Vulnerability Reduction and Building Resilience to Floods

A case study of Kanyama Community in Lusaka Province Zambia

by

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DECLARATION

I declare that the thesis hereby submitted for the qualification of a Master's degree in Disaster Risk Management at the University of the Free State, in the faculty of Natural and Agriculture Sciences, is my own independent work. I have not previously submitted and do not intend to use the same work for a qualification at another university or faculty.

Names:

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ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
CRS	Catholic Relief Services
CDERA	Caribbean Disaster Emergency Response Agency
CSO	Central Statistics Office
DMMU	Disaster Management Mitigation Unit
DRR	Disaster Risk Reduction
ECZ	Electoral Commission of Zambia
FEMA	Federal Emergency Management Agency
FNDP	Fifth National Development Plan
GIS	Geographical Information System
HIV	Human Immuno- Deficiency Virus
IDS	Institute of Development Studies
IPCC	Intergovernmental Panel on Climate Change
ISDR	International Strategy for Disaster Reduction
IUCN	International Union for Conservation of Nature
LDC	Least Developed Country
MMD	Movement for Multi-Party Democracy
PF	Patriotic Front
PAR	Pressure and Release

RDC	Residence Development Committee
SLF	Sustainable Livelihood Framework
SNDP	Six National Development Plan
UN	United Nations
USAID	United States Agency for International Development
UNESCO	United Nation Education Scientific Cultural Organization
ZNBC	Zambia National Broadcasting Corporation
ZRCS	Zambia Red Cross Society
ZVAC	Zambia Vulnerability Assessment Committee

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ABSTRACT

The increase of informal settlements in Zambia has not only created need for more services but also created hazards and potential disasters. In the past five years and more, the community of Kanyama in the Lusaka district and Lusaka province has continued to experience floods. This has raised many questions about why most vulnerable people of this community are the most affected. The analysis of the 2009/ 2010 floods discusses the impact on socio-economic, ecosystems and political variables. The researcher of this study outlines how different characteristics of these factors have shaped people's livelihoods and caused vulnerability to flood hazards and the diseases it comes with.

The issue of vulnerability being associated with poverty, and people with social capital perceived to be less vulnerable is also investigated. The subject of resilience has been analyzed with reference to social capital and how much assets one has to be able to build resilience during floods or recover after floods.

The impact of flooding and measurement of vulnerability and resilience through application of relevant tools and methodologies have been investigated. These have been derived from the theoretical frameworks from which there has been a design of an adapted framework on which recommendations to this study have been made as a follow up on further studies.

Application of the adapted frameworks are based on the framework for vulnerability reduction and resilience building and outlined as vulnerability assessment, identification of vulnerability and resilience indica-

tors, Identification of root causes, analysis of capacities, identification and linkages of key stakeholders, review of legislation and policies, financial resource mobilization and disbursements and decentralization of strategy formulation.

The core words used are: vulnerability, resilience, preparedness, risk, hazard, disaster, socio-economic, ecosystems, political systems, disaster management, emergence response, and recovery and community participation.

The work on the study began in 2011 before Zambia went for her 6th democratic elections and concluded after the elections had taken place. Some information regarding Zambia may have changed in line with the new government.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Climate and weather-induced disasters account for the largest number of natural disasters and affect more people than any other type of natural hazards. Extreme weather and climate events often have severe socio-economic impacts, such as loss of lives and livelihoods, food, water and energy scarcity, and adverse impacts on human health and the environment (USAID, 2009).

Zambia has not been spared from natural disasters and hazards and disasters for epidemics, drought and floods occur. Zambia (figure 1) is an irregularly shaped, land-locked country occupying an area of 752,614 square kilometres. She is surrounded by Angola, Botswana, Democratic Republic of Congo, Malawi, Mozambique, Namibia, Tanzania and Zimbabwe. It has no coast, but shares vital water bodies with neighbouring countries, as the main river basins of the country are trans-boundary. The river Zambezi drains about three quarters of the country, and the Congo River in the south about one-quarter of the country. The country is divided into nine provinces, namely Central, Copperbelt, Eastern, Luapula, Lusaka, and Northern, North-Western, Southern and Western provinces. These provinces consist of 72 districts. The population distribution of the nine provinces varies considerably, with the Copperbelt province having the highest population, which is attributable to mining activity (CSO, 2000). In terms of socio-economic development, there are variations between provinces with respect to the profile. It is clear that there are major differences between rural and urban provinces in terms of economic and social provisioning. Economic opportunities that tend to be concentrated in urban centers have encouraged the phenomenal rural-urban migration that

has dire consequences for the urban centers where pressure on infra-structure services such as housing and sanitation has been great (Fifth National Development Plan, 2006-2010).

Figure 1: Map of Zambia

Source: Adapted from Geology.com (2007)

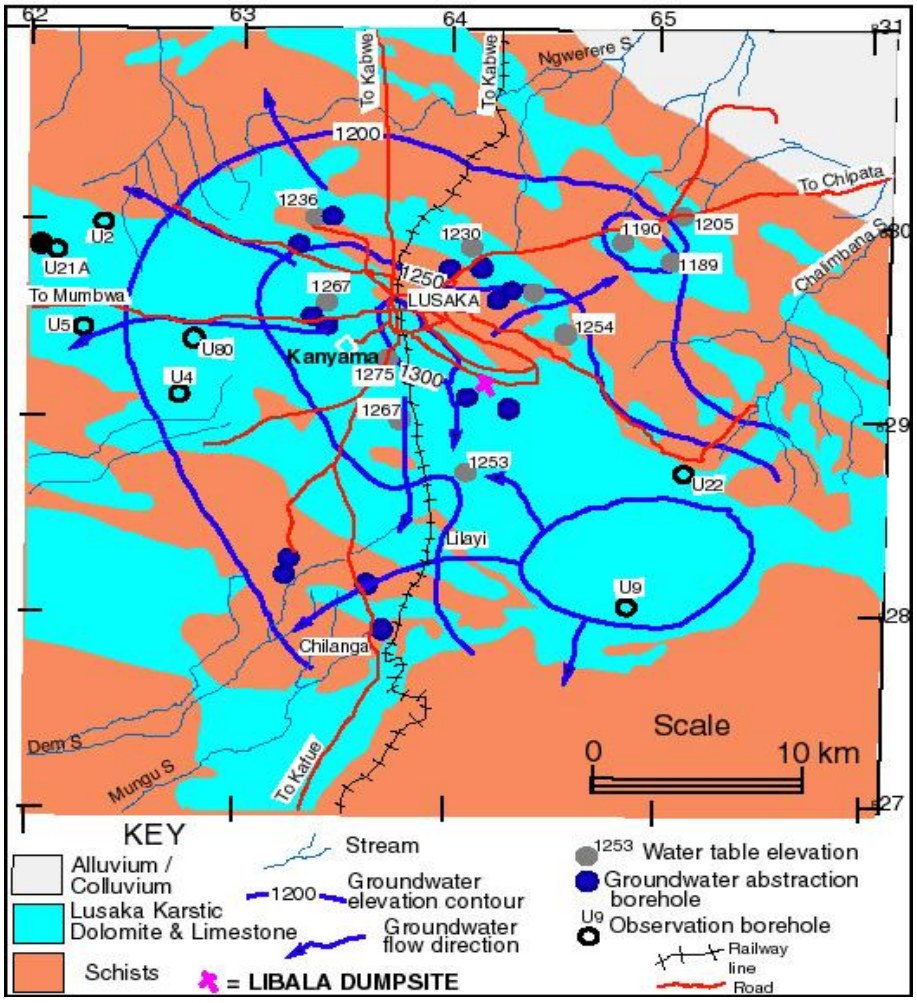


Figure 2: Hydrogeology and geology map of the Lusaka area. The position of the Kanyama settlement is indicated

Source: (Tiger, 2010)

Lusaka province with a population of over 2.1 million (Central Statistics Office,2011) covers an area of about 22,000 square km and has 2,190,000 hectares of land of which 55 percent is arable (Central Statistics Office, 2000). Lusaka and North-Western parts of the country

experience a lot of rains that led to flooding. Kanyama constituency with a population of 366,170 (Central Statistics Office, 2011) south and west of Lusaka (see figure 2) has had the problem of floods for a long time now. Floods in Kanyama Compound go back to more than thirty years, and this brought a lot of suffering, including the floods of 1978 that triggered compassion and creation of a Kanyama Disaster Fund, then (Ndhlovu, 2008). The problem of floods in Kanyama still exists and this occurs during the rainy season the period from November to March/April. “Floods have become an annual phenomenon resulting in thousands of people being displaced while their crops have been washed away. Infrastructure, such as bridges and roads in some parts of the country has been damaged and an ailing economy such as Zambia cannot afford to allow such a situation to continue,’’ (Times of Zambia, 2009).

These floods affect mostly the poor and underprivileged namely women, children, elderly and the physically challenged. Floods damage property, disrupt livelihoods and also displaces the affected population. The people of this community have become vulnerable for a very long time and this has to be reduced in order for them to have meaningful sustainable livelihoods. The adaptation by the people of Kanyama needs to be well built and strengthened by the community itself. However, this can only be achieved through a multi-disciplinary approach by all stakeholders especially the Central and Local governments, Private Sector, Civil Society, the Church, International Organizations and Cooperating partners. With the Disaster Management Act No. 13 of 2010, the government should be able to effectively spearhead projects and programs that should reduce vulnerability and build resilience in Kanyama.

For this community to be a successful or resilient there has to be availability and effective use of tools and techniques such as building human resources, access to equity finance, infrastructure, research, planning, access to credit and building human resources. The community can strengthen and build behaviors by taking a multi- functional approach to create a sustainable development system within the community. Energy has to be focused on both financial and human resources and the establishment of critical mass of co-operating organizations through which locally based initiatives are implemented and evaluated (Centre for Community Enterprise, 2000).

Kanyama community can achieve reducing vulnerability and building resilience through the role of various institutions and stakeholders support, as most of the population is too poor to manage a flood hazard or disaster.

1.2 Motivation

This study will show how flood management in Zambia has been influenced by human activities and interventions and the impact this has had on communities in flood prone areas. Despite the fact that the government has shown political will in disaster mitigation, there is a lot that needs to be done to manage flood disasters. Even though floods are natural events, other factors have contributed to the vulnerability of those that live in flood affected areas. Poverty is one of the underlying causes and this will be explored to find out how the Kanyama community has been affected by floods due to high poverty levels. Floods affect areas where people, who are subjected to different economic, social and cultural constraints, settle. The impact of floods on society will

depend on the effectiveness's of flood management and mitigation (Weichselgartner, 2005).

Different people respond differently to the effect of floods and the study will explore the ways a community such as Kanyama has adapted to flood events. Unity has survived various floods of varying severity and an objective of the study is to find out whether the population understands and has considered the risk of flood hazards or disasters and what makes them adapt and continue living in such an environment.

The focus of this study is about the socio-economic impact of the floods using the Kanyama community as a case study. This study also examines the notion of vulnerability with regard to the target community. The underlying causes of the community's vulnerability are examined and why different individuals or groups are less vulnerable than others shall be investigated. The analysis should provide a clearer and wider understanding of the underlying causes of human vulnerability in a local setting and directing more attention to those most disadvantaged such as the elderly, physically challenged, women and children.

1.3 The problem statement

The problem statement for this research is captured in the following research questions:

- What is the effect of floods on socio-economic, ecosystem and political variables of the Kanyama community and how has the community coped with floods?
- Have the community's characteristics and its geographical location contributed to higher vulnerability of the community or have

these factors contributed to building resilience in the community?

- Has any emergency response and recovery to flood hazard and disasters through effective disaster management legislation from the Zambian government, other relevant stakeholders and the community itself been effective enough to mitigate the flood problem?

- Is there a comprehensive framework to assess vulnerability and resilience of Kanyama community? What recommendations can be made for mitigation of flooding in Kanyama?

1.4 The main objective

The main objective of this study is to assess the impact of flooding and measure vulnerability and resilience of the study community by using the most applicable and relevant tools and methodologies.

1.5 Sub-objectives

- To determine the effect of floods since 2008, on social, economic, ecosystem and political variables and how the community has been coping with floods.

- To assess whether the community's characteristics and geographical location contributed more to vulnerability or building resilience, by selecting a small group of people, from the study area, considered vulnerable.

- To establish whether emergency response and recovery to flood hazard and disaster from the government, other stakeholders and the community itself have been effective enough to effectively manage and mitigate the flooding problem.

- To develop a comprehensive framework to assess vulnerability and resilience of Kanyama community, and recommendations for mitigation of flooding in Kanyama.

1.6 Research hypotheses

The following hypotheses will give guidance to the research:

- The context of this research revolves around the relationship between environments and social, economic and political systems which contribute to varying levels of people's vulnerability within society. The differences in socio-economic and political characteristics shape people's livelihoods and produce unequal exposure to risk, hence the varying level of vulnerability among the population (Cannon, 1994 and Varley, 1994).

- Vulnerability is most associated with poverty. It is believed that when people are poor they are vulnerable to disasters, disease, hunger, etc. Vulnerability however, is caused by many factors. In this study the hypothesis is to determine whether being poor makes a person vulnerable. Furthermore, are people with social capital less vulnerable than those without?

- Are people without social capital having capacity to build more resilience than those with social capital? Can an individual be

resilient if they have no resources? The Sustainable Livelihoods Framework (DFID, 2005) discusses the importance of having assets in order for one to have a meaningful livelihood and contribute to development in the area in which they live. Are those with sufficient assets more likely to be resilient than those without?

1.7 Outline of chapters

The researcher brings to light experiences of the Kanyama community that has been affected by flooding and how the community responded each time there were floods. The issue of vulnerability reduction and building resilience for the people of Kanyama is said to be the researcher's main concern. The study is presented according to chapters as follows:

- **Chapter 1** outlined the rationale for objectives and sub-objectives of the research, as a definition and description of the problem statement and its intended solutions.

- **Chapter 2** is about history and description of the study area, including the physical and socio-economic factors of the case study. The history of flooding in the study area and the extent of the floods are also discussed.

- **Chapter 3** addresses methodology and development of indicators regarding vulnerability and resilience to floods. A brief description of some types of qualitative research is mentioned. The methods regarding the data required, the location of the data,

how the researcher collected, analyzed and interpreted the data are explained.

- **Chapter 4** presents the literature review and theoretical framework of the study

- **Chapter 5** reports findings and analysis of data collected and observations made on vulnerability reduction and building resilience to floods. Relevant characteristics of the study area are discussed to assist in determining the extent of vulnerability reduction and building of resilience.

- **Chapter 6** contains some discussions and a review of concepts.

- **Chapter 7** contains the conclusion, summary and recommendations of the study.

CHAPTER 2: BACKGROUND INFORMATION

2.1 Introduction

This chapter gives background information for the study. After a brief overview, positioning the study area in Zambia with regard to location, political dispensation, developmental challenges and the overall flood problem, the problem of flooding for the study area, the Kanyama community is addressed.

Lusaka is the capital city of Zambia. The UN-Habitat (2007) stated that ", It is 1280 meters above sea level. The city covers an area of 375 square kilometres. It dominates the country's urban system and caters for 32 percent of the total urban population in the country. Planning Lusaka has been inadequate due to insufficient financial resources by the Lusaka City Council. The city has its own major problems of lack of serviced land, speculation on land, complex procedures and lack of correct information of land use and land ownership, lack of human resources, the slow pace of issuing security of land tenure, the failure of effective master planning, increase in illegal settlements and political inference in land allocation and poor waste management systems''. There are also problems of population growth, urban migration and unemployment. The city seems to have limited capacity to provide services to its people. Kanyama is affected as it is one of the biggest informal settlements in Lusaka. This township is characterized by lack of shelter, lack of essential infrastructure, poor access to clean water and good sanitation facilities and services, making the residents vulnerable to flood and epidemics hazards or disasters (UN-Habitat for Humanity, 2007).

Zambia got its independence from Britain on 24th October 1964. Its first president was Dr. Kenneth David Kaunda who served the Zambian people from independence until November 1991. It was a one party state until 1991 when the late Dr. Titus Frederick Chiluba became president and through the Movement for Multi-party Movement (MMD), which is still the political party in government. Dr Chiluba's term ended in 2001 and the late Dr. Levy Patrick Mwanawasa took over until his untimely death in August 2008. The past president is Rupiah Bwezani Banda. Zambia is a democratic country as all its leaders were democratically elected, despite court disputes of election results in some cases (Bureau of African Affairs, 2011).

