanitation Services : 2007** ▪ Water and sanitation, hygiene education and construction of public toilets
SPURRZ	**Strengthening Peri Urban Risk Reduction in Zambia 2009-2011** ▪ Community based disaster risk reduction capacity building training and formation of DRR committees
IAG-PURRZ	**Integrating Adolescent Girls in Peri Urban Risk Reduction in Zambia 2012-2013** ▪ Capacity building for girls and boys in DRR, sanitation and water quality testing at Old Kanyama and Twashuka basic Schools in Kanyama

(Adapted from CARE Evaluation Project Reports; Garret, 2004; Mwanamwambwa, 2011).

CARE implemented these projects by focusing on the participation of the Kanyama community during the implementation of these projects (Mwanamwambwa, 2010) (Appendix A). This research highlights lessons and experiences that can be adapted to formulate 'best practices ''for community based approaches in disaster risk reduction. The lessons are derived from CARE's Peri Urban Self Help (PUSH) project in 1992 to the 2013 project Integrating Adolescent Girls in Peri-Urban Risk Reduction in Zambia (IAG-PURRZ), a replica of a South African project, called Integrating Adolescent Girls in Community based Disaster Risk Reduction in Southern Africa (Forbes and Maartens, 2012; CARE, 2011).

Evaluation reports and findings from CARE's programmes (Nyambe *et al.,* 2010; Nyambe, 2004; Mwanamwambwa, 2011) reveal that some of the projects (Table 5) were funded by donor who contributed to the government directly for poverty reduction support (e.g. World Food Programme (WFP) for PUSH I; USAID for SPURRZ). Donors that worked with CARE included USAID, the Office for Foreign

Development Assistance (OFDA), the European Union, the Canadian Development Agency (CIDA) and DFID. Donor-sponsored projects included PUSH II, PPURSS, PROSPECT, SPURRZ and IAG-PURRZ. These projects will be discussed in detail later. Most of these community projects were designed and implemented by CARE to help vulnerable communities in peri-urban areas of Lusaka.

During the implementation of these projects, CARE partnered with other key stakeholders charged with the development of the city. The Lusaka City Council, Lusaka Water and Sewerage Company, NGOs, public institutions, schools, health centres and Faith Based Organisations in Kanyama settlement were all actively involved. Community based approaches are the most effective in delivering development (Walia, 2008:69). Most of CARE's projects were community based and involved the community during the planning, implementation and monitoring stages.

However, some of these projects for example the Food-For-Work Project made the community become dependent on external support, become less innovative and inhibited their own creativity to sustain themselves. Subsequent sections will dwell on some of the projects implemented by CARE International and the role the community played in their implementation.

7.4.1 Infrastructure development - Peri Urban Self Help (PUSH I) 1992-1994

The first project implemented with community participation was Food–For-Work (FFW). The project was aimed at responding to food crisis in exchange for labour on roads and on drainage channels. In response to the food crisis caused by the drought between 1989 and 1991 and the effects of the state of the economy, the government of the republic of Zambia solicited for relief food supplies from the World Food Programme (WFP) and Canadian International Agency (CIDA) (Garrett, 2004). CARE was identified by the government to assist in distributing relief food to communities in informal settlements in Lusaka and Livingstone in the Southern Province. According to the PUSH I Project Evaluation Report by Garret (2004), the WFP provided US$1.5 million worth of food, while their counterpart CIDA provided C$1.5 million (Garret, 2004). The target beneficiaries of the entire project were people affected by the food crisis. The project lasted for three years from 1992 to1994 (Garret, 2004).

The project came to be known as the Peri-Urban Self Help (PUSH I) Food-For-Work (FFW) Project (Mwanamwambwa, 2011; Cheelo, 2013). In this programme, food was given in exchange for labour on the drainage channels and roads in Kanyama. Women played a significant role in the project, accounting for 95 percent of the labour force (Garret, 2004). Food provided included cooking oil, mealie meal and fish (known as Kapenta) (O'Reilly, 2010; Field data 2013; Cheelo, 2013). In Kanyama settlement between 50.000-100.000 residents benefited from the project (Garret, 2004: 9).

Despite its main focus on food security, this project (FFW) also included infrastructural development such as road rehabilitation, drainage construction, stone pitching as well as sensitising the community on water and sanitation hygiene (Mwanamwambwa, 2011). Garret (2004) observes that women can contribute more to the development of the country than has been believed before. He further notes that women's contribution towards development is overshadowed by male folk due to traditional, stereotypical gender roles that subsist in society. The stereotype belief that a women's only role is to work in the kitchen does not help in the reduction of vulnerabilities in the community.

The lesson learnt from this project is that the community is not helpless but has the capacity to uplift their living standards. Garret (2004) and WDC members that were interviewed, observe that PUSH I used the top- to bottom approach to solve the problem of hunger as well as to improve infrastructure at local level. At national level, on the other hand, the government of Zambia, in partnership with donors CIDA and WFP, delivered food as an incentive for development. At community level, community based leadership structures of Ward Development Committees (WDC) acted as the entry point into the community. The project provided multiple benefits to the vulnerable majority, especially women and children. They were saved from food insecurity on the one hand while they could, on the other hand, help with improving the infrastructure by working on the development of roads and drainage systems..

The former WDC Chairperson reported that PUSH I provided some important lessons on the importance of community participation in community development. Women, being the most disadvantaged in terms of decision making, worked hard,

doing physical work on infrastructural developmental projects. The community also benefited at the same time in terms of food relief supplies. Vulnerable community members, the old and sick were also taken on board by providing food to them for free. Orphaned and vulnerable children (OVC) and the malnourished were provided with food supplements (CARE, 2011; Garret, 2004). Another benefit was that CARE constructed pre- schools (Alston *et al.,* 1993) with support from community members, where children could be looked after, while their mothers were working for food. The project reduced the community's vulnerability to floods through infrastructural development and also offered solutions to meet the basic need for food.

7.4.1.1 Lessons learnt on community participation

Drinkwater (2001) and Garrett (2004) argue that PUSH I was not a community development project but a reactive response to food security crisis, developed by the national government and donors without involving the local community. When implementing community development programmes, there appears to be a thin line between what motivates people into participating and their desire to manipulate or benefit from a project (Osti, 2004). Project Evaluation Reports raise some critical concerns about the Food for Work project. The following observations were raised:

- Only a small number of households were involved compared to the population of vulnerable people in Kanyama settlement;
- The selection of beneficiaries failed to critically identify the most vulnerable members of the community;
- The long term impact of the project on the livelihood of the community was overlooked. This includes issues such as maintenance of the work done on infrastructure without the benefit of provide incentives to the community; Underlying disaster risks such as access to safe water and sanitation and waste management were overlooked; and
-
- The community was not involved during the planning and implementation stage of the project and this made the community view the project as a relief operation.

The analysis of these challenges motivated CARE International to come up with sustainable ways of improving the livelihood of the community by addressing the challenges highlighted above.

Although the project had an impact on the poor and vulnerable of Kanyama in the short term, the project assessment report (Drinkwater, 2008) revealed that PUSH I actually encouraged the culture of dependency. Instead of focusing on sustainable, income-generating activities, the beneficiaries preferred to join the Food For Work activities, which had immediate benefits, rather than engaging in initiatives to generate their own income. The PUSH I project came to end in 1994. The project simply responded to the impact of the drought which hit Zambia between 1991 and 1993.

On the positive side, the potential of the community in development was realised. Labour was provided, particularly by women. It shows that, if the community is mobilised effectively, they can provide for much needed labour and machines need not be used.

On the negative side, community members became dependent on food for work rather than finding their own sources of livelihoods. Having recognised the benefits and challenges of community participation in DRR interventions, the subsequent project (PUSH II) focused on building the capacity of the community so that they could become self-reliant (Hedley and Sanderson, 2000; Mwanamwambwa, 2010).

7.4.2. Capacity building - Peri Urban Self Help (PUSH II) 1994 - 1997

Unlike its predecessor, PUSH II was holistic and aimed to cover a wider range of issues - social, economic and cultural - affecting the community in DRR. PUSH II shifted the from improving physical infrastructure through the Food-For-Work incentives to a Community Driven Development (CDD) approach (Drinkwater, 2001:i) (see also Chapter 2, section 2.5). Poverty is the underlying cause of disaster exposure and vulnerability to hazards in most communities, particularly in the developing world (UNIDSR, 2009). The aim of PUSH II was to reduce poverty by strengthening people's capabilities to initiate and maintain their own development (Hedley and Sanderson, 2000:1). PUSH II was designed with specific outputs and

identified activities in consultation with the community (Hedley and Sanderson, 2000).

To implement PUSH II, CARE secured funding from the United Kingdom's Overseas Development Administration (ODA). PUSH II was implemented between 1994 and 1997. The project applied the participatory approach, focusing on the survival strategies of poor urban women in meeting their family's daily needs (O'Reilly, 2010). 2000 women from the lowest socio-economic category of Kanyama were involved in this programme (Hedley and Sanderson, 2000; Mwanamwambwa, 2010). Some funding was given in the form of soft loans to start small-scale businesses in the community. It was a group scheme, cooperative arrangement with a seed-fund that rotated among members. The project was implemented in partnership with the Lusaka City Council, the Lusaka Water and Sewerage Company and the residents of Kanyama settlement.

7.4.2.1 Lessons learnt on capacity building

Unlike its precursor, the PUSH I project, PUSH II employed participatory approaches (PANA and PRA) (Hedley and Sanderson, 2000). Emphasis was placed on the community's participation in addressing their own needs. The methodology involved training in capacity-building for women in running their own businesses. Activities included semi-structured interviews and focused group discussions and vulnerability analysis among others. Key issues analysed from the community consultation process showed that the most urgent need of the community was for safe water (WEDC, 1999: 226; Mwanamwambwa, 2005:214).

Community structures have to be established through rapport-building (Van Reid and Van Niekerk, 2012:2) (also see Chapter 2, section 2.8). The Local Government Act Cap 281 of 1991 provides for the establishment of community organisations and allows the local authority to invite other stakeholders to participate in developmental projects in the community.

CARE took the initiative of strengthening Area Based Organisations (ABOs) in Kanyama settlement. These included, among others, WDC, RDC and Zone Development Committees (ZDC) (Also see Chapter 5). PUSH II trained these area-

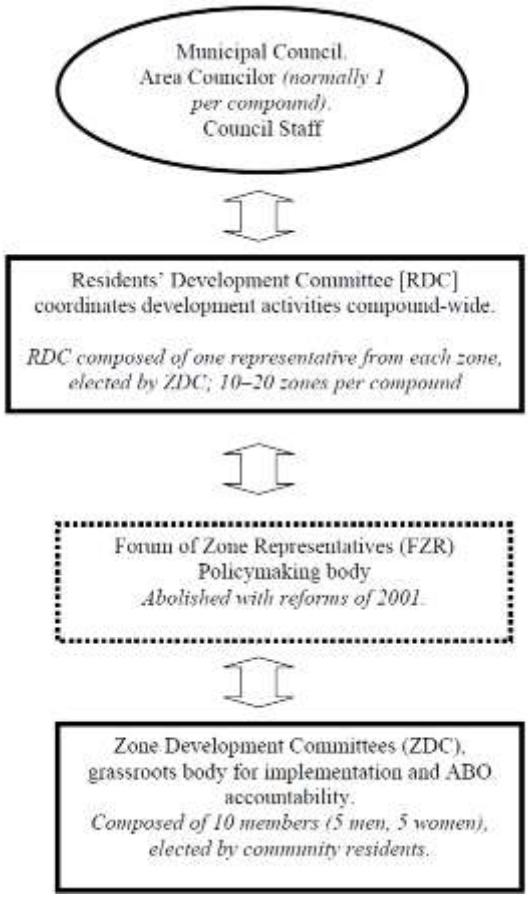
based representatives in leadership skills, community mobilisation, and project management with the support from LCC.

7.4.2.2 Strengthening Area Based Organisations (ABOs) under PUSH II

Effective community development at local level requires that community leadership structures are established and functional. For this reason, CARE under PUSH II, came up with the programme to strengthen ABO as drivers of community based interventions (Mwanamwambwa, 2005:214; Kayaga and Mwanamwambwa, 2006:156). Approximately 2000 community members of area based organisations participated in the training programme in leadership of community development. Topics were centred on community participation, self-help, consultation, conflict resolution, planning, monitoring and evaluation.

Community development committees, WDCs, RDCs and ZDC, comprise of members elected from the community by residents. These committees become drivers of development at community level. Any outside development agent gets into the community through these committees. LCC overseas the functions of these committees as enshrined in the Local Government Act, Cap 281. The representation (Figure 7) shows the hierarchy of the community structures of local authorities.

Figure 7: Community Structures of Local Authorities



(Adapted from Bopp and Bopp, 2001 and Hedley, 1999)

The establishment of community structures (See Figure 7) plays an important role in implementing and monitoring of development projects in residential areas. The lowest level in the structure, ZDC, represents the lowest level of the community. Garret (2004) recognises the fact that ZDCs are closest to the households.

Along with the RDCs, they take responsibility for mobilising residents, implementing projects at grassroots and take community concerns to the RDC to in order to plan development projects. Members of the ZDC are responsible for dissemination of information to households within a particular zone.

Zone Development Committee members are also in charge of mobilising fellow community members to implement developmental activities. The RDCs are made up out of members from the ZDCs. They are in charge of the implementation and the monitoring of projects that cover more than one zone. It is important to note that, in 1991, the responsibilities of RDCs changed concentrating on zones to including the

entire ward. This coverage proved to be too wide a so the size was reduced: Kanyama now had 19 zones and 2 wards (WDC, 2013; Mwanamwambwa, 2013).

At the summit of the structure is the local authority, LCC (refer to Figure 6). The local authority is headed by the mayor as ceremonial leader, elected from among ward councillors. The Kanyama constituency is represented by two councillors in charge of ward development for ward 10 and 11 respectively. These provide political leadership in the development of their respective wards. Any development coming into the community has to come with the approval of LCC and the information has to pass through the leaders of WDC, RDC and ZDC.

7.4.2.3 Lessons learnt on local community organisations

Capacity-building is vital in community participation in DRR (see section 7.4.2). CARE International provided capacity-building training to these leaders whenever they were implementing a project in Kanyama (WDC member, 2013). It is worth noting that the Forum of Zone Representatives (FZR) provided a platform to deliberate on community developmental issues at local level. However, this forum was abolished in 2000 after political conflicts between municipal authorities and ABOs (Garret, 2004:3).

Under PUSH II project, the following community development committees were strengthened and where they did not exist, new ones were formed. Interventions by these committees included:

- Water and Sanitation;
- Neighbourhood Health Committees (NHC) to sensitise communities on water and sanitation, HIV and AIDS and related health matters such as distribution of chlorine for water treatment; and

- Community based Enterprises (CBE) for solid waste collection waste and clearing of drainages to prevent flooding in communities.

The list is not exhaustive and where needs be the community can still form new sub-committees. All these committees have to report to LCC. In addition, the Lusaka Water Sewerage Company is a major stakeholder and is the only company charged with the responsibility of supplying water in Lusaka.

The functioning of ABOs is not without its challenges. CARE International faced some challenges in strengthening these area based organisations in Kanyama settlement. The major one was political conflict between the ABOs and the local hierarchical power structures in Kanyama settlement. Political interference continues to influence the delivery of developmental projects. Projects implemented are aligned to the political party rather than the development committee. Where the ward falls under an opposition party, developmental projects' WDCs became negative towards the projects, leading to vandalism and theft.

The second challenge was the difficulty in structuring organisational incentives to encourage consistent long-term actions to support CDD (see Chapter 2). Members of the public needed more time to concentrate on their income-generation activities and were often too preoccupied to engage in community work. Despite these challenges, CARE's contribution to the operations of ABOs in Kanyama still remains outstanding (See Chapter 5).

