

TITLE

**“A STUDY AND ANALYSIS OF THE SOCIAL VULNERABILITIES OF COMMUNITIES
LIVING IN FLOOD RISK AREAS ON UNPLANNED SETTLEMENTS IN THE CITY OF
LUSAKA, ZAMBIA”**

By

BENNETT MUDENDA SIACHOONO

**STUDENT NUMBER
2010104228**

**Submitted in partial fulfilment of the requirements for the Master of Science degree
In Disaster Management**

In the

Disaster Management Training and Education Centre for Africa

At the

**UNIVERSITY OF THE FREE STATE
Faculty of Natural and Agricultural Sciences
Bloemfontein
Republic of South Africa**

Study Leader: PROFESSOR DUSAN SAKULSKI

2013

Declaration of own work

“A STUDY AND ANALYSIS OF THE SOCIAL VULNERABILITIES OF COMMUNITIES LIVING IN FLOOD RISK AREAS ON UNPLANNED SETTLEMENTS IN THE CITY OF LUSAKA, ZAMBIA”..... is entirely my own work developed through my own creativity and originality. The writings within are as a result of my avid passion and keen interest in disaster management. I further declare that, where the contents are construed as work of others, this has been fully cited and referenced and / or with appropriate acknowledgments given. It is my sincere hope that through this thesis, I will have contributed to ways and means of finding long lasting solutions to the flood problems in the research areas. I further hereby declare that this dissertation has never been submitted to any university before.

Signed:

Date:

Place:

This work is dedicated to my late parents Rice & Jane Siachoono for inculcating in me, a confident mind-set and positive outlook of life. My father's constant reminder that: “....there is nothing so difficult but does not talk that cannot be successfully dealt with....”

Acknowledgements

In the first instance, I hail the respect, cooperation and the significant contributions that I received from the communities in the study areas during my research. I do hereby wish all the respondents a good health, sustainable life and good will in their future aspirations aimed at finding tangible solutions to the recurrent flood phenomena.

The Lusaka District Commissioner's office for the wisdom and support rendered prior to my commencement of the study in the selected sites.

My fellow students for sharing the many hours of anxiety, mental challenges, study group sessions, exam fever, assignment deadline pressures, triumphant joys and general perseverance throughout the course. You will all agree with me that the course has after all, been quite some fun!

Professor Dusan Sakulski; for offering constructive criticism in the different formative stages of this dissertation.

To you all, a million thanks!

Abstract

The republic of Zambia lies on longitude 30° degrees east in the sub-Saharan region of the continent of Africa. The Country's former colonial masters were British. In pursuit of the Cape to Cairo railway link by the British South Africa Company led by Mr John Cecil Rhodes, the development did reach the present day Lusaka in the 1900s. As a link station, Lusaka: the capital of Zambia since May 1935, was never planned to develop any bigger: it was just a perfect northerly route for the planned railway line. The present day city parameters covers an area of 375 square kilometres. The emergence of unplanned settlements all over the city has been as a result of an ever increasing population driven by the rural urban drift of the 1930's. Compelled by the labour demands and the sought after livelihood options in the city, rural-urban migration has been constant to date with a notable pressure on the limited land in the city. Geographically, the city of Lusaka is 1,280 metres above sea level and was founded on a swampy location that has a generalized underlying rock formation made up of dolomite and lime stone. In the past, and prior to the population pressure, the processes of excess water drainage into the sub-soils, took place naturally. Historically, even during the city's founding, occasional flooding was experienced because of the high water table close to the ground surface (UNEP, UN-Habitat, UNESCO & MEWD. 2009:2). The sheer high population density residing in the unplanned settlements has slowed the naturally occurring infiltration of the excess run-off rain water. The city's population majority is found on the unplanned settlements causing serious environmental impacts. Inadvertently, Floods and epidemics have become a norm during every rainy season in the city of Lusaka. Apart from the ecological damage, there is contemporary social vulnerability at all the unplanned settlements; a dimension that is growing by the day. The social dimension embraces social organizations, knowledge, access to governance and social equity (Concern 2005). The seemingly unending population increase, unemployment, urbanization and overwhelmed social services are all the contemporary trends associated with the city of Lusaka.

Table of Contents

Declaration of own work.....	ii
Acknowledgements.....	iii
Abstract.....	iv
List of figures.....	viii
List of tables.....	viii
List of acronyms	ix
TERMINOLOGY GLOSSARY	x
CHAPTER ONE	14
THE FLOOD EFFECTS AND THE RESEARCH STUDY LAYOUT	1
1. INTRODUCTION.....	1
1.1 BACKGROUND OF THE STUDY AREA.....	3
1.1.1 The study Areas.....	4
1.2 MOTIVATION FOR THE STUDY	9
1.3 THEORETICAL FRAMEWORK.....	10
1.4 THE RESEARCH PROBLEM.....	12
1.5 OBJECTIVES OF THE STUDY	13
1.5.1 Primary objectives.....	13
1.5.2 Specific objectives.....	13
1.6 THE RESEARCH DESIGN.....	14
1.6.1 Research questions	15
1.7 ASSUMPTIONS.....	16
1.8 RESEARCH METHODOLOGY	16
1.8.1 Sample size.....	17
1.8.2 Data collection	18
1.8.3 Data collection tools	18
1.8.4 Data analysis	19
1.9 LIMITATION	19
1.10 SCOPE OF THE STUDY.....	19
1.11 ORGANIZATION OF THE DISSERTATION BY CHAPTER.....	20
1.12 SUMMARY	20
CHAPTER TWO	21
FLOOD HAZARD PERSPECTIVES AND IMPACT.....	21

2. INTRODUCTION.....	21
2.1 FLOOD HAZARDS: AS A GLOBAL PERSPECTIVE	22
2.2 FLOOD HAZARDS: THE CITY OF LUSAKA PERSPECTIVE	24
2.2.1 GENERAL FLOOD IMPACTS AT THE STUDY SITES.....	25
2.2.2 THE PRESSURE AND RELEASE MODEL (PAR) AS A TOOL OF ANALYSIS.....	25
2.2.3 LOCAL ECONOMY	27
2.2.4 PHYSICAL ENVIRONMENT	27
2.2.5 SOCIAL RELATIONS.....	30
2.3 CONCLUSION.....	36
CHAPTER THREE.....	37
METHODOLOGICAL FRAME WORK.....	37
3. INTRODUCTION.....	37
3.1 SAMPLED WARDS.....	37
3.1.1 METHOD – 1.....	38
3.1.2 METHOD – 2.....	39
3.1.3 METHOD – 3.....	39
3.2 SELECTION OF THE STUDY SITES.....	39
3.3 RESEARCH APPROVALS AND ETHICAL CONSIDERATIONS.....	40
3.4 DATA COLLECTION	40
3.5 DATA ANALYSIS	41
3.5.1 QUANTITATIVE	41
3.6 FLOOD IMPACT ZONES.....	41
3.5.2 QUALITATIVE	43
3.7 RELIABILITY OF THE COLLECTED DATA.....	43
3.8 CONCLUSION.....	44
CHAPTER FOUR	45
RESULTS AND DISCUSSIONS.....	45
4. INTRODUCTION.....	45
4.1 RESPONDENT INFORMATION	45
4.2 SOCIO-ECONOMIC CHARATERISTICS	47
4.3 PHYSICAL ENVIRONMENT	48
4.4 SOCIAL RELATIONS.....	50
4.5 GENERIC DATA	53
4.6 EFFECTS OF FLOODS ON HOUSEHOLDS AND THE ENVIRONMENT	55
4.7 COPING STRATEGIES	56

4.8 INTEPRETATION OF THE RESULTS.....	57
4.9 LIMITATIONS TO THE RESULTS.....	58
4.10 IMPLICATIONS OF THE RESULTS	58
4.11 CONCLUSION.....	59
CHAPTER FIVE.....	60
RECOMMENDATIONS.....	60
5. INTRODUCTION	60
5.1 RECOMMENDED AREAS FOR FURTHER ACADEMIC RESEARCH.....	60
5.2 POLICY RECOMMENDATION AREAS	61
6. CONCLUDING REMARKS	66
7. REFERENCES.....	67
Annex -: 1	71
Annex -: 2	73
Annex -: 3	79
Annex -: 4	83
Annex -: 5	84

List of figures

FIGURE 1.1: LEGAL NOTICE FOR RESERVED LAND.....	3
FIGURE 1.2: LOCATION OF KANYAMA, CHAWAMA (KUKU), MATERO & MUTENDERE(KALIKILIKI).....	4
FIGURE 1.3: THE GEOLOGY OF LUSAKA & THE LOCATION OF THE STUDY SITES.....	9
FIGURE 2.1: REPORTED DEATHS FROM ALL DISASTERS (1992 - 2001).....	23
FIGURE 2.2: THE PAR MODEL (MODIFIED FOR THE STUDY ANALYSIS).....	26
FIGURE 2.3: FLOODED QUARRY AT CHAWAMA (KUKU).....	30
FIGURE 5.1: THREE KEY ACTIVITY AREAS TO ENHANCE DISASTER RISK MANAGEMENT.....	63
FIGURE 5.2: THE WASTE MANAGEMENT CONTINUUM.....	65

List of tables

TABLE 1.1: POPULATION GROWTH FOR LUSAKA FROM 1969 - 2010.....	5
TABLE 1.2: GRAPHIC PRESENTATION OF THE POPULATION FOR THE CITY OF LUSAKA EVERY 10 YEARS.....	6
TABLE 1.3: RAINFAL RECORDS FOR LUSAKA.....	9
TABLE 1.4: SLUMS AND SQUATTER SETTLEMENTS REPRESENTATION OF A SERIES OF TRADE-OFFS-BETWEEN.....	11
TABLE 2.1: TYPES OF FLOODS.....	23
TABLE 2.2: WASTE DEGENERATION PERIODS FOR DIFFERENT TYPES OF REFUSE.....	34
TABLE 3.1: RESEARCH SAMPLE SIZES BY WARD FOR EACH STUDY SITE.....	38
TABLE 3.2: TABULATION OF THE FLOODING CATEGORIES BY IMPACT ZONE, WORST YEARS AS EXPERIENCED.....	42
TABLE 4.1: RESEARCH AGE GROUPS BY THEIR PERCENTAGE OF FREQUENCY.....	46
TABLE 4.2: PROPORTIONS OF RESPONDENTS FROM ALL THE FOUR DETAILED STUDY SITES ON ECONO VULN.....	51
TABLE 4.3: PERCENTAGE OF RESPONDENTS USING COPING STRATEGIES FOR EACH STUDY SITES.....	56
TABLE 5.1: THREE KEY ACTIVITY AREAS TO ENHANCE DISASTER RISK MANAGEMENT.....	63
TABLE 5.2: THE WASTE MANAGEMENT CONTINUUM.....	65

List of acronyms

ALNAP	Active Learning Network for Accountability in humanitarian Programmes
CBD	Central Business District
DFiD	Department For international Development
DRR	Disaster Risk Reduction
ECZ	Environmental Council of Zambia
FGD	Focus Group Discussions
IDPs	Internally Displaced Persons
IEC	Information Education & Communication
IFRC	International Federation of the Red Cross & Red Crescent Societies
LCC	Lusaka City Council
LDC	Least Developed Countries
LWSC	Lusaka Water and Sewerage Company
LWSSD	Lusaka Water Supply, Sanitation & Drainage
MCC	Millennium Challenge Corporation
MDGs	Millennium Development Goals
MEWD	Ministry of Energy and Water Development
NDMMU	National Disaster Management & Mitigation Unit
OVP	Office of the Vice-President
PAR	Pressure And Release model
UNDP	United Nations Development Programme
UNEP	United Nations Energy Programme
UNESCO	United Nations Educational, Scientific & Cultural Organization
UNIP	United National Independence Party
UNISDR	United Nations International Strategy on Disaster Reduction
WDC	Ward Development Committee
WMU	Waste Management Unit
ZVAC	Zambia Vulnerability Assessment Committee

TERMINOLOGY GLOSSARY

In the interest of disaster terminology and the use of internationally accepted global standards on disaster risk concepts, the United Nations International Strategy on Disaster Reduction (UNISDR)'s terms shall be constantly referred to in the thesis. A selection of the terms relevant to the study are as follows:

1. Acceptable risk

When the probabilities and other factors of hazards are known, a community considers their acceptability on the basis of the economic, political, social and the prevailing environmental conditions. (UN/ISDR, 2009)

2. Adaptation

The process of beneficial adjustment in the human or natural systems towards the effects of climatic phenomena and eventual moderation taking advantage of the open opportunities that may suffice. (UN/ISDR, 2009)

3. Biological hazard

Any biologically active pathogens that may cause loss of life, health impacts, illness such as epidemic diseases, animal plague and insect infestations. (UN/ISDR, 2009)

4. Building code

For reasons of human safety and general welfare, all building structures are supposed to conform to a laid down set of ordinances, associated standards, designs and regulations to pave way for resistant buildings and infrastructure. (UN/ISDR, 2009)

5. Capacity

The coping abilities that a community has within as a combination of strengths, resources and attributes for the purpose of achieving social and economic goals. (UN/ISDR, 2009)

6. Climate change

The changes in the weather pattern through the variability of conditions in persistence for extended decadal periods due to natural changes in the global atmosphere or ecological disturbances driven by human activity. (UN/ISDR, 2009)

7. Coping capacity

The means by society or institution to face and effectively manage an emergency crisis using own abilities in terms of resources, manpower and skills. (UN/ISDR, 2009)

8. Disaster

An adverse condition that has a serious negative consequence on humans particularly when the coping capacities are limited amid the state of vulnerability in terms of economic, social and environment when exposed to a hazard. (UN/ISDR, 2009)

9. Disaster risk

The potential occurrence of losses due to disaster on a community in a time period on livelihoods, health, services and assets which can occur depending on the risk conditions present. (UN/ISDR, 2009)

10. Disaster risk management

This aims at the systematic ways of avoiding or lessening the transfer of adverse effects of hazards through administrative directives, skills and capacities to enhance preparedness, prevention and mitigation activities. (UN/ISDR, 2009)

11. Disaster risk reduction

This entails the systematic efforts to manage and reduce hazard exposure to social, economic and environmental assets of the vulnerable communities at risk. (UN/ISDR, 2009)

12. Early warning system

A combination of capacities used to anticipate and timely disseminate alerts so as to enable the targeted communities to have advance knowledge of an impending hazard for sufficient notice, preparation and action to help reduce the imminent potential losses and harm. (UN/ISDR, 2009)

13. Environmental degradation

A compromised and reduction in the natural ecological capacity and functioning of the environment to maintain and sustain the social needs. (UN/ISDR, 2009)

14. Environmental impact assessment

The process of evaluating the consequences of an envisaged project in terms of its ecological adverse impact on the environment for the purposes of planning and decision making before the onset of such an undertaking. (UN/ISDR, 2009)

15. Exposure

Specific vulnerability of elements like people, systems and property found in hazardous zones compounded with a likelihood to harm and losses. (UN/ISDR, 2009)

16. Extensive risk

This is often the wide spread of risk in a highly localized nature for communities exposed to persistent hazard conditions of low or mild gravity and can lead to recurrence. (UN/ISDR, 2009)

17. Hazard

A phenomenon of a very dangerous order with the potential to cause the loss of life, livelihoods, ecological damage, health impacts, economic disruption and property damage. (UN/ISDR, 2009)

18. Hydro meteorological hazard

A type of hazard associated with hydrological, oceanographic or atmospheric origin that may cause not only environmental damage but property damage, health impacts, loss of life social and economic disruption. (UN/ISDR, 2009)

19. Intensive risk

Large concentrations of vulnerable people exposed to risk and prone to subsequent grave disaster impact characterized by high mortality, asset losses and economic disruption. (UN/ISDR, 2009)

20. Land-use planning

Formulation of long term plans on the different options on the use of land, coupled with the associated consideration for economy, social and environmental objectives with the implications for such plans on different communities in mind to justify acceptable uses. (UN/ISDR, 2009)

CHAPTER ONE

THE FLOOD EFFECTS AND THE RESEARCH STUDY LAYOUT

1. INTRODUCTION

The unplanned settlements of the city of Lusaka have been experiencing floods every rainy season annually with various degrees of magnitude depending on altitude and the human population density for each specific location. The district of Lusaka has a population of 1,747,152, it is the fastest growing city in the Country with an annual growth rate of 4.9 percent and a population density of 4,853.2 persons per square kilometre (Central Statistical Office 2012:29). Eighty (80) percent of this population resides in the slums. The Lusaka provincial population has risen significantly from 1,084,703 captured during the 2000 census 10 years ago. Compounded by climate variability, the flood phenomenon has continued in its frequency and particularly worsens during the wet seasons that record high rainfall receipt marked by a series of heavy down pour and run-off. The city has a network of storm and surface drainages but their effectiveness is lessened due to blockages caused by huge volumes of city refuse. Severe flooding was acknowledged during the focus group discussions to be an acceptable risk and one of the most challenging weather conditions impacting on the day-to-day livelihoods in the informal settlements. According to Ismael (2010:18) frequent and extensive flooding brought about by increased precipitation is the most challenging weather condition experienced by the urban poor of Lusaka. The risk for highly infectious and fatal waterborne diseases such as dysentery, cholera and typhoid increases during this period. The non-compliance to building codes and the off shoot of poor housing structures poses further risks: their collapse results into deaths being experienced at times when unfortunate family households are caught unaware. The likely victims, made up of the poorer groups of such urban communities have low or no coping capacity in the event of a flood hazard. Driven by extreme poverty and the lack of security of land tenure, the city poor tend to settle wherever there is a site of vacant space irrespective of its proneness to flooding. Nchito (2007:539) believes that for many, squatting on illegal settlement in basic shelter, has been the easiest solution to a homestead to live in. The United Nations Human Settlements Programme (2007:6) reports that though generalized by lack of appropriate shelter, essential social services, safe clean water and poor sanitary conditions; the squatter settlements of Lusaka are expanding faster than the rest of the city.

The City of Lusaka has 43 unplanned settlements and the emergence of more still remains a possibility as the population is still growing and all prone to extensive risk to flooding. Because of the ever increasing population, the existing unplanned settlements have started to expand illegally as the demand for land to build shelter is very high. At the time of the research, encroachment of private farm land had become a norm westwards of the city. This state of lawlessness is primarily lead by political cadres from the ruling party in gross defiance of the land leaseholds for the surrounding farms. The study was concentrated on four of the worst affected and flood prone informal settlements in the city. These are Kanyama, Chawama (Kuku), Matero and Mutendere (Kalikiliki) compounds.