President of the Republic of Zambia, Rupiah Bwezani Banda (2010), in his opening speech in the National Assembly of Zambia said, "Despite Zambia following in the category of Least Developed Countries (LDCs), the country's economy until after 1991 depended on copper mining. Now there has been diversification from copper mining to agriculture. The agriculture sector has grown so much that Zambia is able to export its maize. There has also been an emphasis on livestock farming and a department of livestock was established in 2008. The country at the moment looks economically viable for foreign investment. Some new mines have been opened such as Lumwana copper mines in the North-Western part of the country. The construction industry is also coming up very well with most investors coming from South Africa. The financial sector is also expanding and the period between 2009/2010 saw the opening of more than five commercial banks and many micro-lending institutions, even with the recent economic crisis which hit most of the United States, Europe and many countries in the world. The growth rate of 6.6% is being driven by the mining, agriculture, tourism and construction sectors. The inflation rate of a single digit of 9% has been achieved as well and this is expected to decline further to 8%

within a one year period. Zambia's macroeconomic objectives for 2010 were to sustain positive growth and maintain stability. In addition the government wants to set out to accelerate diversification programme, enhance competitiveness of economy and pursue infrastructure development''.

Despite the achievement in sectors, Zambia still has a number of challenges. According to its Sixth National Development Plan (SNDP 2011-2015), the following are the challenges hindering growth and which have led to slow reduction of poverty:

- **Poor infrastructure**: There is a critical constraint for electricity infrastructure, poor transportation, water and sanitation, inadequate Information and Communications Technology (ITC) services.

- **Low quality of human capital**: Despite human development playing an important role in poverty reduction and economic development, the quality of human capital continued to be slow.

- **High cost of financial services**: The high cost of finance posed serious limitations on the ability of entrepreneurs to start and or expand their operations, with small scale farming and other medium enterprises being most affected.

- **Inefficiencies in public expenditure management:** Although public expenditure management generally improved, some weaknesses continued to be a challenge. The monitoring and evaluation systems are poor and the implementation of most

projects is not effective, making it difficult to complete projects on time.

- **Limited access to land**: Land administration and management is still a challenge. The information about land is not reliable and the process of acquiring land is also not clearly defined. Lack of decentralization of land registration system and inadequate collaboration among different stakeholders is a problem.

The above problems are seriously affecting the people of Kanyama. The poor road infrastructure makes the area more vulnerable to flood hazards and disasters. The low quality of human capital makes the response during floods not effective, as the people have to rely on the government through the Disaster Management and Mitigation Unit under the Office of the Vice President. The people's resilience could be enhanced if more people were skilled in different areas so as to be able to respond in times of flood disasters. The preparedness could also be increased with sufficient financial resources, equipment and human capital. Sound public expenditure management helps in ensuring that financial resources are well managed through accountability and transparent systems. The issue of finances is critical if the problem of floods has to be well addressed. The limitation of access to land has created problems as people have no capacity to own land; hence they choose to crowd themselves in small areas that are not designated for habitation. The study area is an informal settlement, and most people find it easy to construct any form of a house for shelter, so that they can have a place to live, and also manage to sustain them.

2.2 Zambia and flooding

Flooding is a natural phenomenon and in the past people adapted to the hydrological systems in their localities. However, over the years, deforestation, soil degradation, climate change and poor urban practices have increased the impact of floods.

According to IUCN, 2007 the main impacts of flood hazards in Zambia are

- Crop damage/loss, leading to food scarcity and hunger.
- Loss of crop land grazing ground.
- Decline in fish catches
- Increase in disease (malaria, dysentery, cholera, etc.).
- Destruction of infrastructures (roads, houses, bridges).
- Life loss (humans and livestock)
- Interference with energy production due to change in water flows.

2.2.1 Flood impacts in Kanyama Township

According to a ZVAC Rapid Assessment Report (2010), the floods of 2010 had a negative impact on livelihood, human life, infrastructure, education, health, water and sanitation, in the following ways:

2.2.2 Sustainable livelihood impact

Kanyama, one of Zambia's large high density areas comprises of people whose main source of livelihood is entrepreneurship. People sell vegetables, groundnuts and other food stuffs. Some have small shelters turned into shops/stalls sell their merchandize, which also includes washing detergents, soaps and other domestic household items. Telephone services for pay phone facilities are also very common. During

the time of floods most people's small shops became waterlogged or the roads became impassable, hence closure and stoppage of trading. The little income for basic needs was no longer there, making it very difficult to survive.

2.2.3 Human, property and infrastructure loss

According to the ZVAC Rapid Assessment Report (2010), Kanyama Constituency had 565 completely damaged, 8,423 partly damaged, 27,219 waterlogged houses. There were 2 clinics surrounded by water, 5 schools were also affected in a similar manner. Most of the roads had been either partly or completely damaged, making them at many times impassable. In flood prone areas the general population is vulnerable to diseases associated with floods such as cholera, dysentery, malaria and bubonic plague. Heavy floods sometimes destroy economic infrastructure such as roads and bridges. The high disease incidences associated with floods also disrupt economic and developmental activities.

2.2.4 Health impact

The flooding incidences especially in poorly planned urban residential areas with poor sanitation and water supply has been observed to causes increase in coli form count levels in groundwater resources leading to high incidences of water borne diseases.

Figure 3: Houses surrounded by water

Source: Zambia Vulnerability Assessment Committee (ZVAC) Rapid Assessment Report (2010)

The floods brought about a number of health problems. This study area is very vulnerable to cholera and other waterborne diseases such as dysentery and diarrhoea. Cholera cases had been reported. The stagnant water was a breeding place for mosquitoes leading to high cases of malaria. There were cases of skin infection on people's feet due to the contaminated water. Furthermore, the floods created indirect problems, including fear of new HIV/AIDS infections; because of high poverty levels in this area, prostitution is a huge problem. The service delivery was also affected as the buildings were partly submerged and the roads became impassable for people in the community, including the healthcare employees.

Figure 4: Houses submerged

Source: Disaster Management and Mitigation Unit (DMMU) National Contingency Plan for 2010/2011

2.2.5 Water and sanitation impact

It was reported that there was a shortage of piped water and the community relied on shallow wells. This lead to lack of clean water, as shallow wells was submerged. The absence of clean and safe drinking water is a big problem. This caused an outbreak of water borne diseases such as cholera and dysentery as discussed in the previous paragraph.

2.2.6 Education impact

There were no schools that had been closed as a result of the 2009/ 2010 floods. However, there were instances where learners were reported sent away for some days when rains were heavy and schools surrounded by water. Some parents became apprehensive in allowing their children to go to school during floods in order to avoid exposing them to any harm due to floods. This behaviour reflects some psycho-

logical effect on both the parents and children regarding the effect of floods in this community.

2.2.7 Political impact

In 2010 there was no direct political impact reported in the area. However, during 2008, the Kanyama community voted for an opposition political leader, because the people i*nter alia* thought that the opposition would make Kanyama a better place to live in. The official results according to the Electoral Commission of Zambia (2008) revealed that: the opposition political party, headed by Michael Chilufya Sata won the Kanyama constituency. Most people of Kanyama community thought the government of Zambia, under the leadership of President Rupiah Bwezani Banda was no sorting out the problem of floods in their area and the recent elections of 20th September 2011 ushered in President Michael Chilufya Sata as Zambia's fifth president.

2.3 Analysis of institutional intervention

The above stated impacts show that work still has to be done in Kanyama. The 2010 floods indicate that there is need for a multi-sectoral effective approach in addressing the flood problem. There was an attempt by government and other key stakeholders such as Care International (Zambia), the Zambia Red Cross Society and the Catholic Relief Services (CRS) to build community resilience through its mitigation and response actions to the floods. The author of this research became aware of this intervention during the course of performing her duties as a government employee.

There is more that should be done, however, to reduce vulnerability and build resilience to floods in this community. The starting point for reducing disaster impacts and promoting a culture of disaster resilience lies in the knowledge of the hazards and the physical, social, economic and environmental conditions and to disseminate the results to decision makers, the public and populations at risk (UN, 2005).

2.4 Community resilience: 2009/ 2010 floods

The challenges of flooding need a resilient community. This is one that has the capacity to manage the problems that come with floods. It requires resources such as financial, equipment and human**.**

ZVAC Rapid Assessment Report (2010) stated that, "In order to cope with floods, the majority of the people of Kanyama constituency bought gumboots to protect their feet as they waded through floodwater. For the water surrounding houses, people used sand bags in order to block water from entering homes. However, this strategy was reported to have worked when floods were not heavy, and when it became impossible to cope, people either relocated as individual families, or the central government through the Disaster Management and Mitigation Unit (DMMU) in conjunction with other stakeholders such as the Red Cross Society of Zambia, UN and volunteers assisted in relocation of affected people DMMU (2010)."

2.5 Community preparedness, response and monitoring plans

Preparedness is very important to communities in dealing with hazards and disasters. It is about considering activities that target improving response action and coping strategies. Preparedness may be for imme-

diate response purposes and also planning for challenges that come with short and long term recovery periods. Preparedness has been defined differently by different researchers. For instance FEMA defines preparedness as,'' the leadership, training, readiness and exercise support, and technical financial assistance to strengthen citizens, communities, state, local, and tribal governments, and professional emergency workers as they prepare for disasters, mitigate the effects of disasters, respond to community needs after a disaster, and launch effective recovery efforts." (www.fema.gov).

DMMU (2010) reported that Kanyama community was involved in a number of projects in preparation of potential flooding of the area. These included unblocking of drainages, solid waste removal, cleaning of schools and markets as well as distribution of chlorine for water treatment of drinking water. About 9.8Billion Kwacha (US $2.04 million) was allocated to be spent on Kanyama drainage clearing and construction in partnership with CARE International (Zambia). There was a close monitoring of all the community projects by Ward Development Committees (WDC), which supervise the progress of the projects as well.

2.6 Community proposed mitigation measures

Mitigation measures regarding floods vary from place to place. These also depend on the type of floods and extent of flooding. The Caribbean Disaster Emergency Response Agency (CDERA) describes three categories of flood mitigation measures namely control over the river, control over the land and other measures (www.cdera.org).

In 2010, the Kanyama community recommended to government and relevant stakeholders such as Care International (Zambia) and Catholic

Relief Services (CRS-Zambia) that they wanted portable toilets, worst affected families are to be relocated, stagnant water be disinfected and flood water be pumped out. Other recommended measures included building of more clinics, planned house constructions and rehabilitation and upgrading of roads.

A community to be successful in addressing the problem needs to be empowered in all the core spheres of development, of socio-economic and environmental matters. The community must also have knowledge of how political systems and civic functions in country operations.

2.7 Reflection of the 2008 to 2010 Kanyama floods

Many factors are said to be the reasons for the relative high impact of flooding in Kanyama, namely urbanization, high poverty levels, illiteracy, and lack of education, lack of employment, poor government, land use management policies and population growth Impact.

All these variables should be further explored and analyzed, to find out whether indeed they are the root causes of unplanned settlements that exacerbate the impacts of floods and disease. The rapid growth of Lusaka, as a city has also caused great social and economic impacts on townships, like Kanyama. People from rural areas of Zambia come to Lusaka in the hope of finding jobs for a better livelihood. Because of low earned income or lack of it, the chances of most people in this community of renting decent accommodation or construction it is limited.

2.8 Conclusion

In this Chapter, the author discussed the background information to flooding in Zambia. The focus on the 2008 to 2010 floods reflects issues to do with lack of physical planning of land use and unplanned settlements. The situation shows the vulnerability of people to floods and its impact on human life, education, health, infrastructure and water and sanitation. The people that were affected do not have adequate spending power, savings or meaningful investment to recover from any negative impact of flood disasters or hazards. Even if there were only a few cases of people dying during this period, sustainable livelihoods are part of human dignity and this problem needs more attention than it has received so far. Some people may have the knowledge of community resilience but the means to protect them adequately during disasters is a major challenge.

In the subsequent chapters, theoretical perspectives on natural disasters, vulnerability and resilience frameworks relating to this research are presented and applied. Vulnerability and resilience indicators are expressed qualitatively and discussed in analyzing the findings of the study.

CHAPTER 3: METHODOLOGY

In this chapter the methodology used in the research is briefly described. Methodologies shape the way the research is approached and how the results are finally interpreted and analyzed. Use was made of expert interviews, semi-structured interviews, and secondary data from government, publications, key stakeholders and work of other authors, as well as some element of author's own observation.

3.1 Steps in the methodology framework

This study followed a set of key steps in order to assure a scientific approach is followed in assessing vulnerability reduction and resilience. The steps include: conducting a focused literature review to determine a suitable theoretical and conceptual framework for the study and the data that is needed to answer the research questions; determine where the data is located and suitable aids that will be used to obtain the data, and determine the procedure that will be used to analyse, interpret and present the data/results. Next these steps will be elaborated on below.

3.2 Literature review

The literature study focuses on assessment of current literature on reduction of vulnerability and building of resilience. Some of the literature was mostly from documentation from DMMU, Zambian newspaper articles, UN Zambia information departments, international journals and some print and electronic media. Other literature was from various authors and journals that have been recorded and used in different forums regarding vulnerability and resilience and related concepts. It must be noted that due to the complex of the subject of reducing vulnerability and building resilience, this researcher has restricted her literature review to information she felt was relevant to this particular

study. The next chapter reports extensively on the literature review indicate the type of data that is needed and the models that can be used to address different dimensions of the research problem.

3.3 Obtaining the required data

Both primary and secondary data is required to do the research. Two methods used to obtain the data were expert and semi-structured interviews

3.3.1 Expert interviews

According to Archer, *et al.,* (1998), a person with specialized information needed for a research may be referred to as an expert.

For this study an expert is described as an individual who may be representing an organization or themselves in their own right. The researcher planned to interview experts namely Medical Practitioners, Health personal, and Physical Planners, Architectures, Civil Engineers, Teachers, Epidemiologists, Academia, government officials, Politicians and environmentalist. This did not happen as most of them claimed to be settling down, after the 20th September 2011 elections.

The selection of these experts in this research was not an easy exercise because of the limitation stated earlier in this chapter. The author of this study's opinion is that this group of experts was the best at the time of the research. Interviews were just a supplement of the methodology, for the purpose of collecting some primary data, and not just secondary data.

The interviews helped in getting a good picture about vulnerability and resilience to floods in Kanyama and its impact on socio-economic, environmental and the political system. (See appendix 1 for questions asked.)

3.3.2 Semi-structured interviews

Damm (2010) described a semi-structured interview as open-ended and that it may cover a number of topics. She described the advantages and disadvantages of these types of interviews as outlined below:

Advantages of semi-structure interviews

- Interviews are appropriate at the time the situation is very difficult. The respondent is prepared by the interviewer prior to interview time and any complexity is discussed. In-depth information is obtained more easily because the situation allows for probing.
- An interviewer can obtain more information through observation of non- verbal reactions.
- It is easy to avoid ambiguity by explaining a question in detail, or ask question in a different form.

Disadvantages of semi-structured interviews

- It is expensive and time wasting especially where the study area is geographically wide.
- The quality of data and information depends on how well both interviewer and interviewee relate to each other at the time of interviews.
- There is a danger of biasness from the researcher in terms of questions and responses.

An attempt was made to gather primary data or experiences and personal stories of those that were affected by floods in 2008 to 2010 rain

seasons in the community of Kanyama through semi-structured interviews. The subject of the interviews was vulnerability reduction and building resilience by the people of this study area. The focus was on the low income earners or those considered vulnerable, that is the women, physically challenged and the elderly men and women. This is because the floods affect people differently.

Components/focus of Semi-Structured Interviews

The following were the major components/focus of the interviews (see Appendix 2):

- Introduction of the interviewer and the respondent.
- Determining experiences the interviewee had with flood events.
- Assessing knowledge about vulnerability and resilience on floods from the interviewer's point of view.
- Interviewee's knowledge about impacts of floods on socio-economic, ecosystems and political systems.
- Interviewee's knowledge as to whether the characteristics and geographical locations contributed to vulnerability or resilience.
- Interviewee's knowledge about emergency and response and recovery to flood hazards and how effective these were.

3.4 Characteristics of research participants

In conducting the interviews, the author of this study selected a small group of people that can be considered as vulnerable. The author had chosen them to be the target group as they were at the time of data collection not in formal employment. Their livelihoods survival was through traditional dancing in a group called Chibolya cultural dance

troop under the Lyikumbi lya Mize cultural association. This culture was recognized by UNESCO as a National Heritage (UNESCO, 2006) the dance troop was easy to interview because the author spoke two local languages spoken by most members of this group and managed to interview in two of the Zambian local languages namely Luvale and Lozi and interpreted into English, an official language of Zambia. Most of the primary data was collected from a total of 18 people from Chibolya, a community in Kanyama. The age group was 17, as lowest and 56 as highest. As stated earlier the majority in this group were youths. Table 1 presents some characteristics of the research participants.