CARE's projects were aimed at building the capacity of the community in Kanyama to reduce poverty, using community structures. In as much as support from outside is appreciated, developmental support from outside the communities at risk must strive to eliminate poverty (See Chapter 4). The next section looks at interventions to eliminate poverty at household level.

7.4.3 Community Transformation: Programme for Support for Poverty Elimination and Community Transformation (PROSPECT) 1998-2004

. PROSPECT was a programme built up out of PUSH I and PUSH II. The project targeted a total of 600,000 beneficiaries from the informal settlements of Lusaka (Garret, 2004). PROSPECT was a community empowerment programme launched in 1998 (Mwanamwambwa, 2005: 214) and aimed at reducing poverty in Kanyama and other informal settlements. The project was implemented from 1998 to 2004. The goal of PROSPECT was to be a multi-sectoral approach to alleviate poverty in the community. The implementation of the project was carried out by community ABOs (see section 7.2.2.1). The project improved the working relationship between the LCC and ABOs (Hedley and Sanderson, 2000).

The independent evaluation of PROSPECT Project Report (Hall *et al*., 2003) revealed that the project energised and integrated community based organisations and ABOs within the municipal governance structures of LCC. Existing local structures and political systems provides a basis for moving towards a more centralised community development (Hickey and Mohan, 2004:5; Mwanamwambwa and Kayaga, 2009). PROSPECT had three major components (Garret, 2004):

- Personal empowerment microfinance;
- Social empowerment and community participation; and
- Infrastructural improvement (water and sanitation).

7.4.3.1 Personal empowerment through micro-finance

Women, being among the most vulnerable members in society, were targeted in PROSPECT,. Through ABOs, particularly zone leaders, women were selected to be part of the local empowerment programme. They were provided with financial assistance (loans) to start small-scale businesses (Mwanamwambwa, 2013; Garret, 2004). The microfinance scheme was managed by CARE on behalf of the community. It involved providing group loans to groups of up to four members who had to come up with individual income- generating activities. The loans provided capital for business activities such as trading at markets and tailoring, among other informal livelihood activities.

The arrangement was that group members support each other by contributing to the pool fund, locally known as "*chilimba"*. It encourages individual members of a group as they can obtain capital from the pool to start or improve their small scale businesses. The group is held accountable to pay back the total sum to CARE. The idea is to offer group security for a loan, After paying back the loan to CARE, members are free to continue lending to each other to expand their small scale businesses.

7.4.3.2 Lessons learnt on empowerment

PROSPECTS focused on empowering the community in participating in community development through structural development of local institutions (See Chapter 2). PROSPECT was a continuation of PUSH I and II. It formed a strong base for

community participation in income-generating activities. ZDCs and RDCs were recognised as the main actors for community driven development plans.

The most sustainable way of empowering the community to participate actively in issues concerning their livelihood is by building their capacity and resources (see Chapter 1). Realising this, CARE undertook various activities to empower the community. Major activities included capacity building training on key community issues such as water, sanitation (Chapter 4) and entrepreneurship. CARE worked in collaboration with the LCC, Area councillors, WDCs, RDCs and ZDCs on PROSPECT project. Committees were established as a way of organising and mobilising community members to participate. Capacity building training in governance, conflict resolution and leadership contributed to the project being accepted by community members (Cheelo, 2013). The project accomplished its intention of strengthening relations and of accomplishing a wider coverage of Kanyama (RDCs, ZDCs and WDCs) in Lusaka (Hedley and Sanderson, 2013).

Community participation: The community participated in solid waste collection at community level. Local entrepreneurs were trained in business administration, water sanitation and hygiene education. After the completion of the training, entrepreneurs were equipped to form small-scale businesses called Community based Enterprises (CBEs). The mode of operation of CBEs was to have three entrepreneurs from the community to come up with business proposals for waste collection. As indicated in the Local Government Act Cap 281 as well as the Environmental Protection and Pollution Control Act no.12 of 1991; NSWCO, 2010 , the LCC has the power to franchise the responsibility of waste collection to the private sector. CBEs are community based organisations with the permission to collect primary waste (EPPCA, Act No. 12 of 1990) in Kanyama settlement. They conduct kerbside or door-to- door waste collection and then transport the waste to the waste containers located in strategic sites around Kanyama settlement. CBEs use simple equipment shovels and wheelbarrows to collect waste from the settlement. The LCC then collects the waste from primary sources and transports it to the landfill in Chunga on the outskirts of Lusaka.

Research done on solid waste management and sanitation by WDC Chairperson (2013) found that the following activities were implemented:

- Collection of solid waste by CBEs;
- Formation of community based volunteers groups;
- Training of 100 community volunteers in partnership with Kanyama Health Centre;
- Creating awareness through road shows on hygiene and sanitation in strategic locations including Kanyama market; and
- Presenting drama activities in schools.

Joel Mpulumutsi, a member of WDC and an entrepreneur who operates a CBE, reports that under PROSPECT, 7 CBEs were formed. However, he is quick to point out some of the challenges facing CBEs. One challenge is that some households are not willing to pay for waste collection services. They maintain that they are simply tenants and that it is the duty of the landlord to collect waste from their house premises. Others feel that it is the responsibility of LCC to collect waste and it is not their duty. The next challenge is the charge of (K15.00 or US$2) per month unaffordable for many citizens. It is reported that those who refuse to pay for waste collection are often also the ones responsible for indiscriminate waste disposal in the community. However, with sensitisation programmes by NHC, the situation has improved slightly, and more citizens are willing to pay for waste collection services.

Findings indicate that the LCC's lack of financial capacity and resources hinder the collection of waste from the community (refer to Plate 3). The Millennium Challenge Cooperation's, Environmental and Social Impact Assessment Report (2012) revealed that heaps of garbage, referred to as historical heaps, still remain uncollected by the LCC due to lack of finances (Public Health Director, LCC).

a. **Infrastructural improvement*:*** Access to safe water and sanitation remains a major challenge for the community of Kanyama settlement. Under the same PROSPECT project (See Chapter 4), infrastructural improvement was one of the key interventions. Major activities implemented under infrastructural improvement included:

- Establishment of the Kanyama Water Trust in 2001 (See section 7.3.5);
- Provision of chlorine for water treatment for free to the general public with NHCs in every zone;

- Capacity building of the community and appointing water vendors in charge of collecting levies for water from the public at the communal water stands (Kiosks);
- Community sensitisation training by means of door to door water and sanitation campaigns in every zone; and
- Environmental education activities to pupils in primary schools in Kanyama on water and sanitation hygiene education.

The Principal Environmental Health Technologist at Kanyama Health Centre, Mr. Tembo (2013) revealed that no significant cases of epidemic of cholera have been recorded since the implementation of the above interventions on water and sanitation.

The lesson learnt from these interventions is that sensitisation and awareness creation, as well as the supply of safe water, contributes to the reduction of exposure to water borne diseases. In addition, it is clear that non-structural measures of DRR alone are not enough to reduce vulnerability. There is also need to focus on structural intervention which requires physical intervention.

7.4.4 Improving water and Sanitation in Kanyama

The use of pit latrines and shallow wells (CARE, 2011) has been a major hazard contributing to underground water contamination in Kanyama as earlier discussed (Chapter 4). Studies by Maseka and Nyambe, (2000) and Bäumle and Kangomba, (2009) suggests that to reduce the risk of exposure to unsafe water and sanitation in informal settlements, is by ensuring that one of the two basic facilities shallow wells or pit latrine is completely removed from the process. This is because there is always continuous contamination of underground water due to proximity of pit latrines to shallow wells (Maseka and Nyambe, 2000) (Also see Chapter 3). Dry toilets or *ecosan* toilets have been identifies as one the technology to avoid the mix between water and sanitation.

The PROSPECT project constructed a total of 60 *ecosan* toilets in old Kanyama (Mukomba, 2012). To show community responsibility and participation, the beneficiary families contributed a sum of K150 (US$ 28) towards the construction of the toilets.

However, the initial intention of the project was to the vulnerable members of the community especially the old and those keeping orphans but this changed due the urgent need to improve sanitation and reduce underground contamination. To complete the sanitation *ecosan* loop, CARE in partnership with the Water and Sanitation Association of Zambia (WASAZA) embarked on a biogas project aimed at processing the human waste from the *ecosan* toilets into energy, biogas for domestic usage mainly cooking to be discussed below.

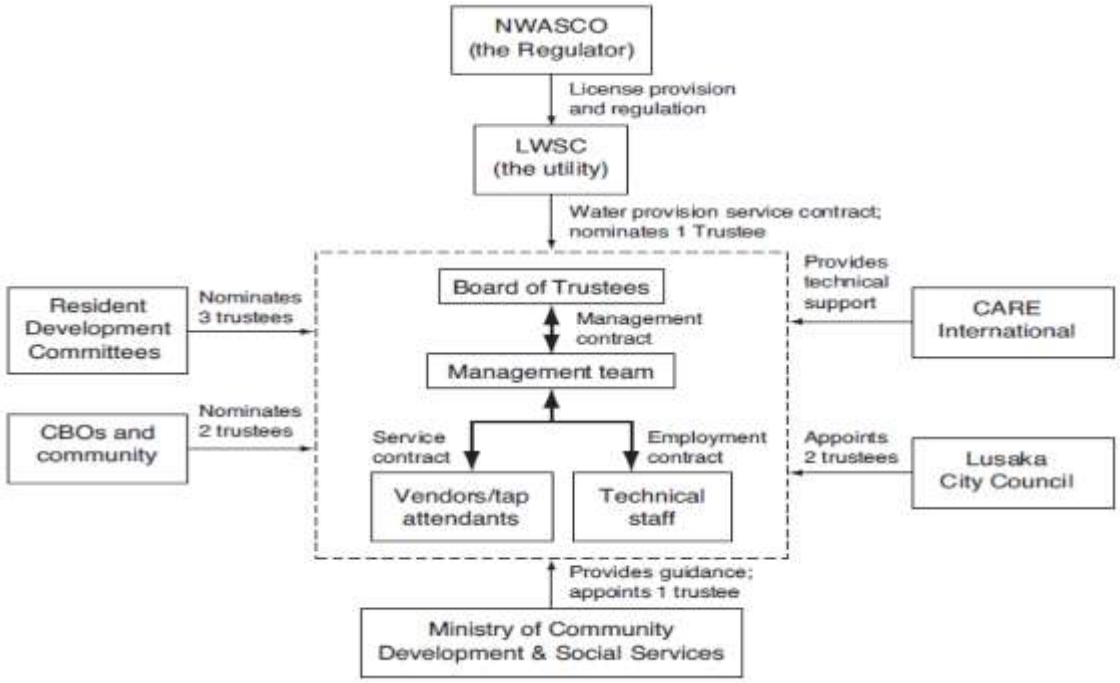
Water is very important component of life but accessing the commodity is a challenge especially for informal settlements. CARE International Zambia came to the aid of the community by facilitating the supply of safe water project.

7.4.4.1 Kanyama Water Trust (KWT)

Water and sanitation has always been a great challenge in Kanyama as mentioned earlier (Kayanga and Mwanamwambwa, 2007) (see Chapter 4). The National Water Supply and Sanitation Council (NWASCO), a regulatory board in charge of water and sanitation indicated that water supply has always been challenge especially in peri urban areas of Lusaka. The Local Government Act Cap 281 and NWASCO provide guidelines for allowing water utility companies to sub contract or license other partners in the supplying water. Water quality test results for Kanyama showed that due to the proximity of shallow wells and pit latrines the quality of water is contaminated by bacteriological and chemical impurities (Nyambe *et al.,* 2004; Nyambe and Maseka, 2000).

CARE International came to the aid of the residents of Kanyama with a project to provide safe water and sanitation in 2001. KWT project was established with funding from the Department For International Development (DFID) as a partnership with stakeholders; LWSC, LCC and the entire Kanyama Community through RDC in 2001 (WDC, 2013;, Kayaga and Mwanamwabwa, 2009). In terms of management and operations, the Water Trust is a community managed organisation operated by the Board of Trustees (Figure 8) with the representation from key stakeholders namely: the community, LCC and LWSC, governmental departments and CARE.

Figure 8: Organisational Structure of Kanyama Water Trust



Key

---------- Key stakeholders in the management of Kanyama Water Trust

◄——► The channels of communication and information flow

(Kayanga and Mwanamwambwa, 2007 p 4)

The Water Trust is a community-managed, domestic water supply scheme in charge of supplying water, using public or communal water taps, referred to as kiosks. The organisational structure of the Water Trust (Figure 8) comprise of representation from RDCs and residents being at the centre of the project. Outside institutions include: CARE International, LWSC and LCC to provide financial and technical support. Operations of the KWT are managed by the board of trustees from partner institutions; LWSC, LCC, CBOs, Care International, technical staff and water vendors, NWASCO and the Ministry of Community Development (Hedley and Sanderson, 2000:2-3), three members from each RDC, members from the Zone Development Committees (ZDC). Two members are directly elected from the community, members from the LCC and LWSC and a representative from the Ministry of Community Development Social Services (Kayaga and Mwanamwambwa, 2009: 5). The community is represented by members elected

from the community to ensure that their needs are taken into consideration in the decision-making and operations of the water trust.

The performance of the community and other stakeholders in the operations of the Water Trust as either drivers of the project or as clients accessing safe water has greatly improved the accessibility of safe water and sanitation in Kanyama. The government, through the Ministry of Local government and Housing (MLGH); Ministry of Community Development Mother and Child Health (MCDMCH), KHC, NHCs and DRR Committees (DRR) worked in partnership with CARE International from the inception and operations of the KWT. Partners supported the Water Trust through mobilizing members of the community through health Education (WASHE) (KHC, EHT, 2013) and awareness campaigns. In 2012, for instance, the Water Trust was serving a total of 120,000 residents from its three boreholes located within Kanyama.

Plate 4a &b: Water Tank at Kanyama Water Trust premises

Source: Researcher's Field Data, 2013

Under the Water Trust Project, CARE constructed 4) elevated tanks (Plate 4a & b) of 10 m^3 capacity and 2 boreholes with a capacity of 36 litres per second and 60 litres

per second respectively. The pipe network currently covers a distance of 5 km around Kanyama Settlement. The water produced is however insufficient to meet the ever-increasing demand for the commodity for the densely populated Kanyama settlement. The target population of the Kanyama water trust project at its inception was to cater for 250,000 residents in 2001. However, the 2010 population census showed that the total population of Kanyama was 366,170 and 78,995 households (CSO, 2010:21). Kanyama Water Trust was established with the core mandate of:

- Improving the livelihood of the Kanyama community through the provision of safe and clean water, taking into consideration the plight of the poor and the provisions of the service management contract with Lusaka Water Sewerage Company; and
- Investing the revenue into desirable ventures, necessary for the attainment of the Water Trust's objectives.

At the beginning of the Water Trust Project, a total of 101 water kiosks (fee paying water points) were installed at various locations in the settlement (WDC, 2013; Munkomba, 2012; Also see Appendix E) . At the time of this research in 2013, Kanyama Water Trust had 120 water stands or kiosk that were operating efficiently. In addition, water was supplied to 5 fee-paying toilets (Secretary WDC, 2013).

The water stands are managed by Community Water Attendants referred to as vendors engaged by the Water trust. They are charged with the responsibility of collecting water charges from residents. The taps are open to the public from 06:00 – 11:00 in the morning, and 16: 00 to 19:00 in the evening daily. The charge for water was K 20 (US$ 5) per 20 litres container (WDC, Interview, 2013). On average, a family uses 40 litres of water per day. Vendors are paid a commission of 30 percent of their collection. Observations by Care international (CARE, 2011), reveal that 60 percent of residents use water from the stand taps for domestic work such as cooking while they maintain the shallow wells for other domestic uses. Reasons included that the water charge is not affordable for them to use the water for general use.

