DISASTER RISK PREPAREDNES STRATEGIES AGAINST FIRE IN URBAN MAKRKETS IN ZAMABIA

A case study of Chisokene Market in KITWE

By

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DEDICATION

This research is dedicated to my beloved family who always encouraged and gave me a spirit of never giving up despite the many challenges I faced and not giving them enough attention during the period of research.

DISCLAIMER

ABSTRACT

This study investigated disaster risk preparedness strategies against fire at Chisokone market in Kitwe, Zambia. The aim of the study was to analyse disaster risk preparedness strategies against fire at Chisokone market in Kitwe to ensure safety at the trading place. The objectives were to identify fire risks at Chisokone market in Kitwe. To establish disaster risk preparedness strategies against fire at Chisokone market in Kitwe. To determine the challenges being faced in implementing disaster risk preparedness strategies against fire at Chisokone market in Kitwe. To analyse efforts being made by the local authority and market committees to reduce fire disasters at the market. Qualitative research design was used with a sample size of 120 respondents in which 108 respondents were stratified and randomly selected from marketeers and customers. On the other hand, 12 respondents were purposively selected from Kitwe City Council, Market Associations and Disaster Management and Mitigation Unit (DMMU) respectively. Primary data for the study were collected using administered questionnaires, observations and interviews while Secondary data were obtained from already published journals and other published materials.

Data collected were subjected to appropriate statistical analysis tools such as Microsoft Excel 2007. Results obtained revealed that out of the five preparedness strategies identified, formation of the neighborhood watch was the most important strategy followed by conducting market inspections. Others were encouraging insurance amongst marketeers, conducting awareness meetings and enhancing communication with the fire brigade department.

Based on the above findings I recommend that the government speeds up the implementation of re-designing and modernizing the Chisokone market. The shop owners and market managers should invite fire experts to give talks of fire safety and the need for having firefighting equipment in their shops. ZESCO should install pre-paid metres at the market to avoid illegal connection of electricity. Further research needs to be carried out to determine the compliance level on preparedness and mitigation measures adopted by market authorities.

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ABBREVIATIONS AND ACRONYMS

BBB	Build Back Better
CBDM	Community Based Disaster Management
CC	City Council
CSOs	Civil Society Organizations
DMMU	Disaster Management and Mitigation Unit
DMP	Disaster Management Policy
DMTC	Disaster Management Technical Committee
DRFPs	Disaster Risk Focal Persons
DRP	Disaster Risk Preparedness
ECZ	Environmental Council of Zambia
ETA	Event Tree Analysis
ETBA	Energy Trace Barrier Analysis
FGMs	Focus Group Meetings
FHA	Functional Hazard Analysis
FMEA	Failure Modes and Effective Analysis
FMECA	Failure Mode Effects and Critically Analysis
FSDs	Fire Service Departments
FTA	Fault Tree Analysis
GRZ	Government Republic of Zambia
HAS	Hazard Analysis Schedules
HAZOP	Hazard and Operability Study
HFA	Hyogo Framework for Action
KCBD	Kitwe Central Business District
KCC	Kitwe City Council
LA	Local Authority
MALs	Market Association Leaders
MC	Municipal Council

MCDs	Multi-Criteria Decision Analysis
MCE	Multi- Criteria Evaluation
NATMAZ	National Marketeers Association of Zambia
NDMC	National Disaster Management Council
NDP	National Disaster Policy
NGOs	Non-Governmental Organizations
SDGs	Sustainable Development Goals
SHA	System Hazard Analysis
SSHA	Subsystem Hazard Analysis
UN	United Nations
UNFCCC	United Nations Framework Convention Climate Change
W.H.O	World Health Organisation
ZANAMA	Zambia National Marketeers Association

CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1 Introduction

Fire is a rapid, self-sustaining oxidation process accompanied by the evolution of heat and light in varying intensities. Fire is believed to be based on four elements being present: fuel, ignition source, oxidizing agent (usually atmospheric oxygen), and mechanism of the reaction. The most common fuels that cause fires include flammable gases used for cooking in homes, furniture, clothing, solvents used in our daily activities, such as kerosene and gasoline, and combustible dusts, such as toners used in offices and starch sold in markets (Occupational Safety and Health Administration Report, 2016).When fire occurs, there are several contributing factors that help it to spread easily and become more destructive. Some of these factors include wood shingle/thatched roofs, high wind, congested access, inadequate water distribution system, lack of exposure protection, inadequate public protection (i.e., fire department inadequacies), unusual hot or dry weather conditions, delay in discovery of fire, inadequate personal fire protection, and delay in raising the fire alarm (Sam-Okyere, 2010). Fire can lead to loss of property or even death (Supermedia, 2011).There is a need to assess disaster preparedness strategies against fire for any possible outbreak. The study focused on collecting data from Marketeers, Customers, Local Authority, Market Associations and Disaster Management and Mitigation Unit (DMMU).

1.2. Background

Fire disasters are generally on the increase in the country and threatening social and economic sustainability. The occurrence of fire disasters is not new phenomenon in Zambian history. In 1997, Society House was gutted in Lusaka. In the same year, Cabinet Office was also burnt. In 2000, Indeni Refinery in Ndola was gutted and in 2008, Hydroelectric plant in Kafue Gorge was also gutted (DMMU, 2008). In recent times, hardly a year passes without news of a fire outbreak in a market in any part of Zambia. For example, Chisokone market in Kitwe has suffered from a series of fire outbreaks destroying property worth millions of Kwacha. The first one occurred in 1998, with another occurring in 2009. On 2nd December, 2012, it also experienced another outbreak. There is no doubt that, therefore that these recent fire outbreaks have generated

numerous discussions centering on how best at risk communities are prepared against fire disasters (Fire brigade report, 2017).

Since the adoption of the Hyogo Framework for Action (2005 – 2015) in 2005 which was the precursor, progress has been achieved in reducing disaster risk including fire risks at local, national, regional and global levels by countries and other relevant stakeholders, leading to a decrease in mortality in the case of some hazards. For example in Zambia, the enactment of the Disaster Management Act in 2010 has given the disaster management cadre made up of the UN, Government, NGOs both local and international and Faith Based Organizations (FBOs) the legal mandate in which to operate. It has also given the DMMU, which is the secretariat of this structure some muscle to take to task all institutions that do not comply with the DRR requirements in the country. At national level, DMMU working in collaboration with all relevant line ministries and UN agencies prepare a contingency plan that ensures preparedness to the impending disasters forecasted by the Early Warning System (EWS) with the view to mitigating the impact thereof. Further, DMMU is currently making arrangements to align the policy and the operations manual which expired in 2010 in line with the disaster management Act. The institution is further working on Statutory Instruments which will then operationalise the Act and afford disaster managers in the country to implement it (DMMU, 2011). Reducing disaster risk is a cost-effective investment in preventing future losses. Effective disaster risk management contributes to sustainable development (UN, 2015).

In 2005, the Government of the Republic of Zambia (GRZ) launched the National Disaster Policy (NDP) intended to address the way Zambia would manage its risks, hazards, disasters, vulnerable populations and the environment at risk and provide a framework for disaster management strategies in the country which include: Building capacity for disaster preparedness (Early warning strategies),Building capacity for Response, Building capacity for disaster prevention, Building capacity for disaster mitigation, Building capacity for rehabilitation, recovery and restoration, Building capacity for coordination disaster risk reduction is being enhanced through partnerships with key stakeholders who have contributed in reducing the impact of disasters (DMMU, 2011).

The steady growth of fire disasters, including the increase of people and assets exposure, combined with the lessons learned from past disasters, indicates the need to further strengthen

strategies for fire disaster preparedness through taking action in anticipation of events, integrating disaster risk reduction in response preparedness and ensure that capacities are in place for effective response and recovery at all levels. Disasters have demonstrated that the recovery, rehabilitation and reconstruction phase, which needs to be prepared ahead of a disaster, is a critical opportunity to "Build Back Better", (BBB) including through integrating disaster risk reduction into development measures, making nations and communities resilient to disasters.