Table 1: Characteristics of research participants of Semi-Structured interviews

Age	Gender	Employment status	Type of housing owner/rented	Length of stay	Impact On livelihood	Level of assistance
34	Male	Not employed	Decent/rented	4years	Disrupted/damages of household goods	None
32	Male	Not employed	Decent/rented by guardian	5years	Disrupted/damages to household goods	None
25	Female	Not employed	Decent/rented by guardian	11 Years	Disruption/damages to household Goods	None
21	Female	Not employed	Decent/rented by parent	15 Years	House got damaged and relocated by building temporal shelter by father	None

17	Female	Not employed	Decent but not strong	15years	Damage of household goods	None
58	Male	Not employed	Decent community house	5years	Damage to household goods	World Division International, Zambia Red Cross Society
25	Female	Not employed	Decent community house	Less than one week	N/A	N/A
22	Female	Not employed	Decent/rented room, poor condition	22	Disruption of livelihood, could not attend school during floods	No
25	Male	Not employed	Decent/ rented house but poor condition	1 Week	Not affected	No
20	Male	Not employed	Decent rented room, in poor condition	1 Week	No	No

25	Male	Not employed	Bricks house, no electricity	4years	Food was difficult to find	No
19	Male	Not employed	Bricks communal house	6 days	No	No
26	Male	Not employed	Bricks communal rented house	6 months	No	No
32	Male	Not employed	Decent but in poor condition	9 years	Petty trading business was affected	No
20	Male	Not employed	Decent but In poor Condition	2 Years	No	No
32	Male	Not employed	Very poor Shelter	4 years	Movements were restrict-ed	No
35	Female	Employed	Decent	4 years	Difficult to get out of house to get to work	None

Source:Author

3.5 Procedures to analyse and interpret the results

The theoretical framework in Chapter 4 provides guidelines for analysing and interpreting the data of this study. It will show how the data has been related to the framework. The interpretation will be based on how the data has been applied in the research.

3.6 Concluding remarks

The author had limitations in collecting primary data because it was very difficult because it was prior to elections time and the environment had become hostile. The small percentage of primary data was collected through semi-structured interviews while secondary data/information was obtained from various reports of research conducted on a similar or related topic. Some information was from both electronic and print media and websites. The author attempted to make some observations from an individual point of because of being very familiar with the area and the livelihood of the people of Kanyama. This author has also been to this area during her course of duty, as government employee. The issues of access to participants, informed consent and culture and understanding township life played a critical role in the interviews and the quality of data collected. The study area is vast and the author restricted herself to what was relevant to the study at that time.

CHAPTER 4: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

4.1 Introduction

This chapter looks at literature on floods, vulnerability and resilience. This is reviewed in order to develop a theoretical framework of the study that will also inform the data needs and data analysis of the study. Different frameworks are discussed to help understand and apply the topic of vulnerability reduction and building resilience to floods in Kanyama community. The core focus is on the social side of natural hazards in relation to vulnerability and resilience and theories by Blaikie et al. (1994), Wisner (2004), including the DFID Sustainable Livelihood Framework (1999), ISDR Hyogo Framework (2005) and the Zambian Disaster Management Act NO. 13 (2010) will be discussed in analysing the effectiveness of preparedness, mitigation, response and recovery by different stakeholders to the problem of floods.

4.2 Approaches to natural hazards

Different authors have written about approaches to natural hazards. Some of these approaches are about hazards being caused by nature and others state that the cause is as a result of people's behaviour and how they manage their lives in relation to the geographical environment in which they live.

Smith (1992) states that there are three main approaches to natural hazard theory in the social sciences identified as dominant approach, behavioural approach and structural approach. Brief reviews of these approaches are next presented.

4.2.1 Dominant approach

This view was that hazards were caused by nature. Wisner (2004) argued and stated that there was a need to consider the social side of natural hazards by discussing vulnerability. Smith (1992) was of the view that because hazards were caused by nature, there has to be control, monitoring and predication of natural events in order to have a solution.

4.2.2 Behavioural approach

This approach explained the response by human beings to hazards. Burton et al (1978) stated the interactions of humans with their environment and how they handled the natural events that occurred within their environment as the behavioural approach. Burton et al. (1978&1993) viewed this approach with regard to a population's vulnerability, through the way people lived, how they used natural resources and how they coped with events. Blaike, *et al.,* (1994) discussed how being poor was related to people living and working in riskier areas and how this put people's lives at risk from flooding and related diseases and problems.

4.2.3 Structural approach

This approach is about the institutional structures put in place in order to help people adapt to the environment in which they live. Smith (1992) considered the structural approach as "the study of the human, environment system within the structuralism view aims at identifying the ways in which political and economic structures determine or constrain individual adjustment to the environment."

The approaches discussed above are relevant for the study of the Kanyama community because its vulnerability can be linked to natural hazard of flooding, behavioural and structural approach.

4.3 Vulnerability and its measurement

A lot of authors have argued to what vulnerability means and the context in which it can be used and applied. Some authors refer to it from a social perspective while others have discussed it in terms of its effect on people and its livelihoods. Its measurement requires a great deal of study. The researcher of this study has highlighted the work of many authors and further applies it to the study area, in the next chapter.

Birkmann (2006) considered that vulnerability research examines causal structures, spatial variability, and methods for disaster reduction. Cutter et al. 2000) defined vulnerability as the potential for loss of property or life from environmental hazards. United Nations University (2006) included a lot of different definitions in its literature regarding concepts and methods to systematize vulnerability, for instance: Chambers, 1989; Bohle, 2001; Wisner, *et al.,* 2004; *et al.,* 2006; UN/ISDR, 2004: 16; Pelling, 2003: 5: Luers, 2005: 215; Green, 2004; 323; UN-Habitat, 2003: 151; Schneiderbauer and Ehrlich, 2004; van Dillen, 2004: 9.; Turner et al.; 2003: 8074; Cardona, 2004b: 37). The website of the ProVention Consortium includes about 20 manuals and different guidebooks on how to estimate vulnerability and risk (ProVention Consortium website). These manuals also include different definitions and various conceptual frameworks of vulnerability.

According to UN (2005), the reduction of disaster and promotion of a resilience culture lies in the knowledge of the hazards and the physical, social, economic and environmental vulnerabilities to disasters that

most societies face. The knowledge regarding ways in which hazards and vulnerabilities are changing in the short and long term, followed by action taken on the basis of that knowledge is also considered important. In the context of the Hyogo Framework, there need to be developed indicators of vulnerability as a core activity (United Nations University, 2006). The key activity of the research was, “Develop systems of indicators of disaster risk and vulnerability at national and sub-national scales that will enable decision-makers to assess the impact of disasters on social, economic and environmental conditions and disseminate the results to decision makers, the public and populations at risk” (UN, 2005).

Damm (2010) describes the theoretical and conceptual framework of vulnerability, in the context of disaster and hazard research and also discusses traditional vulnerability approaches. She acknowledges that vulnerability in the context of socio-ecology and with regard to natural hazards is a, “difficult study, and its research which has evolved from a diversity of concepts and theories”.

Studies on Social- Ecological System and on vulnerability have only recently started to be linked with each other (Adger, 2006). Damm (2010) states that, the initial birth of hazard and disaster research in geography is attributed to Harlan Barrows and his presentation of “geography as human ecology” (Barrows 1923). Damm (2010) observed that; ‘’employing the human ecological approach, Barrows and his students dwelled on the study of how people and society adjust to environmental extremes, most notably floods. Until the 1970’s, the traditional hazard approach dominated the scientific community, but criticism of the narrowness of the theory arose.’’ She noted that the opinion that disasters are not only produced by physical events, but also include socially constructed situations, spread in disaster research.

Consequently as a result, today, disaster research addresses not only the hazard side, but also deals intensively with the notion of vulnerability, (Cannon 1993; Scheneiderbauer and Enhrlich 2004). Alexander (1997), according to Damm (2010) asserted that the "emergence of the notion of vulnerability is one of the most salient achievements in the field during recent decades". Frerks and Bende 2004 observed that vulnerability is associated to social, political, environmental and economic variables, rather than seeing it as associated to an occurrence caused by an external agent. The views of different authors have a critical impact on the subject of how disasters are managed. Bankoff et al (2004:4) stated that "Attempts to control the environment need to be replaced by approaches that emphasize ways of dealing with unexpected events and that stress flexibility, adaptability, resilience and capacity".

Damm (2010) highlighted that, '' the evolution of vulnerability concepts in recent decades has been influenced by different epistemological orientation (human ecology, social science, spatial analysis), their subsequent methodological practices, variations in the choice of hazards (flood, famine, drought) and by the analyzed regions (developing) versus industrialized countries. The issue of vulnerability has recently been gaining ground in the disaster risk community. Recognizing the fact that vulnerability is an important concept for the detection and mitigation of disasters risks, a large variety of concepts and approaches have been developed from different research disciplines''. Cutter et al. (2003) identified vulnerability in relation to exposure, social condition, an integration of potential exposures and societal resilience with specific focus on places. Burton et al. (1993) and Quarantelli (1992) considers that exposure relates to biophysical or technological hazards and its distribution of a hazardous and degree of loss. Cutter et al. (2003) identified vulnerability in social terms as coping responses plus that of

societal resistance and resilience to hazards." The nature of hazardous event is usually viewed as a social construct rooted in historical, cultural, social and economic processes, not biophysical condition,'' the view of (Blaikie et al. 1994; Chambers 1989; Watts and Bohle 1993). Damm (2010) wrote that social vulnerability regarding the integration of biophysical and social should be associated to a specific area or geographic domain.

According to Adger (2006), the analysis of vulnerability is about lack of entitlements and vulnerability to natural hazards. The important variables in his study of entitlements based explanations of vulnerability were institutional, well-being and class, social status and gender. On natural hazards, the vulnerability study developed as an integral knowledge of environmental risks with human response based on geographical and psychological perspectives plus social parameters of risk.

Bohle (2001) studied the "Double Structure of Vulnerability" as internal representing capacities to anticipate, cope with, resist and recover, while eternal considers risk and shocks.

"Sustainable livelihood and poverty research are shown as a successor to vulnerability as entitlement failure" (Adger, 2006)." A sustainable livelihood refers to the well-being of a person or household, and comprises the capabilities, assets, and activities that lead to well-being," (Chambers and Conway 1992; DFID 1999).Damm (2010) stated, "While livelihoods are conceptualized through capital assets including natural capital, the physical and ecological dynamics of risk remain largely unaccounted for in this area of research. The livelihood framework is often applied in vulnerability assessments at local scale concerning the issue of poverty".

The subject of vulnerability is very wide and many researchers have researched this issue from different environments and contexts. The author therefore, has, in this research restricted herself to PAR and Safety models Blaike, *et al.,* (1994) the Sustainable Livelihood Model (2005) model and the ISDR framework and a designed framework, in the analysis of reducing vulnerability and building resilience to floods in Kanyama community, and a community based risk management approach.

4.4 Vulnerability within the framework of hazard and risk

Bollin, *et al.,* (2003:67) research work adopted the conceptual framework to identify risk and distinguishes four components of disaster risks, as hazard, exposure, vulnerability and capacity measures. This framework states that risk is the sum of all the named components. While hazard is defined through its probability and severity, exposure is characterized by structures, population and economy. The conceptual framework by Bollin, *et al.,* (2003:67) was categorized through hazard considering probability and severity; exposure considering structures, population and economy; vulnerability identified by physical, social, economic and environmental variables; including capacity and measures that relate to coping capacity and the involvement of physical planning, social capacity, economic planning and capacity building.

4.5 The Pressure and Release Model

This model illustrates the root causes of vulnerability. It considers the pressures that cause vulnerability and how these have created unsafe conditions for those that have become vulnerable.

According to Senavattanagul (2008), the “Pressure and Release’ (PAR) model, was established by Blaike et al. (1994). In this model risk

is presented as the result of the combination of vulnerability and some of its threats. The model shows the progression of vulnerability from the root causes through dynamic pressures to unsafe conditions which lead to disaster. Blaikie, et al., (1994) argue that," some individuals or groups are more prone to damage, loss and suffering than others. Key characteristics of these variations in impacts include age, class, gender, ethnicity and disability. Other pressures also make them more vulnerable including lack of education, lack of training, low paid jobs, lack of savings, rapid development of industrial areas and urbanization, substance abuse and some levels of poverty'' Blaikie, *et al., (* 1994). Vulnerability can be understood by identifying the social pressures and relationships from personal to national and global levels. The model uses the term 'root cause' for the global pressures which include social, political and economic factors. For the intermediate level, the term 'dynamic pressure' was used to include factors such as population growth, urban development, population pressure and environmental degradation. The 'unsafe conditions' was used when referring to the local pressures which can include social fragility, potential to harm and poverty. Prevention or mitigation measures are conceived as ways of releasing the pressure (Wisner, et al., (2004).

Figure 5 below is a schematic presentation of the Pressure and Release (PAR) model.

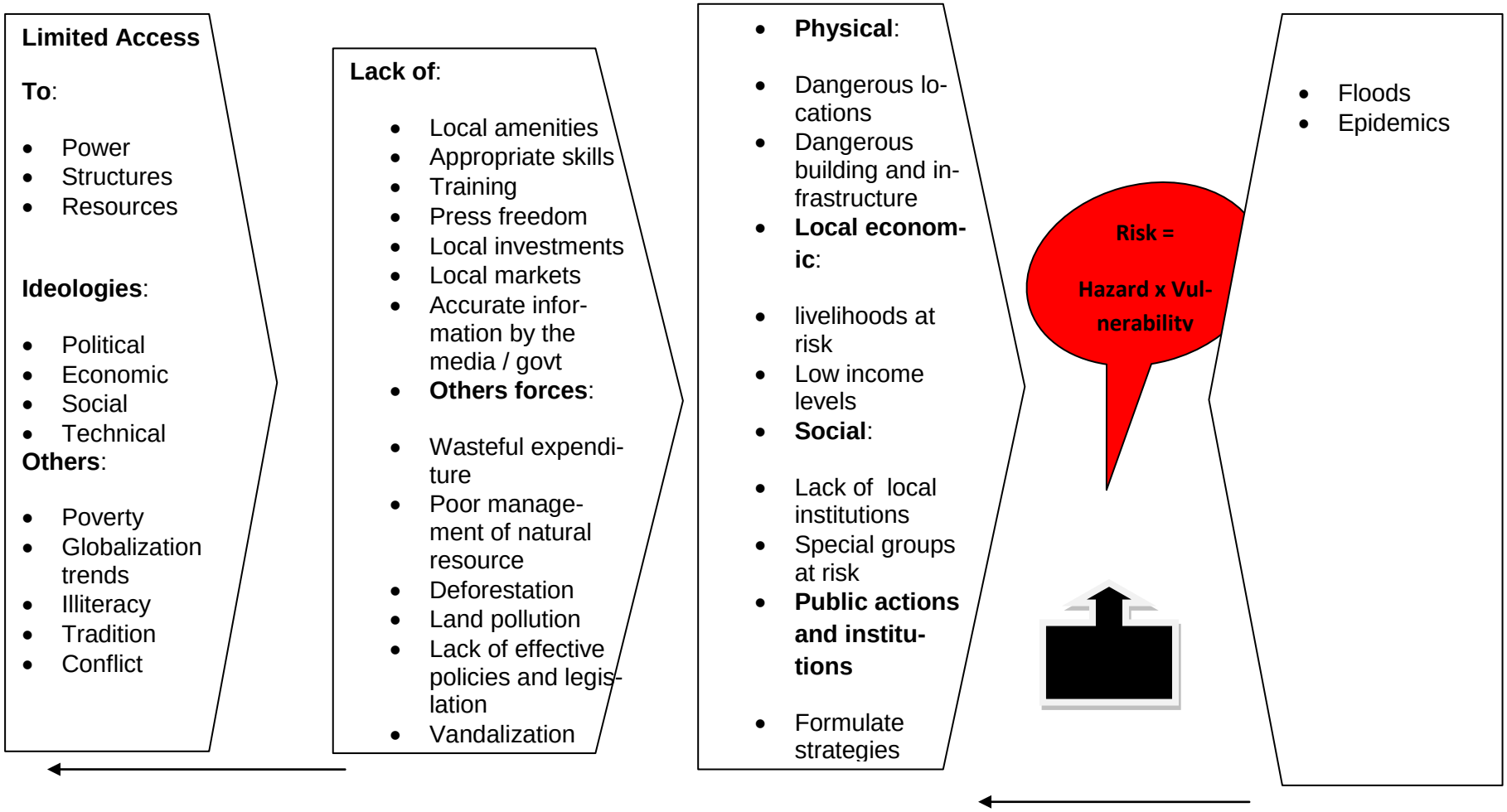


Figure 5: Pressure and Release Model: Source: Wisner, *et al.,* (2007)

4.6 The Progression of Safety model

This model highlights four main components and these are discussed, and the schematic outlay is shown in figure 6 below

- **Address root causes**; through increasing access of vulnerability group to power structures and resources. The challenges in ideologies, political, economic and social system should be addressed if they cause or increase vulnerability. There has to be poverty reduction strategies and networks that support human.