1.1 BACKGROUND OF THE STUDY AREA

The city of Lusaka is geographically positioned at 15° 24' 29.2422" South, 28° 17' 13.7688" East covering an area of 375 square kilometres. The city is largely made up of informal settlements that host the majority of the population. Many years before independence, there were sizable and a limited number of squatter settlements close to the capital city partly due to the strict policing and restrictions imposed on people movements by the colonialists. At post-independence, the rural urban drift in mass exodus became a norm to-date (IBID). The older settlements apparently began as areas of residence for labourers on farms and the emergent poor infrastructure, poor social services and the lack of institutional control, coping capacity and resilience in the event of a flood hazard is extremely low. (Huq, Kovats, Reid & Satterthwaite 2007:6) explain that the drainage systems in any city can so easily get overwhelmed in the event of prolonged heavy rainfall, due to the large volumes of surface water produced. Under these circumstances, aggravated by unmaintained drainages that may be full of silt or refuse or their limited number; the flooding cannot be controlled. Given the high probability to flooding and the associated risk of epidemics in the study area because of ineffective solid waste management, the resident communities have a high social vulnerability status. Open pit Latrines are the only means used for human excreta disposal. (Wisner, Blaikie & Cannon 2006:54) mentions some of the processes that aggravate vulnerability as rapid urban migration, structural adjustment programmes and epidemic disease.

In a recent study at two of the settlements, (Heath, Parker & Weatherhead 2010:7) indicate that the severity of floods accelerated by the speed of onset in rainfall intensity and a high water table built up, ultimately leads to contaminants mixing with the safe water delivery systems as the latrines collapse.

The land on which the settlements are located is legally controlled by the Lusaka City Council. Although the council has by-laws to mandate governance of the unplanned settlements, their enforcement is weak: limited manpower and capacity are clearly the overriding reasons.



Figure 1.1: Legal notice for reserved land

In the back ground: *Illegal constructions on land reserved for a play park for children's recreation*

Photo: by Bennett Siachoono

The unplanned settlements continue to expand in any favourable direction where there is bare land even if reserved or under lease hold. Demolitions of structures built on such land once thwarted early are common. Still, the structures continue to emerge elsewhere in gross defiance

Lusaka district is within the province of Lusaka, the capital City, Lusaka is centrally located and is host to the legislative and administrative wings of the Government of the republic of Zambia. Commerce and industry are highly active and draw a large labour force. The study areas, though away from each other; all share the same characteristics. They are all highly prone to flooding and have a high population density driven by the high poverty levels. The pro-longed exposure to stringent economic reforms over the years and the harsh weather conditions are the leading factors for the increase in vulnerability (Central Statistical Office, Living conditions monitoring survey report 2006 & 2010:172).

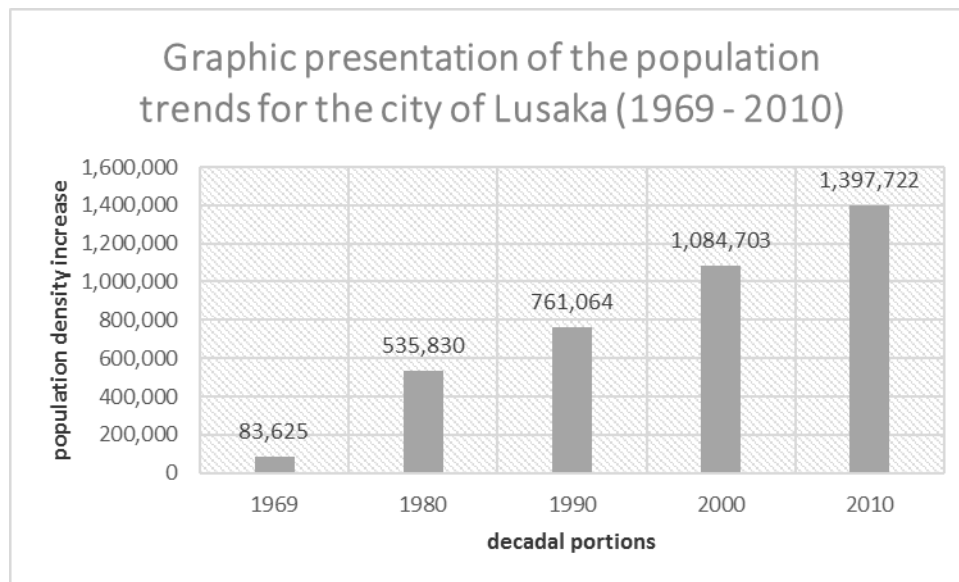
Politically, the district of Lusaka is divided into 33 Wards and 7 constituencies. Each constituency is made of an average of 5 wards. Each Ward elects a ward development councillor who in turn represents the community at the municipal council. The chosen, is a member of the Ward development committee and a zone¹. The wards at each of the constituencies collectively elect their Members of Parliament. The tenure of office is 5 years in time for the next general election. The population for Lusaka district stands at 1,747,152 at 4,853 persons per square kilometre and approximately 80% is settled in unplanned settlements that surround the city's 375 Square kilometres (Central Statistical Office, 2010 Census of population & housing Report 2012:27).

TABLE 1 Lusaka's population growth, 1969 – 2010					
Population growth 1969-2010					
	1969	1980	1990	2000	2010
Lusaka urban	83,625	535,830	761,064	1,084,703	1,397,722
Lusaka district	353,975	691,054	991,226	1,391,329	1,747,152
Zambia	4,056,995	5,661,801	7,759,117	9,885,591	13,092,666

¹Zones are small sub-divisions within the community made up of 12 households with a chosen zonal leader amongst them for representation at the Ward development Committee level.

Table 1.1: Population growth for Lusaka from 1969 – 2010. *SOURCE: Government of the Republic of Zambia (2010) Census report, Central Statistical Office (CSO), Lusaka.*

Table 1.2: Graphic presentation of the population trends for the city of Lusaka every Ten years. *Basis: Central Statistical data*



From the decadal population trends for the city of Lusaka as presented in figure 1.4, the likelihood of another significant population increase by 2020 is strong. With the potential rise in the population density, the social vulnerability status stands to increase not until amicable and long-term solutions are found. Chapter 1.1 item 1.3.7 of the Sixth National Development Plan of the republic of Zambia (GRZ 2019) provides for the reduction of the socio-economic impact of disasters by enhancing and building strong disaster risk management mechanisms at community, district and national levels, as well as building infrastructure that can withstand natural disasters. The United Nations International Strategy on Disaster Risk Reduction. (2011:2) reports that exposure to disaster risk increases further because of rapid urbanization. The main and primary risk for the study areas is the seasonal flooding that is experienced by the communities in the study areas. The floods are triggered by the annual rainfall and depending on intensity, can reduce slightly in the advent of the long-dry season but could last until the next flood episode. The sub-problems associated with the floods are; epidemic outbreaks, over population, progressive ecological degradation and the subsequent resultant of Internally Displaced Persons (IDPs) at the peak of the flood hazards.

The geology of the district of Lusaka is highly characterized with sub rocks of mainly Dolomite and Limestone formations. The seasonal flooding is associated with the slow absorption rate of the rain water which collects during every downpour. Alexander (2000:17) states that the infiltration potential rate is all dependent on the soil properties as well as the state of saturation of the soil. Given the mixture of the topography that is a combination of clay, sand and Rock at the study areas, the flooding is justified. The high population density emitting daily refuse on confined areas however, is one of the main contributing factors to the annual floods. Driven by the search for economic survival, illegal quarrying, during the long dry season; is considered as an alternative means to raise income for the households oblivious of the dangers posed. The quarries created, make the flooding to worsen even further because these ponds fill up with the surface run-off water. The unevenness of the ground surface causes water ponds to form after trapping the surface run-off water. The recurrent floods could also be as a severe consequence of the many years of the quarrying activities. The map below illustrates the typical geological formation for the city of Lusaka.

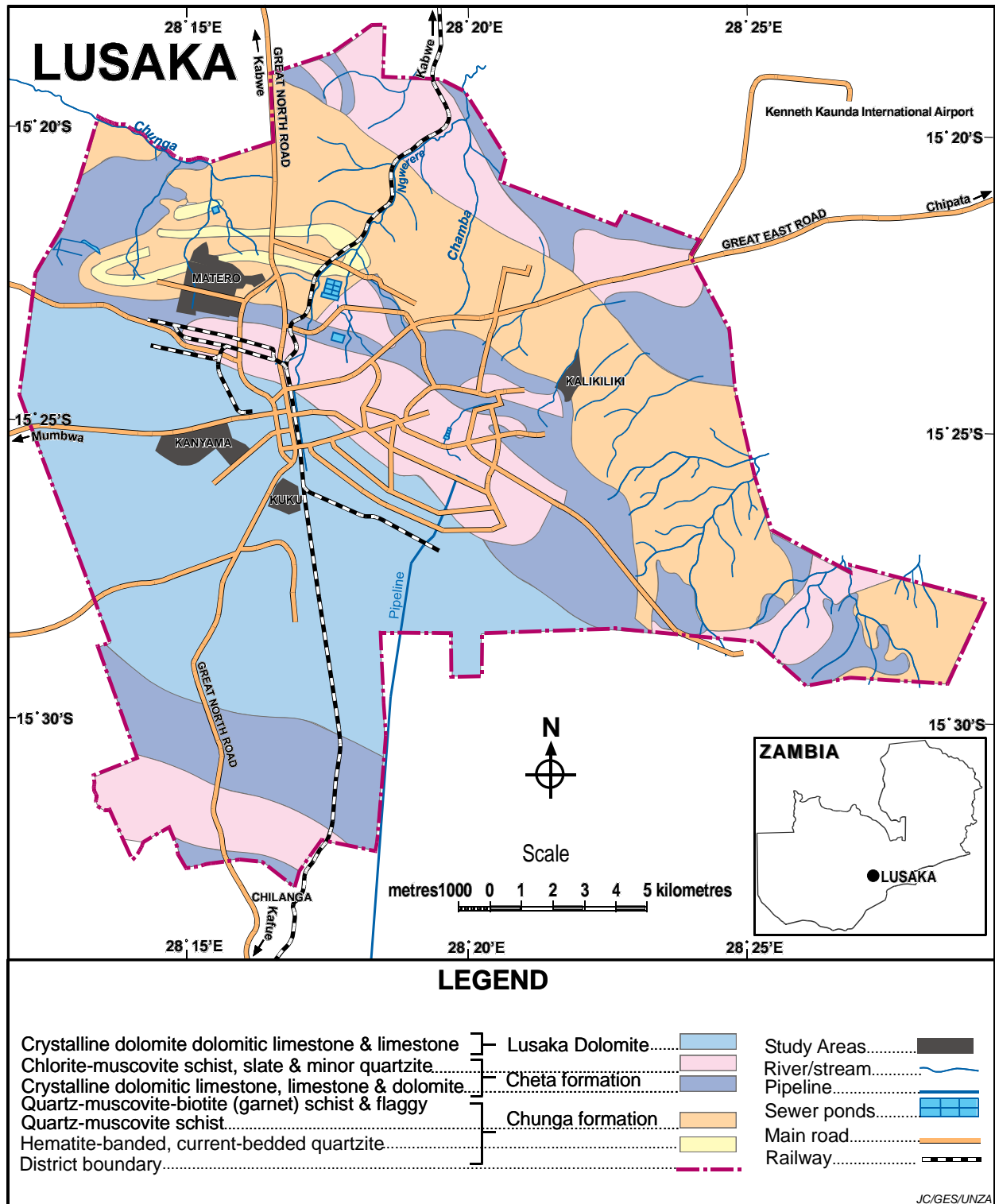


Figure 1.3: The geology of Lusaka & the Location of Kanyama, Chawama(Kuku), Matero & Mutendere (Kalikiliki) compounds of Lusaka. Source: Joseph Chalila (October 2013), Cartographic Unit, Geography Department, University of Zambia great east road campus

1.2 MOTIVATION FOR THE STUDY

Floods have been a growing characteristic for the city of Lusaka with the greatest impact being the unplanned settlements during every rainy season. As a consequence of rapid growth, the present day city has had alarming levels of socially created vulnerabilities. Of similar concern are the environmental issues like degradation, poor solid waste management, poor sanitation systems, including ground water and air pollution. The main sub-problem encountered by the general membership of the community are water-borne diseases at the affected areas. Birkmann (2006:15) believes that the exposure of a vulnerable community to a hazardous event brings about the inevitable manifest of vulnerability and coping capacity. In line with this theory, Turner (2003:4) further indicates that there is complexity and interconnectedness within a system giving rise to new hazards, and the dimension of different vulnerabilities and coping mechanisms.

The rainfall is alluded to for the flood risks in the unplanned settlements since the mid-1970s to-date. An analysis of the 4 decades has been made. Although there is indication that the general rainfall pattern shows a reduction, it all depends on the frequency and intensity. The research areas still experience the floods irrespective of the recorded trends.

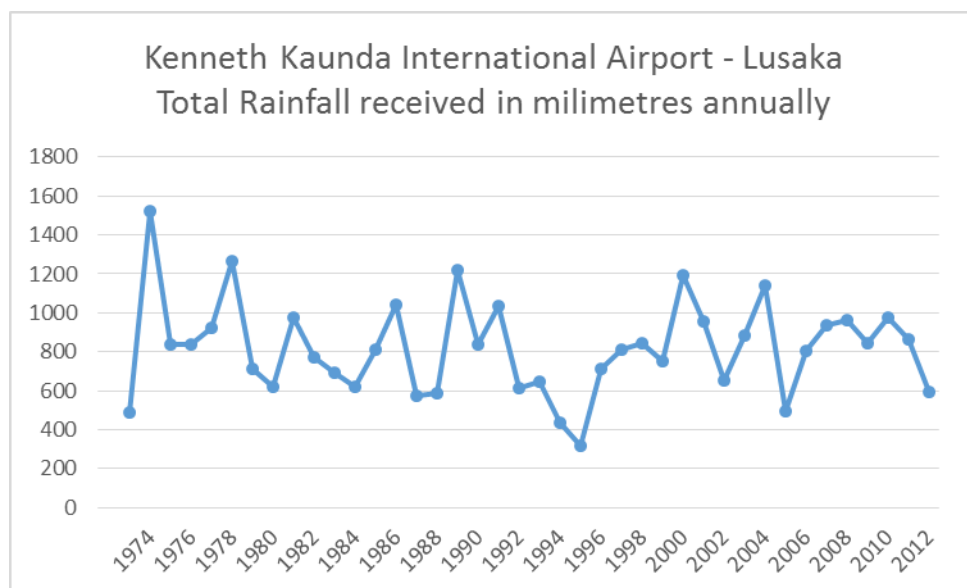


Table 1.3: Rainfall records for Lusaka. *Source: The department of meteorology—Ministry of Transport & Communications: LUSAKA*

The average rainfall received since the mid - 1970s for Lusaka is 820 millimeters. Kanyanga (2013) suggests; in the emergence of the climate change era, the floods have become even more severe. There is no significant vegetative growth at all the study areas and, with no ground cover, soil erosion is intense. Tyrell, (1986) indicates that although the erosion will depend on the prevailing surface conditions, tropical rainfall is damaging particularly when in excess of 25 millimeters per hour. The impact the recurrent flooding hazard has had on the vulnerable communities is a source of concern as the solutions are limited. Twigg, (2001) believes that psychological, social, political and economic factors, are the many dimensions of vulnerability. In association with this logic, The Sphere Project, (2011) indicates that a combination of physical, social, environmental and political factors make people to either become or are already more vulnerable to disasters. It is in light of the humane concerns and the growing threat to the affected communities that the study was carried out. The research study was carried out in an effort to help identify potential remedies for the generated social vulnerabilities at all the sites visited.

1.3 THEORETICAL FRAMEWORK

The rural urban migration became more pronounced after the country's independence in 1964. The freedom of movement, denied under colonial rule; became a contemporary trend as the rural folk of mostly men, moved into the city to engage in whatever odd jobs to earn a livelihood. To-date, distinct high density societies have been created with time whose members are totally different from the urban mainstream. The quest for cheap and affordable accommodation has been the main reason for the increase in informal settlements dotted around the city parameters. The hazardous risks these settlements pose cannot be over-emphasized: it's a time bomb. The Hyogo Framework of Action 2005-2015 (2005:2) indicates that disaster risk reduction must be prioritized and have a linkage to strong institutional arrangements as a basis for implementation, drawing on capacities at national and local levels. This is a governance challenge that calls for concerted efforts to attain the DRR before the 2015 deadline. The unplanned settlements clearly out-weigh the low density areas of the city and as such, cannot be demolished without causing very serious harm to the resident community members.

Solutions to the flood phenomenon have to be found no matter the cost. Strategically located, the inhabitants in these settlements have notable advantages.

Poor living quality	AND	But in close proximity to the jobs and markets
Poor quality of houses	AND	Low and affordable investment in housing
No housing	AND	No worries on tenure insecurity
No access to infrastructure	AND	But have the benefit of informal though intermittent supply of urban services

Table 1.4: *Slums and Squatter settlements representation of a series of trade-offs-between*

Source: Urban Environment Management; the Global Development Research Centre

The risks faced by the communities living in these settlements are real and as such the study explored the vulnerability levels, preparations and mitigation to floods. Grave consequences from the seasonal flooding are experienced yearly resulting into unstable social wellbeing for the community. Although it may be argued that the rainfall does assist in recharging the ground water, this attribute has negative repercussions on the study areas as major public health hazards are posed with too much rainfall. The accumulative surface water becomes a medium for the water-borne epidemics. Outbreaks of Cholera every wet season are common indicating a very serious ground water contamination from which the domestic water is drawn through open wells and boreholes drilled within the settlement locations. Sasaki, Suzuki, Fujino, Kimura and Cheelo, (2009:1) inform that, cholera is transmissible through faecal matter coming into contact with the domestic water due to the poor sanitation methods used by the community at large. Pit latrines are the major means for defecation and these get filled up with the flood waters whenever flooding takes place. For every heavy rainfall storm received, rapid saturation of the soil takes place because of the high ground water table. As a result, through diffusion; there is undoubtable contamination of the water table. Cholera being reportedly a highly infectious and fatal disease, High deaths tolls are recorded during every outbreak during the floods. Safe domestic water remains a major challenge in the study areas. Clearly, the ethics on water and sanitation have been greatly compromised.

The Millennium Development Goal (MDG), (2005:17) target number 6 states: combat HIV/AIDS, Malaria and other major diseases by 2015. With one year to go before the deadline, meeting this target in the study areas is optimistic as more work remains to be carried out.

1.4 THE RESEARCH PROBLEM

The rural urban migration became rapid just after independence in response to the economic boom and the newly acquired freedom of movement for the liberated Zambian populace. The population density increased significantly for Lusaka because of the emerging industries and the demand for domestic hands by the elite class of the city folk. Although the lucky few of the immigrants were accommodated at servant quarters in the low density areas, the majority of the migrant workers was mainly that of industry hands. The only affordable place to stay for this category of workers are the unplanned settlements. The populations started to grow in the settlements as inter-marriages took place with new off-spring born amid a continued rural urban migration trend. The political change in government in the 1990's was a democratic dispensation direction, new economic liberalization policies largely driven by international donors were introduced. It is for all these reasons that the onset of the flood disasters in the unplanned settlements brings about severe and correlated problems in the communities. Wisner et al (2006:54) state that the processes that further worsen vulnerability are; structural adjustment policies, epidemic disease and rapid urban migration. The citizenry of the study areas comprise mainly the very poor. This category can hardly afford a square meal and the only avenue for shelter is at the unplanned settlements. Plots of land on which to build despite their unsuitability are easy to find through ones' connections with the partisan political cadres. The cadres have assumed authority to do so without fear of litigation because of the strong links within the ruling political party. This state of affairs got out of control at the onset of the Movement for Multi-party Democracy's turn to form the new government in the year 1991. Prior to this, during the 27 years of rule by the first government (UNIP), plot allocations were orderly. Politically, the unplanned settlements are a perfect level for manipulation because of their high population numerical advantages during electoral polls. Politicians have taken advantage of this to gain support and subsequent high votes during election time. Promises of good social services and job creation are used to lure the unsuspecting eligible voters in the areas.