1.3. Problem Statement

The research problem addressed in this study is that despite the number of strategies for disaster risk management in Zambia which include: Improvement of vulnerability and risk assessment capacity. Designing contingency plans at district, provincial and central levels of governance. Promotion of public education and awareness and information systems at all levels. Seeking legislative reforms to increase legal powers during as needs arises (for instance the issuance of fire certificates and council certificates to Marketeers) (DMMU, 2005), Urban markets in Zambia have continued experiencing fire disasters. For example; the major fires that have occurred in Zambia's urban markets in recent years include; the gutting of Chisokone market in Kitwe on 2nd December, 2012. On 4th July 2017, City market was gutted and on 31st August 2017, Masala market in Ndola was also gutted (Fire Brigade Report, 2017). From these scenarios, Lives have been lost and properties damaged worth billions of Kwacha (DMMU, 2011).Most of the market fires are caused by electrical problems such as; faulty wiring, misuse of electrical gadgets, improper electrical fittings, power fluctuations, storing of inflammable substances such as charcoal and illegal tapping from the national grid (Simpson, 2010).

Studies on disaster risk preparedness strategies against fire have been carried in other countries such as Tanzania, Kenya, Ghana, Nigeria, Philippines among others. To this Researchers' knowledge however, there is little effort in place to analyse and understand disaster risk preparedness strategies against fire in urban markets in Zambia. This study therefore was carried out to bridge the knowledge gap in terms of disaster risk preparedness strategies against fire at Chisokone market in Kitwe.

1.4. Aim of the Study

The aim of the study was to analyse disaster risk preparedness strategies against fire at Chisokone Market in Kitwe to ensure safety at the trading place.

1.5. Objectives

(i) To identify fire risks at Chisokone market in Kitwe.

(ii) To establish disaster risk preparedness strategies against fire at Chisokone market in Kitwe.

(iii) To determine the challenges being faced in implementing disaster risk preparedness strategies against fire at Chisokone market in Kitwe.

(iv) To analyse efforts being made by the local authority and market committees to reduce fire disasters at Chisokone market in Kitwe.

1.6. Research Questions

(i) What Fire risks is Chisokone market in Kitwe exposed to?

(ii) What disaster risk preparedness strategies against fire are available at Chisokone Market in Kitwe?

(iii) What challenges are being faced in the implementation of disaster risk preparedness strategies against fire at Chisokone market in Kitwe?

(iv) What efforts are put in place by the local market to reduce fire disasters at Chisokone market in Kitwe?

1.7.Significance of the study

The purpose of the study was to analyse disaster risk preparedness strategies against fire at Chisokone market in Kitwe. The results of the study would benefit the government to formulate new policies and guidelines aimed at promoting and improving the prevention and preparedness for fire disasters. The study would also help Kitwe City Council to initiate and implement sustainable programmes and strategies for disaster risk preparedness against fire to ensure the safety of the market users. The study would further help both the marketeers and customers to develop the right attitude to respond to fire disasters. Last but not least, the study would be source of knowledge to students who would want to do a similar study in future.

1.8. Scope of the Study

The study was conducted in Chisokone market in Kitwe. The main issue was about disaster preparedness strategies against fire. Therefore, the study looked at specific strategies that the market was using to reduce fire disasters. These strategies were the dimensions captured in the objectives, the research questions and the conceptual framework of the study.

1.9.Limitations of the Study

It is recognized that disaster management is multi sectoral and multi-disciplinary in nature, involving different sectors such as different Government Ministries, Non-Governmental Organizations (NGOs) and Civil Society Organisations (CSOs). Therefore, the greatest limitation was a larger spectrum of the source of information. To avoid this, the researcher was focused on identifying fire risks at Chisokone market in Kitwe establish disaster preparedness strategies against fire at Chisokone market determine the challenges faced in implementing disaster preparedness strategies against fire at the market and analyze efforts being made to reduce fire disasters at the market. Timing of the research with work was a challenge. In order to successfully do the exercise, the researcher requested for a local leave. Research is a very expensive undertaking in terms of finances. In order to avoid this challenge of finances, the researcher considered applying for a soft loan to fund the research budget.

1.10. Theoretical Framework

The paper is premised on the Sendai Framework 2015 – 2030 which is a model that articulates in a systematic way on how to deal with disaster risk reduction through a list of priorities and guiding principles such as the need for improved understanding of disaster risk in all its dimensions of exposure, vulnerability and hazard characteristics; the strengthening of disaster risk governance, including national platforms; accountability for disaster risk management; preparedness to “Build Back Better”; recognition of stakeholders and their roles; mobilization of risk-sensitive investment to avoid the creation of new risk; resilience of health infrastructure, cultural heritage and work-places; strengthening of international cooperation and global partnership, and risk-informed donor policies and programs, including financial support and loans from international financial institutions. The principles describe the pathway through which disaster risks can be reduced. This is in the context of how the affected community is going to use the available strategies to bring about desired safety of the community from disasters (UN, 2015).