- **Reduction of pressure**; through development of local institutions, appropriate skills, training, press freedom, local investments education and encourage ethical standards in public in life. The reduction in pressure is by management of natural resources, discouraging

- **Safe conditions**: The environment should be protected through creation of safe locations, safe strong building of structures and infrastructure. Safe conditions should be created by strengthening livelihoods, increasing income levels, and creation of sources of income for peri-urban people. There should be provision and development of social institutions and special risk groups require attention. The public institutions should consider formulation of preparedness strategies and that way create safe conditions.

- **Reduction of Hazards**: To reduce hazards, measures should be put in place to reduce flooding, poor low cost housing, increase sensitization programmes of dangers of flood hazards, increase early warning systems and conduct workshops on disaster reduction

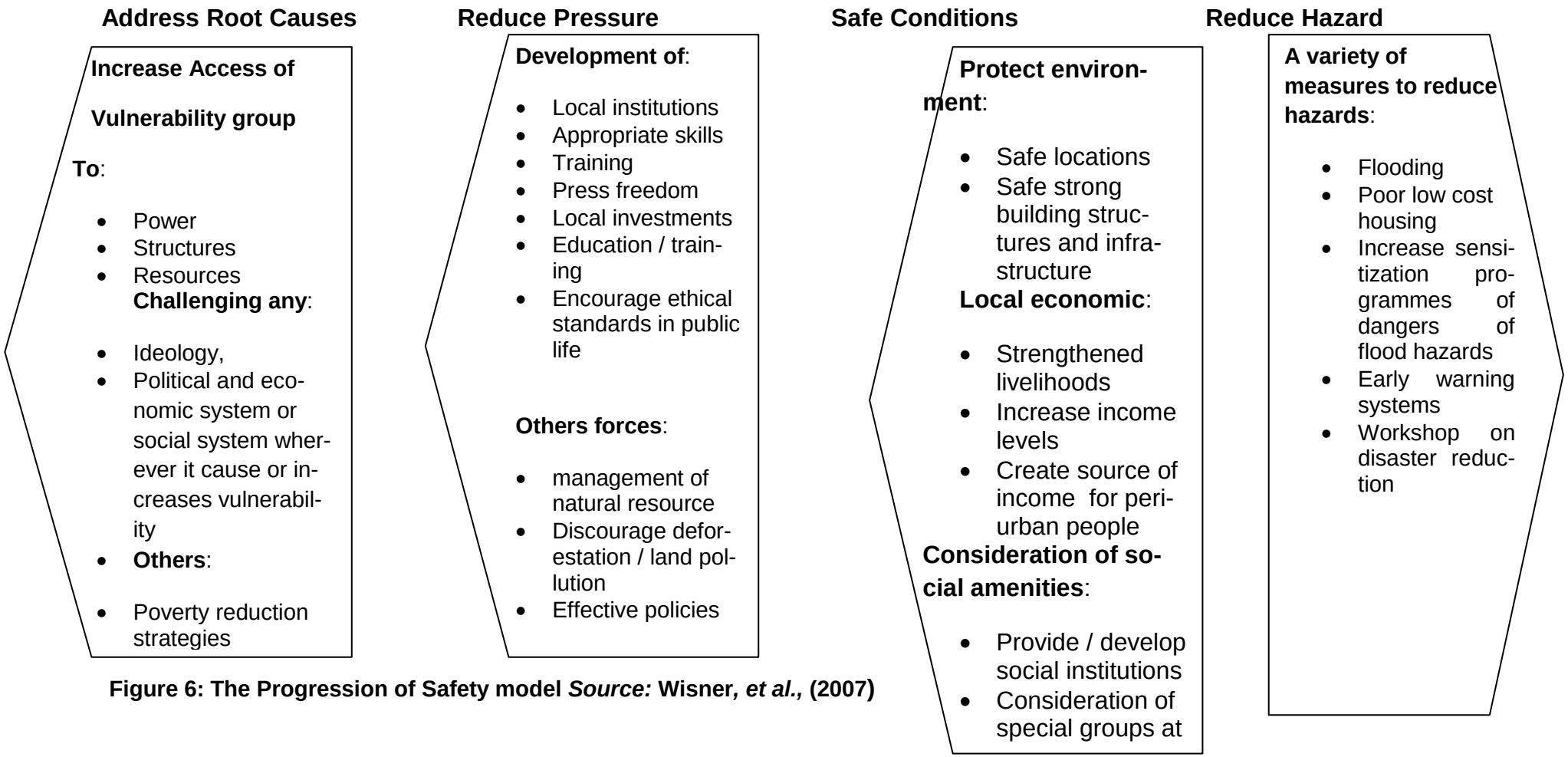


Figure 6: The Progression of Safety model *Source:* Wisner, *et al.,* (2007)

4.7 The Sustainable livelihood framework

The purpose of reviewing this framework is to assess the ability of the people of Kanyama in building resilience when affected by floods hazards or disasters. In Chapter 1, regarding the research hypotheses, one of the points highlighted as guidance into this study was the issue of Sustainable Livelihoods Framework. The author investigates whether having assets can achieve sustainable livelihoods, including building resilience to flood hazards and disasters.

Birkmann (2007 stated that ‘sustainable livelihood framework’ can also be seen as a framework for vulnerability assessment. The main elements of sustainable livelihood framework are the five livelihood assets or capitals (human, natural, financial, social and physical capita) see Figure 7 Shocks, trends and seasonality are important elements and they influence of transforming structures for the livelihood strategies and their outcomes (Sustainable Livelihood Framework (1999).

The sustainable livelihood framework encompasses two major terms, sustainability and livelihoods. Chambers and Conway (1992) developed the concept of livelihoods and viewed livelihoods as the means of gaining living, encompassing livelihood capabilities, and tangible and intangible assets. Within the livelihood framework, the term sustainability is often linked to the ability to cope with and recover from stresses, and shocks as well as to maintain the natural resource base (DFID, 1999; Chambers and Conway, 1992). The framework emphasizes that especially the transforming structures in the government system or private sector and respective structures processes (law, culture) have in-

fluences on livelihood assets of both the access to and major influences on livelihood assets of people.

Furthermore, the SLF (1999) framework discusses livelihoods framework as a tool to improve understanding of livelihoods, especially for the poor. It is said to present main factors that affect people's livelihoods relationships between these factors. The framework has been categorized as vulnerability context, livelihood assets, transforming structures and processes, and formulation of livelihood strategies in order to achieve livelihood outcomes.

According to Lowe and Schilderman (2001), potential positive implications of an enabling regulatory environment for the options of urban poor households are:

- A raise in income levels due to facilitative regulations which enhance economic activity and investment in physical asset base. Security of tenure is very important in the ability of poor people to maintain their ownership in the face of encroaching urban trends and hazards.

- Enhanced well-being due to increased mental and physical health resulting from qualitative improved, incrementally built housing applying technical standards which reflect basic needs and local livelihood priorities.

- Enhanced social capital through increased interaction with a range of local public sector organizations providing information, adequate and affordable housing and basic services.

- Improved equity, the status and livelihood options available to women or at least a reduction in amount of discrimination they endure.

- Reduced vulnerability from economic and physical hazards through appropriate mitigation of the most significant shocks and trends.

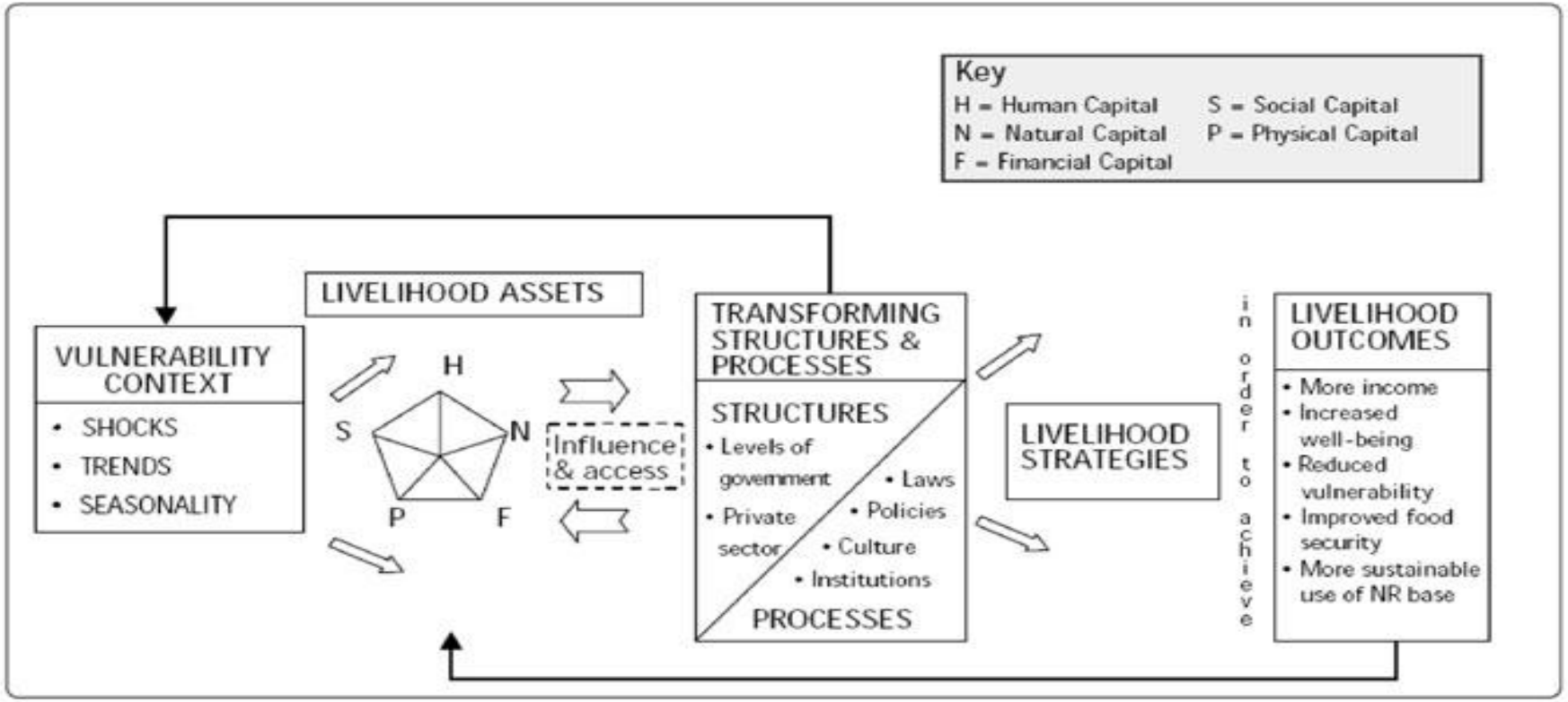


Figure 7: The Sustainable Livelihood framework

Source: DFID 1999

4.8 The ISDR framework for disaster risk reduction

The ISDR (2005) framework for action, see Figure 8, is discussed in the context based on sustainable development in social-cultural, political, economic and ecosystems. It states risk factors vulnerable on social, economic, physical and environmental variables. It categorizes hazards as those that are geological, hydrometerological, biological, technological and environmental.

Disaster risk reduction, as outlined in the ISDR (2004) emphasises the importance of ensuring that effective measures are put in place in reducing risks to hazards or disasters. The main components in the disaster risk reduction in the framework are:

- **Awareness for change in behaviour**: People's behaviour regarding hazards can only change if they become aware about it. The risks about hazards and disasters have to be assessed and analysed in order for stakeholders to determine to what extent behaviour change is required.

- **Knowledge development:** This involves education, training, dissemination of information about awareness of disasters and hazards. The community need skills development and training in disaster risk reduction. Knowledge development is also done through workshops for all relevant stakeholders.

- **Public commitment:** This is about institutional framework strengthening, policy development formulation, land use planning, legislation and codes formulation and development and community action, through participation.

- **Application of risk reduction measures**: These measures constitute environmental management, land use planning, protection of critical facilities, networking and partnerships and financial tools.

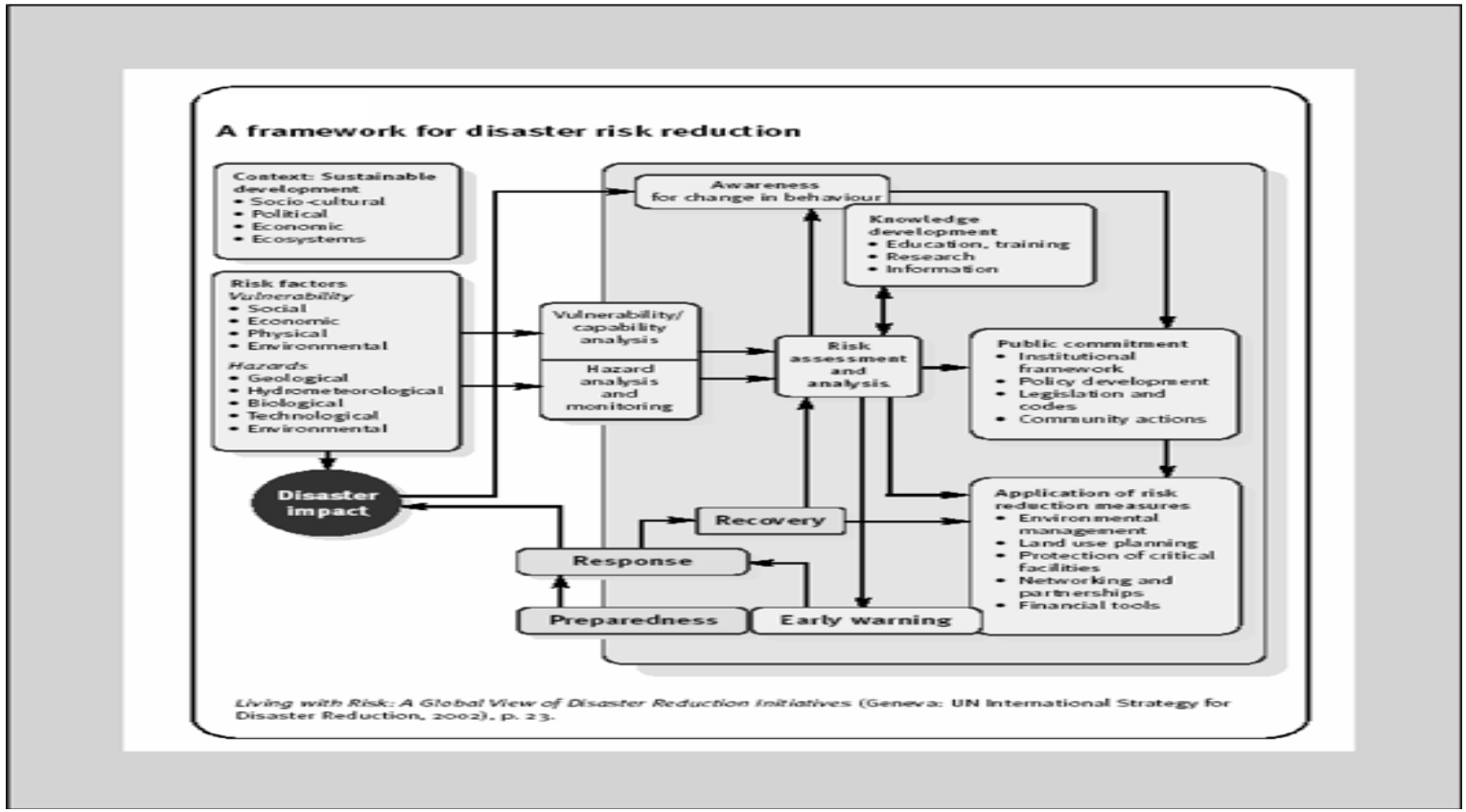


Figure 8: The ISDR Framework for Disaster Risk Reduction

Source:UN/ISDR(2005)

4.9 The Resilient community

To effectively analyse the extent to which resilience has been built or is being built in Kanyama, the author of this research has adapted the priorities of action as formulated. A resilient community is one where disaster risk reduction measures are carried out at national and local priority and implementation at institutional level must be strong. The framework states, 'Strong national and local commitment is required to save lives and livelihoods threatened by natural hazards. Natural hazards must be taken into account in public and private sector decision-making in the same way that environmental and social impact assessments are currently required.