An interview with the Trust Manager revealed that although the water scheme had high operational costs, tariffs have remained stagnant at K100/20litres for the past 4 years. Currently the Water Trust spends K 90 million per month and has a gross revenue of K210 million per month.

Water and sanitation continues to be a big challenge for the Kanyama community. The establishment of Kanyama Water Trust has assisted by improving the quality of water and sanitation. High operational costs pose a great challenge for the expansion of the water supply programme. The Water Trust also faces some challenges in providing water to the community. Some of the challenges include the following:

- Failure to pay for bills;
- Vandalism of pipes and tap stands;
- High tariffs for electricity and load shedding by Zambia Electricity Supply Company (ZESCO) affect the supply of water, forcing residents to revert back to the shallow wells and pit latrines;
- High population density limits space for laying of pipes and allocating more water stands; and
- Theft by the community by uprooting water pipes and connections at water kiosks were reported at the beginning of the project but eventually stopped.

Overall, the Water Trust Project demonstrated how a community can effectively participate in local development. The project afforded residents of Kanyama access to safe water and income. A total of approximately 12,000 people access water from the 120 kiosks that are dotted around the settlement (Garret, 2004). In addition, the community have benefited from income-generating activities, working as water vendors to supplement their sources of livelihood. This fully translates in a successful community managed development project in a holistic manner.

Table 6: Reported Cholera Cases between 2007-2011

Year (Rainy Season)	Number of Cholera Cases Reported
2007/2008	398
2008/2009	1357
2009/2010	1910
2010/2011	7

(WDC, 2013, Cheelo, 2013; CARE, 2011; Mwanamwambwa, 2009: 5)

The benefits of the safe water supply have drastically reduced the exposure of the community to waterborne disease outbreaks of cholera and diarrhoea cases (Table 6). Mr. Elijah Tambo, acting Principal Environmental Health Technologist at KHC (See Appendix F) further reports that incidences of epidemics of water borne illnesses has decreased. Common illnesses include dysentery, cholera, diarrhoea as well as malaria. (Sasaki *et al.,* 2009).

The community further participated in the treatment of water by distributing chlorine to households. The community received support from the government department and other stakeholders including the MLGH, LCC, Zambia News Agency, NGOs (CARE, Society for family Health, and CDARS), UNICEF and the community who have all been working together - before, during and after disaster risks in Kanyama. These institutions offered support in terms of early warning sensitisation, awareness education and capacity-building training for community sub-committees such as NHC and KHC, among others.

The Principal Environmental Health Technologist at Kanyama Health Centre who also participated in training conducted by CARE International and Mulungushi University, attributes the reduction in diseases to interventions by CARE to the following factors:

- Public health and hygiene campaigns conducted by Neighbourhood Health Committees;
- Formation and strengthening of Disaster Risk Reduction Committees (DRR and NHC); and

- Partnership with Oxfam who conducted door-to-door health education and UNICEF, SFH and CARE under SPURRZ project that contributed chlorine to dose water from the Tap stands and at households as well.

These interventions (Table 6) contributed to the low numbers of cholera cases during the rainy season. The other project in Kanyama Community was enhancing sanitation provision from the PROSPECTS project.

7.4.5 Promoting Peri-Urban Sanitation Services (PPURSS) 2007

This project recognised the challenge of poor sanitation in Kanyama settlement. In order to assist the community, CARE worked in conjunction with LWSC and LCC (Perry and Lindell, 2003) to improve the delivery of water to the community. The project (PPURSS) identified sanitation needs that needed urgent improvement: drainage, solid waste management and excreta disposal facilities. Emphasis was on improving the capacity of the local community in the management of their daily needs. CARE engaged selected vulnerable community members in Kanyama to pilot the project.

The other aim of PPURSS was to improve sanitation in informal settlements of Lusaka, Chibolya, Chaisa and Kanyama among others. The project identified drainage construction, improving sanitation facilities, addressing solid waste management and human excreta disposal facilities (CARE/LWSC/LCC, 2010). The implementation of this project involved capacity-building through training of the local community on Water Hygiene and Sanitation Education (WASHE). It also involved the construction of physical infrastructure, particularly drainage systems and the piloting of dry toilets (*ecosan*) for the community (LCC, 2012).

7.4.5.1 The Ecosan Project

Water and sanitation has always been a challenge in Kanyama settlement. The use of pit latrines is not safe as it has been compromised by the geological formation of a high water table (Muteteka and Bäumle, 2009; Water Aid, 2012) and dolomite rock (see Chapter 3, section 3.3), making digging of the toilet a challenge. There has been an innovation of pit latrines through the use of dry toilets commonly referred to as *ecosan* toilets. *Ecosan* is the short form for ecological sanitation toilets (WDC,

2013; Mwanamwambwa and Kayaga, 2009; WASAZA, 2012). Research by WASAZA and others have shown that ecosan toilets are more environmentally beneficial as it produces renewable energy, biogas, for lighting and cooking. Zambia, like many developing nations, is far from reaching the Millennium Development Goal (MDG) Target 7.C which seeks to halve the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015 (Global Monitoring Report,2007) (http//:www.un.org/millenniumgoalswww.un.org/millenniumgoals, Accessed on 25th June, 2013).

The Biogas project was commissioned in 2011 at the Kanyama Water Trust premises. The aim was to close the loop for human waste generated from ecosan toilets. As mentioned earlier, underground water contamination is apparent due to the close proximity of open shallow wells to pit latrines (see Chapter 3). Biogas digesters are technological innovations where human waste is collected and processed to generate methane gas that can then be used to produce energy for the community.

Currently the biogas digester operates with the feed stock coming from household's human waste, collected from ecosan toilets provided by CARE International Zambia. Community members have been engaged as human waste collectors from ecosan toilets to the biogas plant situated at the Kanyama Water Trust premises. New innovations always come with a challenge. The ecosan toilets and biogas project are facing challenges of being accepted by the community. Culturally and socially in Zambia, people do not appreciate the handling of human waste. This has made the acceptance of ecosan technology to be slow.

The ecosan project started in 2008 and it was funded by the European Union through CARE International and constructed by LWSC. There is no digging of a pit as is the case with pit latrines and there are only two chambers (Plate 5a and b). The chambers have been constructed on top of the ground for disposing human waste. The project started with the construction of 50 ecosan toilets and the number later increased to 100 (CARE Programme Manager; 2013; WDC, 2013).

The chambers are used interchangeably once one is filled, the other one becomes into use leaving the other one to decompose. Urine is separated from faecal matter by a separation part on the toilet pan. One chamber is used at a time and when it is filled up, the other chamber is used leaving the first one to dry. It takes between 2-3 years for the faecal matter to be completely dry. Dried human faecal matter is to be used as organic manure and for biogas production. The urine that is collected in the containers has to be diluted to reduce the high concentration of urea before being used for the irrigation of plants.

The ecosan project in Kanyama is based at the premises of the Kanyama Water Trust. According to one of the Water Trust Officers, Mr. Kambeu, the *ecosan* project has employed people to collect human waste from the community to the biogas digester located near the Water Trust. Images 4a and 4b shows some *ecosan* toilets in Kanyama settlement.

Plate 5a: Pilot Ecosan toilet in Kanyama

Plate 5b: Human waste collection chambers

(Fieldwork, 2013)

There are many benefits in using *ecosan* or dry toilets compared to the ordinary pit latrines in Kanyama with its challenging hydro-geological formation. The first is that ordinary latrines have a high risk of underground water contamination due to proximity of toilets and shallow water wells particularly those located in informal settlements. These latrines will always pose a health hazard resulting in outbreaks of cholera (MSF, 2010). *Ecosan* toilets are safer as they do not allow faecal matter to come in contact with underground water (see Chapter 2). Therefore they reduce outbreaks of water and sanitation related diseases such as cholera, typhoid,

dysentery. These are some of the factors that prompted CARE under the PPURSS project to come up with the Ecological Sanitation (*ecosan*) toilets.

7.4.5.2 Challenges implementing ecosan

The concept of *ecosan* toilets is alien to Zambian culture. Most community members interviewed found it odd that human waste can be collected and used for other purposes. The adoption of the *ecosan* technology is slowly being accepted in Kanyama, especially with the challenges of the hydrogeology to dig the pit latrines and the high probability of underground water contamination due to the proximity of pit latrines to shallow wells. Furthermore, limited space for the construction of new pit latrines, poses a great challenge. There seems to be doubts on the part of the community about the use of ecosan toilets due to cultural beliefs about the handling of human waste.

An evaluation of the of the use of *ecosan* facilities by Nyambe *et al.,* (2010) revealed that only less than 25 percent of the beneficiaries of these toilets are willing to use human manure for agriculture and/ or to handle the human waste. This defeats the purpose of ecological sanitation then. It was also observed that there was no policy and legislature on ecological sanitation in Zambia as the current policy does not provide for re-use but “safe disposal” of waste.

Questions that arise include whether human waste is to be collected from households for free or if the community should subsidise the cost? This also compromises the viability of the ecosan implementation process in Zambia and informal settlements in particular.

The other issue to be considered is that ecosan toilets operate most effectively about six users. This is not possible in Kanyama with its high population density where the entire neighbourhood of residents depend on a single sanitation facility. According to the plan, these toilets were expected to be filled up after three years before the compartment could be changed. Due to high numbers of users, some toilets where full within six months.

The government’s delays in the process of upgrading informal settlements in the Zambia and Kanyama in particular keeps on worsening the sanitation problem with

more toilets being sunk close to water wells. The way forward with sanitation lies in the hands of the community and government to work on sensitisation of the community on the need have access to safe water and sanitation.

Lessons drawn from PPURSS project were that, it was designed and implemented from outside by CARE and the donor with no consultation with the community. The project did not involve the local community (LCC, 2012). Hence the project appeared to be alien to them because they were not properly oriented. The community played no role in the implementation, planning or monitoring of the project.

Evaluation Reports by Nyambe *et al.,* (2000) further revealed that during the construction, the works were substandard and delayed by pilferage of construction materials by communities.

In a bid to address the challenges of community participation in the PPURSS project on sanitation, a project to strengthen community efforts was launched by CARE International. The project focused on empowering the community to take responsibility for managing hazards they're exposed to.

7.4.6 Strengthening Peri-Urban i Risk Reduction in Zambia (SPURRZ) 2009-2011

The concept of community based disaster risk reduction is based on the theoretical framework (Chapter 1, section 4) that the most effective way to reduce disaster risks in informal settlements is to work with the local people to identify and analyse their capacity and vulnerability to implement DRR actions (Vinton and Hansford, 2006) (see also Chapter 1). In accordance with this theoretical statement, CARE International came up with the project to strengthen the capacity of the community after implementing previous projects: PUSH I and II, PROSPECTS and PPURSS.

The project, Strengthening Peri Urban Risk Reduction in Zambia (SPURRZ), was a community capacity building project aimed at strengthening the capacity of the local community in informal settlements in reducing disaster risks. SPURRZ was implemented between the years 2009–2012. According to SPURRZ Project Field Officer, (Mukomba, 2012; Malala, 2011) it was a scale up of CARE International

Zambia's previous projects and was meant to energise the community to carry on from previous intervention projects. It also had a component of expanding the Kanyama Water Trust service provision to areas which were not catered for in the provision of water (Mukomba, 2012).

The overall goal of SPURRZ was to reduce disaster risks of natural hazards of flooding and its associated risks affecting the poorest residents of Kanyama informal settlement. Focus was particularly on those that are regularly exposed to floods and its associated illness, cholera and diarrhoea (Mwanamwambwa, 2013). The project had two main objectives, namely;

- To raise awareness about disaster risk reduction in Kanyama; and
- To reduce community exposure to urban water-borne hazards such as cholera and diarrhoea.

Being a community-based developmental project (See Chapter 2), the community was actively involved in raising awareness on disaster risk reduction: ABOs had a crucial task to play. DRR committees worked in partnership with the Health Centre sponsored by NHCs with knowledge and skills in Public Health. Their mandate was to sensitise fellow community members in door-to-door Water Hygiene and Sanitation Education (WASHE) and DRR intervention. Activities involved training the community on hygienic practices such as washing of hands after using the toilets, keeping the surroundings clean, free from indiscriminate waste disposal and the boiling of drinking water, among other activities.

Prior to the implementation of these activities, CARE International contracted MU's DMT-centre to build the capacity of the community. The centre has expertise in disaster risk reduction and management training to the community and NGOs in Zambia. Participants were to go out and train their fellow community members.

Key topics for community training included:

- Defining key terms and concepts used in disaster risk reduction;
- Impact of climate change in informal settlements;
- Urbanisation and environmental health;
- Aspects of Community Based Disaster Risk Reduction;

- Mainstreaming gender and HIV/AIDS in DRR;
- Participatory Rapid Appraisal in analysing disaster risks ; and
- Field excursions into the community.

A total of 380 community members from wards 10 and 11 respectively were trained in DRR and Water and Sanitation Education (DRR/WASH) CARE 2011, WDC, 2013). The training lasted for three years from 2010 to 2013. The mode of training was the workshop method with extensive community participation. Participants were drawn from all the 15 zones of ward 10 and 11. Key partners from the community included teachers, personnel from the KHC, church leaders or FBO and police officers. Due to low literacy levels, workshops were conducted using both the local language (Nyanja) and English. The training sessions were conducted for a duration of three days.

In line with the National Disaster Management Policy of 2005 (Chapter 5, section 5.12) community disaster reduction committees form part of Satellite Disaster Management Committees (SDMC). The functions of disaster reduction committees as noted earlier are to be the first respondents to disasters facing the community. DRR committees operated under the jurisdiction of the Zone Development Committees Ward Development Committees and District Disaster Management Committees.
Some major activities implemented by DRR committees in Kanyama included:

- Distribution of water columns into households;
- Sensitising the community on waste management;
- Sensitising the community on health and hygiene;
- Unblocking of drainages and building drainage in areas where they do not have drainage; and
- Training of fellow community members on DRR issues.

During the SPUURZ project, CARE recognised the role of partnership with key stakeholders in disaster risk reduction, particularly the government through the District Disaster Management Unit (DDMC) and Lusaka City Council. CARE sponsored the rehabilitation and construction of the Kanyama's drainage system project worth K12 billion (about US$ 2,307,692.31) (DDMC, 2008; WDC, 2013).

Existing drainages were either blocked because of indiscriminate waste disposal by residents or have been buried due to lack of maintenance. The central drainage system starts from the planned residential areas to the south of Lusaka through Kamwala Trading area and the CBD before entering Kanyama settlement (LCC, 2012). It is the main channel for draining floodwater from the southern part of Lusaka and the entire Kanyama settlement.

7.4.6.1 Lessons learnt from SPURRZ: Community participation

It must be noted that SPURRZ project experienced many challenges in its implementation process. Midway during the drainage works, the contractor abandoned the project with half of the amount paid while the other half could not be accounted for. In addition, the presence of the dolomite rock formation proved to be an expensive to excavate.

The funds for the project were held in the account of the LCC which hires and supervises the contractor. The contract was later terminated when the contractor failed to complete the project. Limited capacity and resources at LCC to supervise contributed to the misapplication of funds. The government later engaged the Zambian National Service (ZNS), a government military department to complete works from where the contractor ended. The Kanyama drainage project was purely a structural project with no community participation in its implementation. The failure of this project continues to negatively affect the community in terms of flooding. Plans are under way by the government through DMMU to complete the project.

Under SPURRZ, DRR committees (See Chapter 7, section 7.5.6) were introduced in Kanyama to spearhead the operations of community based activities (Choolwe, 2013). The committees, upon undergoing training with MU, went out on door to door campaigns sensitising fellow residents. DRR committees were formed in all 19 zones of Kanyama wards 10 and 11 respectively. The operations were supervised by the local leadership structures of WDCs, RDCs and ZDCs. Project activities under SPURRZ included capacity building (Holloway, 2007) (also see Chapter 2, section 2.5), improving access to safe water and sanitation, community based disaster risk reduction, drainage construction and clearance in partnership with the LCC and LWSC including other partner organisations.