After the elections, it becomes apparent the promises are empty hence the daring behavior exhibited by the political cadres who take law into their own hands by resorting to lead the plot distributions. This behavior has continued even during the current government in place. Habasonda (2012:18) indicates that politically, informal settlements are a hot spot haven for partisan political manipulations all the time; because of the numerical advantages and electoral prowess they possess. Cases of encroachment into private land have become a norm as the population continues to grow and the need for shelter remains high. The loss of institutional control at the unplanned settlement locations, has lead into hazardous areas being developed into residential sites. It is in this way that natural causeways for water infiltration processes are grossly disturbed leading to the overall and generalized water stagnation with the subsequent flooding.

1.5 OBJECTIVES OF THE STUDY

1.5.1 Primary objectives

The exploration and better understand of the linkages between social vulnerability, Disaster Risk Reduction and environmental sustainability was paramount. Through the research study, the release of information to the affected communities in the study areas in respect of the findings and recommendations including the possible solutions to the recurrent floods and the associated secondary problems was the ultimate goal. Furthermore, to adequately inform government through established official channels to stimulate proactive and timely decision making including policy development. Specifically, the development of a long-term policy on unplanned settlements.

1.5.2 Specific objectives

The research was directed at:

1.5.2.1 The determination of the frequency of the floods in the study areas and their impact on all the classes of the people in the community.

1.5.2.2 The definition of the human demographics, socio-economics, physical processes and socio relations in relation to the generated vulnerabilities within the flood affected communities.

1.5.2.3 Assessment of all the institutional structures within and their functions in terms of relevance and perceived purpose.

1.5.2.4 To determine the coping strategies adopted by the different levels of the community members in an attempt to minimize the problem.

1.6 THE RESEARCH DESIGN

Floods can be classified under a phenomenological type of disaster and therefore, the application of principles for a qualitative study was justified. A participatory research process was used to draw conclusions on the extent of the social vulnerabilities at the study sites. Mouton & Barbie (2001:381) state that the use of a participatory research process results into increased high self-esteem for the community member's as their vulnerability levels and adaptations turn out to be better understood by themselves. A qualitative type of research was adopted in view of the nature of the study area to draw deep understanding of the research problem. The social vulnerabilities for the communities were assessed using a Hazard, Vulnerability and Capacity assessment Matrix².

The measured characteristics involved analysis of:

- i.* The extent of the floods during a hazardous event
- ii.* The elements that are at risk including the compelling reasons as to why the elements are at risk
- iii.* The people at risk
- iv.* The physical locations of the people at risk
- v.* The capacity for flood disaster preparedness, resilience and response

² The Hazard and capacity/vulnerability analysis (CVA) is a Tool that can be used to assess community vulnerabilities and capacities (Wisner et al 2006).

1.6.1 Research questions

The research questions were all based on the identified aggregate indicators as follows:

i. Local economy (livelihoods)

- Monthly income
- The number of households in the study areas by gender
- The people's access to social services
- The type of assets owned by each household
- The access to any alternative income

ii. Physical environment

- Homesteads at inhabitable and risky locations
- The general standard or quality of the erected dwelling shelters
- The storm drainage networks
- Land gradient and the geology
- The type of vegetation and the soils

iii. Social relations

- Highly vulnerable social groups at risk (i.e. seriously ill, frail elderly, poorly sheltered, infants/children, single parent families, psychologically and physically disabled etc.)
- Limited or the lack of local institutions (i.e. micro-finance, disaster preparedness, cultural norms, social structures etc.)
- Waterlogging and the subsequent prevalence of waterborne diseases
- The risk of highly infectious diseases versus the number of the available health centers

1.7 ASSUMPTIONS

- There is no sustained collaboration or linkages between all the stakeholders/service providers at institutional level on the recurrent flood hazard at all the research areas in abrogation of section 4.1.4 item 63 of the disaster management policy framework. The item provides for disaster coordination, preparedness, prevention and mitigation at district level.
- The lack of strong and efficient locally based communal disaster risk reduction initiatives perpetrates the flood disasters with impact worsening during every event.
- The coming into being of a consolidated unity of purpose in adherence to the disaster management continuum activity phases by the relevant actors and the provision of resources including the relevant expertise could lessen the subsequent flood impacts on the community at risk.

1.8 RESEARCH METHODOLOGY

The compelling reason for the research was the increasing threat posed by the recurrent flood disasters on human life, health, the environment and livelihoods. The research was conducted during the period September – August 2013 although the initial period was scheduled for June – July 2013 as proposed in the time-frame. This could not be achieved because of the distance between the research areas and the researcher's duty station. The initial stage was extensive literature review on global flood hazards and a specific narrow down on the targeted unplanned settlements on the parameters of the city of Lusaka. Through the administration of clearly defined household and focus group discussion questionnaires, data was obtainable from the disadvantaged communities on the linkages between vulnerability, socio-economics, disaster risk reduction, environmental considerations and flood impacts. In anticipation of finding long-term solutions to the flood phenomenon, the community had to be actively involved in the research process. The participatory approaches adopted could help to build and unite the community members in future.

A bottom-up approach promotes change (Living with Risk 2002:144). In a related theory, Coetzee, Graff, Hendricks & Wood (2001:546) indicate that sustainable development can be paved through the application of participatory action research to bring about empowerment, the wish to do what is right and the accomplished freedom by the target community groups.

1.8.1 Sample size

A simple random selection criteria was used to identify community household respondents at each of the four areas covered by the research. A typical sample size of 25 households at each of the study areas was carried out resulting into 105 sampled interviewees in total. Creswell, (1998 cited in Leedy & Omrod 2011:153) states that for a phenomenological type of study, a sample size of between; 5–25 is typical; it must be made up of individuals with the direct experience to the disaster. The law on statistical regularity states that, on the average; a chosen sample size will have the same composition and characteristics as the population when the simple random sample technique is applied. It is the best means to the selection of a very representative sample (Itsvineeth209, 2009:14). In association with these arguments, my own findings on the ground proved the validity of the stated theories in practical terms.

Although geographically apart, the unplanned settlements had a generally homogeneous type of population with similar characteristics that perfectly met the research interests. Intensive risk to the recurrent flooding at all locations, is the common denominator. The study was not through deliberate planning; the susceptibility levels to the continued flood disasters stimulated the research interests and the eventual undertaking. Through initial blessings by the Lusaka District Commissioner's office³, a plan on how to access all the areas was made. Contact details were availed for all the Ward Development Committee officials at the four study sites. Follow-ups were then made by phone for arrangements for the respective visits to the different locations.

³ The District Commissioner's Office is the designated chair and focal in all matters pertaining to disaster management in the district through the District Disaster Management Committee (National Disaster Management Policy, 2005).

1.8.2 Data collection

Data on the different aspects of the study areas was obtained from a cross-section of the related government departments, private sector, and the municipal council. The collected data served as essential reference material on the documented characteristics for the city. The literature was from books, academic journals, reports and specific study findings on the flood problems in the city. Subsequently, all the drawn facts and statistics were reviewed, analyzed and served as a basis for the formation of logical reasoning and validity of the study. The specific areas of research interest and against which the responses were drawn involved:

- ✓ Human demography
- ✓ The socio-economic characteristics
- ✓ Physical environment
- ✓ Social relations
- ✓ Generic aspects

1.8.3 Data collection tools

Three types of tools were used to collect the data. Firstly, interviews were held by administered questionnaire at each of the four study areas for the selected respondents at household level. The questionnaire was made up of a mixture of open and fixed response questions.

Secondly, one focus group discussion at each study area was held with an average composition of 8 – 12 members to get a comprehensive and thorough understanding of all flood related issues in the settlements. More information was obtained through focus group discussions and observations, than the individual interviews because of the fostered interactions among the participants. People feel more comfortable to talk in a group arrangement; than when spoken to on an individual basis (Creswell, 1998). Thirdly, a systematic identification of related key technocrats /experts at departmental, corporate bodies and institutional level was made and interviews carried out to get professional responses and views.

Through a combination of all the tools, triangulation of the data was done and the common themes were picked for each methodology that was used. This methodology enabled the main results/findings to be systematically obtained. Leedy et al. (2011:105) indicate that triangulation is common in qualitative research as the researcher can engage in many informal observations in the field.

1.8.4 Data analysis

The excel spreadsheets were used as a standard to analyze the data. Descriptive techniques were adopted and used to process the data into graphic presentations, percentages, frequencies and cross tabulations. Through this application, the actual picture of the flood disaster emerged with a clear indication of the potential long-term solutions to the problem.

1.9 LIMITATION

The expert interviews were slow owing to the busy schedules that the officers were alluding to particularly the city engineers. In addition, the levels of cooperation on the study was poor as not all the key expert informers were willing to allocate time for the interview. The researcher had to make adjustments to the interview timings repeatedly with considerable loss of man-hours experienced. At the time of the research, there were serious incidents of intra-party cadre clashes in the ruling party: the Patriotic Front. The unplanned settlements were not peaceful and were dangerous places to work from. There was an inherent risk of harm in case of being caught up in the violence.

1.10 SCOPE OF THE STUDY

Only the unplanned settlements on the parameters of the city of Lusaka were selected for the study because of their risk to flooding during every rainy season. The research was confined to this geographical area with a view of learning the extent of the flooding and the generated discomforts for the vulnerable communities within.

1.11 ORGANIZATION OF THE DISSERTATION BY CHAPTER

There are five inter-linked chapters of the thesis that lead to the ultimate recommendations on research and policy with a subsequent final conclusion made at the end. The first chapter gives an outline of the research focus and scope, highlighting the specific ethical means as to how the study process was conducted to arrive at the deep insights of the identified problem areas. Chapter two, gives details of the flood phenomenon globally and narrows down to the local flooding situation and the social vulnerability of the study sites is analyzed using the Pressure and Release model with a specific application of the social vulnerability level as the main tool of analysis. Chapter three dwells on the way the research was carried out in terms of the three methodologies that were used to get uniform data through the final use of triangulation. Chapter four gives details on the results/findings through discussion and makes graphic presentations of the various aspects of the findings and their interpretation, implications etc. Chapter five is the final chapter and is mainly made up of two sets of recommendations namely; further research and policy.

1.12 SUMMARY

This chapter highlighted the cardinal and compelling reasons for the research, dwelling on the methodologies used in the study, including the over-riding problems and the geographical area for the study. The inappropriate and overwhelmed city planning and the range of human vulnerabilities were all presented as probable attributes to the reasons for the recurrent peri-urban floods. The graphic presentation of the seasonal rainfall pattern for a 4 decadal period in figure 1.5, clearly shows the low receipt trends in the new millennium but all dependent on the quantities received as rapid onset in a single down pour as a flash storm. As a consequence, the high velocity flood flows pose danger to the entire community's livelihoods and their infrastructure with potential internal people displacements due to the serious flooding created.

The storm intensity equally justifies the growing effects of the contemporary climate change episodes that are marked by extreme weather conditions. The constant increase and high

population density prevalent at all the unplanned settlements under discussion, is paramount and makes the flooding problem worse every wet season.

20

All these arguments combine as multiple stressors and impact people's livelihoods heavily. Realistically, the forces identified are valid and present good reasons to prove that the problem statement was arrived at conclusively. The study was demarcated into primary and specific objectives and the defined variables on; livelihoods, physical environment and social relations. All these were addressed by the actual findings of the research study. The pressure and release model⁴ (PAR)'s unsafe conditions was used as a means to measure the highly obvious and conspicuous vulnerabilities in the communities under study. The reviewed literature on floods as perceived through the local and global perspective is discussed in chapter 2.

⁴ The PAR model is a tool used for human vulnerability analysis when exposed to physical hazards (Wisner et al. 2006)

CHAPTER TWO

FLOOD HAZARD PERSPECTIVES AND IMPACT

2. INTRODUCTION

Through the study, it has been established that the seasonal floods experienced at the unplanned settlements of Lusaka are primarily as a result of the poor location of the settlements characterized with a high vulnerability to flooding. The great population density also adds to the pressure on the land and influences the reduction of its water absorptive capacities. Driven by the high poverty levels, for the settled community members, most of the homes are constructed in haste and have poor foundations. The completed housing structures are not resistant to floods and are in gross violation of any laid down building-codes, construction standards and conducive infrastructure siting. Internal displacement remains a high possibility. Irregular collection of the emitted refuse and persistent disease further add to the list of negating factors. All these are high risk elements that compound to worsen the flooding episodes during every wet season.

2.1 FLOOD HAZARDS: AS A GLOBAL PERSPECTIVE

“.....Destitution and demographic pressures have led more people than ever before to live in flood plains or in areas prone to landslides. Poor planning; environmental mismanagement; and lack of regulatory mechanisms both increase the risk and exacerbate the effects of disaster.”

Kofi Annan⁵

The pattern of vulnerabilities in which the flood affected people live can result into a grave impact depending on the flood magnitude. Purely because of human manipulation, the drainage basins and flood plains are not able to function naturally. The ALNAP⁶ (2008:2) suggests, many poor people are the hardest hit by floods in terms of their livelihoods and lives. These people are

⁵ 2002, UN Secretary – General, Foreword to “Living with Risk: A global review of disaster reduction initiatives”, ISDR

⁶ Active Learning Network for Accountability and Performance in Humanitarian Action

most often already vulnerable to HIV/AIDS, hazardous homes, food insecurity and ongoing conflict. Floods after drought and famine have proved to be the second most deadly (CBSE, 2006).

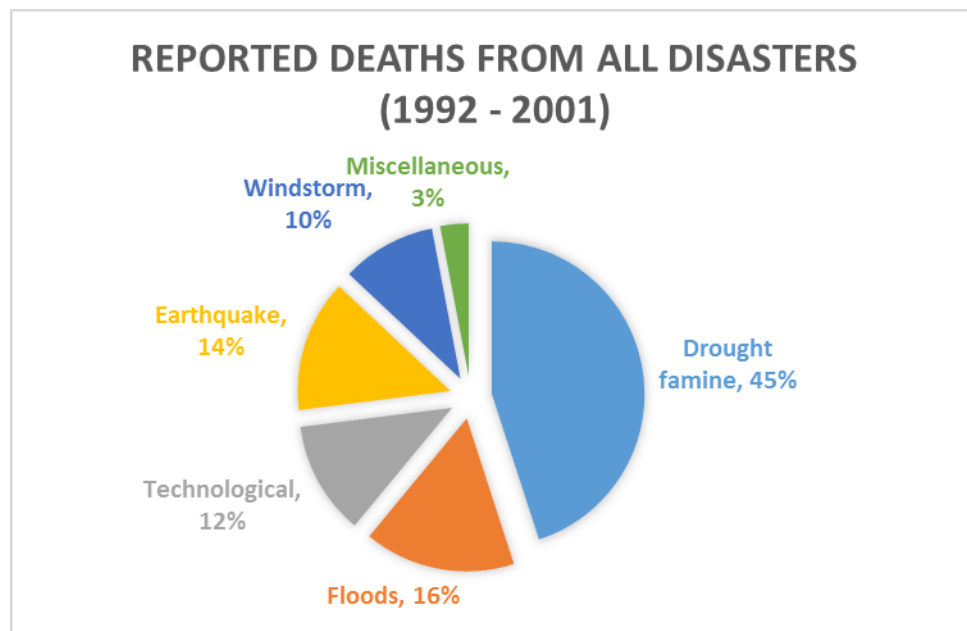


Figure – 2.1: Reported deaths from all disasters (1992-2001) **SOURCE:** Central Board of Secondary Education (2006).

Globally, floods are referred to as a hazard or phenomenon due to the disastrous impact they cause. Damaging floods are normally of an unexpected scale characterized with excessive frequency. The floods are normally intense and unpredictable causing serious and alarming scenarios particularly for local communities living in areas prone to excessive flooding. Generally, there are six types of floods categorized as follows:

Table – 2.1 Types of floods

Type	Duration	Characteristic impacts
Predictable, regular flooding	Up to 3 months	Blocks access. Damage and displacement of population often relatively low depending on levels of protection
Increased size of regular flooding	Up to 6 months	Blocks access to many areas. Greater potential for infrastructure damage, livelihoods impacts and large displacement of population
Flash flooding	A few days to weeks	Rapid cresting often with little warning. High velocity flood flows can destroy infrastructure. Population displacement is often localized.
Urban flooding	A few days to weeks	Can be rapid-onset, often coming from flash floods in urban rivers or from saturation or blockage of urban drainage systems. Potential for infrastructure damage affecting larger service area. Population often localized.
Coastal flooding	A few days	Often combined with wind damage from storms. Damage and displacement along coastline with extent depending on storm size.
Slow-onset from sustained rainfalls	3-6 months	Blocks access. Depending on season, damage to crops may be significant. Population displacement limited and may be dependent

Of particular relevance to the study, is the urban flooding category and its characteristic impact at all the study areas based on the existing vulnerabilities. The Asian Disaster Preparedness Centre (2005:52) states that there are three functional inter-related elements to flood risk defined as:

- The capacity and vulnerability of the communities living within the impact areas
- The type of flood phenomenon
- The various elements within, and their level of exposure in the affected area

2.2 FLOOD HAZARDS: THE CITY OF LUSAKA PERSPECTIVE

The city of Lusaka, was founded on marshy grassland that easily gets water-logged when it rains. Mulenga (2003:2) indicates that apart from having the advantage of being centrally positioned, the city has substantial underground water resources in its limestone and dolomite aquifers and justifies this as one of the reasons for the city's chosen location. Furthermore, because of the water potential, adequate water provision can be made throughout the year. According to the meteorological records, the city of Lusaka recorded the highest rainfall receipt in 1974 at 1,524.5mm followed by 1978 at 1,266.5mm. The latter period marked the beginning of severe and subsequent flood disasters for Kanyama, one of the four research sites. In the year 1978, this settlement experienced flooding of the worst magnitude with fatal incidents recorded. A disaster was declared by the government for the area stimulating donor interest and aid packages rendered in different forms of relief. It is apparent that there was a significant population increase and pressure on the land during this year hence the devastating flood disaster. Due to the poorly constructed houses, limited storm drains, thousands of households were forced out of their homes, to date; there has been no change in the house construction style and disaster recurrence is just a matter of time (Zimba, 2009). Uncollected garbage, compounded with unsafe dwelling structures void of ideal sanitary services are all among the factors that have contributed to the flooding phenomenon in the capital city. The World Bank, (2008) reports that, the low-quality shelters, inadequately maintained and inappropriate, particularly increase the vulnerability to flooding. This intertwines with the low resilience of the urban poor.