The Institute of Development Studies on www.ids.ac.uk/climatechange describes resilience as a 'social resilience'. According to Adger, *et al.,* (2002), it is "a concept referring to the ability of a community to withstand external shocks and stresses without significant upheaval''. Dawson et al, (2007) stated that vulnerability reduction and promotion of resilience of urban centre to climate change is a function of social, economic and political processes. Thomas et al, (2008) outlined the following key vulnerability/resilience indicators:

- Economic well-being and stability (e.g. standard of living, rate of urbanization);
- Demographic structure of population;
- Institutional stability (e.g. institutional 'memory; corruption)
- Strength of and reliance on public infrastructure(e.g. health expenditure; communication, infrastructure; functional, transport, corporate systems; degree of centralization);

- Global interconnectivity (e.g. trade balance; tourism), and,
- Natural resource dependence and regenerative ability of ecosystems (Adger et al., (2005).

The Community Resilience Manual (2000) defines a resilient community as, ‘’ one that takes intentional action to enhance the personal and collective capacity of its citizens and institutions to response to and influence the course of social and economic change”. The manual highlights key functions of a local economy as that community with: access to equity capital, access to credit, building human resource capacity, capacity for research, planning and advocacy and have access to infrastructure. The four dimensions of resilience are people in the community, organizations in the community, resources in the community and the community process. The researcher investigates to what extent the Kanyama community is resilient to floods and how more resilience could be built.

4.10 Community Based Disaster Management

A community that participates well in disaster management is one that fully understands its role. The floods in Kanyama can also be well mitigated partly by those that are affected, as long as they have the means to participate for instance, capacity know how, financial resources and have skills required for disaster management.

Pelling (2003) that community –based disaster management should compose the following characterizes:

- The focus of attention in disaster management is the local community.
- Disaster management activities revolve around reducing vulnerable conditions and the root causes of vulnerability.

- The strategy for vulnerability reduction is to increase a community's capacities, its resources and coping strategies.
- Disasters are viewed as unmanaged and unresolved problems of the development process.
- The community is the key actor as well as the primary beneficiary. Within the community, priority attention is given to the most vulnerable and their mobilization in risk reduction.
- 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. A local organization is linked vertically with national and international level organizations to address the complexity of vulnerability issues.

Pelling (2003) further states that,'' As with any development intervention involving community actors, it is important to know who in the local area should be involved. There are dangers that social relations existing within the community may contribute to social isolation or inequality in access to public resources and these needs to be overcome and not entrenched, through a community approach".

4.11 The (Zambian) Disaster Management Act

This is , "An Act 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 organization 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" Disaster Management Act (2010).

This is a relatively new act of parliament. The government of Zambia has started implementing it, though at a very slow pace. The author analyses the act to see if it has so for been implemented effectively in terms of emergency response, recovery to flood hazard and disasters, in mitigating floods in Kanyama, as highlighted the third problem statement in chapter one.

In discussing the disaster management Act as part of literature and theoretical framework, the author has used some of the following definitions indicated in the act:

- **Disaster**; " Means an event that is associated with the impact of a human induced or natural hazard, which causes a serious disruption in the functioning of a community or environmental losses which exceeds that ability of the affected community or society to cope with the hazard using its own resources". The Disaster Management Act (2010).

- **Disaster Management, "** means a continuous and integrated multi-sectoral, multi-disciplinary process of planning and implementation of measures aimed at preventing or reducing the risk of disasters, mitigating the severity or consequences of disasters, emergency preparedness, rapid and effective response to disasters and post-disaster recovery and rehabilitation". The Disaster Management Act (2010).

- **Disaster Preparedness**, “ means activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effectively early warnings and the evacuation of people and economic assets from a threatened location.’’ The Disaster Management Act (2010).

- **Disaster Prevention,”** means the measures or actions taken to avoid, eliminate, or prevent harmful natural or human adverse phenomena or hazards from causing or resulting in a disaster. The Disaster Management Act (2010).

- **Early Warning “is** the provision of timely and effective information, through relevant institutions, that allows individuals exposed to any hazard, to take action to avoid or reduce their risk and prepare for effective response”. The Disaster Management Act (2010).

- **Emergency**,” means an event, actual or imminent, which endangers or threatens to endanger life, property or the environment and which requires a significant and coordinated response”. The Disaster Management Act (2010).

- **Risk**,” is the probability of harmful consequences such as deaths or injuries, or expected losses of property or livelihoods, disruption of economic activity, or environmental damage, resulting from interaction between natural or human induced hazards and vulnerable conditions’’. The Disaster Management Act (2010).

- **Hazard**,” means a potentially damaging physical event such as an earthquake, a hurricane, flood, drought, fire, epidemic, phenomenon or human activity, which may cause injury or the loss

of life, damage to property, social and economic disruption or environmental degradation, and includes latent conditions that may represent future threats and can have different origins, natural and human induced". The Disaster Management Act (2010).

- **Rehabilitation; Reconstruction and Recovery**,'' is the measures to help restore the livelihoods, assets and production levels of emergency affected communities, to re-build essential infrastructure, productive capacities, institutions and services destroyed or rendered non-operational by a disaster, and to help bring about sustainable development by facilitating the necessary adjustments to the changes caused by the disaster and improving on the status quo, where possible". The Disaster Management Act (2010)

- **Relief**," Is the emergency provision of assistance to save people's lives in the immediate wake of a disaster, including search and rescue, evacuation, distribution of food and water, temporary provision of sanitation, health care and shelter, and the restoration of immediate personal security. The Disaster Management Act (2010).

The above defined terminologies could help the reader understand meanings and concepts used by the Zambian government in mitigating the problem of floods and indeed any other hazard or disaster. In this study the author explores the extent to which the act has been implemented and whether the structures under which it is being operated are effective, for response, recovery and an effective disaster management system that is adequate for flood mitigation in Kanyama.

4.12 Conclusion remarks

The theoretical framework in this research is critical to highlight how much research importance has been attached to the subject of vulnerability and resilience. We see different definitions of vulnerability and its evolution. This chapter has shown how wide the subject is. This research is based on the PAR and Progression of Safety Models; the Sustainable Livelihoods Framework and the 2005 Hyogo Framework, Community Based Disaster Management and the Zambia Disaster Management Act (2010). The application is done in the next chapter by analysing disaster risk framework in Zambia through the discussed frameworks and theories.

CHAPTER 5: APPLICATIONS AND FINDINGS

The aim of this chapter is to present the findings of the study. It analyses the data and information and brings out the indicators and outcomes to measure vulnerability and resilience, using the sustainable development variables namely social, economic, and political and ecosystems.

Kanyama is a vast area. It is also a constituency which has many wards. Most of the population is described as poor, but has an element of some medium and high class people (those with sufficient farms and smallholdings). The focus of the study has been on the poor and vulnerable. These are people in parts of Kanyama called Chibolya, Old Kanyama, and the surrounding areas of the old and new Soweto markets.

This chapter first outlines characteristics of the study area, then apply the modified PAR and Progression of Safety models as well as the Sustainable Livelihood, the ISDR (Hyogo) and Community based disaster risk management frameworks on the study area. The findings of both the expert and semi-structured interviews are also discussed, including indicators and outcomes of vulnerability and resilience and observations made by the researcher.

5.1 Characteristics of a peri-urban area - Kanyama community

Kanyama, being an informal settlement in a peri-urban area has a lot of problems and the area and its people are vulnerable. In assessing vulnerability in Kanyama, reference is made to Nyambe (2007) who highlighted the characteristics of a peri-urban area as follows:

- **Informal or formal settlements of unplanned origin**: Peri-urban areas, from the Zambian adopted definition have been recognized as areas that began as unplanned and informal, though they are being formalized now. This unplanned nature is a hindrance to up-grading of services in the areas as it does not afford an easy layout of piped network in order to achieve desired higher levels of service (household connections) of 100% coverage.
- **High density low cost housing units**: These areas, like Kanyama have been recognized to consisting of high density low costing units based on demographic data in Zambia (Census, 2000)
- **Server service deficiencies (poor infrastructure):** The housing units are inadequate and have insufficient basic water and sanitation, roads and poor water drainage system.
- **Unprotected wells, boreholes and dilapidated small piped water networks as water sources**. Most of the peri-urban areas particularly in Lusaka, which covers Kanyama community, are located in low flat areas, which are discharged areas and as such they have water tables often sitting on excellent aquifer systems. As a result, groundwater source is near, leading to abundance of unprotected shallow wells and boreholes as sources of water. In addition, small networks that were built in these areas are dilapidated.
- **Poor water quality and supply**: From the above point, peri-urban areas tend to have poor water quality and supply. In Kanyama for example pit latrines have contributed significantly to high levels of faecal coli forms most measuring 'too numerous to count', (Zulu and Nyambe, 2001).

- **Poor public health with high disease prevalence**: Because of lack of facilities to dispose solid waste and poor sanitation there is a high prevalence of disease particularly water borne disease such as cholera.
- **High population density and growth rate:** Demographically, areas such as Kanyama, with a population of 198, 686 people have a higher population compared to Kabwe with 176, 758 people, and a planned municipality with water and sanitation network in a planned coverage (Central Statistics Office, 2000).
- **High unemployment levels**: High illiteracy levels means that most of the residents cannot obtain formal employment with most deriving their income from small-scale businesses. The unemployment levels are highest among the youth.
- **Low income levels:** Rising from lack of employment and high illiteracy levels, most residents earn very low incomes from small-scale businesses, petty trading, and wages from informal employment.
- **High illiteracy levels**: There is no government high school in Kanyama, even with its population of over 198 000.
- **Sizeable number of skilled and talented human resource in various disciplines**: Most of the retirees from formal employment find their new homes in the peri-urban areas. These form a group of people with talent and of course including those with skills that cannot find employment because of lack of job creation by the government.
- **Strong social, economic and religious activities:** With higher population drawn from those migrating from rural to urban areas, there is high concentration of social group with a marked pattern of economic (with high poverty) and religious differentiation and hence lack homogeneity ethically, culturally and religious. Those

who may not belong to these groupings end up with low levels of social control and cohesion, and have no feeling of belonging to the community and hence do not share similar interests and objectives.

- **Market for goods and services:** Due to a high population, there is a large market for goods and services. However, due to survival strategies, some of these markets are breeding areas for illegal activities such as use and sale of narcotic substances.
- **Strong platform for political activities:** There is a large eligible and illiterate population whom is a centre stage for political activities. Politicians find it easy to use unemployed youth to their political advantage. Kanyama is one such area where unemployed youths end up being vulnerable to political usage, because of the little gain of some financial resources, for their immediate consumption. Nyambe (2007) stated that such a group of people are also vulnerable to vote buying by the politicians.
- **Haphazard solid waste and solid waste disposal:** There is lack of solid disposal sites and as such, disposal is haphazard with no system in place for collection of solid waste.
- **High number of vulnerable groups (orphaned, elderly, physically challenged including those infected with HIV/AIDS):** High prevalence of diseases and high poverty levels has created an unprecedented social dimension in peri-urban areas, creating house-holds headed by children (orphans) and the elderly including the physically challenged and those living with HIV/AIDS.
- **High mobility level:** Due to unemployment and lack of sustainable means of livelihoods, general migration of rural population in search of employment is very high. Most of the residents are in rented accommodation and fail to sustain it.

- **Lack of social, strong community based organizations and governing bodies**: There is lack of strong traditional leadership and institutions as well as strong communities because of the il-legal status of these areas. A few have a rural development committee (RDC).

- **High levels of vandalism**: Due to high poverty levels, there is a high level of vandalism in peri-urban areas such as Kanyama.

5.2 Applying the modified PAR model

Table 2 is the Modified Pressure and Release (PAR) Model to analyse vulnerability to Floods in Kanyama Community, with regard to root causes, dynamic pressures and unsafe conditions.

5.2.1 Root causes

Limited Access: The people of Kanyama have limited to poor, structures and resources. The characteristics above give a clear picture of how vulnerable the people are. In most cases after floods, the people take a fairly long time to recover. The flood impact becomes so big for due to lack of power/influence, have no structures and financial resources to build their homes or re-turn to their livelihood activities, mostly of trading and informal employment.

- **Ideologies:** When people are poor, their capacity to read a polit-ical system and its policies is very limited. They wait for the poli-ticians to decide how they should live. They leave to politicians to have a say on service delivery and other social amenities such as provision of clean water, schools and hospitals. The economy of a country is a root cause of vulnerability or sustain-able livelihood. When the economy is not doing well the people that are most affected are the poor people. These are the ones

who fail to survive as they have no savings, no proper housing, poor education leading to no good jobs for them and no sustainable survival activities.

5.2.2 Dynamic pressures

- **Lack of local institutions, training, appropriate skills, local investments, local markets, press freedom and ethical standards in public life**: These pressures have been mentioned under the characteristics of peri-urban areas. The community of the study area depends on the local government for all the services, and if their views are not well represented at municipality or parliamentary level, then they become vulnerable. The issue of floods has been there for a long time and up to now; the community has had no permanent solution. Press freedom is not up date yet. Most people are afraid to go to the press to air out their views on issues of development.
- **Macro-forces**: These include rapid population change, rapid urbanization, and debt repayment, deforestation and decline in soil productivity.

5.2.3 Unsafe conditions

- **Physical environment:** Most houses are not well built and are washed away each time there are floods. Buildings are not protected properly and the infrastructure is poorly constructed/developed as most of the places are not officially designated for habitat.
- **Local economy:** Livelihoods at risk and low income levels have made people in the study area be exposed to flood hazard risks. If people had enough money to secure land and build good houses, they would not live in a place such as Kanyama.

- **Social relations:** Lack of special groups and local institutions makes the place unsafe for most people in the community. There is no effective private partnership between government and private companies to develop poor communities well.
- **Public actions and institutions:** Lack of disaster preparedness and prevalence of endemic diseases has made the community unsafe.

Table 2: Modified Pressure and Release (PAR) Model to analyze vulnerability to Floods in Kanyama Community

Hazard: **Crisis** **indicators**	**Elements at Risk (Disaster Situation)**	**Unsafe conditions**	**Dynamic** **Pressures**	**Root Causes**
• Lack of shelter • Disruption of school calendar • Epidemics • Hunger • Disruption of livelihood	• Land / fresh water pollution • Houses damaged • Livelihood / harvest affected • Ecosystem / Environmental destruction • Education of children disrupted • Spread of diverse diseases	• Community forced to live in unsafe environment with hazardous toxic waste material floating around the creeks • No safe water available for public consumption. • Poor health condition as a result of and contaminated water • Food shortage because of disruptions of livelihoods	• Lack of steady income and unstable livelihoods from other sources • Lack of access to basic amenities • Limited access to power / basic services • Neglect by government • Illiteracy due to lack of education	• Lack of land for better housing • Migration from rural areas to urban areas • Poor peri- urban upgrading policies • Lack of priorities by local and central governments • Lack of an effective Private Partnership between government and the private sector to develop poor communities. • High Illiteracy levels.

Source: Author, adapted from PAR model

5.3 Applying the adapted Progression of Safety model

The progression of Safety model (see Figure 6) is considered the opposite of the PAR model. It comprises of: addressing root causes, reduction of pressures, achieving safe conditions, in order to reduce disaster risks and reduce hazards. The following is particularly relevant for the Kanyama community:

- **Address root causes:** This can be achieved by increasing the access of vulnerable groups to power structures and resources.
- **Reduction of pressures;** by development of local institutions, education, training, appropriate skills, local investment, local markets, press freedom and ethical standards in public life. The macro-forces that need to be considered are; population and health programmes, management of urbanization and re-forestations.
- **Achievements of safe conditions**: This can be achieved through protected environment by safe locations, hazard-resistant buildings, infrastructure improvement and diversification of rural income. Resilience of local economy through strengthening livelihoods and increase of incomes has to be considered. The public action of disaster preparedness has to be enhanced.
- **Reduction of risk;** There has to be an aim for a controlled situation to ensure no loss of life, few causalities and adequate food security.
- **Reduction of hazards:** A range of measures to reduce certain hazards to be done through effective flood control.

In analysing the PAR model it is important to also discuss the Safety model. The latter serves as the solution measures that can be used in reducing vulnerability. If all the measures of the Safety model are effectively administered in Kanyama, the people of this community would be

able to build sufficient resilience in coping with floods each time they are faced with such a hazard.