Physical activities performed by DRR committees included door to door campaigns on hygiene, chlorine distribution from the water trust and garbage collection. On the other hand, non-physical activities involved sensitisation programmes through the conducting of road shows, local television programmes broadcasted at MUVI Studios and the radio station.

7.4.7 Integrating Adolescent Girls in Peri Urban Risk Reduction in Zambia (IAG-PURRZ Project) 2012-2013

The IAG-PURRZ project was a one year project piloted in Kanyama settlement from 2012-2013 as a community based gender sensitive approach for reducing disaster risks facing adolescent girls in peri-urban. The project drew from experiences of the African Centre for Disasters (ACDS) of North West University in South Africa's project Girls in Risk Reduction Leadership (G.I.R.R.L). Lessons from the South African model were that gender relations, specifically risks associated with traditional gender roles and differential power in decision making processes at household level play an important role in risk reduction. Emphasis was placed on training adolescent girls alongside adolescent boys along with other local actors in DRR. The DRR project targeted adolescent girls and boys aged between 12 and 13 in two basic schools of Kanyama settlement, Twashuka and Kanyama Primary School (CARE, 2013). The objective was to integrate the needs of adolescent girls into existing community based DRR plans. Additionally, to educate the girls by equipping them with knowledge and skills to change their behaviour and address hazards affecting them and the community at large. Skills imparted were in water and sanitation, hygiene, sexual education to avoid unwanted pregnancy, menstruation and HIV/AIDS risks. Adolescent girls, in two basic schools, Twashuka and New Kanyama, were empowered to become change agents within their communities after being equipped with skills in water and sanitation hygiene education, entrepreneurship, leadership and decision-making.

7.4.7.1 Adolescent Girls and flooding in Kanyama

Flooding in Kanyama has been identified as the major risk the community is exposed to. The area has poor surface drainage due to a relatively flat terrain coupled with

the impervious dolomite rock formation (see Chapter 3). Furthermore, Kanyama attracts a build-up of uncollected solid waste and debris in ditches and sinkholes leading to underground water contamination. Kanyama settlement is identified as one of the most flood-prone areas in Lusaka (CARE, 2013). The situation results into floods affecting schools and Kanyama Health Centre and other public infrastructure. For instance, in 2009, Twashuka Basic School was closed for over a month due to the flooding of the entire school grounds, including the pit latrines (WDC, 2013). The limited number of pit latrines, coupled with poor hygiene practices among the school population, is a major health concern for the school administration. The absence of hand soap and the location of water taps close to pit latrines enhance the risk of water-borne diseases such as cholera, dysentery and diarrhoea. The Zambia Demographic and Health Report (2010) indicated that, during the rainy season, 17 percent of children under the age of five in urban areas of Lusaka had diarrhoea.

Although flooding affects all school- going pupils, the worst affect affected are adolescent girls who face double impact due to issues of menstruation and lack of disposal facilities for sanitary towels (Mwanamwambwa, 2013). CARE International Zambia decided to come up with the IAG- PURRZ project (See Chapter 7, section 7.5.7) in order to focus on helping adolescent girls and boys in Kanyama. The project was introduced in the community by conducting group discussions with women (mothers) and female teachers.

The outcome of these discussions revealed that the major concern for adolescent girls during disasters was the increased incidences of sexual abuse after major floods. After a flood, people's movements are restricted as most of the roads become impassable. During these times, families whose houses have collapsed are forced to relocate to drier areas including to their neighbours and relatives for safety. This situation makes adolescent girls more vulnerable to risks such as sexual abuse and harassment.

Floods also affect the livelihood of the Kanyama community whose main source is street vending - which is predominantly done by women. During floods, street vending is forbidden by the local authority and the Health department to prevent the occurrence of water-borne diseases. This means that household income sources are reduced, hence girl children have to support their mothers in fending for the

household. Some girls are forced to join their mothers in trading instead of going to school, while others fall prey to prostitution, exposing themselves to HIV/AIDS. Early marriages and unwanted pregnancies deprive girls of future livelihood opportunities as they are removed from the education system early. The situation is even worse for families who are evacuated or relocated as the safety of the girls are overlooked by those in charge of the victims (WDC, 2013).

The IAG-PURRZ project was therefore developed to empower adolescent girls with knowledge and skills against disaster risks. This was because the DRR plans developed under SPURRZ and interventions by the government did not address the unique risks and needs of adolescent girls. Statistics indicate that there is a high rate of girls who drop out school in the education system in Lusaka. In 2007,

for instance, only 8.6 percent of girls completed high school level education in Lusaka (CSO, 2006; ECZ, 2003:7). The IAG-PURRZ project recognises that one way to retain girls in school for a longer period is to support and encourage them by making the learning environment convenient for them. Keys issues to be considered include sanitation and hygiene education as well as sex education among other issues.

The presence of CARE in disaster risk reduction interventions in Kanyama laid a firm foundation for community mobilisation and participation in development. Under SPURRZ, DRR committees and Neighbourhood Health Committees conducted urban vulnerability and risk assessments and created a DRR/WASH action plan. DRR training manuals were already in use by the community. The CARE SPURRZ project was the first disaster risk reduction intervention in Zambia. The government usually provides emergency relief after flooding and outbreaks of cholera in Kanyama areas. The DMMU, under the office of the Vice President, recognises that government alone cannot fully address the problem of annual flooding (DMMU, 2013). Key stakeholders - the Ministry of Health, DMMU and the Lusaka City Council- have to find long-term and permanent solutions to the problem of flooding.

7.4.7.2 Partnership in DRR local institutions in Kanyama

Capacity building and skills development have a crucial role to play in empowering the community to actively participate in DRR. Specialised institutions in DRR include

academic institutions, NGOs, government sector departments and faith based institutions. Under SPURRZ, CARE collaborated with the Disaster Management and Mitigation Unit (DMMU) which is the national level agency mandated with the responsibility with the responsibility of DRR in the country (Disaster Management Act No. of 2010). At district level, the District Disaster Management Committee (DDMC) ensures the smooth implementation of DRR intervention in the district. Since the government has too many pressing national needs to meet, funds and resources for disaster risk reduction are usually inadequate. CARE complemented the government's effort by providing resources directly to the community using local community structures within Kanyama. At local level, CARE collaborated with WDCs, the NHCs, police and teachers, among others, in implementing DRR interventions.

7.4.7.3 CARE partners with academic institutions - Mulungushi University

CARE recognised the expertise of academic institutions and two universities were subsequently engaged to offer capacity-building training in DRR (MU's DMTC) and the University of Zambia – Integrated Water Resource Water Management unit (UNZA-IWRM) taught girls how to test water for domestic use. Since its inception, DMTC has been a well known partner for community outreach for both government and public sector NGOs. The partnership between Mulungushi University and CARE started in 2010 with the SPURRZ project (see section 6.5.6 above; Appendix A). MU was engaged to develop training materials for community members and institutions involved in DRR interventions at community level.

7.5 CONCLUSION

Lessons of best practice in DRR in Kanyama informal settlement involve attending to basic needs that make the community vulnerable to disaster risks. Major aspects related to the exposure to disaster risks in Kanyama include accessing safe water and sanitation, poor waste management, poor infrastructure, insufficient drainage, substandard roads, the unplanned character of the settlement and high poverty levels among the citizens. These are some of the major drivers of flooding which has been a major disaster risk affecting the settlement for a long time. Attempts have been made by the government, through DMMU, to help the community with relief food, water and shelter whenever floods occur. This has been only short term. Every

year the same problem occurs and the same type of support is offered to the community. The approach by the government has been a top-down, reactive emergency response.

CARE International Zambia, on the other hand, took a different approach, focusing on community participation in a bottom-up, proactive way. This chapter has revealed that CARE's approach focused more on engaging the community in understanding the disaster risks they face and helping them become part of the solution in addressing them. The community could become involved particularly with those risks related to meeting their basic needs of safe water and sanitation, waste management, poverty reduction, infrastructure repairs and community development in general. The point of entry in the community is to create an understanding of disaster risks affecting the community.

The Food-For-Work project under PUSH I and PUSH II addressed the food crisis caused by the drought while improving infrastructure, roads and drainage channels. The lesson is that the community has the capacity and responsibility to contribute to reducing their own vulnerability to disaster risks. Support from outside is welcome, but the mandate to implement has to be community based. The capacity of the community in understanding DRR is very important if the community is to effectively participate and analyse their disaster risks. Capacity building training is critical for the community to understand disaster risks. Accessing safe water and sanitation is a big challenge for informal settlements. The Kanyama Water Trust project supplies safe water and sanitation to the community. The community is also part of the project by being part of the project management board and by providing a service as vendors on behalf of the company.

Planning for DRR interventions requires a well-educated and skilled community, capable of analysing disaster risks in their community. CARE focused on a community based approach of understanding disaster risks in Kanyama. Universities were engaged to facilitate the learning process on disaster risk reduction. With skills and knowledge in the community, monitoring and evaluation of interventions is of great benefit for the community. This has been a challenge in DRR. Whenever external support for DRR projects is removed, the community returns to its original vulnerable condition.

The onus is on the government to provide basic services according to legal frameworks for the vulnerable community. Other stakeholders come in to assist the community to actively realise their potential to avoid disasters. Community based disaster risk reduction is therefore a holistic approach to addressing hazards before they become disasters. It requires a systematic approach in organising the community to understand and take measures in mitigating disaster risks in their community.

CHAPTER 8:

A NEW MODEL FOR COMMUNITY BASED DISASTER RISK REDUCTION

8.1 INTRODUCTION

Disaster risk reduction lessons from DRR interventions in Kanyama presented in Chapter 7 have shown that the participation of the community at risk in mitigating exposure to disaster risks is very important. Reactive responses to DRR are not sustainable as they bring the community back to the same, if not worse, vulnerable conditions. The main purpose of this Chapter is to create a model for community based disaster risk reduction in informal settlements (see Chapter 1). The research is premised on the theoretical framework that lack of comprehensive governance and legal frameworks (top-down approach) contribute to the failure of DRR interventions for communities at risk (Holloway, 2003; Pelling and Wisner, 2009). Secondly, the most effective way to reduce disaster risks in informal settlements is to work with the local people to identify their vulnerability and capacities to implement DRR actions towards sustainable living (Venton and Hansford, 2006).

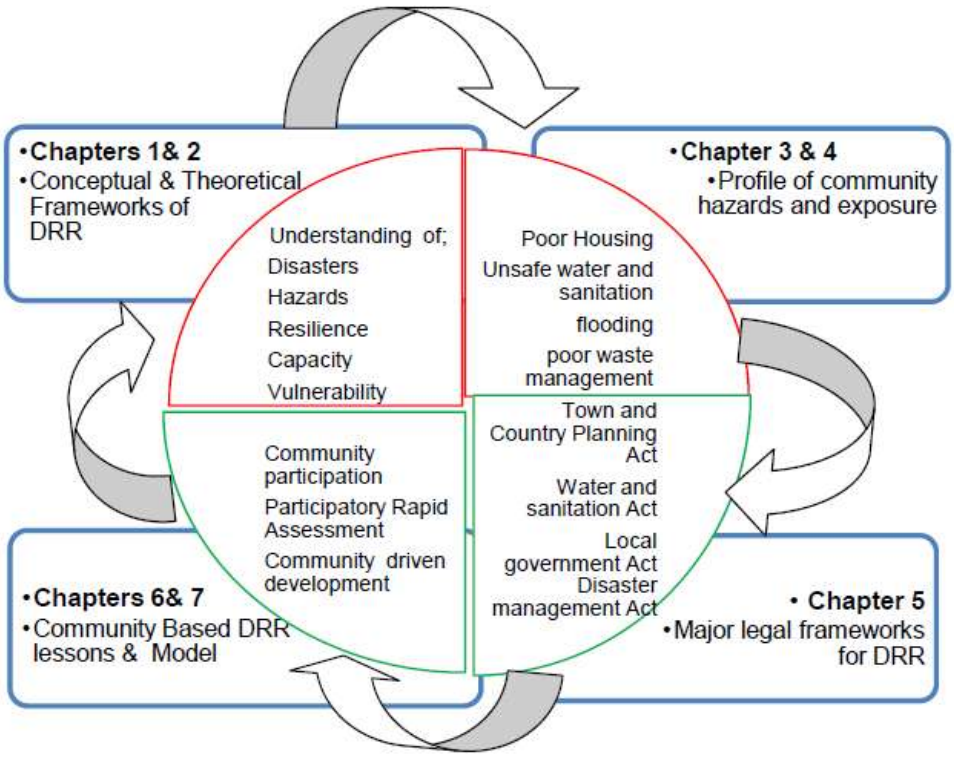
Lessons learnt from DRR interventions in Kanyama settlement (See Chapter 7) have shown that community based DRR (bottom up approach) emphasises community driven development to reduce vulnerability and exposure to disaster risks. This model highlights strategies of engaging with the community in building capacity for planning and implementation of disaster risk reduction interventions. This model is intended to be used by DRR practitioners, including community leaders, NGOs and government departments working with less privileged communities residing in marginalised settlements. The lack of essential infrastructure and inadequate access to clean portable water and safe sanitation facilities expose the inhabitants of these settlements to disease epidemics (UNHABITAT, 2007).

8.2 WORKING TOWARDS A REVISED MODEL FOR COMMUNITY BASED DISASTER RISK REDUCTION AND MANAGEMENT

This model of Community based Disaster Risk Reduction and Management (CBDRRM) is a realisation that top-down interventions of aid and relief response, as

often offered by governments and some NGOs, in responding to disasters in hazard prone communities (Heijmans, 2009) (also see Chapter 1) are not sustainable. This has been observed by DIPECHO (2004) and Venton and Hansford, (2006) who state that programmes that directly support communities and local organisations have proven to be the best option for enhancing coping capacity and building resilience in the community. Community ownership of DRR programmes is crucial for reducing vulnerability to hazards and it enhances local development at the same time (UNDP, 2003:114).

Figure 9: A model for Community Based Disaster Risk Management Process



This model (Figure 9) is centred on four major variables of understanding DRR, derived from the specific objectives of this study and presented earlier in Chapters 1-6. Key elements of the model consist of the following:

- Conceptual and theoretical frameworks of DRR;
- Profile of hazards in the community;
- Legal frameworks and policies; and
- Community based DRR process.

The four variables provide guidelines for implementing DRR interventions. In addition to the four elements, four sub-components of each of the elements are outlined. These provide an outline of the constituents of each element. This is the information that must be inculcated into the community for effective participation in DRR activities. The conceptual and theoretical framework of DRR (see Chapters 1-2) presents key concepts for understanding DRR. After the DRR concepts are clearly understood, the next step is to identify and assess the hazards that a community are exposed to. A profile of hazards and risks is developed (see Chapter 3). Community participation is cardinal in identifying these hazards. These are factors that make a community disaster prone (see Chapter 5). It is the responsibility of the government to provide a safety net for its citizens (GRZ, 2005).

The legal framework provides guidance for standard provision of goods and services citizens are entitled to. These include access to safe water and adequate sanitation, safe housing and a habitable environment. The last step is the creation of a model for community based disaster risk reduction and management (See above Chapter 8; Figure 9). The model is premised on lessons learnt during the process of responding to DRR by both the government, NGOs and the community. The best lessons and experience after a disaster form a foundation for engaging with the community, using PRA tools (See Chapter 2, section 2.4.2). The process of CBDRRM is a continuum and continues back to the initial stage of understanding the context of disaster risk exposure in the community. The proceeding sections provided stages of the model.