2.2.1 GENERAL FLOOD IMPACTS AT THE STUDY SITES

Of all the four research sites, the unplanned settlement of Kanyama has the highest population density and covers a wider area. It also suffers the worst in terms of flooding and the associated secondary risks. The flood impact for the rest of the sites: Chawama, Matero and Mutendere take different dimensions dependent on infrastructure layout, land gradient, frequency, magnitude and the inherent levels of vulnerabilities found within each settlement. Generally, the flood impacts are on lives and livelihoods at all the study sites. Under the circumstances, flood risk reduction measures are inevitable to pave way for sustainable development through the collective effort of the government and stakeholders holding similar interests in finding long-term solutions (ALNAP, 2008).

2.2.2 THE PRESSURE AND RELEASE MODEL (PAR)⁷ AS A TOOL OF ANALYSIS

The PAR conceptual frame work is a tool that is used primarily for community vulnerability analysis. It is based on the disaster risk equation:

$$\text{RISK} = \frac{\text{Hazard (H)} \times \text{Vulnerability (V)}}{\text{Capacity (C)}}$$

The paradigm has three progressive levels: root causes, dynamic pressures and unsafe conditions. It identifies all the conditions that lead to social vulnerability and exposes them (Birkmann, 2006:29; Turner et al, 2003). Although all the levels contribute to vulnerability

⁷ The Pressure And Release (PAR) model: progression to vulnerability is one of the many tools that can be used for vulnerability analysis for specific hazard situations through the rooted social processes that affect marginalized communities (Wisner et al, 2006)

progression, the research focused on the unsafe conditions level, to expose the specific social vulnerabilities within the communities that were subjected to the research study.

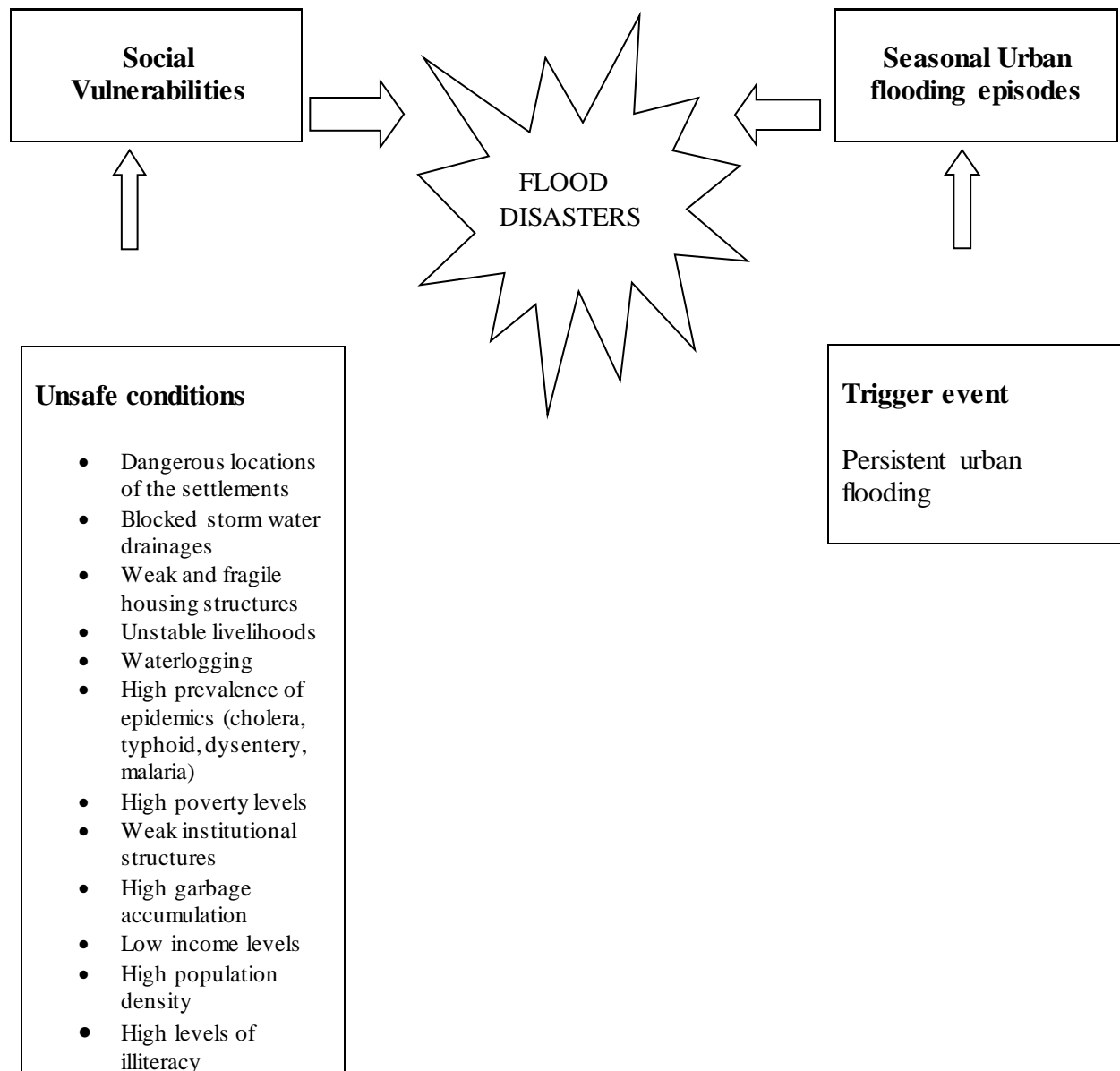


FIGURE – 2.3: The PAR model, (adapted from Wisner et al.) modified to suit the flood analysis for the study areas using the unsafe conditions level only

2.2.3 LOCAL ECONOMY

The local economy at each of the study sites is driven by a diverse of vending activities, menial labour and a handful of regularly employed community members. The host of these jobs serve as main livelihoods in the research areas. The women folk in particular are formally involved in small time trading by selling food stuff (Dry Beans, Rice, maize meal, dry fish, fresh vegetables etc.) by the streets. The food stuff is pre-packed into the smallest units for reasons of affordability for all the community members irrespective of their cash strength. Strategically, the sellers are positioned to entice passers-by to purchase any of the displayed items on sale by persuasive call outs. From the observations made on the ground, street vending; is probably the logical avenue taken up as a pre-occupation to generate readily available disposable cash for the women in the research areas. During the Focus Group Discussions (FGD) held, the women openly disclosed this initiative as the best means to get instant cash to pay for other pressing needs at home for the evening and hopefully to make fresh stock orders for resale the next day. Such limited and unsustainable livelihoods depict a “hand-to-mouth” survival strategy with the “food basket” as the only fulfilment in mind. Habasonda (2012:25) discloses that such disadvantaged communities fail to invest in good housing because of insufficient resources, regrettably, a higher amount of what they earn is spent on food. The dire need for “real” cash income for household maintenance is hard to find for these communities. Amid the flood phenomenon, the women’s vulnerability levels in particular, tend to increase as they take the role of fending for their families. Women’s empowerment as a whole, in modern society is compromised by poor living conditions, security threat, health, well-being, economic security and unsustainable livelihoods (UN-Gender, UN –Habitat 2009:1).

2.2.4 PHYSICAL ENVIRONMENT

Driven by the high poverty levels and lack of space on which to build homes, the poor have no option but to either encroach on undeveloped private land “organized” by the political cadres from the ruling party or; because of sheer desperation, occupy dangerous usually swampy low-lying marginal environmental sites deemed unideal for human settlement. All the study sites are generally located on land prone to seasonal urban flooding (Nchito, 2007; Simatele, 2010). Given the lack of capital to construct standard housing structures, the end result is the emergence of a majority of houses built out of cement blocks made with a very low cement to sand ratio.

During three separate FGDs at Kanyama, Kuku and Mutendere, the participants reported as follows:

“The mixture is so poor that it takes only 5 – 6 (50) kg pockets of Cement to construct a single room measuring 5 x 5 meters with 15 upward courses of 4” concrete blocks”.

In addition to this type of structures, and depending on resources; the residents also resort to using any form of flat, hard and stable material for construction purposes. The unconventional building materials used range from metal sheeting/corrugated iron to cardboard material. Typically, the shelters constructed with materials and techniques that cannot resist extreme weather or natural disasters is characteristic for most poor people’s houses in the vulnerable informal settlements (Parry et al. 2009). These types of structures, were allowed in the early self-help poor housing schemes during the late 1940s by the colonial government with the understanding that the settlers would return to their places of origin in the rural areas at the completion of their work contracts in the city (Mulenga, 2003). The use of such material has however continued to date with fatalities recorded during the flood disasters when such structures collapse when they get soggy. Kanyama for instance recorded 11 flood related deaths in the February 1978 flood disaster, whilst Mutendere recorded 4 similar deaths caused by strong water current in the 2010 floods. In the latter incident, the victims were trying to cross a flooded storm drainage (Zimba, 2009; FGD, Mutendere. 2013). Broken or refuse blocked storm drains and general damages to the water reticulation infrastructure present excess water flow difficulties.

Ecologically, the imbalances created in any of the natural processes entails that vulnerability sets in quickly. The population density in the study areas is changing and increasing constantly. The pressure exerted on the land is ignored and because of survival instinct and weak enforcement, the impact is left to chance. In pursuit of income, the underlying limestone rock is being mined indiscriminately by the community. With no serious regulatory frameworks in place, quarrying is carried out in huge volumes as a source of income and taken as a livelihood strategy. This trend was observed at Kanyama, Kuku, and Mutendere study sites. The quarrying is carried out, oblivious of the health risks, environmental damage and degradation it brings about.

Unfortunately, during every rainy season, the deep quarries created fill up with rain water and not only are the pools a breeding ground for malaria but pose serious danger to excited children, who bath and swim in the pooled water with great risk. The children use them for swimming and bathing because of no forms of recreation in the community. The demand for crushed stones is high in the city.

The construction industry's demands are high given the never ending building erections, and this is what makes the illegal quarrying business thrive. Through collective marketing amongst the venders of the crushed stone, large quantities are handled at a negotiable price. It is apparent that the legitimate crush stone dealers have met real competition and are struggling to keep up with the competitive trends presented especially starting in the early 1990s. The new government founded on multi-party democratic principles brought about a free-market economy and relaxed the laws on home ownership and building constructions propelling an increase in the search for the raw materials.

Historically, industrial quarrying took place at designated places during the colonial era and this activity was of such significant scale that the city infrastructure was built by the raw materials obtained from such industries. The designated locations were in places that the colonial government never anticipated the possibility of human habitation and this assumption has been proven wrong as such places have all been occupied. Although abandoned as disused quarries, these deep ditches fill with underground water and an annual recharge during the wet season. They never dry up. According to the WDC chairman and the subsequent focus group discussion at Kuku:

“These quarries not only pose very serious health risks to the community around, when the rain comes, they get filled up with rain water and start spilling the water throughout the settlement inflow with the land gradient. In 2010, we ended up having homes submerged in flood waters and the IDP’s had to be evacuated to safety on higher ground until the floods subsided”.



Figure – 2.4: Flooded quarry (Ngwenya) within Chawama (Kuku). The CBD in the background. Picture by: Eddie Mwanaleza; The Post newspaper 28th, March 2010.

Kalaluka (2010:1), indicates that 30 households⁸ had their houses submerged in water and had to be evacuated. Environmental vulnerability has been progressive especially over the recent years as the population in the city has continued to grow impacting more and more on the physical characteristics.

2.2.5 SOCIAL RELATIONS

From the research findings, the communities in the study areas have more or less similar demographic characteristics. The social structure organization is however not cohesive enough to withstand or recover from the flood disasters. Furthermore, from the FGDs, it is apparent that despite the unstable social structure organization, the communities possess remarkable strengths on how they view themselves and their ability to work together to find solutions to the recurrent disaster floods. Twigg, (2001:3) indicates, stimulated by crises, extraordinary efforts can be made by disaster affected communities. Social capital is the only major asset that the communities have as they depend on the people connections within for networking, trust, reciprocity, exchange and relationship building. The other forms of assets, namely capital, human, natural and financial vary in strength depending on the wealth ranking in the social parameters.

⁸ The average family size for the respondents was 7.3 members per household at the time of the research (August - September 2013). The normal range is 5 – 6 members per household.

Generally, these are missing in the real sense because of the high poverty levels in the unplanned settlements. The research findings were that 26.6% of the 105 sampled respondents were associated with membership of clubs, church grouping etc. Further individual discussions on this yielded the view that such bonding has been very helpful when a family is faced with any socially related problem. The researcher's finding on the ground however, was that linkage and affiliation to faith based or religious circles probably provided the best avenue for support mechanisms when in dire need or in the wake of a flood disaster.

Health wise, the impact suffered by the settlements particularly during the floods has been grave primarily because of the few health centers and few paramedics against the large number of people. Each of the four research areas has 1 health facility to cater for the entire community membership. During a flood episode, the local health facility system gets completely overwhelmed by the pressure from the needy patients. A total of 77.7% of the respondents in the household interviews indicated that Cholera was the highest prevalent disease during the floods followed by Malaria at 13.3%, Dysentery was third at 4.4% and lastly, Typhoid at 2.2%. In association with these findings, Sasaki et al, (2009:1) indicate that disease prevalence has been worsened by the poor living conditions in recent years in sub-Saharan Africa, where most of the cholera cases are now being recorded. (Cairncross and Feacham, 1993; cited in the Asian Disaster Preparedness Centre/UNDP primer, 2005) suggest that among the water-borne diseases transmitted by a pathogen mainly through the excreta-oral route and highly transmissible in water are Typhoid, Cholera, acute diarrhea and other intestinal diseases.

Poor sanitary conditions remain a big challenge at all the unplanned settlements. Pit latrines are the only means for urine and faecal disposal. It was also noted that not all the homes have their own pit latrine and sharing is common with a ratio of 1 pit latrine to 10 people. The World Bank (2002) reports that over 60 percent of the people in non-regularized settlements shared pit latrines whilst 90 percent of all the populace used unimproved pit latrines. Because of the rocky formation underground, the pit latrines do not have deep holes and during flooding, the effluent is slowly discharged and mixes with the flood waters which build up. In addition, for reasons of economy, the unplanned settlements have shallow wells constructed at some homesteads to take advantage of the high water table.

The combination of untreated effluent with the ground water leads to a logical conclusion that all the underground water at these locations has high levels of contamination and the evidence are the looming epidemics every wet season. At each of the study sites, there is only one health centre to cater for all the populace within. Apart from the inadequate health provision, the staffing levels are very low against the community needs. This situation often worsens during the flood disasters as the paramedics can hardly cope. This is compounded by the erratic supply of the essential drugs. All the respondents highlighted this to be a major problem in the slums. Attempts at all the research areas have been made to supply safe water by the Lusaka Water and Sewerage Company (LWSC) through piped water as communal stand pipe systems at strategic points accessible by the community membership at large. Whilst this is acknowledged by the communities, not all can afford this water because of the high poverty levels. At K1.50 (less than 2 US \$ cent) per month as a fixed charge irrespective of family size and quantity of water drawn it is still considered too high by the majority of the community members. Safe water continues to be difficult to access by the needy community. The United Nations High Commissioner for Refugees (UNHCR, 1992:2) emphasizes that, essential to life and health; is safe water.

Whilst people can survive long with food they can survive even longer with water alone. To supplement the water shortfall, the disadvantaged families resort to using water from the dug shallow wells with consequences. During the focus group discussion at Kanyama, the residents disclosed:

“Not all the wells have good water, others have water that makes you scratch all over after bathing. We only use the well water to wash our clothes and the kitchen plates. At the well sources where the well water is ok for bathing, we use it for bathing”.

Zambia is listed under the category of Least Development Countries (LDC) and is classified as being prone to epidemics (cholera, dysentery, typhoid and vector diseases like malaria), drought and floods. (UNDP, 2001). All the mentioned disasters have once upon a time befallen these communities with potential for future disasters. High vulnerability to natural hazards is a characteristic of the LDCs. (UNISDR2002:10). This observation makes the MDG targets look

too optimistic as the year 2015 is close by. In an effort to address the disaster challenges in the country, the Sixth National Development Plan (SNDP) has a clause on disaster risk reduction imbedded.

32

Chapter 1.1, item 1.3.7 of the SNDP of the Republic of Zambia (GRZ 201:9) provides for natural disaster reduction through the enhancement of stronger disaster risk mechanisms to mitigate the socio-economic impacts at national, district and community levels. The building of disaster resistant infrastructure is also indicated as a paramount strategy to ensure that the new era dwelling houses conform to the laid standard building codes.

Education at all the study areas has been badly impacted with or without the flood disasters. At all the four study sites, each had government run primary schools at basic level and a few private fee paying kindergarten/primary schools, including faith-based community schools. Purely because of the high population pressures and the low income levels in these areas, the enrolment at the government schools can be so high that the teacher pupil ratio at times stands at 1:100-250 for first graders (FGD Mutendere and Kanyama, 2013). The flood disasters further worsen the situation as the schools are forced to close down during the flood episodes for prolonged periods until the floods subside. This could take up to three to four weeks or months on end, depending on the magnitude of the flooding experienced in a particular season. The consequences are irreversible as too many lesson –hours are lost and cannot be recovered. The advanced reasons, are clearly the attributes as to why there are very high illiteracy prevalence levels in the informal-settlements.

Waterlogging at all the research areas is severe and is perpetrated by the ineffective storm drains at all the study sites. Efforts by the Lusaka City Council (LCC)'s public health department and specifically the Waste Management Unit (WMU) to regularly collect garbage have been marred with the lack of capacity and resources. The council has very few garbage collection trucks and have had to sub-contract communities in the study areas to take over this responsibility (household interview respondent at Matero, 2013). From observations, the drainages are either, too narrow and shallow or have too much limestone along and this makes it difficult for the water to flow as the garbage gets trapped resulting into flooding. In addition, the drainages are not all laced with cement wall or masonry work to ease maintenance and aid the flow of the excess water. Apart from being few when compared with the settlement layout, there are obstacles noted particularly of homes that are constructed in the way of the drainages and the

natural land gradient. The only well engineered drainages, are the systems purposefully built alongside the main access roads leading into the settlements although they are the worst in terms of garbage pile ups because of the large volumes of water they carry during a heavy down pour of rainfall.

33

At two FGDs, kanyama and mutendere, the respondents also suggested that the sides of the drainage walls need to be raised as a way of keeping off too much refuse from being suctioned into the drainage systems. Clearly, the uncollected heaps of garbage impacts heavily on the meagre drainage systems in particularly the unplanned settlements where population pressure leads to high refuse being off-loaded daily. From the LCC's perspective, the public relations department was quoted as follows:

“Individual citizen's activities must be blamed on the blocked drainages and not the council. The problem of blocked drainages in the city cannot be solved if people's attitudes cannot change. The carelessness is on the part of individuals and the negative repercussions are hitting back on the same people who are causing the blockage of the drainages”

(Mulunda Habenzu – assistant public relations manager; LCC, *Times of Zambia*; 2013)

Inadvertently, the daily refuse is a combination of mostly non-biodegradable material, mostly made up of plastic. The future consequences for this, is regrettably; severe pollution of the city's environment if no real solutions are found soonest. Below is a tabulation presenting the degeneration periods for the day-to day refuse which is discarded to the environment without consideration to the future impact of such actions:

TYPE OF WASTE	TIME NEEDED TO DEGENERATE, IF LEFT UNTREATED
Organic wastes (vegetable, fruits & food etc.)	7 – 15 days
Paper	10 – 30 days
Cotton cloth	2 – 5 months
Woolen cloth	12 months
Wood	10 – 15 years

Tin, Aluminum and other metal cans	200 – 500 years
Plastic	100 – 1,000 years
Glass	Not determined

Table – 2.2: Waste degeneration periods for different types of refuse.