5.4 The Hyogo framework for disaster risk reduction

The author of this study has also adapted the ISDR framework for disaster risk reduction. This will assist in analysing the effectiveness's of risk reduction mechanisms to floods in Kanyama community by examination of the Zambian Disaster Risk Management Act of 2010 and to what extent it has been effective and whether there has been a reduction in vulnerability and promotion of resilience in the study area. The main elements of disaster risk reduction are outlined below:

5.4.1 Awareness for change in behaviour

There is need for effective awareness programs for the community on issues of floods and flood management in the study area. The community should be made aware of the impact of floods and how people should respond to flood hazards and disasters that may occur. The awareness would lead to behaviour change. There is for instance a lot of garbage in Kanyama and many people throw garbage anywhere causing the drainage system to be blocked. The author has visited Kanyama many times during the course of duty and also at one time lived in an area called Makeni, not too far from this study area and therefore observed the way of life of the people of Kanyama. The waste management is very poor despite some campaigns from various stakeholders such as the Lusaka City council, the Environment Authority of Zambia and the Disaster Management Mitigation Unit (DMMU). Awareness about behaviour change regarding exposure to flood risks can help the community or individuals in ensuring that drainage systems are not blocked, waste management regulations are adhered to and construction of housing in undesignated areas is not done.

The framework has the following components recommended for disaster risk reduction as agreed upon by various stakeholders, in 1995, in Japan, and most of these have been adapted in the Zambian Disaster Management Act of 2010. The recommendations can be used as operational guidelines for development of other plans such as contingency development plans.

These components have been applied to the study area so as to describe how they can be used for mitigation of floods hazards and disasters.

5.4.2 Knowledge development

- **Education/Training**: This is about education on issues of floods hazards and disasters. There has to be capacity building on the impacts of flooding, early warning, preparedness, response to floods, recovery and rehabilitation.

- **Information**: Information is very critical to decision making in disaster management. Information should be reliable and relevant for all stakeholders. Information is required on flood related issues so that people are knowledgeable and take appropriate measures in case of flood hazards and disasters.

5.4.3 Public commitment

- **Institutional framework**: This is about strategy and policy formulation. The policies must be well implemented. The public should be sensitized about the policies and structures of government in place.

- **Policy Development**: Again, a policy on disaster management is in place but not effective. Concentration has been on response until recently when preparedness is being addressed

especially after creation the positions and employment of Provincial Disaster Management Coordinators in all provinces.

- **Land Use Planning**: The Ministry of Local Government is committed to physical planning, but the challenge has been that Kanyama is an informal settlement with a few parts that are designated for official housing, commercial and industrial purposes.

- **Legislation and codes**: There is a Disaster Management Act of 2010, but a lot more needs to be done, such as finding an effective way of implementing the Act. The Act cannot be effective if the budget line for disaster management is not sufficient. The government should formulate a plan for financial resource mobilization. This will make preparedness a lot easier than just responding to flood hazards and disasters.

- **Community Actions**: There are community groups dealing with and participating in disaster risk reduction through the Residence Development Committees (RDCs), the local government councillors, as well as Members of the House of Representative. The challenge once more is adequate resources for community participation. In some cases there have been allegations of poor accountability of financial resources.

5.4.4 Application of risk reduction measures

This involves environmental management, land use planning, protection of critical facilities, networking and partnerships and financial costs.

The framework for disaster risk reduction involves components regarding the context of sustainable development referred to as; social-cultural, political, and economic and ecosystems.

5.4.5 Effective vulnerability reduction and resilience promotion framework

In assessing the impact of flooding and measuring of vulnerability and resilience of Kanyama community, it is important for all stakeholders to ensure that a suitable framework is used. This assists in determining impact of floods on socio-economic, ecosystems and political systems in the study area. It also helps in investigating as to whether the community's physical and demographic characteristics contribute to reducing vulnerability and promotion of resilience. Furthermore an assessment into what extent government and relevant stakeholders has contributed effectively to emergency response and recovery after exposure to flood hazard or disaster must also be assessed. The Kanyama community needs to be empowered in terms of financial resources so that in an event of flood disasters, people could manage to recover, instead of waiting for the government and other stakeholders to provide recovery support and logistics.

5.5 Application of community based disaster management

In assessing vulnerability in Kanyama, the author agrees with Pelling (2004) that strategies for community based risk reduction should be:

- Reinforcing people's existing livelihoods to increase or maintain current levels of production and income and so access to basic needs. Most people in Kanyama have very little disposable income. They livelihoods depend on trading, doing manual jobs and depending on friends and relatives. They are not able to access basic needs like food, water and sanitation and decent and good shelter.

- Strengthening social and organizational support structures and this can act as a means of accessing basic needs in times of emergency.

- Seasonal circles of preparedness to include weather reports, efforts to retrofit buildings and clean drains to improve resilience.

- Encouraging a shift from managing poverty to managing vulnerability. Whilst this may be difficult at an individual level, and could heighten local inequalities, at a communal level, tree planting or the training of local health workers or educationalists can reduce vulnerability for all in the long run.

- Enhance the human resources of community activists and leaders. The increase of local awareness of group leadership skills and of external sources of assistance can improve the effectiveness of local organizations playing a role in community level development.

- Making health and sanitation services available at local level. This can include lobbying for physical infrastructure provision or the resources to form a locally managed solid waste management service, and investment in human resources to provide local first aid. Everyday primary and child health and nutritional care and advice are also included.

Conducting advocacy campaigns in the media and local and national government can help build a local spirit of solidarity and avert harmful external policies.

The author has adapted PAR and Progression of Safety Model, the Hyogo framework and the Sustainable Livelihood Framework and applied it in this research. The Zambia Disaster Management Act of 2010

has been applied in a similar way, as the Hyogo framework, whose main objective is disaster risk reduction. Community Based Disaster Management can be effective management tools in helping a community cope with floods hazards and disasters. Effective mitigation of flood hazards or disasters requires an effective DRR, and effective community participation for promotion of resiliency in Kanyama community.

In the next section an analysis of conducted interviews is presented.

5.6 Analysis of the conducted interviews

First the outcome of the expert interviews is presented, followed by the semi-structured interviews.

5.6.1 Expert interviews

According to the International Federation of the Red Cross and Red Cross Crescent Societies-Zambia (2010), the following were stated to be the impact of the response regarding the 2009/2010 floods in Lusaka:

- There was an effect on the socio-economic activities of the people. Some of the victims could not go to work because their houses were either submerged or access to work was difficult as roads were impassable. Access to clinics and hospitals was also limited, because public transport was disrupted, as taxi drivers and other motorists refused to go into the study area for fear of being stuck in the mad or water.

- Bridges were washed away. These are those feeder roads and foot-paths that link one section of the study area to another.

- There was limitation to access to school by children. It was reported that there was absenteeism by both pupils and teachers,

as roads were impassable or the school grounds were surrounded by water.

- Small scale businesses such as trading were affected. The worst affected were those traders who sell by the road side or make-shift stands, as it was not possible to sell when the ground was waterlogged.

- There was a problem of safe drinking water and sanitation. Those residents in Kanyama who use pit-latrines had their toilets submerged or collapsed because of the heavy rains. This caused water-borne diseases such as cholera, dysentery and diarrhoea.

- Loss of confidence in local and government leaders due to the floods hazards. People were reported to have lost touch with their civic leaders because most roads had become impassable.

5.6.2 Semi-structured interviews

The interviews were conducted in an ordinary atmosphere at the residences of the participants/dancing group (see Chapter 3). The dwelling places of the 18 participants had a lot of similarities in the way they were built. The housing was considered decent, according to the participants way of life and status of employment, that of being unemployed. The livelihoods have been dependent on petty trading, piece-work's/manual work and dancing in a cultural group for survival. The earnings are not enough for a decent sustainable livelihood.

The characteristics of the interviewees interviewed are as follows: Most of the participants were not well educated. The highest educated was one, a government official who just enrolled into university a year ago, the rest did not finish secondary school and not even primary educa-

tion. The females were keen to return to school, but all had financial problems.

- The participants had come from different parts of the country in order to earn a living in Lusaka city.
- The participants live among other ordinary poor community.
- There is no high school near this community.
- There was no clinic or see a clinic or hospital nearby.
- The quality of life is very low. There shared communal toilets. There was one tap for more than 50 people. Some of the people were not willing to be interviewed.
- There was no road to Chibolya community; one had to pass through spaces between houses and no drainages either.
- The area is full of rocks, and water does not sink quickly after it rained, as there was a pools of water and mad just it rained a couple of times.
- There is no sewage system and no disposal place for garbage. The place was full of litter.

From the stories told to the author about the flood victims, those with social capital, for example had the means to relocate on their own, compared to those without as they had to wait for government to help them response to floods. The interviews were about detailed specific information about Kanyama's flooding history and its exposure to flood hazards as well as vulnerability to epidemics that occur during floods such as cholera and malaria, due to breeding of mosquitoes because of waterlogging.

Further observations are that there is likelihood that the response to the author's questions was influenced by the interviewee's perception about the author. Some knew that the author was working for the government and thought she had been sent, until the author explained in detail her mission. It is also possible that the participants may have perceived the author through a number of roles, including a relative, a privileged woman from an "affluent society and partly studied abroad." The knowledge that author was a government official could also have influenced their responses.

Despite how the interviewees could have perceived the author, it was imperative that some primary data be collected for this study, and the author considered this opportunity, a privilege. Table 3 is a summary of the characteristics of the interviewees and their views; see also Table 1.

Table 3: Characteristics of interviewees and their views

Variables	Comments
• Demographics	• Age group was between 18 and 59 • Only one was employed out of 19 responders • Education level of responders only had primary education, with 2 dropping out of high school, and 1 just went into university.
• Social-Economic	• Dwelling places were decent but not in good condition • Only 1 out of 19 owned a house, the rest were dependents and rented. • The household size ranged from 6 to 9 • The total income ranged from K400,000 to K1.5m • Main source of income was piece works • Length of stay was from one week to 21 years
• Awareness of 2009/2010 floods	• All except 3 were aware of the floods • All responders did not prepare for floods • They all did not have information regarding floods • They all said they were affected by floods • They all said their household goods got damaged • They all said roads were flooded and impassable and livelihoods were disrupted
• Preparedness	• Responders all acknowledged Kanyama and surrounding areas has flooding problem • They all said they were not prepared and still are not because of lack of money.

• Capacity	• None had attended any disaster management course • Out of 18 only two knew about a Disaster Management Organization in Zambia and local authority. • They all said they never received support from any one • They all said they had no capacity either to help themselves and hoped for the government and local council.
• General	• They all said Kanyama has a serious flooding problem because of poor roads, no drainages, poor housing. • They hoped that one day, the government of Zambia or someone would help them out of this problem of floods one day.

Source:Author

In summary, what was learned are; the high vulnerability of the youth in Kanyama but despite this they have some resilience to survive in dire circumstances. Their circumstances and views help to 'calibrate' the indicators that are presented in the subsequent paragraphs.

5.7 Indicators for identification of vulnerability and resilience to floods

Indicators are important in that they help in decision making in an organization. They point to the subject and give an estimation of the expected results.

Damm (2010) states that," the assessment of vulnerability requires a reduction of potentially available data set of important indicators and criteria that facilitates an estimation of vulnerability". She further states that the Hyogo Framework for Action 2005-2015 emphasized the need to," develop systems of indicators of disaster risk and vulnerability at national and sub-national scales that will enable decision-makers to assess the impact of disasters" UN/ISDR(2005).

According to Gallopin (1997), Indicators may be either qualitative or quantitative variables. When quantitative information is not available, qualitative indicators could be preferred. "Indicators are widely recognized as useful measurement tools in distinct fields of research, and are considered to highlight trends and conditions for policy purposes. The basic premises of indicators is that through a limited set of figures, social-ecological issues can be effectively communicated, conditions monitored, and results of policy and management can be measured. Damm (2010) agrees with Moldan, *et al.,* (2007) that indicators are about the interface between science and politics, and therefore must be credible, legitimate and relevant to decision making. Table 4 contains some definitions of indicators.

Table 4: **Some definitions of Indicators**

Source	**Definition**
Nardo et al., 2005	Indicators are simply tools that can be used to define or point to a more significant issue. They may be developed from either primary or secondary data sources.
King and MacGregor 2000	A variable which is an operational representation of a characteristic or quality of a system able to provide information regarding the susceptibility, coping capacity and resilience of a system to an impact of albeit an ill-defined event linked with a hazard of natural origin. An indicator can be a single variable or a sophisticated aggregated measure that describes a system or process.
Birkmann et al.2006: 57	An index number is a measure of a quantity relative to a base period. Indices are a statistical concept, providing an indirect way of measuring a given quantity or state allowing comparison over time.

Source: Damm (2010)

Development and selection of indicators may be tasking, because consideration has to be paid to a number of factors such as the methodology, and whether the indicators are based on quantitative or qualitative information. In this research, the author has limited herself to indicators according to the adapted theoretical framework and the formulated framework of this research. Identification of indicators helped in creating an understanding the factors that have contributed to vulnerability in Kanyama area. Damm (2010) recognized the work of Benson (2004) in identification and the understanding of vulnerability, factors that are important aims of measuring vulnerability.

The author also discusses resilience indicators in the study area. Resilience in this research is mainly about social resilience, which Adger (et al., 2002) refers to it as, '' the ability of a community to withstand external shocks and stresses without significant upheaval." Tanner (et al., 2008) acknowledged the work of Dawson (et al., 2007) which stated that vulnerability reduction and strengthening resilience of urban centres to climate change is a function of social, economic and political processes.

5.8 Vulnerability and resilience indicators

The following are vulnerability and resilience indicators outlined by Tanner (et al., 2008):

- Economic well-being and stability (e.g. standard of living; rate of urbanization).
- Demographic structure of population.
- Institutional stability (e.g. institutional 'memory; corruption).

- Strength of and reliance on public infrastructure (e.g. health expenditure; communication, infrastructure; financial, transport, corporate and systems, degree of centralization).
- Global interconnectivity (e.g. trade balance)
- Natural resource dependence and regenerative ability of ecosystems (cited in Dawson et al., 2007).

An effective way of developing or identifying indicators is by identifying the components of a baseline. In this study the baseline for resilience are the same as those for vulnerability and have been restricted to the ecosystem, social -economic and political indicators.

5.9 Indicators and outcomes

The outcomes and indicators to measure vulnerability and resilience in relation to social, economic, environmental and political variables are as follows for Kanyama, see Table 5:

5.9.1 Social indicators and outcomes

- Indicator of high levels of quality education: The outcome of the findings revealed that most children attend school especially basic education. However, there is no government high school in Kanyama.
- Indicator of good road network: The road infrastructure is mostly not tarred, except for the main high way which is Lusaka-Mongu in the west, Los Angeles in central Kanyama, Kafue road in south and Makeni road. The gravel roads are impassable during the rain seasons.

Table 5: Vulnerability and resilience indicators of Kanyama using four baselines

ECOSYSTEM INDICATORS	SOCIAL INDICATORS	ECONOMIC INDICATORS	POLITICAL INDICATORS
High level of air pollution	Inadequate schools	Poor standard of living	Political acrimony
Soil Erosion	Poor road network	High rate of urbanization	Low confidence in government and local government systems
Soil degradation	Public transport challenges	Low income levels	High rate of aspiring candidates for house of Representative
	Poor Health services	Child headed households	Ineffective lasting solution for illegal housing
	Poor staffing in clinics	High urban migration rate	Ineffective land distribution
	Poor staffing in schools	Lack of micro investment finance	
	Lack of social capital	High rate of unemployment	
	High rate of drug abuse		

Source: Author

- Indicator of good transport system: The finding is that the most reliable form of transport is by road, and the common form of transport is the public transport buses. When roads are flooded, public transport is disrupted.

- Indicator of good health services: The health services showed lapses in the health sector and more needs to be done. There is one main health centre, Kanyama health centre. The clinic is poorly staffed and without much equipment and medicines.

5.9.2 Ecosystem indicators and outcome

Zaferators (2011) stated that “the environmental outcome emphasizes the application of management practices to achieve environmentally beginning processes in production, agricultural restoration and regeneration, and increased community resiliency to hazards.”

- Indicators of environmental degradation: Waste management was discovered as a challenge to most residents of Kanyama. The Lusaka city council has a put in place waste management regulation, but there is still a lot of garbage lying around.

- Indicator of Air pollution: It was mentioned by some residents that each time there are floods, there are pools of water and waste, making the air polluted, and making it a health hazards.

- Indicator of Soil erosion and soil degradation was seen in some areas.

5.9.3 Economic indicators

- Indicator of good standard of living. The finding was that the most households have challenges in having a sustainable livelihood.

- Indicator of high rate of Urbanization: Kanyama is highly populated due to a high level of urbanization.

- Indicator of low income levels: There are many people in Kanyama that are involved in trading in and only have enough to survive.