8.2.1 Conceptualising the theoretical framework of DRR

The CBDRRM process commences with the understanding of key concepts as well as a theoretical background of DRR. The aim is to elaborate on how a community becomes vulnerable and exposed to disaster risks in the context of community level. The community has to understand what disasters are and what causes vulnerability (See Chapter 2, section 2.2.1). Community vulnerability and exposure can be caused by either natural or human induced hazards, depending on the capacity of the community to cope (Wisner, 2004).

The coping capacity on the other hand is the community's ability to be able to use

local resources and capacities within the community (UNISDR, 2009). In this model, a disaster is understood to be a result of failure to adequately address causes of vulnerabilities in the community. Vulnerabilities include lack of access to safe drinking water, poor sanitation, lack of drainage systems including high levels of poverty (see Chapter 4) - typical conditions in informal settlements. A community based disaster risk reduction approach therefore strives to help the community to take responsibility in reducing their chances of being exposed to disaster risks in their community. The aim behind DRR is to build resilience at community level.

The cause of exposure to disaster risks can be illustrated using the disaster notation by Wisner, (2004; UNISDR 2002:41) (Also see Chapter 2, section 2.2.2).

$$\text{Disaster risk} = \frac{\text{Vulnerability x Hazard}}{\text{Coping capacity}}$$

Disaster risk is the product of the combination of three major elements which include vulnerability, coping capacity and hazard (UNISDR 2002:41). In this equation, the cause of exposure to disaster risks in the community is vulnerability to hazards present in the community. In addition, vulnerability to disaster risks or hazard depends on the community's capacity to respond and prepare before a disaster happens. The equation by Wisner, (2004) provides a theoretical understanding of how a community's exposure to disaster risks can be explained.

It must be noted that even if the entire community may be at risk of being affected by a disaster, not everyone will suffer the consequences in the same manner. This is supported by Canon, Twigg and Rowell (2002) who argue that the impact of a disaster depends on people's economic status, including sources of livelihoods. Furthermore, exposure to disaster risks may depend on the community's geographical location, physical infrastructure available such as safe water, clear drainage channels, provision of waste collection facilities and good sanitary facilities.

Traditionally, communities have viewed disasters to be events which can only be addressed by seeking emergency response from outside (Nchito, 2007). This approach is not sustainable nowadays as communities become more exposed to climate change and variability risks. Furthermore, interventions through the distribution of emergency relief aid at the expense of developing local capacities are

not sustainable. The Hyogo Framework for Action, UNISDR (2009) recommends that hazards and disaster risks must be given a priority both at national and community level. The community must know the risk and take action. This can be done through implementing DRR interventions at community level (see Chapter 7). Capacity building in terms of knowledge and skills about addressing disaster risks is also very important (UNISDR, 2009) (Also see Chapter 7, section 7.4.2).

The thrust of CBDRRM must be the reduction of vulnerability and exposure to hazards while building the coping capacity of the community. This can be achieved through community participation in planning, preparedness, prevention, mitigation and implementation of DRR interventions. After creating an understanding of the theoretical and conceptual of DRR, the next stage is to develop a profile of the hazards a community is vulnerable to.

8.2.2 A community profile of hazards and vulnerability

A community profile in this model refers to the geological and geographical orientation of a community (See Chapter 3, section 3.3). A community may become susceptible to disaster risks by virtue of its location on a flood prone area, near the industry with pollution and so on. The profile provides a background of how a community may be vulnerable and exposed to disaster risks. Exposure to disaster risks may be as a result of the following; historical, topographical, geological, demographic, socioeconomic characteristics of the community.

Historically, a community may be exposed by nature of its establishment. The information includes where the first settlers came from and how the area has evolved to the current state (See Chapter 3, section 3.5). This profile helps to establish the history of the area in relation to hazards and vulnerability of the community.

Secondly, the topography or landscape of the area can also be a cause of vulnerability. This refers to the geographical make-up of the settlement. Some communities, due to limited resources, settle on unsafe locations including wetlands, hilly places or near industrial locations which make them susceptible to disaster risks such as flooding, pollution and mud slides. These locations are often on the outskirts of major cities and may not be recognised by the government in terms of physical land use planning and the provision of basic services such as water and sanitation.

In addition to topography, the geological formation may also contribute to hazards such as flooding, earthquakes and underground water contamination. The rock formation, such as dolomite, may cover a large portion of the ground, making it not only hard to construct drainage systems but also slow down the percolation of surface water, leading to flooding (Nyambe and Maseka, 2000) (Also see Chapter 3, section 3.3).

Thirdly, the socioeconomic status of the community is reflected by the sources of livelihoods in the community. Formal livelihood activities refer to residents earning a living from wage employment with a constant cash flow from the employer. Informal livelihood, on the other hand, includes informal sector livelihood activities performed by individual community members to earn a living. These could include trading at markets and on streets, domestic servant jobs and skills-oriented jobs such as carpentry, brick-laying, among others. In general, poverty levels are high in these communities.

The fourth aspect of the profile is demography. Informal settlements attract many people due to unregulated procedures in acquiring land for the construction of shelter and due to low rental charges. The population density of informal settlements is usually very high compared to the planned locations of the urban centre (CSO, 2000). As noted by the UNHABITAT (2007), 73 percent of the urban population in developing nations reside in informal settlements, which is only about 20 percent of the entire urban centre. High population in an unplanned settlement with no safe water and adequate facilities available put the community at risk of outbreaks of communicable diseases like cholera.

These are some of the major characteristics of hazards in informal settlements. The hazard profile provides an outline of hazards which expose the community to disaster risks.

The methodology used for compiling these hazards in the community is community participation. Participatory Rural Appraisal tools (PRA) as noted in Chapter 2, help the community to become responsible actors in the DRR interventions to be implemented. Pelling, (2007) and UNDP, (2003: 114) recommend community participation to create a sense of community ownership of proposed projects.

Additionally, Robert Chambers, (2008) (Also see Chapter 2, section 2.4.2), argues that PRA tools are best used to get an overview of community perspectives concerning their livelihoods and analysing their problems.

In DRR, PRA methods encourage the participation of the community in making decisions affecting their community. These tools - individually or collectively - can assist in obtaining an overview of the hazards and risks faced by a community.

Popular PRA tools in need for compiling the hazard and vulnerability profile (See Chapter 6, Table 4) include:

- Historical Profile (Timeline);
- Seasonal calendar;
- Hazard mapping;
- Problem analysis and
- Vulnerability and risk assessment.

8.2.2.1 Historical profile

This tool is used to provide the general historical background of a community. The history of a settlement helps in establishing links between the community and its exposure to disaster risks. The timeline shows when the settlement was first established, where settlers came from and how they decided to settle in the area. Additionally, changes in terms of livelihoods and physical infrastructure are also highlighted (Chapter 4). Other information includes a record of the occurrence of past disasters, their frequency and the losses caused.

In DRR, the historical profile helps DRR practitioners to fully understand the genesis of the exposure of the community in the past and to prepare for possible future disasters. This information can be obtained through group work activities with community members and prominent elderly members. The timeline helps in contextualising the community's understanding and perception of problems.

8.2.2.2 Seasonal calendar

This calendar provides the community's annual livelihood activities in one full calendar year. It shows what major events and risks a community is exposed to and when such events happen. Events could be months when people are exposed to flooding, time of low income at household level, times when diseases outbreaks are prevalent, among others.

The seasonal calendar is useful for disaster risk reduction planning purposes in a calendar year. It is also necessary for identifying types of hazards and to establish when they occur so that effective measures can be put into place to reduce disaster risks.

8.2.2.3 Hazard mapping

This tool is important for locating and presenting locations in the community with regards to disaster risk exposure. Community members outline areas at risk of being affected by identifying types of hazards. It also shows resources and capacities available in the community for instance schools, community organisational structures, Resident Development Committees and Neighbourhood Health Committees (NHCs) (see Chapter 5). Hazards can be flood prone locations, heaps of uncollected garbage, unsafe water sources and poor sanitation facilities. A hazard map is used to show the physical location of hazards and potential resources and capacities within the community.

8.2.2.4 Problem analysis

This methodology in DRR can be used to critically analyse the root cause of the exposure to hazards in the community. It an appropriate tool for analysing communities where there are low education standards. The image of a tree is used as an illustration of the causes, problem and effects. The trunk of a tree represents the problem, roots are the main causes of the problem and the fruits of a tree represent the effects.

In the case of Kanyama (see Chapter 6, section 6.4) the illustration of the problem tree analysis showed that flooding was the main problem or hazard affecting the community. The root cause was the lack of drainage facilities, resulting in diarrhoea

and cholera outbreaks.

8.2.2.5 Vulnerability and risk assessment

This methodology is crucial for analysing how a community is exposed to disaster risks. As mentioned earlier, lack of access to resources makes some communities settle in unsafe locations on the outskirts of urban centres. Vulnerability assessments focus on analysing the following issues:

- Population densities and types of housing units;
- Types of housing units and access to water and sanitation services;
- Vulnerable groups;
- Location of population groups in relation to the hazard;
- Location of vital facilities, for example hospitals in relation to the hazard;
- Data on physical infrastructure, environment, demography, culture and
- Developing vulnerability profile or maps.

These factors have to be quantified to explore whether a community has the capacity to manage should a disaster occur.

Risk assessment goes hand in hand with vulnerability assessment. According to Pelling, (2007), disaster risk assessment is aimed at making a community safer and resilient while Morrissey, (2005) is of the view that risk assessments are carried out to examine how a local community might respond should a disaster occur. It relies heavily on the vulnerability of the community as explained in the previous section.

This model of Community based DRR interventions addresses community exposure to disaster risks within their livelihood activities. For instance, the approach of DRR interventions (see Chapter 6) by CARE on SPURRZ water supply and sanitation, waste collection and Food-For-Work, was aimed at improving the socioeconomic amenities to uplift the standard of living of the community.

Communities are exposed to disaster risks because of their vulnerability and exposure to disaster risks (see Chapter 3 and 4). Informal settlements are locations that normally start as illegal settlements with limited or no basic services provided (LCC, 2008). The illegal status and informal nature of settlement can be attributed to poor governance and to poor implementation of legal frameworks by the government

(see Chapter 5).

8.2.3 Legal frameworks and policies in CBDRRM

The government has the responsibility to ensure that its citizens have basic services which include safe water, adequate sanitation, shelter and social services such as education and health. Through legal frameworks and policies, the government has the authority to control the establishment of settlements (refer to Town and Country Planning Act Cap 283 of 1994 in Chapter 5). National policies and legal frameworks influence the organisation and the planning of developmental activities in the country, including the provision of basic services. The organisational structure and hierarchy of disaster risk reduction needs to be supported by the national policies and legal framework (See Chapter 5 section 5.5.4) Policies provide guidelines on standard requirements for habitable settlements in the country.

CBDRRM interventions focus more on local community governance in terms of decision making and participation in development planning at community level. There is a need for the government to decentralise powers from the national level down through to community level (See Chapter 7; Local government Act, Cap 281 of 1991). In Zambia, for instance, the Ward Development Committees are structures with the responsibility of spearheading developmental programmes at community level (See Chapter 5, section 5.5.2).

Apart from having these leadership structures, subcommittees involving the wider membership from the community should be formed to implement DRR programmes. Some committees, for example the Neighbourhood Health Committee, could look at public health issues and take responsibility for the sensitisation of the community regarding hygiene and sanitation issues.

In instances where the government has limited capacity and resources (LCC, 2008), it has the power to delegate some of its responsibilities to private sector institutions (LCC, 2008; EPPCA of 1991). Although it is dictated by law that the government should collect waste from residential areas (Waste Management Strategy document), legal provision is made to allow the local authorities to subcontract to the private sector, including community based institutions (CBEs) (see Chapter 7), to assist in waste collection.

The hazard and vulnerability profiles (See Chapters 3 and 4) indicate that a community can be vulnerable by residing in locations which are unsafe for human settlement, for instance flood prone locations. This situation is exacerbated by the poor implementation of policies by the local government. Residents set up substandard housing units without conforming to the building standard.

Community based disaster risk reductions and management interventions should not be made the responsibility of the at-risk community alone, but should also involve stakeholders in charge of community welfare (See Chapter 7, section 7.4). DRR interventions should therefore supplement the government's efforts in improving the standard of living of the less-privileged. Policies and regulations permit nongovernmental and private institutions to supplement government efforts (see Chapter 5).

The central government has structures such as education, health and the police. Community development normally pertains to the lowest level of the community who can be engaged to be part of the DRR interventions (refer to the Satellite Disaster Management Committees (GRZ, 2005). Apart from local community members, the government institutions comprise of the educated in the community. Teachers, social workers, pastors and health workers are among the people who facilitate DRR programmes.

The success of implementing CBDRR interventions depends on the active participation of the community in identifying their exposure to hazards and on their capacity to overcome them. On the other hand, the government has to provide leadership and guidance to ensure that people settle in safe locations. The hazard and vulnerability profile as presented in Chapter 3 provides the background information needed for the planning and the effective implementation of DRR interventions in the community.

8.2.4 Community based DRRM Implementation process

The last stage of the model is the planning and the implementation of CBDRRM. It is premised on the understanding that the community at risk should take action. The top-down approach of emergency relief by central governments fails to consult local

communities on disaster risks in the community. DRR interventions involve a multi-sectoral approach, which includes all stakeholders (refer to Chapter 2,section 2.8.5) in the planning and the implementation of DRR activities by means of the following steps shown in Figure 10:

- Community participation and engagement;
- Capacity building;
- Community planning;
- Implementation of DRR activities; and
- Participatory monitoring and evaluation.

Figure 10: The process of implementing Community based Disaster Risk Reduction and Management Process

CDRRM interventions are aimed at transforming a vulnerable community from being dependent on emergency relief support to becoming drivers of DRR interventions in their community. The community has to be involved from the start in DRR planning (CARE, 2012). CARE involved the community in water supply and sanitation in PROSPECTS, in the Kanyama Water Trust section, and in the DRR Committees (see Chapter 7, section 7.4.2.2).

DRR interventions rely on community participation in reducing disaster risks at

community level. The community can be motivated to participate if interventions address their most urgent needs, such as water and sanitation.

The planning process of CBDRRM involves engaging the community in DRR interventions at community level. The steps in Figure 10 are not a standard formula, but can be adjusted to suit the prevailing conditions.

Step 1 Community communication and orientation

The implementation of community based disaster risk reduction begins with the understanding and orientation of the community. DRR interventions must be clearly understood by the community at risk. The background of the community in terms of exposure to disaster risks is very important. The participation of the community is highly dependent on their local environment.

Step 2: Call for community participation

The starting point for DRR practitioners to engage the community is to create a rapport with the community at risk. Links with the community through existing leadership structures should be established. Consultations have to be held to focus on the hazards and the disaster risks that the community is exposed to. PRA tools provide effective procedures for engaging the community in analysing their problems (See Chapter 2, section 2.8.5).

Rapport building: Rapport building refers to actions that enhance relations between the practitioner and the community regarding DRR interventions (Abarquez and Murshed, 2004). Key decision-makers at community level include chiefs, local government officials, Ward Development Committees, Neighbourhood Health Committee (NHCs), teachers and medical personnel.

The next activity under community mobilisation is creating a theoretical and conceptual understanding of DRR experiences by the community (see Chapter 1). Experiencing disasters motivate people to look for options for survival. Community participation entails making the community at risk understand the social and environmental impact of disaster risks (Cooke and Kothan, 2001).

Formation and strengthening of community based institutions: The establishment of community organisations depends on the community's social, economical and political standing (Abarquez and Murshed, 2004). DRR committees are formed to implement DRR phases: *pre-disaster, during disaster and post disaster.* DRR community committees (Chapter 5, section 5.5.2.1) have to be formed to implement specific disaster risk interventions. Examples of these committees are: water and sanitation sensitisation committees, solid waste management committees, drainage clearing committees and health committees. Where such structures already exist, they should be integrated with new committees rather than reinventing the wheel.