Source: *Urban Environment Management; the Global Development Research Centre (GDRC).*

34

In recognition of all the mentioned challenges for the city, the American government and the Zambian government have partnered by initiating a Millennium Challenge Corporation (MCC) project with a time frame of 25 years to conclude in the year 2035. Worth US \$ 355 million, the project is aimed at improving the city of Lusaka's drainages, sanitation and safe water supply to all the residents. The project title is Lusaka Water Supply, Sanitation and Drainage (LWSSD) and is to start by early 2014 (Kangwa, 2013).

On capacity and preparedness, a total of 57 % of the respondents indicated that they were not prepared for the floods whilst 43 % were affirmative with their level of preparedness. Of the respondents that indicated preparedness, none could substantiate the actual preparedness referred to. From observation, the alleged preparedness seems to originate from the state of being resilient because of the repeated exposure to the flood hazards over time and the fact that there are limited or no options available. (Disaster Risk Reduction (DRR) strategies are available with support from the National Disaster Management and Mitigation Unit (NDMMU) but not effective because of the requirement that the members at community level render their services as volunteers without any monetary gain at all.

This was a cited difficulty, as the spirit of volunteerism becomes weaker because of the man-hours that are involved in supporting other community members. (FGD, Kuku & Kanyama, 2013). The respondents agreed to being involved in the enhancement of Information, Education and Communication (IEC) programmes in the communities. Hygiene promotion, sanitation, water, drainage maintenance, and solid waste management are the topics handled.

Overall, all the aspects discussed are linked to the Public Health Cap 295 and the Food and Drugs Act Cap 303 of the laws of Zambia local Government and its By-laws. The Public Health Department role is to suppress and control communicable diseases throughout the city of Lusaka irrespective of location. For reasons of capacity, this has proved to be a major challenge faced by the Lusaka City Council (LCC).

2.3 CONCLUSION

As alluded to in the introduction, there are obvious disparities as shown by the analysis which indicate that social vulnerability at all the study sites is at alarming levels. The fact that the un-planned settlements are located on poor sites should not mean that service delivery is also difficult to render. The disorderly layout of the homesteads poses a serious challenge particularly in terms of access roads and storm drainages. The community members' mindset in terms of refuse discard has serious repercussions and this is probably the main reason why the rain water tends to flood instead of flowing normally. The study has also systematically proven the inadequacy of the storm drain network of the city which can be rectified by the city engineers with effective plans and funding. Generally, floods tend to affect almost all the city: the worst impact is on the unplanned settlements because of low gradient, garbage, population pressure and poor housing layout. Water and sanitation are paramount source of concern as there seems to be high levels of contamination especially during the flood episodes which bring about the outbreak of water-borne diseases.

Floods will continue to have a negative impact on the livelihoods for the communities due to the disruptions experienced on the meagre small time income generation activities engaged into by almost everyone in the community. The high compromise of the economy ultimately leads to instability at household level as social insecurity is bound to set in. Recovery from this is not easily achieved as the losses are immense often requiring external assistance.

CHAPTER THREE

METHODOLOGICAL FRAME WORK

3. INTRODUCTION

The specific design and research methodology will be detailed to justify the results arrived at through the use of questionnaires prepared with open-ended and semi-structured questions and the subsequent analyses of the data drawn from the research sites. The central goal was to find tangible solutions to the highlighted research problem in a thorough and complete manner to stimulate viable policy recommendations through government to the relevant departments. In order to objectively arrive at the research findings, three methods were applied for multiple data collection for the ultimate purpose of data triangulation to consolidate the research (Leedy & Omrod, 2011). Relevant primary literature review was the basis and consolidation of this research to obtain the rich and descriptive data.

3.1 SAMPLED WARDS

Politically, the city of Lusaka is divided into 7 constituencies and 33 wards. A constituency is made up of wards and the research was narrowed down to specific wards that are more susceptible to flooding even with the smallest amount of rainfall receipt. The social vulnerability of the members within each ward were the central reasons for inclusion in the research. The ward development chairpersons facilitated the interview processes at each of the selected ward. The following seven wards were sampled; Harry Mwaanga Nkumbula (HMN) -11, Munkolo -12, kanyama – 10, muchinga, matero, nkoloma and mutendere. All the wards, represent the four urban settlements within the parameters for the city of Lusaka.

NAME OF SETTLEMENT	WARDS SAMPLED	SAMPLE SIZES
Kanyama*	Harry Mwaanga Nkhumbula (HMNW)Ward, Munkolo Ward & Kanyama ward 10	n = 30
Chawama (Kuku)	Nkholoma ward 1 & Nyerere ward 1	n = 25
Matero	Muchinga Ward 24 & Matero Ward 28	n = 25
Mutendere (Kalikiliki)	Ward A-Kalikiliki, Valley view & Mutendere east	n = 25

* Had a higher sample because of the larger population density for the settlement

Table 3.1: Research sample sizes by ward for each study site

3.1.1 METHOD – 1

Questionnaire administration was applied on randomly selected 105 households drawn from within the intensive risk communities by visiting them at their respective individual households, one-on-one. Along with the filling up of the questionnaires, a voice recorder was used and the data was transcribed thereafter. Through the responses captured from the respondents, the corresponding specific objectives under clause 1.5.2(1, 2, 3 & 4) were adequately addressed. The analysis involved the responses being grouped into common themes, the flood impacts over the years and the coping strategies adopted, the generated vulnerabilities and the effectiveness of the institutional structures in the research locations. The qualitative forms of research processes were conformed to.

3.1.2 METHOD – 2

The second level involved Focus Group Discussions (FGD) made up of between 8 – 12 members of the research communities. A total of 4 FGDs were held, 1 at each research site. Using the same pre-determined questions modified for group responses, the groups gave their respective responses in a collective manner. The specific objectives under clause 1.5.2(1, 2, 3 & 4) were addressed during the discussions. Comprehensive qualitative data is normally gathered through focus group discussions in social research (Hennink, 2007).

3.1.3 METHOD – 3

Thirdly, the final method was the conduction of key expert interviews for the relevant departments that are party to the flood problems and hold the assigned responsibility during every flood phenomena. Although a total of 6 key experts were eventually interviewed, this was probably the most challenging part of the research. The levels of cooperation were very low; everyone seemed to have had endless excuses to meet for a discussion and interview. In addition, there was too much red tape regarding the access of any form of data. The advanced forms to be filled in and returned, were never received back. This attitude is worrisome because it retards all efforts aimed at finding long lasting solutions to the seasonal floods in the slums of the city of Lusaka. Service delivery, disaster preparedness, socio-economics, governance, cultural norms and social vulnerabilities were the issues raised and in line with particularly the research specific objectives 1.5.2.2 and 1.5.2.3.

3.2 SELECTION OF THE STUDY SITES

Four research sites were selected for this study, namely chawama-kuku, kanyama, mutendere-kalikiliki and matero. These settlements suffer extensive risk through their experiences of the different levels of flood disasters and sub disasters. This enabled comparisons

and conclusions to be drawn on the extent, consequences and spread of the flood phenomenon across the densely populated slums of the city of Lusaka. Disaster mitigation interventions have been rendered to lessen impact in the past but the demand for this is still apparent every wet season due to various factors.

The initial plan was to limit the research to three sites but expert advice suggested the inclusion of Matero. A planned settlement on high altitude but suffers repeated epidemic outbreaks during the rainy seasons because of the defunct drainage network system for the location. All the research sites have similar characteristics in terms of annual flooding, high population densities, similar livelihood strategies and their proximity to the CBD of the city of Lusaka including geographical landscape. All these attributes justified their inclusion in the research. Selecting these areas helped to gauge the effectiveness of disaster management specifically at community level on Disaster Risk Reduction (DRR) activities and resilience. Recognition of the local trends and risk patterns through decentralized responsibilities on DRR is an appropriate step. Building capacity ultimately reduces vulnerability of the poor (Hyogo Framework of Action, 2005; DFID, 2006)

3.3 RESEARCH APPROVALS AND ETHICAL CONSIDERATIONS

Consent was officially obtained from the Office of the District Commissioner for Lusaka District by written authority to the respective WDCs at each of the four research sites. Prior to this, formal presentations of the research objectives was made to the District Commissioner's office as a safety net for possible allegations or probable misunderstanding from the communities. All the respondents were assured of anonymity with a reserved right to avoid answering any of the questions if they felt infringed. All the questionnaires were allocated a code (basically; an abbreviation of the area name and a serial number) as a means of reference and cross checking. This was also to preserve the anonymity of especially the individual household respondents.

3.4 DATA COLLECTION

All the discussions and structured interviews took place during the September – October 2013 timeframe. A representative sample was taken despite the limited period. The ward

development committee chairpersons at each of the four sites undertook the role of research assistants and helped to systematically arrange for all the research respondents including logistics. The basis for interview selection was that the identified community members had experienced the flooding disaster on more than one occasion and could clearly articulate the impact the floods have had in their lives. Demographically, the age group range for most respondents was at 51-60, representing 29% of all the age groupings.

40

This could be factored into the selection of flood disaster experienced senior residents as respondents. The gender analysis on the other hand revealed that 62.22 % were female respondents: representing the highly vulnerable social groups in the local community. As a matter of observation, it was however noted that all the research sites had a largest composition of young people. The youth, mainly of voting eligibility; have had the misfortune of being manipulated for partisan political gains through job promises, micro-credit loans etc.

3.5 DATA ANALYSIS

The raw data entry and analysis process was solely done by the researcher. Through review of the different packages for data analysis, the excel spread sheets were found to be more appropriate and were used to generate the specific findings / results.

3.5.1 QUANTITATIVE

All the numerical data collected was analyzed using Microsoft excel version 2013 spreadsheets. The quick analysis tool was used to calculate all the range of data irrespective of type as captured on the three types of questionnaires that were administered in the research.

3.6 FLOOD IMPACT ZONES

In order to determine the impact of flooding at the four research sites, and the actual effects it has on the communities, the data from the FGD and interviews was used to identify the areas that experience the worst flooding and severe human consequences. Low (40-49%), medium (50-59%), high (60-69%) and extreme (70-100%) risk indices were arrived at from the FGD and interview data on socio-economics and vulnerability. This was through the use of the key principle for flood measurement of:

$$\text{Intensity} \times \text{Duration} = \text{Magnitude}$$

Followed by the equation:

Hazard = function of (P & I) where “P” is probability and “I” is intensity

41

The high intensity of the floods and the probability of recurrence helped to determine high risk zones through the developed indices. The historical rainfall data for the city was paramount as it was the basis on which the records were compared with the flood experiences as told by the respondents at all the four research sites. The tabulation below is a presentation breakdown of the status for each of the research sites:

Table 3.2: Tabulation of the flooding categories by impact zone, worst years as experienced and rank index

IMPACT ZONE & WARDS AFFECTED	TYPE OF FLOODING	LAST FLOOD EPISODE OF NOTABLE IMPACT DUE TO MAGNITUDE (RATING BY RESPONDENTS)	INDEX RANKING
KANYAMA HMN ward 11, Munkolo ward 12 & Kanyama ward 10	Predictable regular flooding	2010 (73%)	Extreme
MATERO Muchinga & Matero	Flash flooding	2010 (50%)	Medium
CHAWAMA (KUKU) Nkoloma	Predictable regular flooding	2010 (60%)	High
MUTENDERE (KALIKILIKI) Mutendere	Flash flooding	2012 (40%)	Low

Because of a wide range of variables at play, all the listed types of flooding sum up to urban flooding collectively. Through comparison of particularly the data on flood magnitude in relation to the worst flooding experienced, the stated periods in years measure up well with the rainfall data from the meteorology department. Torrential rainfall was experienced during few episodes as opposed to a long and spread period of receipt for the year 2010 in the city.

42

The high flooding for 2010, could be alluded to the imminent climate variability phase for the region in general. According to Vogel & O'Brien (2003), a substantial increase in social and environmental challenges with food security high on the list will be faced by many developing countries as they are doomed to suffer from the effects of climate change. Barker (2007:49/53) explains, for many regions of the world, heavy rainfall events, their frequency and severity is projected to increase resulting into the disruption of settlements and societies due to flooding. Bwalya (2010:7) indicates, due to climate variability and trends, the prediction is that flood magnitude and intensity will increase due to heavy rainfall. During the same year, (2010) an assessment of the flood damage was made by the Zambia Vulnerability Assessment Committee and reported that 27,219 homes were submerged in water (ZVAC, 2010). The International Federation of the Red Cross and Red Crescent Societies (IFRC) through the local Red Cross in Zambia made pledged for assistance to 1,200 affected households in the same year in acknowledgement of their plight. (IFRC, 2010).

3.5.2 QUALITATIVE

All the open-ended questions were coded and grouped into themes for eventual analysis whilst the FGD qualitative comprehensive data was also entered on Excel spread sheets and coded. This resulted into the emergence of final and correlated common themes when the data was comparatively analyzed.

3.7 RELIABILITY OF THE COLLECTED DATA

The information drawn from the respondents was assessed in terms of intention and corrected for errors to form logical and valid data sets of unquestionable validity. According to Strydom, Fouche & Delport, (2005:346), when a subject was accurately identified and

described conclusively, internal credibility is assumed thereby consolidating the validity of the data and this paves way for analysis by data sets.

3.8 CONCLUSION

The use of a triadic way to draw information from the research community helped to generate data that is not only representative of the community residents but brings out the reality of the dreadful seasonal flood disasters. The situation at hand requires collective efforts to be employed so as to either completely eradicate the recurrent floods and the epidemic outbreaks or lessen the generalized impact on the community. The methodology used, helped to inculcate a positive mood amongst the resident respondents in the unity of purpose by highlighting the different and challenging situations faced in the wake of the flood disasters. This aspect was especially observed during the FGDs conducted at all the sites. The attitude and cooperation exhibited by all the respondents was enough indication of the high levels of desperation that lie in the communities. The researcher detected that at particularly FGD level, the group was in anticipation of positive developmental outcomes from the interaction. Expectations were high on the sufficing of perhaps a new project that would somehow alleviate the high poverty levels and ever increasing social vulnerabilities: a negative characteristic at all the settlements. The objectives for the research were adequately covered through the use of academically approved research ethics.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4. INTRODUCTION

All the results arrived at, were structured around the specific and main objectives of the research study. The achieved results are mainly based on the quantitative and qualitative information that was obtained from the research communities including the key expert interviews. The results, are the basis for the discussion and pave way for rational conclusions.

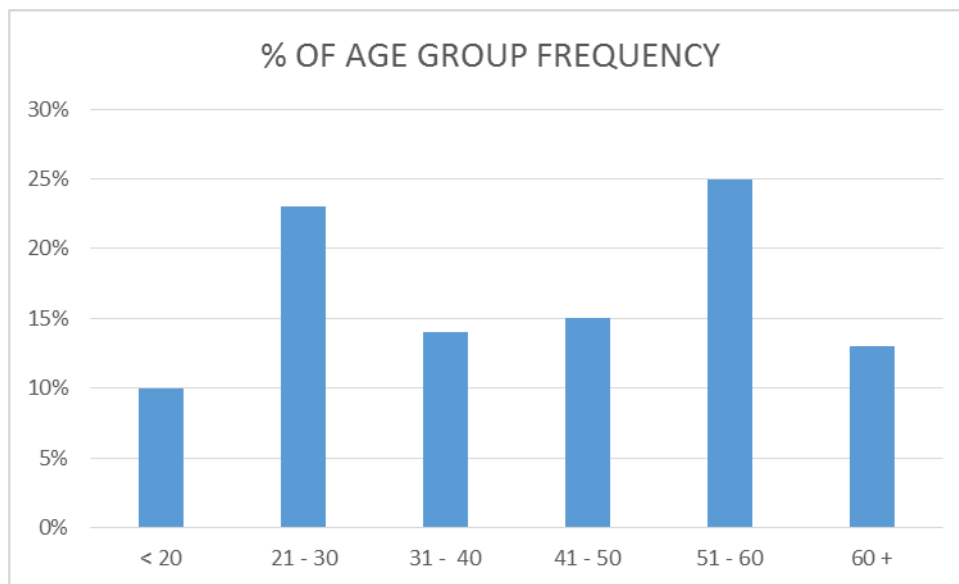
4.1 RESPONDENT INFORMATION

Demography

The study revealed that the 51-60 age group was more prominent as respondents. This was followed by the 21-30 age group, 41-50 age group, 31-40 age group, 60+ age group and finally the under 20 age group respectively. The selection criteria was “Flood experiences” as subjected to by the residents rather than age hence the mixture of age groups. The length of stay in the community was also a factor considered as it meant that the longer a resident stayed in the settlement, the more likelihood of having experienced a succession of flood disasters. For the majority of the respondents, their lengths of stay in the high flood risk communities was an average of 15 years. Through the survey, it was established that 75.56% of the respondents were married whilst 13.33% were widowed, 8.89% were single and 2.22% were divorcees. Amid the

poverty pressures and capacity to with stand the floods, different degrees of impact continued to be experienced by the community members.

Table 4.1: Graphic presentation of the age groups by their percentage of frequency in the study

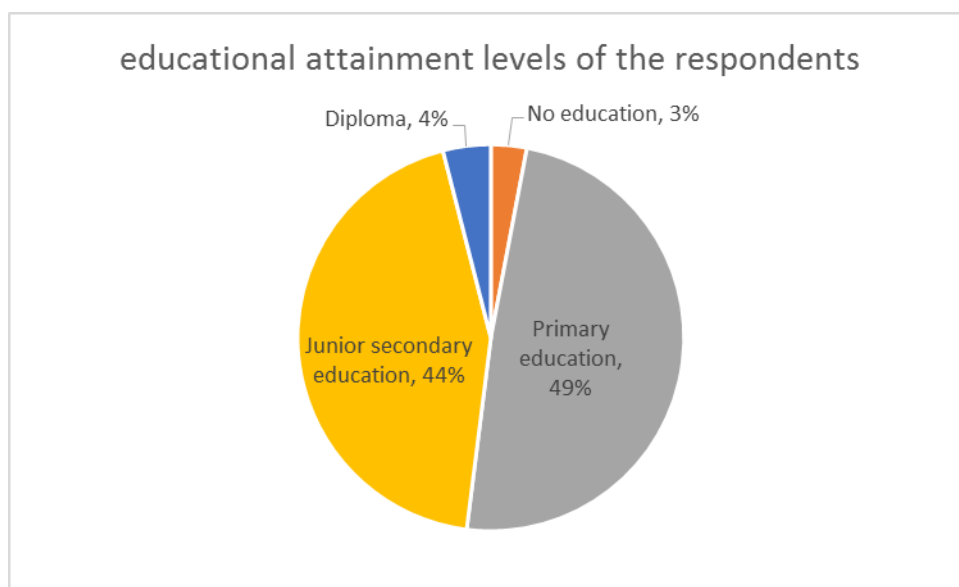


Meanwhile, the educational attainment levels were limited to: no education, primary level and lower secondary level. Out of the sampled respondents, 49% had reached primary education, 44% had attained junior secondary education, and 4% had reached up to diploma level whilst 3% had no education at all. Issues such as nutrition, poverty status, employment earnings, and health can be linked to individual educational attainment. Lifestyle and the general situation of the population and prevailing socio-economics borders on education levels as this is a key determinant that can have a substantial effect on human populations. (ECZ, 2008). Through the research, it was established that that the young and energetic age group of < 20 had very little or had not attained any significant levels of education. The future repercussions this will have on the communities is grave and perpetrates the unending poverty cycle. Although primary education was notably high, it only adds to minimum literacy levels in the communities. The ability to read, count and write is only

enhanced to a minimal extent. The right to education is grossly undermined at all the research sites. The figure below justifies this argument and view.