- Indicator of child headed households: It was revealed that there are a lot of homes headed by Children due to the HIV pandemic.

- Indicator of micro-investment finance: There are very few people that can afford loans for investment, because the interest rates are very high.

- Indicator of employment: There is a high level of unemployment in the study area.

5.9.4 Political indicators

- Acrimony: There was acrimony on the 20th September 2011 during the tripartite elections where election material in Nakatindi ward was destroyed, News at Ninteen.2011. (Television Broadcast).ZNBC. September 21.

- Loss of Confidence in government: People's confidence in government and local government system as indicated by the people not only voting for a House of Representative but also for Presidency, in which President Michael Chilufya Sata was de-

clared winner. News at Eight.2011 (Television Broadcast). ZNBC.September 23.

- Indicators of illegal housing: It was discovered that the houses are not built in designated areas and most of them are not safe and strong enough to withstand floods.

- Indicator of ineffective land distribution: The issue of land distribution and allocation is still a problem. There is allegation of corruption on the part of the Lusaka city council in a way land is allocated.

5.10 Indicators of resilience

The following were mentioned by the few people that the author talked to during her informal visit to the study area, when she went to attend a funeral of someone she knew who lived in that area and had died. The following issues came out from the people she met:

- Entrepreneurship: People survive by selling all sorts of things including charcoal, merchandize, alcohol, food and other commodities.

- Poultry farming: This is done by very few households as most people do not have enough space for such activities.

- Boiling water or treating water with chlorine: During floods water is contaminated and becomes unsafe for drinking and use. To prevent cholera the people in this community take such measures.

- Disposal of waste in designated areas: While this is still a challenge to many and also a hazard as there is exposure, some

people are able to dispose of waste properly to prevent diseases such as diarrhoea and dysentery.

- Early evacuation by the government and other stakeholders when water levels increase: In the 2008/2009 floods some people were evacuated to the Independence stadium until the end of floods.

- Drainage Rehabilitation and Construction: The Disaster Management and Mitigation Unit (DMMU) under Office of the Vice President is said to have rehabilitated and constructed drainages in the area to allow water to flow.

Some people said each time their place was flooded they relocated to safer areas or lived with friends and relatives.

5.11 Concluding remarks

The findings in this chapter emphasised the problems caused by floods in Kanyama. The people are vulnerable to floods. There have been impacts with regard to social,-economic, environment and political dimensions. The indicators show that people are vulnerable partly because they are poor. They do not own sufficient assets to make them resilient enough during and after floods.

A number of model frameworks were applied to the study area. This study has shown that some of the frameworks can only be well implemented where the community is skilled and has knowledge of the hazards or disasters. Various disaster risk reduction measures are required in Kanyama, in order to mitigate the floods effectively.

Furthermore, it was found that to some extent, when people are very poor, they are more exposed to risks and impacts of disasters. Out of the 18 interviewed with semi-structured questionnaires, none expert,

the author was told that all except one decided to live in Kanyama because they are poor, and cannot afford to build a house or pay rent in low density areas. The general opinion is well reflected in the following said by a 34 year old man,'' what can I do? Where can I go? I only hope that one day, my life can change, and I will also have money to build my own house and live in a better way. I also hope the government will seriously consider that even us the poor, need better life. But for now, even if it rained heavily, I would not go anywhere, unless someone comes to my aid".

CHAPTER 6: DISCUSSION AND REVIEW OF CONCEPTS

The aim of this chapter is to discuss and review concepts that have been used in this study in order to recommend a framework for vulnerability reduction and resilience building in Kanyama.

6.1 The vulnerability and resilience concepts

These concepts have been defined and discussed in the literature review and theoretical framework, in chapter 4.In this chapter the researcher has used them in the formulation of a conceptual framework that, which is recommended for reducing vulnerability and building resilience. Figure 9 shows the elements of the conceptual framework. These have been categorized into those related to vulnerability namely; defining root causes, identification of dynamic pressures and creation of safe conditions. The others refer to resilience, and these are effective risk reduction, governance, sustainable livelihood community based risk reduction planning process and community based disaster management.

6.2 Recommended vulnerability reduction and resilience promotion framework

The main category of the framework this author has developed involves the following:

- Vulnerability reduction through defining root causes
- Vulnerability reduction through identification of dynamic pressures
- Vulnerability reduction through creation of safe conditions
- Building Resilience through effective risk reduction policies

- Building resilience through effective urban governance
- Building resilience through for sustainable livelihood
- Building resilience through high level community participation

6.3 Vulnerability reduction

The issue of vulnerability in Kanyama is real. It is manifested in several ways. It can be categorized differently by different people or researchers or indeed the community itself. It can be referred to economic vulnerability, social vulnerability, political vulnerability and environmental vulnerability. In this research, it has been simply been called vulnerability with an emphasis on reduction, exploring the possibility of building of resilience and the impacts of floods on socio-economic, political and the environment.

Reducing vulnerability and promotion of resilience to floods is attainable through an effective implementation of a framework, as outlined below, see Figure 9

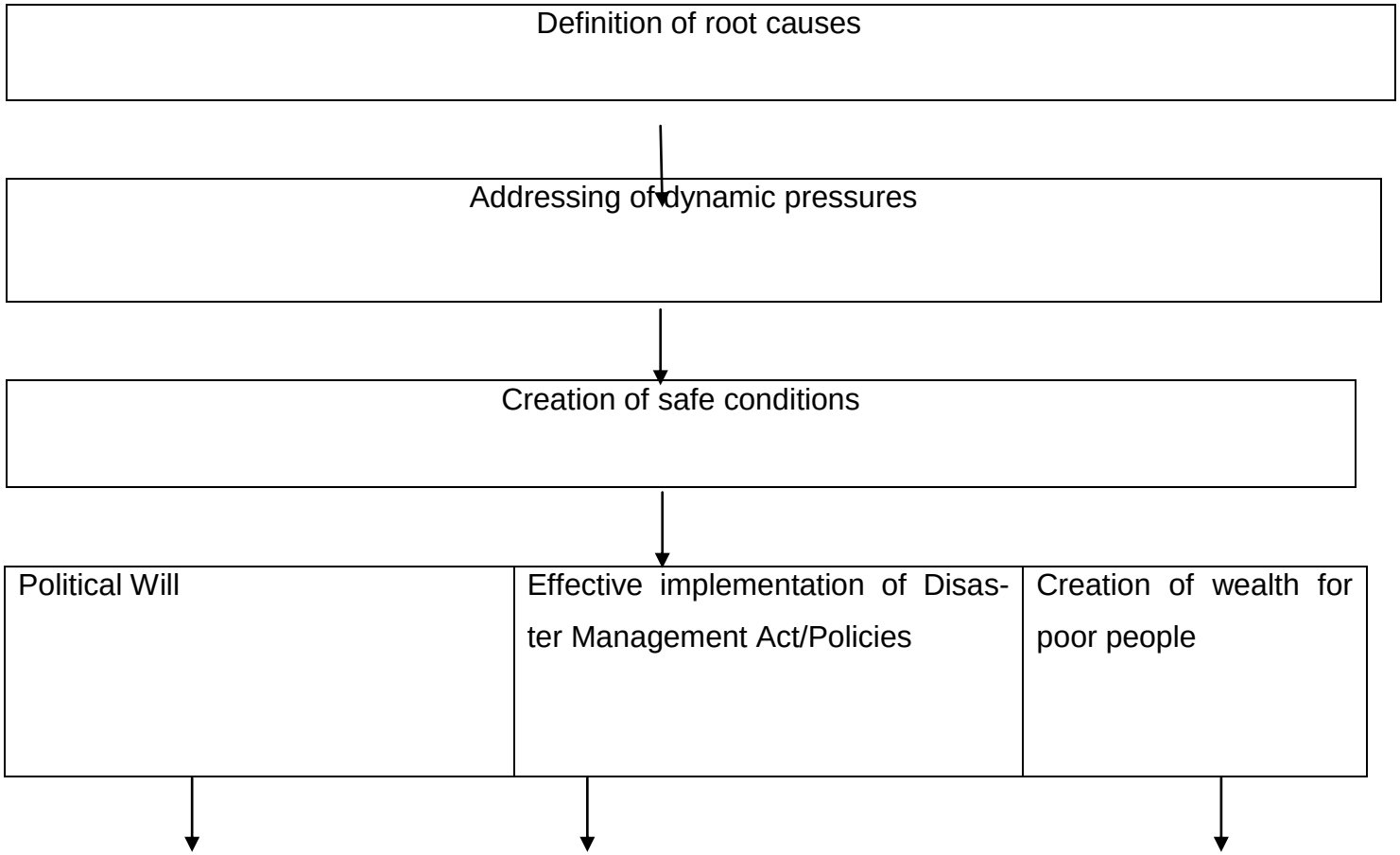
6.3.1 Defining root causes

In order to reduce vulnerability in Kanyama community, the root cause needs to be properly defined. During the interviews it was clear that most people of this area are struggling to survive. People have migrated to this peri-urban area to find jobs. They do not earn enough to build strong houses that can withstand floods. They do not have money to relocate to good places that are not affected by floods. The central and local governments including other stakeholders must ensure that they find a way of addressing the actual causes of vulnerability, than just responding each time there are floods.

6.3.2 Identification of dynamic pressures

The government should identify and address the following dynamic pressures:

- Lack of steady income due to sustainable livelihoods activities which are disrupted by flooding, such as petty trading from make-shift shelters.
- Lack of access to basic social amenities. Kanyama has problems of water and sanitation, and it lacks adequate health facilities for all.
- Limited access to power makes the people of the study area more vulnerable. They have limited power to make decisions that regarding flood mitigation and policy issues related to this subject.
- Illiteracy due to lack of education. People need good education to help live a decent live. Education can provide employment and also creates opportunities for self- employment, where the economy is doing well.


Definition of root causes
Addressing of dynamic pressures
Creation of safe conditions
Political Will
Effective implementation of Disas-ter Management Act/Policies
Creation of wealth for poor people

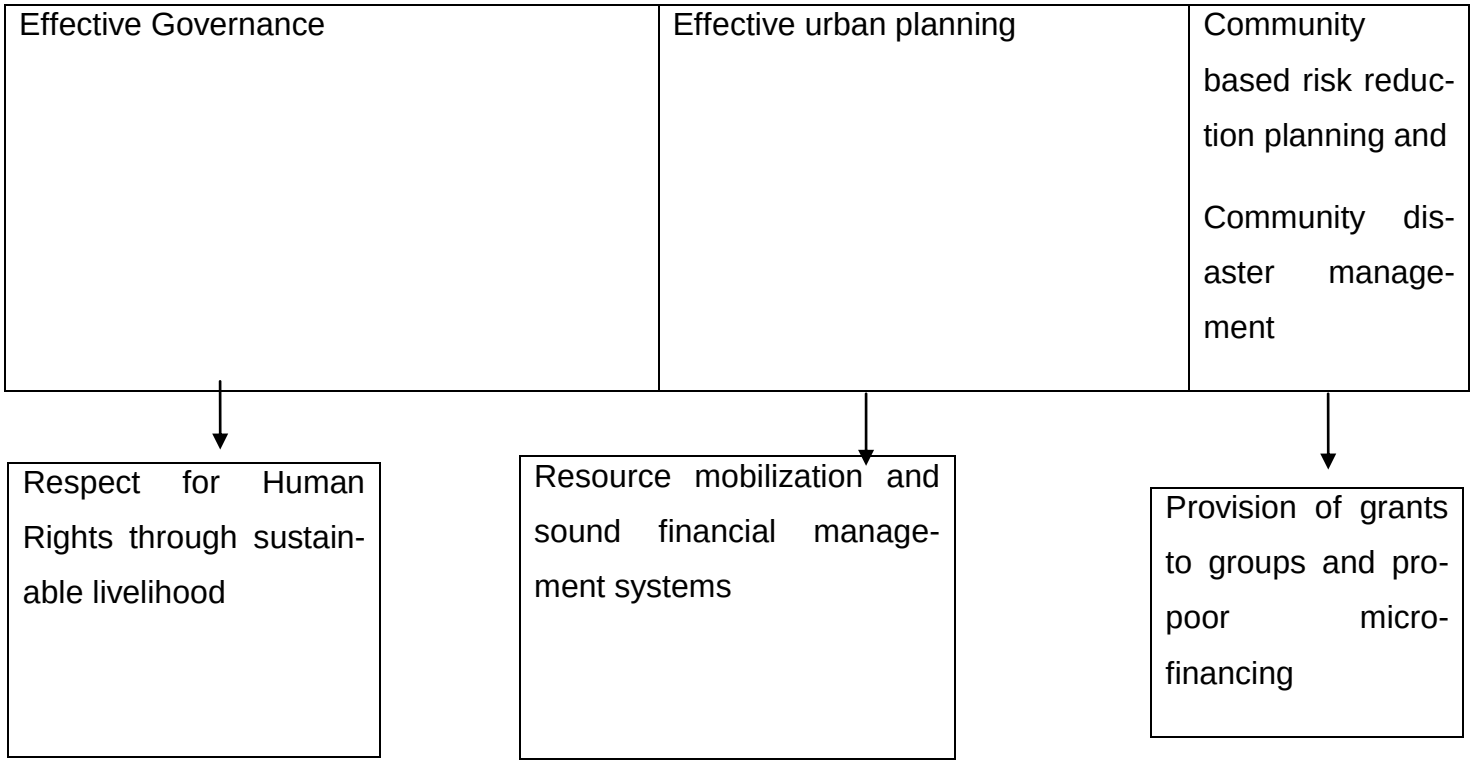


Figure 9: Conceptual frameworks for vulnerability reduction and resilience building

Source: Author

6.3.3 Creation of safe conditions

The importance of creating safe conditions such as political will, effective implementation of Disaster Management Act of 2010 and creation of wealth for the vulnerable such as women, youth, those physically challenged and the elderly, should be emphasized.

Political will is about good governance. This involves respect for Human rights through sustainable livelihood. There is also a need for effective urban planning by the government. Resource mobilization should be part of urban planning. Sound financial management systems and control, transparent and accountability should be effective. The community should be empowered economically. The Kanyama community should be assisted with grants and micro-financing where possible.

6.4 Resilience building

In this research, the findings have been that, there is very little to build resilience on or nothing at all. Part of the community for instance those interviewed from Chibolya indicated that the people are so poor that they are not able to build resilience. Resilience building requires sufficient means. It requires an appropriate sustainable livelihood. It requires a person to be educated, be in employment and earned sufficient income.

6.4.1 Resilience through disaster risk reduction measures

The Disaster Management Act No. 13 of 2010 in Zambia should be making Disaster Risk Reduction effective. DMMU is ensuring that risks are reduced in flood prone areas as much as possible. Drainage construction and rehabilitation is still an on-going programme. Communities are still being sensitized on the possibility of floods and epidemics

that come with the flood problem. These programmes should be effectively planned and monitored by qualified personnel. The local authority, in this case the Lusaka city council should effectively implement disaster risk reduction, in collaboration with the central government, NGOs and cooperating partners.

6.4.2 Resilience through urban governance

Urban governance plays a very critical role in building resilience. Local governments have the responsibility of provision of infrastructure, disaster preparedness, disaster response and city planning development. According to Huq et al (2007), one of the most direct influences that municipalities have on poverty and vulnerability is through provision of water, sanitation, drainage, solid waste collection, public health and housing construction and rehabilitation. Action Aid 2006 however suggests that, “recent evidence suggests that many municipal governments do not have adequate provisions in order to deal with increased climate hazards such as flood management”.

6.4.3 Resilience through sustainable livelihood

Resilience can be built when people are empowered. The author acknowledges that sustainable livelihoods for all in Kanyama are important if resilience has to be built. A livelihood asset of human, social, physical, natural and financial capital reduces vulnerability and also promotes resilience. Transforming structures and processes in government, private sector and processes at institutional level, into livelihood strategies in order to achieve livelihood outcomes are necessary. The outcomes will be creation of more income, increases wellbeing, reduced vulnerability and improved food security.

6.4.4 Resilience through community based risk reduction planning process

A resilient community is one that is involved in community based risk reduction planning process. According to Yodmani (2008) this is about participation by the community and meaningful external involvement. Under literature review, the element of community based disaster management was discussed and its characteristics highlighted. In this chapter it is necessary to also review part of a very important process of community based risk reduction planning. Yodmani (2008) (Figure 10) stated there are six stages of community based risk reduction planning categorized as:

- **Stage 1: External involvement**: The role of ensuring that there is external involvement by the government and private sectors. This involves conducting a vulnerability assessment, identification of threats and vulnerability and knowledge of disaster management.