After the mobilisation of the community and the establishment of partnerships in the community, the next step is to build the capacity of the community to actively participate in DRR interventions.

Step 3: Capacity building of the community

The aim of this step is to build on the local knowledge and skills regarding disaster risk and exposure in the community. These skills can be joined with specialised, technical knowledge from outside the community. Capacity building can be in the form of imparting knowledge and skills (see Conceptual framework) as well as in the form of infrastructural support through construction and rehabilitation. Community training plays a crucial role in empowering the community at risk with knowledge on preparedness and prevention activities.

Capacity building training is aimed at equipping the community with knowledge and skills about DRR and creating a platform for the dissemination of information and the implementation of measures to reduce vulnerability.

Capacity building can help the community understand vulnerabilities based on:

- Local disaster risks and hazards experienced in the community from the past, present and expected risks in the future;
- Identifying vulnerable groups in the community using PRA tools methods such as the vulnerability and capacity assessments;

- Influential community leadership structures e.g. political leaders, faith based organisations, teachers and medical personnel; and
- Gaps in the community's knowledge of disaster risks.

In informal settlements, the benefits of capacity building include the following:

- Providing education in disaster preparedness, prevention and mitigation.
- Empowering the community with new or alternative livelihood activities which will reduce their vulnerability and exposure to future disasters e.g. credit facilities and community based enterprises for small scale businesses (See Chapter 7).
- Conducting community training to equip the community with DRR skills and knowledge. The Trainer of Trainer (TOT) approach (See Chapter 7, section 7.5.6) is an effective model. The training is community based, interactive and uses local experiences and local language in facilitation.
- Considering gender during the selection of the participants for the TOT. Specific DRR responses require gender consideration e.g. risks associated with water and sanitation are traditionally the responsibility of women and the girl child e.g. in IAG-PURRZ project (See Chapter 7, section 7.4.7).

Capacity building training: The typical content for capacity building training on Community DRR may include, but is not limited, to the following topics:

- Team building exercises;
- Identifying disaster risks and hazards;
- Terms and concepts for understanding disaster risk management;
- Mainstreaming gender and HIV/AIDS in disaster risk reduction;
- Early warning systems –indigenous knowledge in adaptation;
- Community based disaster risk reduction planning and implementation;
- Monitoring and evaluation of CBDRRM projects;
- Institutional arrangements of disaster risk reduction; and
- PRA Tools in DRR.

An institution working with the community at risk should focus on sharing knowledge and skills on DRR with the community. Facilitation is the desired method of imparting knowledge in the community. Through facilitation, information about reducing vulnerability and exposure to hazards in the community is passed on (DMTC, 2011). Training has to be continuous due to low education levels in informal settlements.

The approach for training should be the Trainer of Trainers (ToT) approach whereby members of the community are selected for the training programme. Capacity building is aimed at creating awareness and understanding of the basics of DRR activities. Participants in the TOT training should be those members of the community that are capable of initiating change. These may include community leaders, teachers and medical personnel, among others.

Training has to be a continuous process to keep the community up to date with knowledge on DRR. Capacity building does not only involve the passing on of knowledge but also the empowering of the community with physical infrastructural support needed to prevent hazards from becoming disasters.

Structural measures in DRR: The community's vulnerability can be due to an unsafe location, lack of access to safe water and sanitation, inadequate provision of drainage and insufficient waste management services (see Chapter 3). These challenges may require engineering solutions to address them. The government has to ensure that the community has access to safe water and sanitation (see Water Sanitation Act of 1997 in Chapter 5, section 5.2.2).

Additionally, structural interventions should involve the participation of the community in planning and/or implementation. In projects where the community is not involved in the planning and implementation, theft and vandalism is rampant (JICA, 2008). The community may participate in DRR interventions by providing semi-skilled and unskilled labour during the project's implementation. For instance, in the Kanyama Water Trust Project the community is part of the project, working as vendors as well as providing chlorine for treatment of water at the water kiosks.

Step 4: Community planning

A community, as defined in Chapter 2, is a group of people with common interests, who live in similar conditions, who are exposed to similar hazards and who have similar opportunities (Abarquez and Murshed, 2004: 12). During the planning stage, all stakeholders must be involved. The input of the local community takes central stage in the planning process.

Stakeholders in disaster risk reduction in the community have to agree on DRR interventions. As noted by Chambers (2008), community participation is effective for development because complex and diverse views are resolved in the spirit of common goals when people work together. Furthermore, PRA are the most appropriate tools for involving the participation of the community in programmes that are aimed at understanding their problems, as well as for proposing solutions at local level.

Community interventions: DRR interventions must be focused on long term benefits for the community rather than make them become even more dependent on external support. Experiences from CARE Interventions (See Chapter 7), on water supply and sanitation implemented under PROSPECTS by Kanyama Water Trust and DRR Committees (See Chapter 7, section 7.4) are examples of long term benefits.

Planning for long term interventions should consider the following:

- Comprehensive governance and legal framework using the bottom-up approach with clear DRR targets for the community at risk (Holloway, 2003; Pelling and Wisner, 2009; see Chapter 1);

- Making DRR a local priority through community participation in analyzing local vulnerability and capacities to implement DRR action plans and ensure sustainable living (Venton and Hansford, 2006; UNISDR, 2004) (Also see Chapter 1);

- Long term measures focusing on immediate community needs (short term) while recognising the role of the government (Legal Framework and Policies; see Chapter 5); and

- Building a sense of ownership of projects and interventions by designing intervention activities that will directly involve the participation of the community in implementation (Mwanamwambwa and Kayaga, 2009) (Also see Chapter 2 section 2.8.1).

Community participation is central in the bottom-up approach as noted by IFRC (2009:59); Allen (2006) in the theoretical framework presented in Chapter 1. The planning of DRR activities should place a special emphasis on the participation of the community at risk.

Planned actions in CBDRRM interventions should include the following components:

- Community preparedness training: before, during and after disaster;
- Community awareness through door to door campaigns, road shows and other activities;
- Early Warning system, evacuation, first aid, conducting needs and damage assessments;
- Networking and coordination of intervention activities with partner institutions, both within and outside of the community and
- Monitoring and evaluation of DRR activities.

The implementation of the planned activities is to be carried out by community based institutions. Established committees are allowed to take a leading role in the implementation of DRR activities. Committees and sub-committees can be in charge of DRR, Water, Sanitation Hygiene Education (WASHE)and Waste Management, among others. The committees must be multi-sectoral, involving stakeholders such as staff from government departments, members of Faith Based Organisations, NGOs and community members, taking gender into consideration.

The effective functioning of the committees depends on the preparation done through capacity building, community participation and planning of DRR

interventions as discussed above. Once this is achieved, the preceding stage is the actual implementation of DRR activities in the community.

Step 5**: **Implementation of DRR activities

In CBDRR, the entire process is implemented by the community members themselves. Committees and sub-committees share roles and responsibilities for implementation (See Chapter 7). The implementation recognises existing community leadership and developmental structures. In the Zambian scenario, WDCs have an influential role in the local development of the community.

The aim of participation and implementation is to bring change and improve the living conditions in the community (Abarquez and Murshed, 2004). In the disaster risk reduction process, DRR intervention is meant to build resilience and assist the adaptation of the community regarding disaster risks. The intervention focuses on assisting the community to actively participate in DRR activities that affect them.

DRR implementations by the outside institution / agency: The role of the outside agency at this stage is to ensure that the community at risk implement DRR activities as planned during the capacity building stage. Their role is that of a facilitator and partner, working with the community based institution. The outsider provides guidance to and supervision of the community during the implementation of DRR activities. Other roles include safeguarding project resources such as materials and giving financial advice to ensure the prudent management of resources. Hence, both the community and other stakeholders must have the final say during the disbursal of resources.

The outside institutions allow the community to take responsibility in the use of resources. The local leadership structure and committees are the direct contacts, ensuring the activities are implemented as planned. Where they face a change, the outsider keeps the doors open for technical advice and consultation. During the implementation stage, the outsider prepares the community to own the project, aiming at long term benefits.

DRR interventions which do not have active participation (top-down) of the community at risk normally collapse soon after the project's funding period expires

(refer to the Theoretical Framework in Chapter 1). It must be noted that short term DRR focus may meet the immediate needs of the community but in the long term they are not sustainable. In addition, the short term focus of emergency relief supplies makes the community dependent on relief supplies.

Therefore, the focus should be on sustaining DRR activities that are based on ensuring community participation in finding long term solutions for their vulnerability and their exposure to hazards and disaster risks. The key focus of community based DRR should therefore be on sustaining DRR projects and programmes through monitoring and evaluation.

Step 6: Participatory monitoring and evaluation

The sustainability of community based DRR interventions relies in active participation of the communities-at risk in the implementation of activities (See Chapter 2, section 2.8). The sustainability of DRR interventions must focus on a constant assessment and evaluation of the impact of implemented activities on the community. The effectiveness of DRR interventions should be evaluated with the full participation of the community at risk. In the Urban Hazard Vulnerability Assessment report (UHVA, 2011), the successes of CARE interventions, such as the reduction in cholera and flooding experienced, were attributed to the active participation of the community (See Chapter 7). Challenges in community driven development, such as theft and vandalism, will always be there. However, the solution lies in empowering the local community leadership to create local development structures that are in charge of monitoring and evaluation.

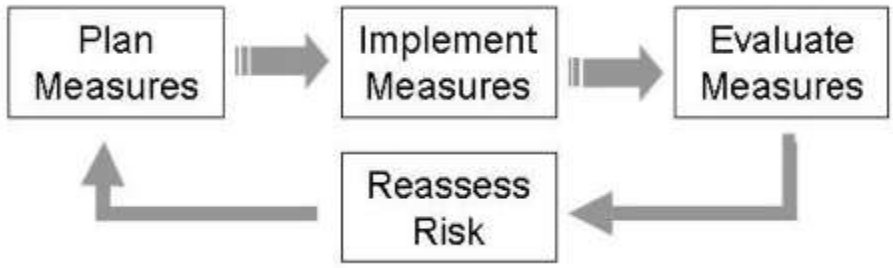
Evaluation is aimed at improving implementation, using local capacity with support from outside. What has been presented above is simply a model for effective and sustainable DRR interventions in a community.

The success and sustainability of community DRR interventions depend on lessons learnt from experiences of disasters in the past and then making improvements to avoid future negative impacts. Participatory monitoring and evaluation is cardinal in analysing the implementation of DRR interventions. Participatory Monitoring and Evaluation (PME) refers to the examining of the progress of implementation as well

as to the supporting of the decision-making and management system (Chapter 2, section 2.8).

Generally, participatory monitoring and evaluation involve having an understanding of DRR interventions and observing changes in vulnerability and risk exposure in the community. Weaknesses and strengths of DRR interventions have to be analysed critically and better approaches should be identified and, where necessary, improvements in the delivery should be made. Community participation builds confidence in the implementation of DRR projects among stakeholders and creates an opportunity to replicate lessons learnt in other communities (See Chapter 7). Most projects collapse when external funding dries up. Sustaining a project at community level is usually a challenge for most communities. Figure 11 provides an outline of the process of sustaining a community project.

Figure 11: Sustaining Community based Disaster Risk Reduction and Management Interventions



8.2.4.1 Sustainability of community based DRR interventions

The steps in closing the loop in DRR are intended to provide guidelines that are necessary for the effective implementation and the continuation of projects by the community. The process follows the planning stage of DRR activities as mentioned earlier, while concentrating more on the monitoring and the evaluation of interventions.

Plan measures: This follows the review of recommendations made after evaluation. Stakeholders, as insiders and as outside support agencies, review what went wrong in order to plan for new measures (Figure 11). The process then continues with the implementation of the reviewed measures.

Implement measures: This stage is based on activities that are to be implemented in the community. The community has dual responsibilities as actors, implementing DRR activities, as well as in reducing the vulnerability of the community as well as their exposure to disaster risks in their community.

Evaluate measures: The next step is the evaluation of measures that were put in place. This is to assess if the implementation of DRR activities helped in reducing vulnerability and exposure to disaster risks. Indicators for evaluation include reduced vulnerability and reduced exposure to disaster risks in the community. DRR interventions strive to improve livelihoods through increasing the provision of of basic services. If no improvement in the lives of community is recorded after implementing measures, the next step is to reassess the risks.

Reassess Risks: After the evaluation of disaster risks, the community reassess the risks to find out what went wrong. This stage acts as an indicator for improving the implementation of DRR activities in the community and for reducing vulnerability. It is from persistent risks that the community based disaster risk reduction planning process begins again.

After reassessing disaster risks, the next stage is to go back to the main stages of understanding the conceptual framework; and then the process of advocacy with the government starts to remind them of their responsibility to ensure that there is development at community level.

The model presented above is simply a synopsis of community based management of DRR in an informal settlement. As opposed to the top-down approach of governments and other external agencies, the community based approach focuses on reducing vulnerability in the community. The community-at-risk takes a leading role in DRR interventions to reduce their vulnerability and exposure to disaster risks. External institutions, on the other hand, are simply there to support the government in providing basic services to the community.

8.3 CONCLUSION

This chapter provides the Community based Disaster Risk Reduction Model, highlighting four major elements in implementing DRR interventions in the

community. This chapter is the fulfilment of the main objective of the study, namely to create a model for community based disaster risk reduction in informal settlements. The procedure for community based DRR focuses on key elements of DRR. These elements include building the capacity of the community at risk in understanding the conceptual framework of DRR, developing a vulnerability and hazard profile of the disasters the community is exposed to, developing legal frameworks and policies relating to DRR and lastly implementing the CBDRRM process. Practitioners of DRR and the community at risk must work together in the planning, implementation, monitoring and evaluation of DRR interventions. Active participation of the community at risk is cardinal.

This CBDRRM model is derived from lessons and experiences learnt in DRR interventions from both the community based approach as well as the top-down approach of DRR. Interventions include projects aimed at reducing vulnerability and hazards in informal settlements. These include access to safe water and sanitation, poverty reduction, solid waste management, drainage rehabilitation and women's vulnerability to disasters. The model also focuses on the sustainability of the community DRR projects after the monitoring and evaluation stage. This is always a challenge in externally funded projects. Sustainability depends on the commitment of the community to continuously monitor and evaluate DRR interventions as well as reassessment of measures in order to improve on implementation.

CHAPTER 9:
CONCLUSION AND RECOMMENDATIONS

9.1 INTRODUCTION

The ultimate objective of this research is to create a model for community based DRR in informal settlements. This chapter presents a summary of the major elements in the process of implementing community based disaster risk reduction and management There has been a recent paradigm shift in managing disaster risks from the traditional (top-bottom) emergency response to a proactive (bottom-up) response (see Chapter 2). Governments and Non-Governmental Organisations respond to disaster risks using either reactive top-down approaches or participatory community based interventions. This study aims to highlight the importance of using the (bottom-up) proactive approach with the active participation of the community in DRR interventions (see Chapter 1).

The ultimate objective of this research is to create a model for community based disaster risk reduction (CBDRRM) as presented in Chapter 8. This is in line with the ultimate objective of this research which is to create a model for community based disaster risk reduction and management in informal settlements as presented in Chapter 1.The model is derived from lessons gained during and experiences of DRR interventions and includes both the reactive (top-down) and the proactive (bottom-up) approach in Kanyama settlement. The implementation was done, amongst others, by the Government of the Republic of Zambia, by CARE International Zambia and by community (see Chapter 6). This chapter is the conclusion of the research and provides a general picture of CBDRRM in informal settlements based on the aim and objectives of this research.

The first objective focused on reviewing the conceptual and theoretical framework for community based disaster risk reduction. In community driven development (as in Chapter 2), community participation forms the basis to mobilise the community to participate in development intervention. The general understanding of disaster risk reduction and management as a paradigm shift is presented in Chapter 2.