Preparedness strategies which are the dependent variables can be influenced by several independent variables (Fire risks) which include; Faulty wiring, Misuse of electrical gadgets, storing inflammable substances, Power fluctuations, Illegal tapping from the national grid, No fire assembly points among others. This research analysed various disaster risk preparedness

strategies against fire at Chisokone market in Kitwe based on the framework shown in the figure below.

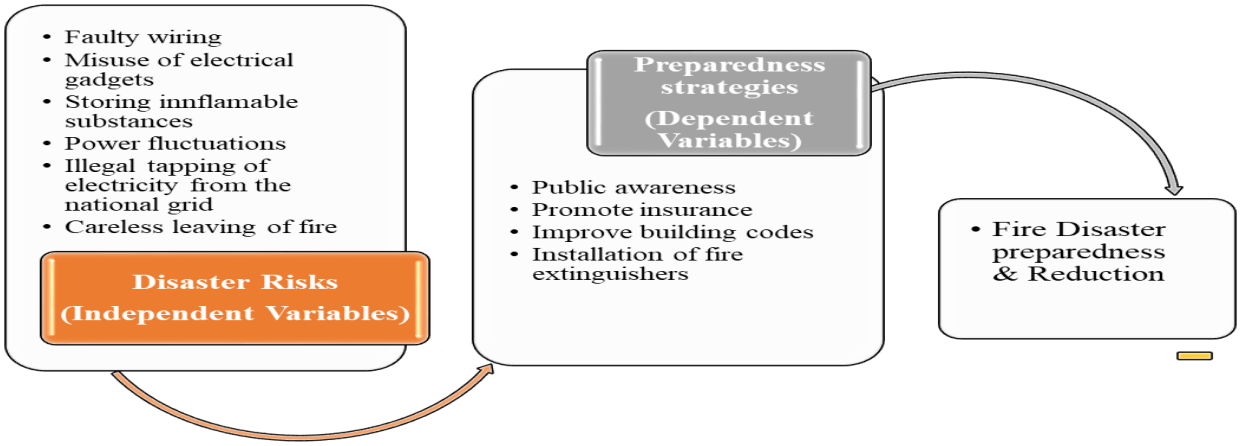

Figure 1 Conceptual Framework diagram

Source: Researchers' own ideas (2017)

1.11. Summary

This chapter centered on introducing the research topic and its importance. It presented the background, problem statement as well as the aim and objectives. The chapter further presented research questions and the importance of conducting the study. The chapter continued with the scope of the study and limitations before presenting the theoretical framework.

The Dissertation is organized in six chapters. Chapter one is introduction which consists of the background of the study, problem statement, aim of the study and objectives as well as the theoretical and conceptual framework.

Chapter two is Literature review consisting of already published information from publications such as books, journals among others.

Chapter three is Materials and Methods. This chapter contains materials and methods used in conducting the study. It involves sections such as research design, location of study area, target population, sample selection, research instruments, data collection and data analysis.

Chapter four is research findings while chapter five looks at discussion of research findings and finally chapter six is conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter is devoted to relevant literature which was reviewed focusing mainly on disaster preparedness strategies against fire and case studies from other countries.

2.2. The concept of Disaster Risk Preparedness

A disaster is an adverse situation that overwhelms the capacity of those in the vicinity to protect their lives and livelihoods, and in most instances requires external help in dealing with the losses. Disasters can cause both physical damage and losses incurred by social units and the disruption of the unit's routine functioning and within its network of other social units. Disaster risk refers to the probability that harmful consequences or expected losses will result from a hazard event. It can also be described as the probability of a disaster (ISDR, 2009). DMMU (2015), states that Disaster Preparedness refers to activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and evacuation of people and economic assets from a threatened location.