- **Stage 2: Community Profiling**: Community profiling is essential for assessing the development of the community, the contents upon which disasters would have an impact. Social and cultural groups have to be identified, so that there is sufficient information about the groups of people in the community. DMMU is mandated to work with NGOs and the community on profiling.

- **Stage 3: Community Risk Assessment**: This involves hazard mapping, vulnerability assessment and resource assessment. The ZVAP has been involved in community risk assessment through vulnerability assessment.

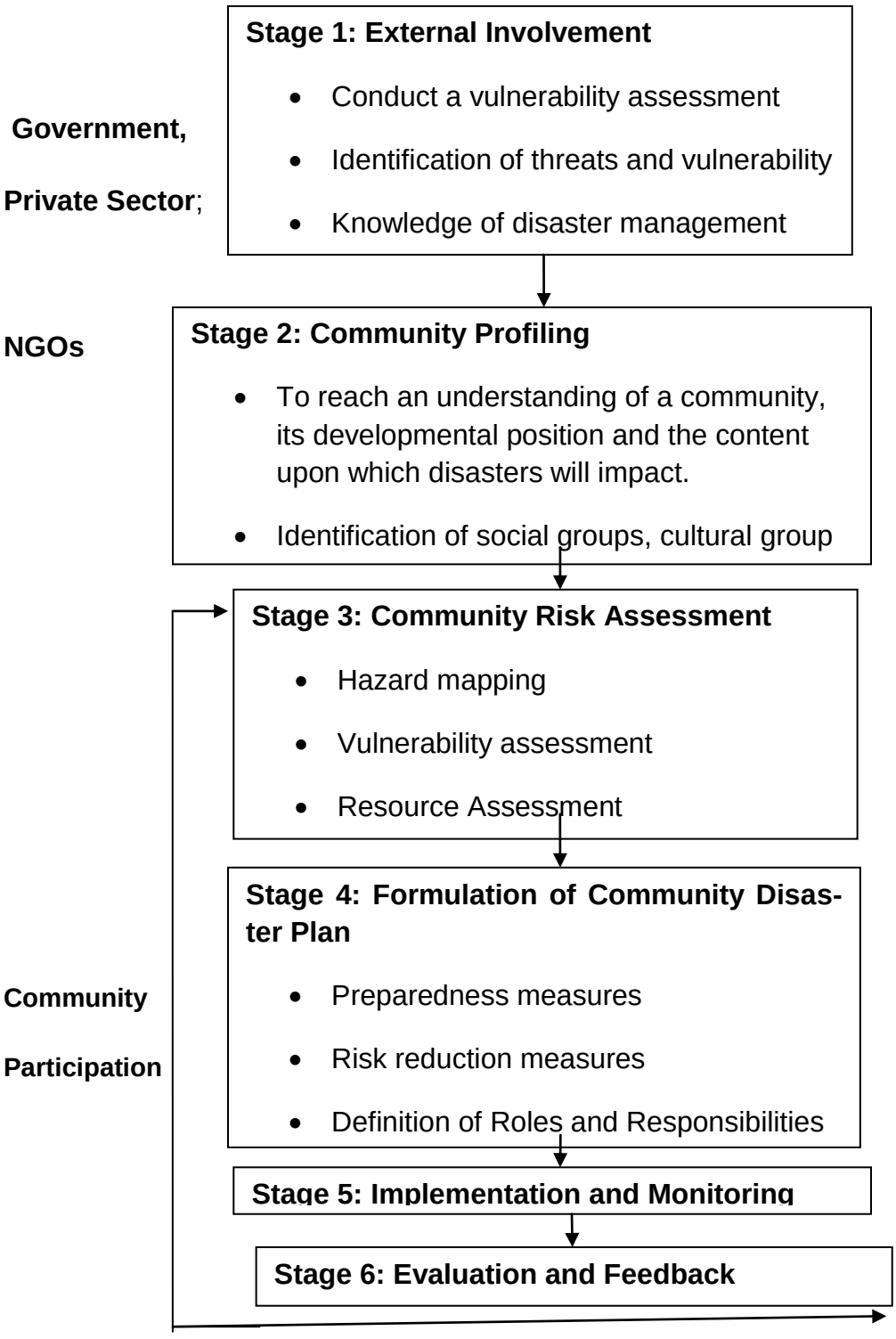
- **Stage 4: Formulation of Community Disaster Plan**: The community's participation is very important and includes prepar-

edness measures, risk reduction measures and definition of roles and responsibilities.

- **Stage 5: Implementation and Monitoring** has to be carried out by the community. In Kanyama, there seems to be insufficient capacity by the community to implement and monitor plans. The government should therefore strengthen communities such as Kanyama so that the community can fully and effectively participate in the planning process.

- **Stage 6: Evaluation and Feedback** is a vital stage that requires resources and capacity. The Kanyama community is yet to be strengthened in this area. The DMMU is working with the community through Resident Development Committees in evaluation and feedback.

Figure 10 Community Based Risk Reduction Planning Process



Source: Yodmani (2008)

6.5 Phases and roles in community based disaster management

Phases and roles have been categorized in five stages, by Delical (1999), namely community situation analysis, community profiling, community risk assessment, counter disaster plan and action, evaluation and feedback see Figure 11. The stages are participated by both outsiders and insiders, similar to Yodmani (2008), community disaster reduction planning process. In relation to the study area, Zambia has not yet reached this far in terms of planning. There is still a lot of work to be done by the DMMU, through an effective implementation of the Disaster Management Act (2010).

OUTSIDERS	Phasing In	Mobilization	Setting Agenda	Integration and Expansion	Phase Over	INSIDERS
	Identification of risks and vulnerabilities Clarification of roles and objective Planning Strategy Resource Inventory **Request Assistance** **Family Coping** **Community ongoing efforts**	Entry and Immersion Rapport Building Learning Community study Validating issues Organizing **Problem ID** **Socio-economic-political- cultural situation** **Biophysical situation**	Facilitating Training Providing Material Linking with resources Group capacity building **Hazard Mapping** **Vulnerability Assessment** **Resource Assessment**	Group strengthening Facilitating linkages **Preparedness measures** **Risk reduction measures** **Roles, responsibilities, schedules, inputs** **Implementing project**	Consulting **Initiating Project** **Facilitating** **Controlling** **Pressuring** **Negotiating** **Influencing other communities** **Reflecting** **Adjusting** **Expanding** **Sustaining**	
	Community Situation Analysis, (STAGE 1)	Community Profiling, (STAGE 2)	Community Risk Assessment, (STAGE 3)	Counter Disaster Plan and Action, (STAGE 4)	Evaluation/ Feedback(STAGE 5)	

Figure 11: Phases and Roles in community based disaster management Source*: Delica (1999)*

6.6 Conclusion

The discussions about the concepts of vulnerability and resilience cannot be discussed without explaining the role and importance of a community. Community Based Risk Assessment is very important to finding a solution to reducing vulnerability. The author stated earlier in Chapter 5 that at the time of interviews of a few people from Kanyama, Chibolya area in particular it showed that there is little resilience or none at all. The reason is that most people are poor and do not have adequate sustainable livelihoods. They do not have assets or wealth that can make them resilient. The researcher discussed vulnerability and resilience in general, even though these terminologies can be categorized and defined in socio-economic, environmental and political dimensions. The conceptual framework formulated is recommended by the researcher for vulnerability reduction and building resilience.

CHAPTER 7: Summary, Conclusions and Recommendations

7.1 Overview of Study

The general overview is that the researcher has attempted to discuss the subject of vulnerability and building resilience to floods, in Kanyama. The problem statement has been defined. There is a problem of flooding in Kanyama whenever it rained heavily. The effect of floods on socio-economic, political and ecosystems has been established. Livelihoods became disrupted during the 2009/2010 floods. The soils were affected as there was soil erosion and soil degradation. The environment was polluted as the result of contamination of water mixed with sewage and waste. Politically people lost confidence in the MMD party that ruled for twenty years until 23rd September 2010, after which the Zambian people voted for the Patriotic Front. As for the House of Representatives, the Kanyama community voted for the opposition political party since the year 2006, which became the ruling party on 23r September, 2011.The study area is vast. It is made up of different small communities and the majority is the poor people. There are many youths, women and people with physical challenges that are struggling for a sustainable livelihood.

The problem statement reflected in the research questions in chapter one have adequately been covered. The effect of floods on socio-economic, ecosystem and political variables of Kanyama community have been established in chapter 5. The characteristics and geographical location contributed to vulnerability. These factors did not help in building resilience. Resilience still needs to be promoted. Emergency response and recovery to flood hazard was conducted by the government during the 2009/2010 floods. The DMMU is attempting to manage

floods in Kanyama, by using the Disaster Management Act of 2010. However, the problem of flooding is still real.

7.2 Comments on 2009/2010 floods

The 2009/2010 floods had a big impact on people's livelihoods. The government of the Republic of Zambia responded quite well to the flood situation. However, other challenges such as the breaking down of cholera made the situation worse. Other partners and volunteers from organizations such as the Zambia Red Cross Society and the UN (Zambia) worked together with the DMMU, but still had another challenge of sustainability of the people that had been evacuated to the Independence Stadium. Pupil's school calendar was disrupted. There was another risk hazard of water contamination.

7.3 Summary discussion of conceptual framework

The author derived a conceptual framework from the PAR and Progression of Safety Models, the Sustainable livelihood and the Hyogo Framework that emphasizes disaster risk reduction. The Disaster Risk Management Act of Zambia has been referred to as it is the official regulation framework of disaster management in Zambia. It was enacted in May 2010, and has not therefore been fully implemented. Community based disaster management was also considered, in analysing the issue of resilience and community participation. The conceptual framework used in this study gave rise to indicator analysis. The analysis was not easy, as its development was also a challenge for the researcher. Despite the inability to logically develop and analyse, indicators can be used to inform the process of disaster risk reduction. Indicators can be ranked by use of statistical methods. Indicators in this study are qualitative.

This research has provided a basis for future disaster risk analysis. Technical aspects of vulnerability and resilience could be researched further. Hazard mapping should be used to assess vulnerability. Data should be captured through use of the Geographical Information System (GIS) in order to establish actual areas affected. Social impact on infrastructure such as schools, clinics, roads, markets, bridges and railway lines can easily be interpreted through GIS.

The ZVAC (2010) considered objectives including those of finding out to what extent floods had impacted water and sanitation, education, human settlement and others, and areas affected. The author agrees with approach to risk reduction as formulated in the Disaster Management Act (no 13 of 2010). However, it is a needs assessment, for responding to hazards and disasters and not preparedness.

7.4 Recommendations

The author strongly recommends the following to the government of Zambia, and other stakeholders:

- **To concentrate on disaster preparedness** and covering all components of the disaster preparedness framework namely; vulnerability assessment, information systems, response mechanisms, planning, resource base, public education and training, institutional framework, warning systems and rehearsals, Zambia Red Cross Society(2011)

- **Effective implementation of the Disaster management Act (2010**): The implementation of the disaster management act is very critical. There has to be a clear distinction of hazards or disaster the country experiences and strategies of how to implement them be formulated. The expansion of the DMMU through the creation of Provincial DMMUs should be promoted.

- **Effective vulnerability reduction and resilience promotion methodologies:** There has to be continuous vulnerability assessments, with the main objective of reducing them. The root causes have to be first sorted out, just as indicated under the PAR and Progression of Safety Models. The issues of housing, water and sanitation, waste management and poverty in general need more effort from the central government. The DRR measures needs to be well formulated and implemented. Community based risk reduction planning should be encouraged with a lot of participation from the community.

- **Effective implementation of sustainable livelihood strategies:** The poverty levels need to be reduced. People, especially the most vulnerable must be empowered and supported in the creation of wealth, for a sustainable livelihood. The people of Kanyama need better assets, and even more income that could help people recover from any potential disasters. There has to be deliberate policies of job creation, and decent and permanent jobs and not just wages. The community should have more high schools so that people become educated and manage their lives well in the future. The hospitals and clinics must be rehabilitated and constructed, for better health services, and reduction in pandemics that break out during the rainy season.

- **Effective participation of the affected community, as key stakeholders**: There is need for an effective capacity building program for the population of Kanyama. People need education and warning about flood hazards and disasters. The people should be trained and empowered with disaster management skills so that they can contribute to finding solutions to mitigate floods in the area. Furthermore the community should be edu-

cated on the need of constructing houses in designated areas. They should be taught about waste management at a community level and the need for skills development of disaster management.

- **Continuous political will for good governance**: There is already an indication that the new government of the Patriotic Front is “a people’s government”. President Michael Chilufya Sata has said this during his inauguration speech of 23rd September 2011 after being elected, as President of Zambia. What is required are more financial resources, an effective way of implementing disaster management programs and strategies. The problems of root causes of the flood problem in Kanyama can be addressed if there is sufficient political will and effective participation by all key stakeholders such as the community, religious leaders, NGOs, private sector and both the local and central government .

7.5 Conclusion

Vulnerability reduction is a process. It requires commitment from all stakeholders. It needs a lot of financial and other resources like capacity building at all institutional levels. For a country like Zambia, with many other challenges of governance and equitable distribution of resources, more effort should be added if exposure to the risk of flooding and potential disasters in Kanyama has to be minimized. Resilience can only be promoted when enough wealth is created for all.

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INTERVIEW QUESTIONS

APPENDIX I: UNSTRUCTURED EXPERT INTERVIEWS

1. What Is Your Job Title?

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2. Would You Like To State Your Age?

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3. For How Long Have You Held This Title?

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4. Are You Aware Of The 2008/2009 Floods In Kanyama?

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……

5. Would You Know Of Any People Or Group Of People That Were Affected By These Floods?

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……

6. What Else Would You Remember About The Floods?

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……

7. In Your Opinion Do You Think Floods Have An Impact On Socio-Economic, Environmental And Political System In Kanyama? If So What Is/Are The Impact/S?

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8. Do You Think The People Of Kanyama Are Vulnerable To Floods?

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9. If Yes, Why Do You Think There Are Vulnerable?

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10. Do You Think There Are Some People Who Had Coping Or Have Strategies In Place During Floods?

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11. What Do You Think Made Them/Makes Some People Of Kanyama To Be Resilient To Flood Hazards/Disasters?

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12. What Would You Name/State As Indicators Of Vulnerability To Floods In This Area?

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13. What Would You Consider As Indicators Of Resilience To Floods To People Of Kanyama?

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14. What Do You Think Are The Root Causes Of Floods In Kanyama?

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15. Are The Key Stakeholders Such As Government And Community Doing Enough To Sort Out Flood Problems Kanyama?
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    .....
    .....
16. Have You Heard Of The Disaster Management Act Of 2010? If Yes Do You Think It Is Effective In Finding A Solution To Floods Kanyama?
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17. What Would You Recommend Should Be Done To Reduce Vulnerability to Floods In Kanyama?

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18. Do You Think There Are Ways Of Promoting Resilient To Floods In This Area?

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19. What Would Be Your View About The Kanyama Community And Floods?

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20. Any Further Comments?

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THANK YOU VERY MUCH!

APPENDIX II: SEMI-STRUCTURED INTERVIEWS

PART A: DEMOGRAPHICS

1. What Is Your Age?

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2. What Is Your Employment Status E.G Unemployed, Self-Employed?

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   ……

3. Is Your Education Status (Highest Level Of Education)?

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   ……

PART B: SOCIAL ECONOMIC

1. How Can You Describe Your Dwelling? House E.G Decent House E.G Decent House?

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   ……

2. Do You Own Or Rent The House You Are Living In?

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   ……

3. What Is The Household Size?

   ……
   ……

4. Would You Know The Total Income Of The Household?

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5. What Is The Main Source Of Income?

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6. How Long Have You Lived In Kanyama?

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PART 3: AWARENESS OF FLOODS

7. Are You Aware Of The 2008/2009 Floods?

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8. Were You Affected By The Floods?

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9. How Were You Affected?

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10. Did You Prepare For The Floods?

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11. Is You aware Of Any Information Regarding Awareness Of Floods In Kanyama?

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PART 4: PREPAREDNESS

12. Is Floods A Problem In This Area?

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13. If It Rains Heavily Again This Year, What Will You Do?

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PART 5: CAPACITY

14. Have You Attended Any Disaster Related Workshop?

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15. Are You Aware Of Any Disaster Management Organization In Zambia? If Yes What Is It?

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16. What Do You Think Is The Role Of The Named Organization?

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17. Are You Aware Of Any Disaster Management Organization?

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18. Did Any Local Government Leader Help You?

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19. Who Else Helped You?

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PART: GENERAL

20. Why Do You Think Is Kanyama Compound Has A Flooding Hazard/Disaster Problem?

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21. What Do You Recommend Should Be Done About This Problem?

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THANK YOU VERY MUCH!