The second objective provides a profile of Kanyama Settlement in terms of topographical, spatial, hydrogeological and demographical make-up in relation to disaster risks of flooding presented in Chapter 3. These characteristics have a great bearing on the vulnerability of the community of Kanyama to hazards of flooding and water related diseases.

The third objective highlights disaster risks faced by the community of Kanyama settlement (see Chapter 4). These include flooding, the poor standard of housing units, poor drainage network, poor waste management, lack of access to safe water and inadequate sanitation.

The fourth objective analyses some key Zambian legal frameworks and policies related to exposure to disaster risks presented in Chapter 5. This includes providing guidelines on accessing basic services including water, sanitation, waste management and land-use planning. Key legal frameworks include the Town and Country Planning Act Cap 283 of 1994, the Local Government Act Cap 281, the Environmental Protection and Pollution Control Act No. 12 of 1991, the Water and Sanitation Act and the Disaster management Act of 2010.

Lessons learnt from DRR interventions, using the community based, bottom – up approach which responds to objective 5, is presented in Chapter 6. CARE International Zambia has been operating in Kanyama settlement, focusing on community based interventions targeting the community members to take responsibility of DRR interventions since 1991.

Lastly, the sixth objective of this study is to create a model of community based disaster risk reduction and management (as in Chapter 8). The model is derived from lessons learnt through experiences of responding to disaster risks and hazards in Kanyama settlement as presented in Chapters 1-6. The model focuses on community participation in DRR interventions. Key elements for engaging the community in DRR centre on community participation, using the bottom-top approach, as opposed to the reactive response (as in Chapter 8).

The model is presented in Chapter 8. The community based disaster risk reduction

model presented in this Chapter is determined by a combination of four major elements. These elements are derived from the specific objectives of this research. The objective include the conceptual framework of DRR, the community hazard and vulnerability profile, the legal framework and policies related to disaster risk reduction, as well as experiences and best practice lessons learnt from DRR interventions. These contribute to the design of the actual CBDRRM model. The ultimate objective of this research is to create a model of community based DRRM for informal settlements. Its implementation mainly focuses on community participation in decision-making, implementation and on monitoring DRR interventions.

9.2 A THEORETICAL AND CONCEPTUAL UNDERSTANDING OF CBDRRM

This sections looks at the background of community based disaster risk reduction and the paradigm shift away from the traditional disaster management approach to disaster risk reduction (UNISDR, 2009). The main focus of the paradigm shift has been moving away from the direct command and emergency response approach (top-down) to a community participatory, bottom-up approach. In the new paradigm, disaster risk reduction interventions must be localised and community centred. The Hyogo Frame for Action meeting in Kobe resolved that DRR must be a priority at both national and local levels (UNISDR, 2009). The Hyogo Framework for Action emphasizes the need for local communities to participate in preventing, mitigating and responding to disasters (ADPC, 2004; Li, 2002). In addition, women and children have been identified as the groups that are most vulnerable to disaster risks.

Theoretically, the community based disaster risk reduction approach is a more sustainable approach in managing disaster risks. It recognises that the community at -risk has the best knowledge and understands their vulnerability better than the government and NGOs outside the community (Shaw, 2004). The theory of the community driven development approach (CDD) (see Chapter 2) recognises the role of the local community in coming up with solutions to reduce their vulnerability in the community.

Wisner, (2004) notes that in the disaster risk reduction equation, the exposure of a community to disaster risks is a function of vulnerability and limited capacity to cope

with a hazard. This is true in the case of informal settlements worldwide. Residents in these settlements have limited access to basic services, including water and sanitation, and are generally neglected by governments (as discussed in chapter 4). The poor people who reside in these areas are exposed to a variety of disaster risks including diseases and loss of property. The government, and other powerful institutions, come to the aid of these communities with emergency aid only when a disaster happens.

The possible solution to disaster risk exposure at community level lies in reducing the vulnerability of the people. Vulnerability comes in many forms. It could be political, socio-economically, geographically and cultural. Generally, the most vulnerable members of the community include women, children and the aged.

9.3 COMMON VULNERABILITIES IN INFORMAL SETTLEMENTS

The historical background of a settlement plays a very important role in tracing the root of vulnerability of the community to disaster risks (See Chapter 4). For instance, the uncoordinated development of the infrastructure in Kanyama settlement started when it was a village under Chief Lusaka before becoming a farm for Potgieter in the 1930s. People from various parts of the country started migrating into Lusaka in search of a better life. When Potgieter left, Kanyama became a free for all or a no man's land with people settling illegally without following any settlement guidelines. The other factor attracting people is the presence of the Chinika industrial area (See Chapter 3, Figure 3). It attracts migrants from all over the country in search of a better urban life.

The acquisition of land was orchestrated by corruption. Political influence played a major role in the allocation of land for residential development. The local government has limited capacity to implement legal frameworks and policies to ensure that people settle on safe locations. Guidelines and regulations are there, but the challenge is to ensure that the guidelines and legal frameworks are adhered to by the community. For instance, the Town and Country Planning Act Cap 283 of 1994 and National Housing Policy, if well implemented, would prevent people from settling in unsafe, hazard-prone locations. People build substandard housing units without leaving any space for drainage and road networks. Furthermore, the lack of a waste

management system has made people dump waste in the few existing drainage systems which causes blockage during the rainy season.

Kanyama is one of the most disaster prone informal settlements of Lusaka. The community is particularly vulnerable to flooding. The government, through the Lusaka City Council and the Disaster Management and Mitigation Unit (DMMU), attempts to provide basic services to protect the community against hazards. These attempts are supplemented by nongovernmental organisations (NGOs).

A settlement may be vulnerable to disaster risks based on its geographical location. The vulnerability of the community may depend on geographical phenomena, including the topography, landscape, geological, hydrogeological and demographical formation of the community (see Chapter 3). Informal settlements are often located on the outskirts of urban centres and cities (Mulenga, 2003; ECZ, 2008), normally in unsafe locations. Informal settlements are usually characterised by high population density, unplanned residential housing units with no access to roads, poor drainage networks resulting in flooding, limited access to water and sanitation and high poverty levels. In addition, these settlements receive very little attention in terms of provision basic services from the government since it started as an illegal settlement.

Residents resort to settle on any space available, including hazard prone locations. Water has to be sourced from shallow, hand dug wells close to pit latrines with a very high risk of underground water contamination (see Chapter 4). The community has no waste collection system in place, leaving heaps of waste at markets and other public locations. During the rainy season, the heaps become environmental hazards and breeding grounds for vectors, contaminating ground even more. Additionally, lack of space for waste disposal facilities make residents dump waste in sinkholes left after quarrying. This causes even more damage to the underground water sources.

The challenge here is that, despite locations being geographically hazard prone, people will always settle in such locations (Chapter 3). The hazard profile of most informal settlements are natural, with very little one can do to change the situation, apart from avoiding settling there. Vulnerabilities in informal settlements are a combination of rapid urbanisation and high poverty levels. Natural conditions, such

as geological formations lead to flooding, but it is people's limited access to safe locations that force people to settle in such locations anyway. These are among the major factors that contribute to the exposure of communities in informal settlements (Kanyama settlement) to disaster risks.

9.4 DISASTER RISKS IN INFORMAL SETTLEMENTS

Informal settlements are more exposed to disaster risks than formal and planned settlements in the same city. The exposure of communities residing in informal settlements to disasters and hazards is well known globally. Governments, particularly in developing nations, have limited resources to provide in basic needs (LCC, 2008). The government has no obligation to provide basic services to informal communities due to their illegal background. Research findings in Chapter 4 reveal that flood related hazards are the most common disaster risks experienced in Kanyama Settlement. There is a high prevalence of water-related disasters, particularly cholera and diarrhoea, during the rainy season. The other impact of flooding is damage to physical infrastructure. A heavy downpour is always a big worry for the Kanyama residents. Roads become flooded and houses collapse, leaving hundreds of people homeless.

The background of flooding experienced in Kanyama follows a trend of 10 years, according to the historical profile of the settlement. In 1968 there was a serious flood, the famous "Kanyama disaster" flood (presented in Chapter 4, image 4.1a) which still remains in the minds of the people. Hundreds were evacuated and resettled in Kuomboka in Chawama, another informal settlement. Other major floods were experienced in 1988 and 2009/2010, submerging the primary school and the Kanyama Health Centre grounds. The government, through the Office of the Vice-President's Disaster Management and Mitigation Unit (DMMU) and with the support of partners, had to evacuate about 400 families to the footballs stadium for safety (Refer Chapter 1, section 1.4). However, after the rainy season, residents still return to their flood prone residential settlements. During periods of extreme flooding, school attendance in the two public primary schools drops significantly. At times, for instance during the floods of 1998 and 2009/2010, schools were even closed. The health centre being flooded made it difficult to access medical services.

The government of the republic of Zambia, through DMMU, has been responding to disaster risks related to flooding by providing tents, relief food supplies and assisting with the evacuation of residents in some cases. The challenge with the government approach has been that it is only meant for emergency. After the disaster, the victims are soon forgotten and not provided with any sustainable solution. On the other hand, the community also end up becoming dependent on relief. By returning to hazard prone locations, they are assured of emergency supplies when disaster strikes. Additionally, the proximity of Kanyama to economic opportunities in CBD and the Soweto market, leaves the community with limited alternatives to look for safer locations elsewhere.

The upgrading process (Town and Country Planning Act Cap 283 of 1994) was implemented in corroboration with support from donors, NGOs, Care International Zambia, Lusaka District Commissioner's Office and the Kanyama community itself, among other stakeholders. Measures included providing safe water and sanitation facilities and designing a new drainage system. This project is ongoing. Funding of the project was a challenge. CARE sourced some funds (K12 billion) and the money was handed over to the Lusaka City Council for implementation. But due to bureaucracy, the funds were not well accounted for, resulting in the collapse of the project.

Kanyama's exposure to disaster risks can be attributed to both natural and human causes. Natural, because due to geographical factors, including the geological dolomite formation which does not allow the easy percolation of water and the flat undulating topography, which does not allow water to flow easily, the settlement is flood prone. On the other hand, poverty is also a contributing factor. People have limited options for selecting safe locations. The government's model of (top-down) relief and emergency response does not help in reducing vulnerability of the community in the long term. As presented in Chapter 4, the community becomes flooded during the rainy season, and the then depends on emergency response from the government.

In view of escalating exposure and losses suffered due to disaster risks, the government has made huge efforts to reduce vulnerability in the community. There are adequate legal frameworks and policies concerning the establishment and

management of residential settlements that are safe for human habitation, but the implementation remains a challenge.

9.5 LEGAL FRAMEWORKS AND POLICIES IN DRR ZAMBIA

Chapter 6 presented experiences in and lessons learnt from DRR interventions in Kanyama settlement. The lessons learnt showed that two approaches were used in reducing vulnerability in the community. The government employed the top-down approach while CARE employed the bottom up approach. It must be noted that both approaches are supported by the legal frameworks and policies by the government for the benefit of the community at risk. CARE International Zambia aimed at making the community become main actors in implementing developmental projects which, in turn, will reduce their exposure to disaster risks. Projects implemented focused on addressing access to safe water and sanitation (see Chapter 6) which are the major challenges the community face.

True to the first theoretical statement, lack of comprehensive governance and legal frameworks contribute to the failure to set clear disaster reduction targets for communities at risk (Holloway, 2003; Pelling and Wisner, 2009). It is the responsibility of the government to provide basic services to its citizens through local authorities (see Local government Act, Cap 281 of 1991 in Chapter 5). The Food-For-Work (FFW) Project under PUSH I&II by CARE, for instance, were implemented based on the reactive emergency relief response project but ended up making residents dependent on relief rather than finding lasting solutions. On the other hand, projects such as PUSH II and PROSPECTS worked on strengthening and building the capacity of local community structures (WDC, RDC and ZDC) at ward and zone level respectively, so that citizens can be active participants in the developmental process.

Unsafe water and inadequate sanitation continue to be the main factors exposing the Kanyama community to water borne diseases. CARE, working with the community, implemented the Kanyama Water Trust Water Supply Project (Chapter 7, section 7.4.4.1). It is a community based project involving the participation of the community in the management of daily operations. It has provided safe water and

simultaneously created jobs for residents who work as water vendors at the water kiosks around the settlement.

The vulnerable members of the community, women and girls, were not left out. The F-F-W project provided food security and had women actively participating. Girls are the future women in the community and adolescent girls participated, acting as role models to sensitise their fellow pupils on sanitation and hygiene education. As an outside agency, CARE recognised the importance of partnership in development. CARE partnered with other outside institutions in its implementation, CARE included the local authority LCC, water utility companies, learning and research institutions, schools and universities in capacity building training for community members on water quality testing, disaster risk reduction and water and sanitation hygiene education. A good rapport between the outside institution and the community at risk, using the participatory bottom up approach, can assist the community in analysing and identifying their vulnerabilities and finding solutions to their needs (Venton and Hansford, 2006). The following chapter provides a model for community based disaster risk reduction based on CARE International Zambia's experiences in community development projects.

The top-bottom, relief and emergency looks at communities at risk as helpless victims while the bottom up, proactive approach, on the other hand, focuses on community participation in disaster risk reduction activities and on building resilient communities.

The chapter presents key legal and policy frameworks associated with residential settlements and disaster risks exposure. The Town and Country Planning Act Cap 283 of 1994 and the National Housing Policy of 2006 all provide guidelines for the approval of land use plans and giving permission for the construction of standard housing units in safe environments. Additionally, the Disaster management Act of 2010 and the Zambian National Policy on Environment of 2007, aim at ensuring that a safe environment in residential settlements is created. Implementing these policies effectively would really help prevent the mushrooming and growth of informal settlements in Zambia. Community participation has also been recognised as being cardinal in risk reduction and management.

The Local Government Act Cap, 281 of 1991 allows local authority, LCC, to delegate functions through the participation of the community in local development through the formation of Ward and Residents Development Committees (RDC and WDC) respectively, as well as Community based Enterprises (CBEs). In general, guidelines are adequate to create disaster-free residential settlements, if only they were implemented effectively.

Lastly, responding to disasters only once they strike, as was done by the Disaster Management and Mitigation Unit (DMMU), has not been helpful in reducing the vulnerability of Kanyama residents to disaster risks. The reaction approach of providing relief in times of disaster creates the dependency syndrome for the community who then merely depend on relief handouts. Furthermore, this observation is supported by Turnbull, Sterrett and Hilleboe (2013), who argue that communities affected by disasters tend to be very receptive to interventions from outside that aim to reduce their vulnerability to similar hazards.

9.6 DRR INTERVENTIONS IN INFORMAL SETTLEMENTS - A CASE OF KANYAMA

In Chapter 6, lessons of best practices in DRR interventions are presented. The government has, in most cases, responded to disaster management using the reactive (top-down) approach by providing relief supplies including tents, food and water to affected families. This has not helped much in reducing vulnerability in the long term. Families assisted with relief unfortunately return to their unsafe conditions and face similar challenges every year.

On the other hand, the community based approach using the (bottom–up) proactive interventions focused on community participation in the implementation of DRR interventions (discussed in Table 5, Chapter). Projects implemented included Food-For- Work under PUSH I and II to improve food security in exchange for labour in the construction of roads and drainage in the community. The Kanyama water Trust is yet another community based project aimed at providing safe water and sanitation, with members from the community working as water vendors.

Understanding the conceptual and theoretical theories associated with DRR is important for community participation in DRR. Community based training was conducted by Mulungushi University's Disaster Management Training Centre where this researcher was a facilitator. The project was called Strengthening Peri Urban Risk Reduction in Zambia (SPURRZ). The training content included understanding DRR concepts, contingency planning, PRA tools for vulnerability assessment, early warning and community based disaster risk reduction basics (as discussed in Chapter 7, section 7.4.6). The problem tree analysis was used to identify hazards and community vulnerability to disaster risks.