2.3. Understanding Fire

Fire is a rapid, self-sustaining oxidation process accompanied by the evolution of heat and light in varying intensities. Fire is believed to be based on four elements being present: fuel, ignition source, oxidizing agent (usually atmospheric oxygen), and mechanism of the reaction (Addai. etal, 2016). Fires start when a flammable and/or a combustible material, in combination with a sufficient quantity of an oxidizer such as oxygen gas or another oxygen-rich compound (though non oxygen oxidizers exist that can replace oxygen), is exposed to a source of heat or ambient temperature above the flash point for the fuel/oxidizer mix, and is able to sustain a rate of rapid oxidation that produces a chain reaction. This is commonly called the fire tetrahedron. Fire cannot exist without all of these elements in place and in the right proportions. Some fuel-oxygen mixes may require a catalyst, a substance that is not directly involved in any chemical reaction during combustion, but which enables the reactants to combust more readily. Once ignited, a chain reaction takes place whereby fires can sustain their own heat by the further release of heat energy in the process of combustion and may propagate, provided there is a continuous supply of an oxidizer and fuel. If the oxidizer is oxygen from the surrounding air, the presence of a force of

gravity, or of some similar force caused by acceleration, is necessary to produce convection, which removes combustion products and brings a supply of oxygen to the fire. Without gravity, a fire rapidly surrounds itself with its own combustion products and non-oxidizing gases from the air, which exclude oxygen and extinguish it (Oteng-Ababio, 2015).

When a fire begins, it grows bigger and then runs out of control and gets a firm grip on its surroundings. There is drama in full measure: people die; corporate assets go up in smoke; livelihoods melt away in the heat and eventually somebody is saddled with the blame. Although it is agreed that fire risks and fire wastage are a statistical function of development in any country, there is need to ensure that such is kept to a minimum (Simpson, 2010).

Historically, many fires occurred in buildings due to the careless disposal of smoking material into waste paper baskets. As a result of the no-smoking ban inside most buildings, such fires have become very uncommon. However, in today's world of electronic office equipment, are as a result of an increase in fire incidents due to faulty electrical equipment and power distribution systems. Many common causes of fire can be related to open flames, electrical fires, cooking and spontaneous ignition and the Ignition of waste materials. Open Flames arise from such unsafe conditions as negligence in conducting hot work, such as welding, cutting or grinding; improper use of candles; improper handling of flammable or combustible liquids or flammable gases in near-to-potential ignition sources; and matches and cigarettes that are improperly disposed of, or left unattended near combustibles. Electrical fires arise from conditions including damaged electrical conductors, plug wires or extension cords; use of faulty, modified or unapproved electrical equipment; insufficient space or clearance between electrical heating equipment and combustibles; short or overloaded circuits; loose electrical connections; and lighting. Fires occurring as a result of cooking arise from such unsafe conditions including deep frying in pots or pans on stove tops; unattended cooking appliances; and combustibles located dangerously close to cooking equipment. Spontaneous ignition and the ignition of waste materials occur when there is improper disposal of materials susceptible to spontaneous combustion, such as oily rags from wood finishing or polishing; accumulation of organic materials, such as green hay, grain or woodchips; and accumulation of waste combustible materials near potential sources of ignition (Ayarkwa, J, 2010).

2.4. Fire Incidences in Markets: A Global perspective

Fire incidents in markets have been happening worldwide. Though the magnitude and severity differ from one country to another, the awareness and preparedness level also do differ. United Kingdom, one of the developed countries has also experienced several fire incidents in markets (Arson Control Forum, 2006).The Government has created awareness to marketeers through providing fire safety education and give advice on fire prevention, risk assessment, evacuation and anti – arson measures (Arson Control Forum, 2006).Fire incidences in markets were reported to have long term and short-term impacts depending on the magnitude and severity of the fire itself. Among the common effects noted were temporary closures of markets, disruptions of trading, loss of trading time.

In the United States of America the cases of fire have decreased tremendously, which reflects the high level of preparedness which is in place. A Report from United States Fire Administration, National Fire 2007 revealed that there were no reported market or school related fire deaths in 2007. This does not mean that there were no fire cases, but the impact on the life of people was minimal. This situation is contributed by the enforcement of policies and strict monitoring. Fire drills and fire education in public places are taken very seriously (United States Fire Administration, 2007).