46

Figure 4.1: Respondent's educational levels



4.2 SOCIO-ECONOMIC CHARATERISTICS

The general livelihoods at all the research sites was casual work or daily paid employees for mostly the men folk usually at the industries in proximity to the settlement. The advantage is, there are no transport fares for the movements; to and from work. The low education levels are attributed for the engagement in small time and casual employment. Out of all the 105 respondents, 49% had attended primary school and can barely read or write. For communication purposes, basic English is picked from the streets. Despite the high levels of illiteracy, the community members engage in any economical venture to earn a daily livelihood. The women folk are all marketers, specialized in merchandize largely of vegetable and fruit origin. Although a few might engage in other stuff to sale, fruit and veg sales

dominate. The monthly income range is Zambian Kwacha 50.00 – 80 (US\$ 9 – 14). Given this, few family households survive on alternative sources of income from close and better off relations to see them through to the month end.

47

Amongst the respondents were a bracket of money lenders (usurers), building hardware sales men, and land lords. These were making as much as US\$ 180 – 270 monthly and considered well off in the community. Only 24% of the respondents owned a combination of assets like; permanently built brick/cement block house, a radio, bed and mattress. On home ownership, specifically; a total of 46.67% were residing in houses of their own (irrespective of construction type, as long as the homes offered shelter) whilst 53.33% lived in rented houses. The rest had none of these items justifying the high poverty levels within the communities. Out of all the respondents, 73.33% did not belong to any clubs, associations and neither were they members of any social action activity. The rest; 26.67% belonged to a series of associations: micro-finance, HIV/AIDS, Church women's clubs, etc. It was noted that the Ministry of Gender does support women's clubs in the settlements on various themes. At the time of the research, the specific information on this was not available.

4.3 PHYSICAL ENVIRONMENT

This section dealt with issues pertaining to primarily the relevant infrastructure available within the settlement locations and how it helps in relieving the floods. Bridges, culverts, storm drains and roads was the infrastructure analyzed in terms of its availability and effectiveness in preventing the flooding. It was established through 40% of the respondents that the bridges, storm drains, culverts and roads were available in the settlements. 33.33% of the respondents indicated the availability of roads only, 6.67% disclosed that

there was no such infrastructure present in their respective location of their settlement. Coincidentally. Another 6.67% admitted to having storm drains, culverts and roads only in their section whilst yet another 6.67% admitted to storm drains and roads only. 2.22% admitted to culverts and roads only. 2.22% to culverts and 2.22% to storm drains as single items and the only flood relief infrastructure in their respective sections of the settlement.

48

As to whether the said infrastructure offers any relief, 44.44% indicated that there was no flood relief offered by the infrastructure because of their poor construction amid the underground rock formations and the general lack of maintenance plus the aspect of too much uncollected refuse that ends up blocking the drainage system. Meanwhile, 15.56% indicated that yes, the said infrastructure does offer flood relief. 13.33% mentioned that the road net-work was there but there were no drainages to accompany the roads causing run-off and the roads being washed away. 6.67% revealed that the smooth flow of the rain water is hampered by too much sand sedimentation which leads to the flooding because of the low land gradient of the settlements. A total of 20% of the respondents gave varying reasons; small culverts, clay soils which slow the absorption rate for the rain water, there is no orderliness in terms of house construction as the structures are built so compactly together in the way of storm drains such that the rainwater has nowhere to flow to. From the responses, it is apparently clear that although the flood relief or flood preventive infrastructure is available in the settlements, it offers very limited in terms of relieving the settlements of the flood pressures that build up, to an extent; exacerbated by the weak law enforcements on among others, garbage collection. Alexander, (2000:177) suggests, communities in a modern society access the essential services; schools, food supplies, hospital, and communication between homes and getting to places of work through a functional road net-work. There are grave socio-economic consequences brought about by failed roads and bridges. On the housing structures built in the settlements, 75.5% mentioned that almost all the structures do not conform to building codes. Although the over-riding reason is poverty, the cost of obtaining approvals from the municipal council is beyond the reach of a

multitude of the people in the unplanned settlements. 24.5% had houses that were built in compliance to house construction ethics. The majority of these are in the settlement of matero, the housing units were originally municipal council houses that were later sold to sitting tenants.

4.4 SOCIAL RELATIONS

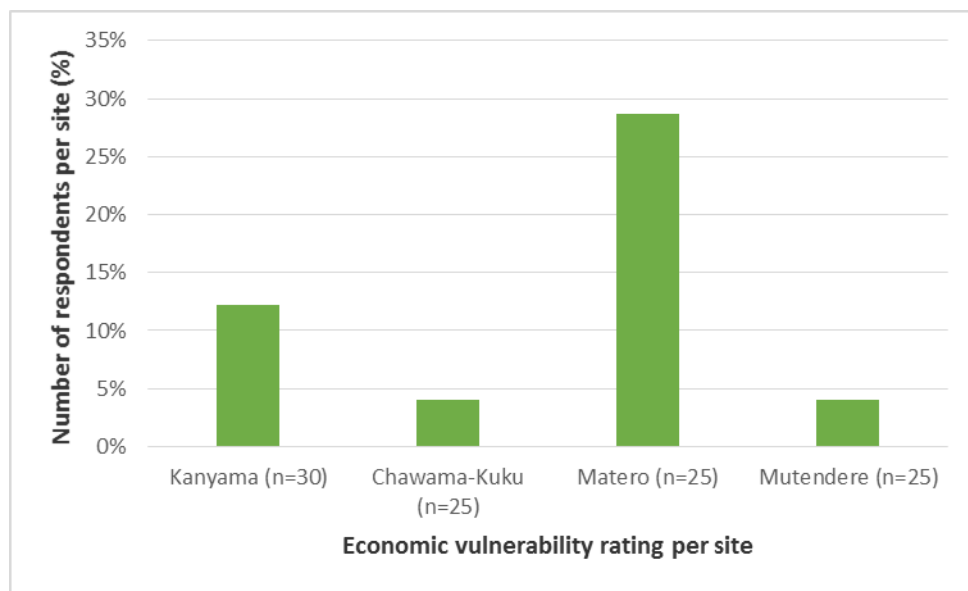
Highly vulnerable social groups at risk

From a range of four, namely; single female parent headed households, male headed households and child headed households, 71% of the respondents indicated that the child headed households were more highly vulnerable socially than the rest.

Vulnerability

A total of 48.89% of the interviewees, isolated economic disadvantages as the leading cause of the social vulnerability in the flood prone communities however, 28.89% gave high poverty levels as the leading cause of vulnerability. Lack of disaster preparedness on floods and weak social structures in the community were both viewed as causes of the social vulnerability at 8.89% each. Poor shelter at 4.44% was the least on the leading causes of the social vulnerability. A spiral of chronic poverty can be the consequence for the poor if repeated exposure to disasters becomes the order of all the wet seasons. (UNISDR, 2002). In the context of the research, this is the case as there is: high unequal distribution of wealth, poor economic conditions, unemployment, household food insecurity, lack of personal security, political instability, and primary health care including human rights violations.

Table 4.2: Graphic presentation of the proportion % of respondents from all the four detailed study sites that identified economic vulnerability to be the main issue faced at all the flood risk settlements



Public Health

A total of 80% of the respondents were of the view that the existing local Health centers could not handle the volumes of patients needing emergency medical attention during a flood disaster episode at all the research sites. This response or view does justify the weak institutional arrangements at this level for effective service delivery to the needy community. The information gathered for instance for the government primary school in kanyama, the enrollment at Grade – 1 is so high that the teacher pupil ratio is at times as high as 1:250). The schools are forced to close down due to the high transmission rate of the water-borne diseases every wet season as a safety measure (FDG, 2013. Out of the five epidemics experienced by the communities, cholera had

the highest ranking at 77.78%, malaria was at 13.33%, dysentery at 4.44%, whilst diarrhoea and typhoid each had a rating percentage of 2.22%.

Water and Sanitation

A total of 68.89% of the respondents representing all the research sites, indicated they got their domestic water from communal taps. This finding clearly consolidates the efforts being made by the Lusaka Water and Sewerage Company (LWSC) to supply safe water to all the unplanned settlements of the city. Amid this positive service provision, 24.44% admitted to using water from the shallow wells. The justification for this is that the treated tap water supplied by LWSC was too expensive for the poor families and that besides, the water from the shallow wells was only used for bathing and laundry purposes; rarely for drinking.

During a FGD at kanyama, a respondent did explain that the shallow water at times does make them *“scratch all over because of contaminants”* so, water from specific wells is avoided. 4.44% had piped water in their homes. These were all from matero settlement whose orderly lay out was planned in a way that each home had provision for a water tap outside. After the houses were sold by the municipal council, a few new owners took the initiative to extend the piping into their homes. 2.22% got their domestic water from the boreholes drilled within the settlements. Upon probing during all the three levels of data collection, there was apprehension as to just how safe this water is because of the perceived contaminated water table. It was also indicated by the respondents that even the LWSC water’s domestic safety was questionable because of the numerous broken points on the pipeline network and they argued that these could be the entry points for pathogens into the supply lines.

A total of 84.44% admitted to the use of Pit latrines for excreta disposal, 13.33% had hygienic water borne toilets (all from matero as per reasons advanced earlier). 2.22% admitted to the use of “flying toilets”⁹.

During the research, it was observed that not all the homesteads have pit latrines.

There seems to prevail general understanding that anyone can access any of these structures with or without permission from the owners. At a FGD in chawama-Kuku, it was disclosed that a large percentage of the rented accommodation has no such facilities. When in place, the pit latrines are not well constructed especially because of the under laying rock formation that presents digging difficulties. As a result, the pits are shallow and easily fill-up when it floods. These get submerged in the flood waters and the discharged effluent ends up mixing with the collected flood waters. Although construction innovations have been observed involving the raising of the pit latrines above the ground level, the consequences are the same. All the respondents indicated that the pit latrines get flooded but with nowhere else to go, they keep using the same. In some instances, the pit latrines double as bathrooms. The common practice though, is to bath indoors using an improvised bath tub and discard the dirty water outside.

Collectively, the sanitary actions not only pollute the underground table water, but the surrounding air masses around. One is greeted by offensive smells all the time.

4.5 GENERIC DATA

Disaster impact

A total of 97.78% indicated that floods generally brought about very serious repercussions every time around. Collapsing of houses, submerged houses, fatalities due

⁹ Use of any form of disposable container i.e. plastic bags, opaque beer packs etc. for excreta. To be irresponsibly thrown away discreetly, hence the term “flying toilet”.

to flood related accidents and epidemics; are all the types of impacts floods have on the communities. Only 2.22% appreciated the relocations of worst affected households to higher ground during the flood episode by the Disaster Management and Mitigation Unit (DMMU) under the auspices of the Office of the Vice President during the 2010 floods.

Disaster preparedness

The respondents were asked to indicate if they considered themselves well prepared for the next floods. 42.22% intimated to have assumed a level of preparedness because of the resilience levels attained so far given the repeated flood disasters subjected to in the area. 57.78% of the respondents boldly mentioned that they were far from being prepared as the flood magnitude varies from time to time in terms of the impact it has on the community. At all the sites, the residents live in constant fear at the onset of every rainy season yet there is no collective community initiatives aimed at pro-active DRR activities in preparation and data gathering in readiness for the floods. Kunreuther, Novemsky & Kahneman, (2003:3) point out that there is evidence that such data, when available may not even be used for planning as people tend to disregard it even in the likelihood of a disaster event occurring. Flood awareness and preparedness is especially important for a flood-prone population (SCARM, 2000:60).

External donors and actors

A total of 60% of the respondents indicated that there were no external donors that come to their aid during or before a flood disaster episode. In contrast, 37.78% were affirmative on the presence of humanitarian agencies working hand-in-hand with the Disaster Management and Mitigation Unit (DMMU) at district level, whilst 2.22% were did not advance any reason at all. For this question, it was observed that, the disparity in views and responses is marred with the partisan politics that prevail in the community. With the limited literacy levels, the respondents are always living in fear of putting

themselves in jeopardy depending on the response they give; no matter the private nature of the interview.

Disaster management training

A total of 84.44% indicated there were no such trainings being offered in the community. 13.33% consented to some trainings in the community by the DMMU on how to prepare drainage furrows to pave the flow of the flood waters away from their homesteads and the use of chlorine to purify the domestic water. Lessons on refuse disposal were also given. Meanwhile, 2.22% made no comment on this.

Suggested solutions to the seasonal flooding in the four research communities

77.78% of the respondents were of the opinion that the construction of expertly engineered storm drains, complete with masonry reinforcement walls, bottom void of any rock formation with regular maintenance and cleaning would be the long-term solution to the seasonal flooding at all the four research sites. 13.33% further indicated that filling up of all the quarries and ditches around with laterite soils, including the surroundings for the houses in the flood risk zones would be the permanent solution. Meanwhile, 2.22% felt that the settlements must be relocated to higher ground on the basis of a planned layout with orderly drainage systems in place. 4.44% had no suggested solutions to the recurrent floods.

4.6 EFFECTS OF FLOODS ON HOUSEHOLDS AND THE ENVIRONMENT

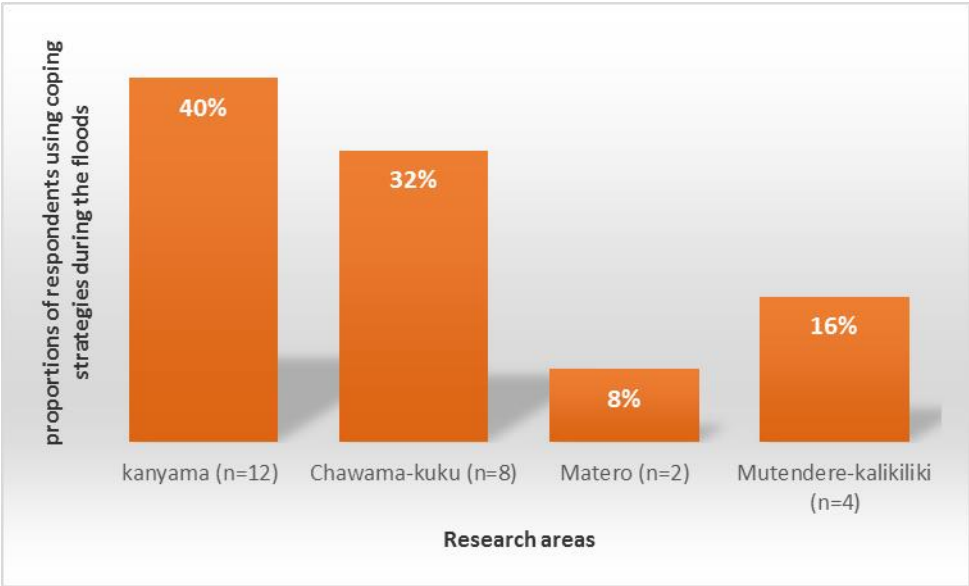
In the four detailed study sites, the floods are perceived to have devastating impacts on not only the respective communities but have caused environmental degradation. It was

observed that there was serious erosion at all the sites and there was no vegetative cover but isolated ornamental trees. Furthermore, activities like the stone-quarrying activity has had a serious negative impact on the environment. Excavations for limestone as a livelihood leaves huge craters on the ground. These fill up with flood water during the rainy season threatening human health by increasing the potential for water-borne diseases and accidents.

4.7 COPING STRATEGIES

Although a wide range of coping strategies were mentioned, normally at the peak of the floods, the common strategies mentioned at all the four study sites are as illustrated below:

Table 4.3: percentages of respondents using coping strategies for each study site



A total of 40% of the respondents from kanyama mentioned the compaction of soils around their respective homesteads so as to raise the ground surrounding the houses. In so doing, the flood water does not get into the houses. This strategy was only applicable for a selection of households, whose homes had the advantage of being on slightly higher ground. 32% of the respondents at chawama-kuku employed the construction of raised pit latrines to limit the flooding of the latrine shafts. At matero, 8% indicated that they cover the man-holes

with plastic sheeting to prevent flood water from filling up the septic tanks. Meanwhile, 16% of the respondents at mutendere-kalikiliki indicated the laying of stones leading to their homes to enable them to walk freely up to the houses. This is done essentially to guide anyone. The ditches on the ground normally fill-up with flood water and falling into such is a common occurrence during the floods resulting into serious injuries being sustained by the victims. The admission by some respondents to use some kind of DRR technique to ease their lives is a positive move exhibited by the residents.

56

If harnessed further, this can open avenues for the introduction of more coping strategies for the community which will in turn add to the build-up of the community resilience levels. Through the survey, it was noted that the DMMU structure at grass-roots level was weak. The membership on the ground lacks constant DRR training in meeting with the aspirations of the preparatory phase of the disaster management cycle. The satellite committees only seem to be active during the emergency response phase.

4.8 INTEPRETATION OF THE RESULTS

From the overall findings, it is quite clear that the seasonal floods have had serious consequences on the communities subjected to the study. The phenomena has made the residents more socially vulnerable for living on unsafe land in equally unsafe shelters for the purpose of proximity to employment opportunities and the central business district (CBD). The prevailing high population densities at all the sites is also a contributing factor to the flooding. The careless emission of refuse on a daily basis compounds the flooding because of ineffective disposal facilities. Although in some instances, the garbage is collected for formal disposal at the designated Lusaka City Council (LCC) dumpsites, the service is irregular and the waste keeps accumulating. This was identified as the main cause of blockages along the storm drains during the wet season. The high volumes of non-bio-degradable materials like; bottles, aluminum cans, plastics all end up in the drainages. Given the identified high economic vulnerabilities in the research communities, every resident only thinks of how to survive the next day without giving any consideration to the pollution caused by their irresponsible dumping actions.

The poor water and sanitation situation in the study areas correlates to the waste disposal problem as both are unhygienic and generally impact heavily on public health. The

non-hygienic sanitary conditions found are quite alarming for such a multitude of people to live in under the capital city parameters. The seasonality of epidemics in association with precipitation patterns clearly emanate from the poor living conditions presented in such an environment. The epidemic disease impact however seems to vary from season to season depending on firstly; the magnitude of the floods and their duration secondly, the preventive strategies put in place prior to the flooding by the community health fraternity.

57

Of very severe drawback is probably the loss of the meagre livelihoods because of the floods. This has adverse effects on the household food security as the type of livelihoods witnessed are prominently hand-to-mouth sort of business undertakings. Therefore, any disruption, leads to a marked retrogression because of the economic losses incurred by the households.