The training session attended by zone leaders in Kanyama community was a "Trainer Of Trainer's" workshop. The trained community members went ahead formed Disaster Risk Reduction (DRR) committees in their respective zones. These became involved door to door community sensitisation and awareness campaigns.

9.7 A MODEL FOR COMMUNITY SUPPORTED DRR INTERVENTIONS

It is the ultimate aim of this study to propose a model for disaster risk reduction for informal settlements. Informal settlements are neglected residential areas located on the outskirts of urban centres with limited provision of basic services by governments. These settlements are exposed to a variety of disaster risks due to geological, hydrogeological and historical factors as can be seen in the profile of the settlement in Kanyama as presented in Chapters 2-4.

The government has responded to disasters by providing emergency supplies, the evacuation of victims and by providing water treatment interventions on an annual basis. However, this has not yielded much positive results. Disaster efforts by the government have often been taken as benefits for the state from the state. The community, in most cases, is not consulted on activities to reduce their exposure permanently. CARE International, on the other hand, used the community based approach and came up with measures to help reduce vulnerability in Kanyama.

The CBDRRM model presented in Chapter 8, Figure 10 has four key elements to be considered namely:

- Theoretical and conceptual framework of DRR;

- Hazard and vulnerability profile of the community;
- Legal framework and policies; and
- Community based DRR and management process.

These elements represent major guidelines for implementing DRR interventions in the community. However, the order in the implementation is not rigid, but can be adapted in any format depending on the situation appropriate to the practitioner's view. The success and effectiveness of community participation in DRR depends on correct understanding and perception of the community at risk.

The study finally concludes, in line with the first theoretical framework, in part that "lack of comprehensive governance and legal framework, usually (top-down approach) contributes to the failure to set clear disaster risk reduction targets for communities-at-risk" (Holloway, 2003, Pelling and Wisner, 2009).

In accordance with the second theoretical framework, "the most effective way to reduce disaster risks in informal settlements is to work with the local people to identify and analyse their vulnerability". The sustainability of DRR in this model requires that the community at-risk own the DRR. The focus of DRR interventions should therefore be on tapping into the local community labour force to reduce their vulnerability and exposure to disaster risks. The community will have the sense of ownership of the project and will therefore sustain it.

9.8 RECOMMENDATIONS

Having analysed vulnerability and exposure of communities such as Kanyama to disaster risks, including lessons from experiences in DRR interventions by CARE International Zambia, the following recommendations are proposed for sustainable community based DRR interventions:

- The implementation of any constructive decisions to upgrade informal settlements should be expedited so that communities can have access to basic services including safe water and sanitation, accessing education and health services, having regular waste collection services, among others. This would help reduce the use of contaminated shallow wells and pit latrines and reduce disaster risks ;

- The government should allocate more resources to local authorities for the provision of basic services water and sanitation including land use planning and development control for the construction of housing units;

- Currently, land allocation has been mismanaged by local community leaders who end up allocating plots on unsafe locations. Furthermore, government should enforce laws and regulations regarding settlements more rigorously to prevent people from settling in locations unsafe for human settlements rather than waiting for settlements to be established before shifting;

- Extend DRR awareness campaigns to schools (by integrating DRR into the curriculum), churches, market places and shops and conducting road shows to sensitise members of the community;

- Planning for DRR interventions should include putting an exit strategy in place, for continuation of the project once external support is withdrawn or comes to an end. Community based structures should be capacity-built to carry over the project when external support comes to an end; and

- DRR interventions should focus on long term developmental projects to provide basic services, including safe water, adequate sanitation, waste management and land-use which include community participation as done in the case of Kanyama Water Trust.

9.9 FUTURE RESEARCH

This research has revealed that community based (bottom-up) intervention in DRR is an effective way of reducing vulnerabilities in the community. In light of this, I recommend future research in the following subject areas:

- A detailed analysis on the quality of water from shallow wells and its impact on the health of community members and

- Developing a community based strategic plan for disaster risk reduction for Kanyama settlement

9.10 CONCLUSION

This chapter provides a summary of the entire research on community based disaster risk reduction and management for informal settlements. Informal settlements are deprived of basic needs required for sustainable livelihoods due their illegal origins. Kanyama is located in an area prone to flooding due to its geological and hydrogeological profile. Findings have shown that the government's response has been reactive, emergency- based with a focus on providing relief response. On the other hand, CARE International Zambia approached DRR intervention by targeting the community members.

The CBDRRM model created in this research emphasises community driven development and the participation of the community members in addressing DRR. The procedure starts with building the capacity of the community to understand the theoretical and conceptual frameworks of disaster risk reduction. Development agencies need to build the capacity in the form of understanding disaster risks and hazards. Secondly, a profile of factors that make a community vulnerable to disaster risks have to be noted. These could be geological or demographical in nature. This step is then followed by analysing disaster risks facing the community. The outside institution has to take note of legal frameworks which failed to help in reducing disaster risks. After this stage, the next activity is to look at interventions that have been put in place to address disaster risks. The planning of DRR interventions will be based on DRR lessons learnt.

This new model is not without any challenges. Community willingness to participate is cardinal for its successful implementation. Caution has to be taken not to make the community become dependent on handouts. The aim of community based disaster risk reduction and management is to make the community self-reliant. The research has revealed that the bottom–up approach encourages the participation of the community at risk to take responsibility and participate in solving the problems.

To respond effectively to disaster risks, there is a need to create an understanding of the theoretical and conceptual frameworks of DRR which includes key concepts of DRR such as the origin and the paradigm shift from disaster management to disaster risk reduction. Then a hazard and disaster profile of the community has to be

developed. This highlights factors that contribute to exposure to disaster risks. Factors could be geographical, geological, historical or demographical in nature. Kayama settlement has a geological rock formation of dolomite which is responsible for flooding. After the hazard profile, the vulnerability, exposure and impact of hazards on the community have to be analysed. The impact includes outbreaks of water-borne diseases and the fact that flooding destroys property and livelihoods. The government has legal frameworks in place to provide guidance on service delivery. Acts such as the Town and Country Planning Act Cap 283 provide for the location of residential settlements on safe locations and the Public Health Act ensures that people are free from exposure to diseases.

It is because of the failure to comply with these legal frameworks that informal settlements continue to grow and exist in urban areas. Interventions in DRR can be either be reactive emergency (top-bottom), providing relief food, water or they can be proactive, emphasising preparedness and prevention after learning lessons from disaster risks experiences. Lessons from CARE International Zambia in Kanyama have shown that the bottom-up community based interventions have proven to be effective and sustainable.

The government, on the other hand, has a crucial role to play in reducing exposure by addressing the underlying causes of vulnerability such as effective land use planning on safe locations, providing adequate water and sanitation services. Informal settlements need to be upgraded expeditiously and no new informal settlements should be allowed to grow. Legal frameworks must be adhered to strictly. Otherwise, if no proactive measures are put into place, informal settlements will remain hotspots for disaster risks, retarding development both at city and national level while citizens have to respond to disasters rather than hazards.

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APPENDIX A: Permission to use CARE International on DRR information

CARE International in Zambia
Plot 9, Chilemwiko Close, Kabulonga
P. O. Box 36238
Lusaka, Zambia
Tel: +260 211 267950-4, 58-9
Fax: +260 211 267956-7
E-mail: info@carezam.org
Website:http://www.careinternational.org

11 April, 2014

North West University,
South Africa.

Dear Sir,

Permission Granted To Adrian Phiri To Use Information Of CARE Zambia For PhD Studies With Your Institution.

This is to confirm that we have upon receipt and consideration of the request, allowed the above named individual to use our information (Zambia Disaster Risk Reduction and Related Activities in KanyamaSettlement) for the sole purpose of academic only.

This is for the research titled **"Creating A Model in Community - Based Disaster Risk Management for Informal Settlements: A Case Of Kanyama Settlement Lusaka, Zambia."**

Any other use not mentioned in this letter is prohibited.

Yours faithfully,

Dennis O'Brien
Country Director

APPENDIX B: Focus Group Discussion (FGD) Interview Schedule: Kanyama Settlement

A. Background Information of Kanyama settlement

1. What are the major sources of livelihood in this area?
2. What are the main sources of water and sanitation?
3. What challenges do you encounter with the sources of water and sanitation mentioned?
4. What interventions have been put in place to address these challenges and by whom?
5. What is historical profile of Kanyama settlement? (before and after independence)

B. Hazards and Disaster Risks Profile

6. Definition of disasters and hazards (what do you understand by hazard and disaster risks?) Give examples of the most common hazards and disaster risks faced in Kanyama settlement
7. What are the main causes of these hazards risks mentioned ?
8. What assistance do you get in mitigating these hazards from becoming disasters?
9. Explain from whom?

C. Disaster Risk Reduction Interventions :

10. What role does the government play in your community in preparedness and coping strategies during flooding exists?
11. What projects has been in place by the private sector and NGOs in DRR?
12. CARE International Zambia DRR in Kanyama settlement: What role has CARE International played in DRR in Kanyama ?
13. Compare interventions in Place by CARE International Zambia and the Government of Zambia through Lusaka City Council and Disaster Management and Mitigation Unit (DMMU)?
14. Which institution has helped in mitigation of flooding?
15. What external assistance do you get in times of hazards and from whom ?
16. What do you think is the best way to sustainable handle disaster exposure?

APPENDIX C: Key Informants Interview Guide

Analysis of Community based DRR in Kanyama Settlement

Respondent's Name :……

Position in the Institution:……

Date:……

1. What are your responsibilities in your institution concerning Kanyama settlement?
2. What are some of the hazards and disasters experienced in the Kanyama?
3. How have these hazards and disaster risks been handled and by who?
4. What role has the government, private sector and NGOs played in responding to disaster risks and hazard?
5. How has community participation been to these disaster risk reduction interventions?
6. What challenges does the community face in reducing disaster risks in Kanyama?
7. In relation to government policies and legal frameworks, is Kanyama settlement habitable settlement?
8. What is your perception on CARE International's projects in Kanyama?
9. Compared CARE and the government, which interventions have been more effective in your opinion and explain why you think so?
10. Would you recommend community participation or is it the mandate of the government to implement DRR interventions? Explain your answer
11. What is your overview of the understanding that it's the responsibility of the community disaster residing?
12. What is the way forward in implement institution ? Is the government's way or NGOs approach effective ? Explain your answer?.

APPENDIX D: Questionnaire for Kanyama Household Interviews

Survey Date …….2011 Survey Number ……

(Answer by ticking or filling in the spaces)

Part 1: *Personal Information*

1	Zone No.	Ward No.				
2	Age	1. 14-21	2. 22-35	3. 36-50	4. 51 plus	
3	Gender	1.Male	2.Female			
4	livelihood	1.Trading	2.Formal Employment	3.informal employment	4. Others specify……..	
5	Level of Education	1.Basic Education	2. High School	3. Tertiary Level	4. None	
6	No. of People in the Household					
7	Perception of the threat of disaster risks in your zone	1. Minimal	2. Low	3. Medium	4. High	5. Very High
8	Changes in disaster losses(lives , livelihood, property and assets) since 2005	1. Substantial Increase	2. Slight Increase	3. No change	4. Slight decrease	5. Substantial decrease
9	Common disaster risks in you zone	1. Cholera	2. Floods	3. Poor sanitation	4. Poor quality of water	5. Waste disposal / 6. Others specify……
10	Rank disaster risks you face starting with the worst	1.	2.	3.	4.	5.

Part 2: *Community Vulnerability to Disasters*

12	Material your house is made of.	1.Bricks and iron sheets	2.Mud and iron sheets	3.mud and grass	4.others specify ……
13	Source of water	1.Communal Tap	2. Hand dug Well	3. Private tap	
14	Quality of water	1.Very Good	2. Good	3. Poor	4. Don't Know
15	Toilet Facilities	1.Pit latrine	2. Flush Toilet	3. Open spaces	4.No toilet
16	How accessible are health services and facilities		1.Easy	2. Not easy	

17	If Not easy, Give reasons	1.Clinic is far	2. Costly	3.No drugs	4.Other specify ……
18	Are education facilities easily accessible in your zone	1. Yes	2. No		
19	If No give reasons	1. Too far	2. Costly	3. Other specify	
20	Is your house able to withstand heavy rains	1.Yes	2.No		
21	If No, what do you do in case of floods	1.Go to neighbours and relatives	2.Wait for assistance from others	3.Nothing	Others specify ……
22	What do you think are the causes flooding in your area?	1.Impervious rock	2. blocked drainages	3. No drainages	4. Don't know
23	List particular areas in your community that are vulnerable to disaster risks?	1.	2.	3	4
24	Are you or do you have someone in your household	1.Elderly (old)	2. Disabled or terminally ill	3. 0-5years old	
25	Access to information & communication services	1.cell phone	2.Radio	3.TV	4.None

Part 3*: Capacity Assessment*

26	Are there community disaster risk management plans being implemented	1. Yes	2. No	3. Don't Know
27	Does the community have access to seasonal forecasts and other climate information	1. Yes	2. No	
28	Is there a functional early warning systems in place	1. Yes	2. No	3. Don't Know
29	If, Yes, give an example			
30	Does the community have capacity to monitor, analyze and disseminate information on current and future disaster risks	1.Yes	2. No	4.Don't Know

End of interview
Thank your for your time

APPENDIX E: Personal communication with officials

Dates of interviews : 14 – 18th April, 2013.

- Mwanamwambwa, C.K.,February. Director, Northern Region, CARE International Zambia , Lusaka, Zambia.
- Mukomba, B. December, SPURRZ Project Manager, Water and sanitation CARE International Zambia, Lusaka.
- Sigundu, B. April , Ward Development Committee Secretary, Kanyama Ward 11. Lusaka.
- Musonda. A. May, Director of Public of Health, Lusaka City Council.
- Kabungo, M. November, Assistant Director of Planning, Lusaka City Council, Lusaka.
- Tembo, J. April, Principal Environmental Health Technologist, Kanyama Health Centre, Lusaka.
- Mpulumusi J. Community based Enterprise (CBE) Member, Kanyama Settlement.
- Kabunda T. Programme Manager, CARE International Zambia, Lusaka.
- Malala, P. SPURRZ Project Management Coordinator, CARE Zambia, Lusaka Zambia.
- Kateya, L. Manager, Kanyama Water Trust, Kanyama Settlement. Lusaka.
- Mwangelwa, C. Coordinator, Victim Support Unit, Kanyama Police Station.
- Simoonga, M.Deputy Director of Engineering, Lusaka City Council.
- Joseph Ngoma, Interim Ward Development Committee Chairperson, Kanyama Settlement.

APPENDIX F :List of community members interviewed

Date of interviews: 14th April to 31st July 2012

1. Mr. Lucas Banda, Guidance Teacher Twashuka Basic School
2. Mr. Leonard Cheelo, Ward Development Committee Chairman
3. Ms. Anisa Phiri, Zone 13 Leader
4. Ms. Yvonne Mulemeli, Zone 9 Leader
5. Ms. Juliet Tembo, Zone 11 Leader
6. Ms. Melody Simukali, Field Officer Children International
7. Ms. Mary Mweene, Masauko Market Fee Paying Toilet Vendor
8. Mr. Aishula Phiri, Resident Kanyama West (Ecosan Toilet Owner)
9. Mr. Nyambe Simushi, Teacher Kanyama Salvation Army Community School
10. Mr. Raphael Gavio, Teacher Kanyama Salvation Army Community School
11. Mr. Gabriel Chipilipili, Head teacher Kanyama Salvation Army Community School
12. Mrs. Rhoda Mweemba, Chairperson Ward Development Committee, Kanyama, Lusaka
13. Mr. Charles Banda, Teacher, Twashuka Primary School, Kanyama, Lusaka
14. Ms. Grace Nanyangwe Mwanza, Teacher, Primary School