It was also established that the essential services, in particular; schools and health facilities are not easily accessible during the peak floods. The schools close-down prematurely mid-term, completely suspending the lessons only to re-open when the floods subside depending on the flood magnitude. This is one of the reasons as to why the levels of illiteracy are high in the unplanned settlements. The school going children are subjected to interruptions and soon a young mind loses focus on school academics and eventually drops-out. Driven by the high poverty levels, such children end up pursuing quick daily cash on the streets.

4.9 LIMITATIONS TO THE RESULTS

The study period was brief preference was a longer study period that extended well into the wet season, so as to have more validation of the responses against the observations on the ground. Whilst the target of respondents was met, the level of key expert personnel was not due to bureaucratic procedures on data access and unending excuses for personal interviews. The target was to meet all the stakeholder government ministries or departments including the specific departments i.e. engineering and public health at the Lusaka City Council (LCC).

4.10 IMPLICATIONS OF THE RESULTS

Flooding at all the research sites will continue annually though with a variance in terms of intensity. The risks associated are multi-dimensional and affect all the residents irrespective of wealth ranking. In the wake of climate change, sufficiently larger floods should be anticipated at some time in future. It is not a matter of if, but of when? According to Huq, Rahman, Konate & Reid, (2003:12) sub-Saharan Africa is the most vulnerable region to climate change due to the frequent natural disasters like droughts and floods, amid the low adaptive capacity of Africans because of their extreme poverty levels.

58

The disaster principle of: *“If it has happened before, it will happen again”*, must not be ignored completely as nature cannot be stopped. The results suggest that the social vulnerability levels at all the study sites remain dangerously risky and long-term solutions have to be found in addressing the plight of the affected residents. With such prevailing negating factors, sustainable development of the settlements still remains a big challenge that requires determined collective unity and effort to be fostered. Early warning systems and awareness campaigns in the disaster prone settlements requires to be introduced to help empower such knowledge to the residents.

4.11 CONCLUSION

The results are all in line with the research objectives through which exhaustive investigations were made and documented. The glaring findings arrived at, will be used as a strong basis and foundation for the future recommendations. Through the recommendations, it is hoped that sustainable solutions for the seasonal floods at all the four research sites will be found to foster better and more livelihood options for the affected communities in general. The high social vulnerabilities and demographic pressures across the four research areas entail more flooding unless a permanent solution to the ineffective drainages and the general lawlessness in the flood prone communities is addressed.

The evidence of the weak institutional structures is an area that needs further investigation to get to the real reasons why this is the case. Strong institutional arrangements can be a conduit of communication flow on all the matters affecting the community. The fact that only a total of 27% of the respondents belonged to local clubs and associations is indicative of the disunity in the research communities. The unity problems are characterized

with high levels of desperation as the residents look out for avenues to find livelihoods on a daily basis. There is need for external stakeholders to help with the initiation of viable associations with support from the related government departments and humanitarian agencies.

CHAPTER FIVE

RECOMMENDATIONS

5. INTRODUCTION

Based on this study, two levels of recommendations have been made. The reason for this is mainly to differentiate two themes of the pertinent issues that provoked deeper analysis and thoughts in the mind of the researcher. This opinion is solely for the purpose of presentation of logical and practical suggestions on the identified flood problem in the unplanned settlements. Through the research results, it is now clearer that floods will continue at the researched sites well into the future at different magnitudes with the potential to increase with the advent of climate change. This unwelcome scenario, has to be dealt with and given the due attention it deserves soonest. The floods have to be managed for the sake of sustaining humanitarian well-being and to foster sustainable development at this level. A practical disaster management strategy that addresses environmental management in addition to social and economic development must be developed. The first recommendations are suggestions for further research areas at the study sites. The second set of recommendations is on proposed policies for government to help stimulate high office level consideration; even if there might be implications of different dimensions.

5.1 RECOMMENDED AREAS FOR FURTHER ACADEMIC RESEARCH

- A study has to be undertaken on the present drainage network for the entire city of Lusaka; its effectiveness in modern times etc. The study should include aspects such as: the likely avenues for channeling the flood waters i.e. streams, river catchments, watersheds etc. through construction of new and effective large volume designed storm drains. The socio-economic benefits for such project undertaking should be exhaustively analyzed.

60

- Research into the open mining quarries especially at chawama- kuku and kanyama areas. Issues like land reclamation for erection of social service infrastructure i.e. Schools, Health center, Community welfare center etc. must be put into consideration.
- Research into water and sanitation facilities (kanyama, chawama-kuku & mutendere), Issues;
 - a. Dry composting pit latrines (Ecological Sanitation)
 - b. Safe domestic water (system upgrade? affordability, adequate supply?)
 - c. Shallow well water (can it be made safe?)
- Investigate / research into the use of vertiver grass (*vertiveria zizaniodes*) for a selection of households in the flood paths as a pilot to limit / reduce the flood water speed. In turn, reduce on the soil erosion and sedimentation along the storm drainages. Collaboration could be with the line government land-use department, forestry department including the environmental council of Zambia and the regional scientific research station.
- Investigate / research into the use of eucalyptus (any spp. *grandis*, *maculata* etc.) trees at worse-off swampy areas at risk to flooding as a mitigation strategy. The deep tap root of the eucalyptus could help to drain the water particularly during the dry season.

5.2 POLICY RECOMMENDATION AREAS

- Accord the National Disaster Management and Mitigation Unit (NDMMU) currently under the Office of the Vice-president (OVP) more flexibility and autonomy to make non-politically biased management decisions and actions. In line with especially the mitigation and preparedness stages as outlined in the Disaster Management continuum. All the post and pre – disaster phases have to be adhered to and conformed to in principle.

61

In addition, the NDMMU national office must have a department on floods and droughts as both are not only co-related water based hazards and call for unquestionable DRR expertise. Zambia is more prone to these disasters and has had decadal repeats on the droughts countrywide whilst floods have more or less been experienced every wet season at not only the research areas but at regional level countrywide.

In addition, the current operational hierarchy has a weak point at satellite level as observed / proven during the research. There is urgent need to take stock of the “real” disaster management committee membership in the unplanned settlements. These should be evaluated / upraised, engaged and given incentives like monetary allowances to motivate them. The designed and perceived expectations that these people be treated as community volunteers is not working at all. Chapter 6, section 6.1.1 of the Disaster Management Operations Manual (2005:8) highlights a list of 16 roles and responsibilities expected from the satellite disaster management committee membership.

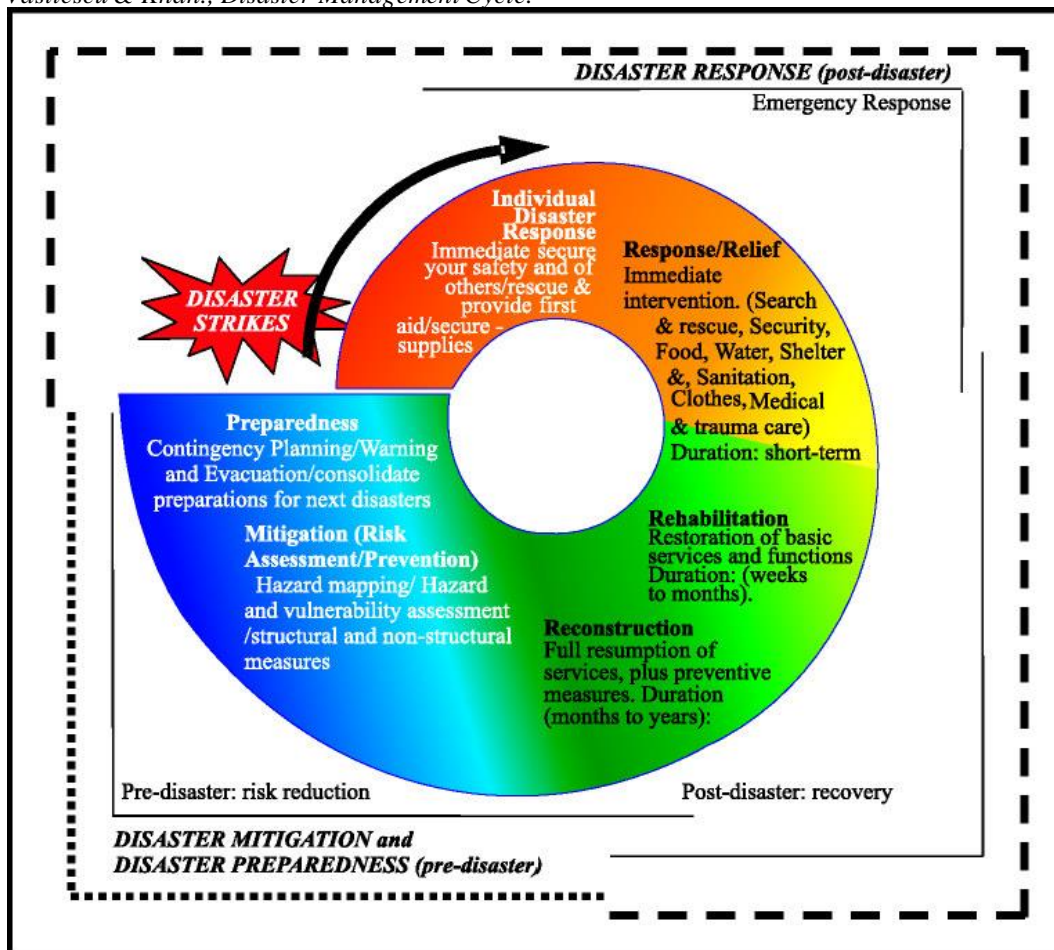
The list is overly optimistic and is practically beyond their means as they have to fend for their daily subsistence given the high poverty levels and the economic disadvantages in the settlements.

IRP / UNDP, (2010:42) notes on recovery governance suggest that planning and preparation are essential in order to strengthen the local grassroots

capacity in disaster recovery. Sustainable recovery efforts must be consolidated before a disaster happens. Prioritizing disaster risk management is paramount with a purpose of avoiding a disaster. Specifically, aspects on timing like; during, before and after disaster are cardinal in disaster impact reduction including from the incurred losses. Through the findings, three areas warrant to be focused on as illustrated in figure 5.1 below:

62

Figure 5.1: Three key activity areas to enhance disaster risk management *Adapted from: Khan, Vasilescu & Khan.; Disaster Management Cycle.*



It is recommended that the three areas highlighted should be the main focal points for the identified DRR activities in the unplanned settlements. This should be sustained with the full compliance it deserves to enhance capacity building and the ultimate resilience for the residents at risk.

- Recapitalization of micro-financing at the unplanned settlements. Findings indicate there is on-going micro-credit facilities, access demand is high and this justifies the injection of more funds in this sector. A portion of the CDFs could be used for this facility but this calls for high level directives and policy formalities. Non-collateral microcredit type of loans could make an impact and should target poor borrowers.

63

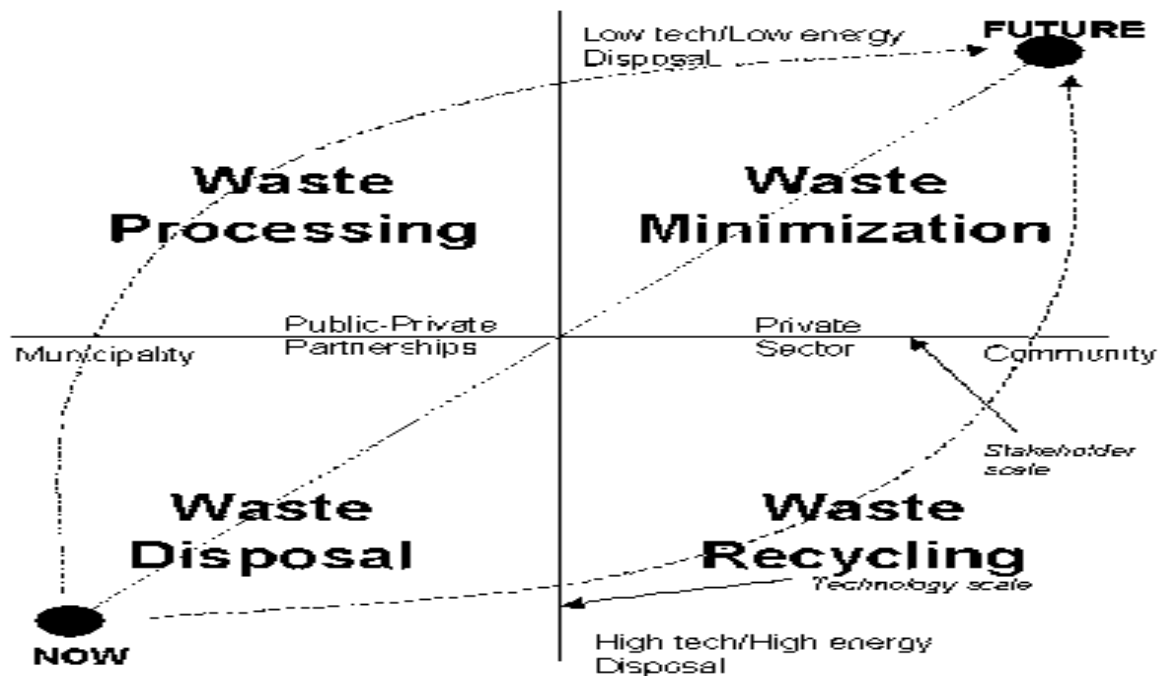
Capacity building for the beneficiaries however remains paramount for full comprehension to give the facility a fair chance of success.

- From the findings across the study sites, the refuse or garbage generated is a main contributor to the general blockage of the storm drainages resulting into flooding. The type of waste is mainly made up of non-bio-degradable material; plastic, aluminum cans, glass and paper. Recycling for mainly plastic bottles is currently being undertaken by a few local industries. The volumes handled are low and make no impact on ridding the environment of the waste. There is need to embrace all forms of refuse treatment to lessen the negative impacts on the air, human health, land etc. to pave way for a cleaner environment. This avenue should be considered as a business avenue by the Lusaka City Council (LCC) with backing from the local government ministry. To attain a realistic purpose, a premium price must be paid for any type of waste brought in for sale by the community members through a cash-on-delivery understanding. It is the only way that larger waste volumes will end up being recycled. Although the suggestion is for the municipal council to consider this as a business avenue, a multi-stakeholder approach is ideal to increase the chances of success and a sustained venture; well into the future in anticipation of population and city growth. The integrated approach to

waste management could apply the urban waste management continuum principle as illustrated below:

64

Figure 5.2: The Waste Management Continuum. Adapted from: Scrinivas Hari. GDRC



Apart from the environmental benefits of the strategy, ready cash will be made available to the community residents as a ready income generation activity they could undertake any time. The more garbage collected, the more money realized from the sales.

- For the effective control of storm water drainage and the seasonal flooding in the study sites, there is need for a storm water management plan as part of the disaster management committee function at satellite level. The defined functions in the current DMMU Policy at this level are generic and the inclusion of storm water management would specifically address the flood disaster aspect. Flood behaviour can be evaluated and assist in future flood prognosis and in turn make appropriate management decisions including early warning.

6. CONCLUDING REMARKS

Flood disasters at the four study sites are severe and pose very significant threats to the residents in terms of their livelihoods and general social status. The challenges faced by the communities suggest that future flood mitigation strategies must be developed in close consultation with the flood affected communities. The disaster management and mitigation committees at community level will require reorganization. Capacity building, membership evaluations, roles/responsibilities etc. need to be looked into with renewed objectivity. This study highlights the importance of understanding the social vulnerability factors associated with the flood disasters experienced by the communities at the research sites. Collectively identified solutions to the imminent flood phenomena calls for stakeholder commitment and involvement. A changed mindset on hygienic living by the flood prone communities could start the hygiene revolution. As earlier alluded to, the waste generated daily and carelessly discarded by the residents is one of the reasons that leads to flooding and if this is eliminated, the floods are bound to lessen.

7. REFERENCES

- ALNAP & Provention. 2008. *Flood disasters. Learning from previous relief and recovery operations.*
- Alexander W.J.R. 2000. *Flood Risk Reduction measures. Department of Civil Engineering,* University of Pretoria; the Republic of South Africa.
- Asian Disaster Preparedness Centre (ADPC) & UNDP. 2005. The primer: *Integrated Flood Risk management in Asia*, adpc, UNDP.
- Babbie E & Mouton J. 2001. *The practice of social research.* (1st, South African Edition) Cape Town: Oxford University Press. South Africa. Chapters 4, 10 & 11.
- Barker T. 2007. Climate Change. 2007 synthesis Report. *An assessment of the inter-governmental panel on climate change.* IPCC plenary XXVII (Valencia, Spain; 12 – 17th, November 2007).
- Birkmann J. 2006. *Measuring vulnerability to promote disaster – resilient societies: conceptual frameworks and definitions.* PMU: WSL (W) 15/8/06 PP. 7 – 54
- Bwalya S.M. 2010. *Climate Change in Zambia. Opportunities for Adaptation and mitigation through Africa Bio-Carbon initiative Report.* Centre for international Forest Research. Southern Africa Regional Office, Lusaka – Zambia.
- Central Board of Secondary Education (CBSE). 2006. *Natural Hazards and Disaster Management.* Delhi: Preet Vihar, 2006.
- Central Statistical Office. 2012. *2010 Census of Population and Housing. Population Summary Report.* Central Statistical Office: June 2012; Lusaka – Zambia.

- Central Statistical Office. 2012. *Living Conditions monitoring Survey Report 2006 & 2010*. Living Conditions Monitoring branch, central statistical office; Lusaka – Zambia.
- Coetzee J. K. J, Graaf, F. Hendrix & G. Wood. 2001. *Development, Theory, Policy and Practice*. Cape Town; Oxford University Press Southern Africa (Chapter 33).
- Concern. 2005. *Approaches to Disaster Risk Reduction*. Emergency Unit [accessed; 15th, October 2013]
- Creswell J.W. 1998. *Qualitative inquiry and research design: Choosing among the traditions*. Thousand Oaks, CA: sage.
- DFID. 2006. *Reducing the risk of Disasters – helping to Achieve Sustainable Poverty Reduction in a vulnerable World*. A DFID policy paper.
- Disaster Management & Mitigation Unit. 2005. *National Disaster Management Policy*. Government printers, Lusaka – Zambia.
- Disaster Management & Mitigation Unit. 2005. *Disaster Management Operations Manual*. Government printers, Lusaka – Zambia.
- 67
- Environmental Council of Zambia. 2008. *Zambia Environmental outlook Report*. -3
- Government of the Republic of Zambia (GRZ). 2011. *The Sixth National Development Plan: (2011 – 2015)*.
- Habasonda B. G. 2013. *Political Ecology of Slum Development: The case of Kanyama: Zambia*. International Institute of Social Studies. The Hague, Netherlands.
- Hari S. 2012. *An Urban Waste management Continuum*. www.gdrc.org/uem/waste/continuum.html [accessed: 15h, October 2013]
- Heath T, A. Parker & K. Weatherhead. 2010. *How to climate proof Water and Sanitation Services in the peri-urban areas of Lusaka*. Water & Sanitation for the Urban Poor (WSUP). Report prepared by Cranfield University.
- Hennink M.M. 2007. *International Focus: A hand book for the Health and Social Sciences*. Cambridge University Press, Cambridge; UK.
- Hug S, A. Rahman, M. Konate, Y. Sokona & H. Reid. 2003. *Mainstreaming adaptation to climate change in least developed countries*. International Institute for Environment and Development (iied)
- Hyogo Framework for Action (2005 – 2015). 2005. *Building the resilience of Nations and Communities to Disasters*. Extract from the final report of the World Conference on Disaster Reduction (A/CONF.206/6). International Strategy for Disaster Reduction. www.unisdr.org [accessed: 12th, October 2013]
- IFRC. 2010. *Zambia: Floods DREF operation number MDRZM007*. Glide number FL – 2010 – 000038-ZMB [accessed: 12th, October 2013]

IRP / UNDP. 2010. *Guidance Note on Recovery: GOVERNANCE* – UNDP: India

ISDR. 2009. *“Towards a post – 2015 Framework for Disaster Risk Reduction”*
[accessed: 12th, October 2013]

Kangwa B. 2013. US\$ 355 Million Millennium Challenge Corporation (MCC) compact to improve Water, Sanitation and Drainage in Lusaka
<http://cbezambia.org/?cat=5> [accessed: 15th, October 2013]

Kanyanga J. 2013. Interview with the researcher on the 10th, October 2013. Department of Meteorology, Lusaka; Zambia.

Khan H, L. Vasilescu, A, Khan. 2008. *Disaster Management Cycle* – A theoretical Approach

Kunreuther H, N. Novemsky & D. Kahneman. 2000. *Making low Probabilities useful*. Wharton School. University of Pennsylvania, Philadelphia, USA.

Leedy P.D, Omrod J.E. 2011. *Practical Research Planning and Design*. International edition, UFS; Republic of South Africa.

68

Mc Cluskey J. 2001. Water supply, Health and Vulnerability in Floods. Waterlines. Vol.19 No. 3 January 2001.

Mulenga A. 2013. *Cops arrest 300 PF Cadres for Criminal trespass*. The Post newspaper, 27th, September 2013.

Mwanaleza E. 2010. *Floods in Lusaka’s new Kuku*. The Post newspaper, 28th, March 2010.

Nchito W. 2007. *Flood risk in unplanned settlements in Lusaka*. Environment and Urbanization 2007 19:539-551 DOI: 10.1177/0956247807082835. International Institute For Environment and Development.
<http://www.sagepub.com/journalsPermissions.nav>
[accessed: June 15th, 2013]

Parry M, N. Arnell, P. Berry, D. Dodman, S. Fankhauser, C. Hope, S. Kovats, R. Nicholls, D. Satterwaite, R. Tiffin & T. Wheeler. 2009. *Assessing the costs of adaptation to climate change. A review of the UNFCCC and other recent estimates*. London: IIED
(International Institute for environment and development and Grantham Institute for climate change).

Saileemal H, S. Kovats, H. Reid & D. Satterthwaite. 2007. *Reducing risks to cities from disasters and climate change*. Environment and Urbanization 2007 19:3 DOI: 10.1177/0956247807078058 <http://eau.sagepub.com/content/19/1/3>
[accessed: June 15th, 2013]

Sasaki S, H. Suzuki, Y. Fujino, Y. Kimura & M. Cheelo. 2009. *Impact of Drainage Network on Cholera outbreaks in Lusaka; Zambia* in American Journal of Public Health journal information 99(11:1982 – 1987)

SCARM. 2000. *Flood Plain management in Australia: Best practice principles and guidelines*.

SCARM report; number 73.363.349360.994. ISBN 0643060340.

Simatele D. 2010. *Climate change adaptation in Lusaka, Zambia: A case study of Kalingalinga and Linda Compounds*. Global Urban Research Centre (GURC) Working Paper No. 6 ISBN: 978-1-907120-05-3, University of Manchester, M13 9PL UNITED KINGDOM.

Strydom H, Fouche C.B & Delport C.S.L. 2005. *Research at grassroots for Social Sciences and human service professions*. (Third edition)

The UN Millennium Development Goals (2005 – 2015). www.unmillenniumproject.org/goals/

The Sphere Project. 2011. *Humanitarian Charter and minimum standards in humanitarian Response*. ISBN 978-1-908176-00-4

Turner B.L, R.E Kasperson, P.A Matsen, J.J McCathy, R.W Corell, L. Christensen, N. Eckeley, J.X Kasperson, A. Luers, M. L Martello, C. Poloky, A. Pulsifer & A. Shiller. 2003. *A framework for vulnerability analysis in sustainability Science*. PNAS 8074-8079.
www.Pnas.org/cgi/doi/10.1073/Pnas.1231335100 [accessed: 12th, June 2013]

69

Twigg J. 2001. *Sustainable livelihoods and vulnerability to disasters*. Benfield Greig Hazard Research Centre for Disaster Mitigation Institute (DMI).

Tyrell G.J. 1986. “*The Climate of Lusaka*” in J. Geoffrey Williams (Editor) *Lusaka and its Environs*. Zambia Geographical Association Pages 34 – 45.

UN Human Settlements Programme. (UN – HABITAT), 2007. *Participatory Slum Upgrading Programme in African, Caribbean and Pacific Countries. Zambia: Lusaka Urban Sector Profile*. <http://www.unhabitat.org>

UNDP. 2001. *Disaster Profiles of the Least Developed Countries*. Centre for Research of the Epidemiology on Diseases (CRED), Emergency Disasters Database (EMDAT).

UNEP, UN – HABITAT, UNESCO & Ministry of Environment and Water Development. 2009. *Assessment of pollution and vulnerability of water supply aquifers of African Cities. A case study for John Laing, Mass-media and Misisi areas in Lusaka*. Multi-agency Project – Zambia.

UN – Habitat/DMP – Gender. *Concept brief “Gender, Disaster and conflict: A human Settlement’s perspective”* <http://gridaca.grid.unep.ch/undp> [accessed: 30th, November 2013]

UNISDR. 2002. *Living with Risk. A global review of Disaster Reduction initiatives*, Geneva; Switzerland.

UNISDR. 2002. *Disaster Reduction and Sustainable Development. Understanding the links between vulnerability and the risk to disasters related to development*.

UNHCR. 1992. *Water manual for Refugee Situations*. Programme and Technical support section,

Geneva; Switzerland.

Vogel C & K. O'Brien. 2003. *"Climate forecasts in Southern Africa". In coping with climate variability: The use of seasonal Forecasts in Southern Africa.*
Edited by O'Brien K and Vogel. Aldershot, UK: Ashgate.

Wisner B, P. Blaikie, T. Cannon. 2006. *AT RISK. Natural hazards, People's vulnerability and disasters.* Second edition. ISBN 0-415-25216-4 (pbk). Great Britain.

World Bank. 2002. *Upgrading Low-income urban Settlements: Country assessment Report, Zambia.*
<http://web.mit.edu/urbanupgrading/case-examples/overview-africa/country-assesments/zambia.html> [accessed: 15th, October 2013].

World Bank. 2008. *Climate Resilient Cities: 2008 primer: Reducing Vulnerabilities to Climate Impacts and Strengthening Disaster Risk management in East Asian Cities.*
Washington DC: World Bank, FGD RR AND UNISDR.

Zimba J. 2009. *Climate Change: Zambia's doomsday scenario.*

70

Annex -: 1



Disaster Management Training and Education Centre for Africa (DiMTEC)
Faculty of Natural and Agricultural Sciences
University of the Free State, Bloemfontein
Republic of South Africa

QUESTIONNAIRE FOR FOCUS GROUP DISCUSSIONS: COMMUNITY FLOODS

LUSAKA DISTRICT

WARD NAME:

DATE:

START TIME::.....

END TIME::.....

LOCATION:

Preamble / Self introduction

I am a Masters Degree university student gathering information on the recurrent floods that occur in your area during the rainy season. I would like to know and fully understand the extent of the problem and ways in which this problem has impacted on your general welfare and livelihood including the probable solutions that could mitigate the effects of the flood phenomenon in your community. The aim of the research is to recommend ways to manage the flood related disasters in the unplanned settlements of the city.

The purpose of this discussion is for me to better understand your experiences with the recurrent floods in the settlements particularly how this phenomenon impacts on everyone. It would be relevant and informative for me to hear how you deal with the floods and also your suggestions on how to best prevent the floods.

I have a number of questions to ask and there are no right or wrong answers. Please feel free to share your views, even if they differ from others. It is very likely that different group members will have different views and this is fine and justifies the essence of this discussion. This is meant to be an open and participatory discussion meeting. Your comments will be kept confidential and your names will not be included in any reports.

Many thanks for your coming and agreeing to meet me and let's begin. The meeting will take about 60 minutes but highly dependent on the quick flow of ideas and contributions.

1. What are the different livelihoods/occupations do the people in your settlement engage in throughout the year.

2. What are the main issues that disrupt sustained income for the people engaged in these occupations?

71

3. Can you rank these issues in order of importance in terms of those that have the greatest effect on the amount of livelihood disruptions.

4. Are floods a real problem in this area? If yes, to what extent?

5. What practical mitigation measures would you suggest as coping strategies?

6. Are there specific areas that experience more flood damage than others or is the flooding generalized?

7. What are the compelling reasons for settling in unplanned settlements in the city in defiance of the apparent disaster risks?

8. Has the flooding worsened or lessened during the last 10 years? (2000 – 2012)

9. Does the disaster management structure exist in the community? Are there any active members involved in capacity building?

10. Has the National Disaster Management and Mitigation Unit (DMMU) played any significant role in training of the communities in disaster prone settlements? Has the training been beneficial in community resilience building?

11. Are all the houses constructed in line with building codes? If no, why is this so?

12. Is water and sanitation a major issue in the community particularly during flood episodes when the pit latrines fill up with water?

13. What measures would you recommend to reduce the vulnerability to floods in the settlement?
14. Are risk and hazard assessments carried out regularly in the settlement? If yes, by who?
15. Are the social services (i.e. Clinics, Schools etc.) sufficient to cater for all the population in the settlement?
16. Considering all that we have discussed at this point, what do you think would be the most effective strategy for managing the floods in future?

72

Annex -: 2



Disaster Management Training and Education Centre for Africa (DIMTEC)
Faculty of Natural and Agricultural Sciences
 University of the Free State, Bloemfontein
 Republic of South Africa

QUESTIONNAIRE FOR FLOOD AFFECTED HOUSEHOLDS

INTERVIEW DETAILS

LUSAKA DISTRICT

WARD NAME:

DATE:

START TIME::.....

END TIME::.....

LOCATION:

Preamble / Self introduction

I am a university student gathering information on the recurrent floods that occur in your area during the rainy season. I would like to know and fully understand the extent of the problem and ways in which this problem has impacted on your general welfare and livelihood including the probable solutions that could mitigate the effects of the flood phenomenon in your community.

- I will be asking questions on your flood experiences, the disruptions on your daily livelihood, health and infrastructure damage. All the information obtained from you will be kept as confidential and privileged data and only for academic usage.
- The interview is expected to take between 30 – 45 minutes.
- Please feel free not to answer any question that you may not want to respond to in case it infringes on your personal integrity.
- If at any point you wish to raise a question, please feel free to do so.
- Your candidature for interview has been chosen in a representative sample and was not forwarded or suggested by anyone.

PART – 1: HUMAN DEMOGRAPHY

1.1 Sex: *Male / Female*

1.2 Age: <20 / 21 – 30 / 31 – 40 / 41 – 50 / 51 – 60 / 60 +

1.3 Marital Status: 1. Single 2. Married 3. Divorced 4. Separated 5. Widowed

1.4 Household Family Size: Male 73 Female Total

1.5 What is the highest level of education you attained?

None Artisan training Primary Secondary
University Other (please specify)

PART – 2: SOCIO – ECONOMIC CHARACTERISTICS

2.1 Indicate your main livelihood avenue (s) throughout the year and give their rankings.

1. Beer brewing
2. Trading / vending (specify)
.....
3. Bricklaying
4. Electronics repair
5. Quarrying
6. Formal regular employment (specify)
.....

7. Casual employment (specify)

8. Shack farming

9. Self-employed (specify)

10. Other.....

2.2 Do you have alternative sources of income? If yes, specify.....

2.3 What is your monthly income? (If it varies, give a range).....

2.4 Which of the following assets do you own?

74

0 Car or Truck 0 Electric Stove 0 TV 0 Radio 0 Permanent brick/block

0 Fridge 0 Micro wave oven 0 Bicycle 0 Bed

2.5 Are you a member of any social action committees or associations? Y / N If yes, please state

.....

2.6 Do you own or rent the house you are living in?

2.7 How long have you lived in this community?

PART – 3: PHYSICAL ENVIRONMENT

3.1 What is the type of relevant infrastructure that is found in the settlement which could help, Lessen the flooding?

1. Bridges 2. Storm drains 3. Culverts 4. Roads

Do these offer any relief in the event of a flood event? Y / N If no,

house

Why?

.....

.....

3.2 Why is your settlement prone to flooding every rainy season?

.....

.....

3.3 What do you think are the reasons for the recurrent floods?

.....

.....

3.4 Have you ever lost your house due to flooding? Y / N If yes, did you have to relocate to a new location? Indicate by percentage how many households in your community were affected in a similar way.....

3.5 Did the house you live in conform to standard building codes prior to construction? Y / N

Yes, is this the case for all the houses in this settlement?

.....

.....

.....

PART - 4: SOCIAL RELATIONS

4.1 Highly Vulnerable social groupings at risk

Which of the following household type would you indicate as being the most vulnerable to the flood disasters in your community?

- (a) Single parent headed households (b) Male headed households (c) Child headed households

4.2 Vulnerability

What do you think are the reasons and causes of the social vulnerability in your community?

4.2.1 Economic disadvantages	0
4.2.2 Socially/Physically isolated	0
4.2.3 Poor shelter	0
4.2.4 Weak social structures within the communities	0
4.2.5 Lack of disaster preparedness on floods	0
4.2.6 High poverty levels	0

4.3 Public Health

Are the health facilities able to cope with a rise in service demand during a flood episode? Y / N If yes, how many centers are available within this settlement?

.....

The following epidemics are generally associated with floods and waterlogging. Please indicate through ranking order, the most prevalent ones:

4.3.1 Cholera	<input type="text"/>
4.3.2 Malaria	<input type="text"/>
4.3.3 Dysentery	<input type="text"/>
4.3.4 Typhoid	<input type="text"/>
4.3.5 Diarrhea	<input type="text"/>

76

4.4 Water and Sanitation

Where do you draw your domestic water for daily household use? Is it.....

4.4.1 Self constructed Shallow well	0
4.4.2 Communal tap (water & Sewerage utility company)	0
4.4.3 Stream	0
4.4.4 Borehole	0
4.4.5 Others, Specify.....	

4.4.6 Do you consider the water you use “Safe” or “Unsafe” if unsafe, what are your reasons?

.....

.....

4.4.7 What system is used for the disposal of excreta?

.....

4.4.8 Does the sanitary system used get submerged in water during the flood episodes? If yes, what do you resort to?

.....

PART – 2: GENERAL

1. According to you, which years were the worst in terms of flood hazards in the last 13 years and their impact on you?

.....

.....

77

2. Would you consider yourself well prepared for the next floods?

.....

3. Who are the external donors that have come to your rescue during the flood disasters?

.....

4. Have you ever benefited from any disaster management training? Y/N If yes, what did you learn?

.....

.....

5. Why do you think your settlement is prone to flooding and how do you think this problem can be eliminated or minimized?

.....

.....

.....

THANK YOU FOR YOUR TIME



Disaster Management Training and Education Centre for Africa (DiMTEC)

Faculty of Natural and Agricultural Sciences

University of the Free State, Bloemfontein

Republic of South Africa

QUESTIONNAIRE FOR KEY TECHNOCRATS AND SENIOR OFFICIALS ON FLOOD PRONE COMMUNITIES IN THE UNPLANNED SETTLEMENTS OF LUSAKA DISTRICT

DEPARTMENT:

NAME:

POSITION HELD:

DATE:

1. Are you abreast with the seasonal recurrence of the flooding phenomenon in the unplanned settlements in the city? If yes, please let me have your views on this.

.....
.....
.....

2. What is your opinion on the floods and their impact on all the classes of the people in the affected communities?

.....
.....
.....

3. What do you think is the socio-economic status given the generated vulnerabilities in these communities?

.....
.....
.....

4. What can you say about the effectiveness of the institutional structures in terms of their functions and relevance in these communities?

79

.....
.....
.....

5. I would like to have your comments in the context of the unplanned settlements in the following areas:

5.1 Cultural norms in the settlements

.....
.....

5.2 Indigenous knowledge systems

.....

.....

5.3 Disaster preparedness

.....

.....

.....

5.4 Prevalence of epidemics

.....

.....

.....

5.5 Environmental sustainability

.....

.....

.....

5.6 Governance (By-laws, Policing etc.)

.....

.....

.....

.....

6 What do you think are the causes for the floods in the settlements?

.....

.....

7 What is your comment on the stakeholders obligations in finding long term solutions to the floods in the settlements

.....

.....
.....

- 8 What would be your recommendations to curb the social vulnerabilities in these settlements?

.....
.....
.....
.....
.....

- 9 What is your comment on the effectiveness of the disaster management structure in terms of mitigating the floods phenomenon?

.....
.....
.....
.....

.....

- 10 Are you aware of the government policy on Disaster Management? Y / N. If yes, do you anticipate any long term impact on sustainable livelihoods in the flood prone settlements?

.....
.....
.....
.....
.....

THANK YOU FOR YOUR TIME



LUSAKA CITY COUNCIL MEMORANDUM

TO : The Director of Public Health
CC : The Director of Engineering Services
FROM : The Acting Director of Human Resource & Administration
REF : SMS/ rm
TCD/7/58/10
DATE : 9th October, 2013

RESEARCH – BEENETT MUDENDA SIACHOONO

The above mentioned is a student at the University of the Free State and is conducting a research entitled “**Floods in Lusaka Compounds; Kanyama, Chawama and Matero Compounds**”.

The research is being conducted in partial fulfillment for the award of a Master’s in Disaster Management. He has since paid the research fee of K60.50 on receipt number BX 34696.

Kindly therefore, provide him with the necessary information to enable him carry out the research.

RABECCA C. BANDA

Telephone: +260 211 231097 / 223378
Fax: +260 211 226823



REPUBLIC OF ZAMBIA
OFFICE OF THE PRESIDENT

In reply please quote

No.:
DC/52/3/2

DISTRICT COMMISSIONER'S OFFICE
BOMA BUILDING
CHURCH ROAD
P.O. BOX 31996
LUSAKA-ZAMBIA

2nd September, 2013

The Ward Development Committee Chairman
Chawama ,Kanyama ,Mtendere and Matero
LUSAKA

RE: LETTER OF INTRODUCTION – MR. BENNET MUDENDA SIACHOONO

The above subject refers.

Please kindly receive the bearer Mr. Siachoono in your ward a student pursuing studies in Disaster Management.

The District Commissioner's office has allowed him to carry out a study research in your area and your assistance to this noble cause shall highly be appreciated.

ASHELL KAMPENGELE
DISTRICT COMMISSIONER –LUSAKA