The fire accidents in both the United States of America and United Kingdom have some similarities, in both prevention and protection measures, as both awareness and equipment have been put in place. Preparedness reduces the severity of the fire accident to the people and properties. There is significant reduction in death cases in most of the fire accidents in UK and USA compared to other countries.

In the Philippines, a public market located in the heart of Mandaluyong City, was destroyed in 1991 in a major fire, in large part because most of the structure was made of wood. As a temporary answer for the displaced vendors, the government allowed about 500 of them to set up stalls along the area's roads and sidewalks. This rapidly proved to be impractical, in that it led to both traffic congestion and sanitation problems. Rebuilding the public market became a high priority for the city government, but financing a project with an estimated cost of P50 million was beyond the city's capability. The answer to this problem that the city government decided to utilize was based on the Philippines' national Build-Operate-Transfer law of 1991. This provided

the statutory basis for developing a public-private partnership (PPP) for the project. A business consortium was created – called the Macro Funders and Developers, Inc. (MFD) – to complete the project. Ultimately the project demonstrated the importance of appropriate risk allocation, especially when world conditions are uncertain. Had the risk been shared differently on this project, the Mandaluyong City government could have potentially faced a dire situation from the 50 percent increase in project costs. Because of the effective structuring of the partnership, MFD was able to absorb the additional costs. If this had not been the case, the project might not have been completed (UNDP, 2012).

2.5. Fire Incidences in Markets: African perspective

In Africa, fire cases in markets are very common and frequent. For example, in Ghana, the Kumasi Central Market has suffered from a series of fire outbreaks. The first occurred on May 28, 2009, with another occurring on January 2, 2010. In December 30, 2012, it also experienced another outbreak within which more than 150 shops were gutted by fire by fire (Sam- Okyre, 2010). The plate below shows the gutting of Kumasi market in Ghana. Plate 1a (left) shows the initiation stage of the fire. Plate 1b (middle) shows the burning stage and plate 1c (right) shows the end stage and clearing of debris.

Plate 1a, b and c Fire outbreak at Kumasi market

Source: **Addai K, (2016)**

The other important place that has been destroyed by fire is the Kantamanto Market, home of second hand goods, popularly called ‘Bend down boutique’ in the local parlance. Kantamanto is

one of the biggest and busiest markets in Accra, the capital city of Ghana, (Oteng-Ababio, 2015). Anaglatey (2013) observed that one of the main causes of fire outbreak in Ghana has been electrical problems resulting from faulty wiring and misuse of electrical gadgets. According to Simpson (2010), electrical faults originate from poorly designed and poorly constructed electrical circuits, and the electrical wiring found in many domestic buildings in Ghana is designed not by an electrical engineer, but by an artisan with scant knowledge of electrical circuit design. Electrical cables are commonly found strewn haphazardly on the ceiling of most domestic buildings, and when the cables' insulation deteriorates with time, short circuitry occurs, resulting in fire outbreaks. Causes of naked flames are defined by Simpson (2010), to include cooking (e.g., kerosene stoves, electric cookers, gas cookers, and coal pots), lighting devices (e.g., candles lanterns), cigarettes, and lighted mosquito coils. Boateng (2013) noted that improper electrical fittings, use of substandard electrical materials, defective generators, power fluctuations resulting from frequent power outages, and illegal tapping from the national grid are some of the possible causes of fire outbreaks. The effects of these fire outbreaks, which have become a frequent occurrence, have been devastating. Most of these fires whether domestic, industrial, institutional, commercial, vehicular, or bush come with devastating consequences, including loss of lives and properties (Abu, 2013). Based on the nature of the fire situation in Ghana, the issue of public education is intensified within the country. Both the Fire Service and the National Disaster Management Organization have embarked on an intensive educational campaign among the residents regarding fire prevention and safety measures, because it is highlighted that most fires actually occur out of ignorance and negligence on the part of the residents. There is a campaign to ensure that fire safety regulations are consistently followed throughout the country. This also includes the rehabilitation of the electrical wiring system (one

that follows standard regulations during installation), proper use and handling of combustible materials, installation of fire hydrants, and widening of roads for easy access to fire services with a recommendation that households be provided with fire extinguishers. Simpson (2010) calls for improved building codes in fire disaster preparedness. Building codes are rules that specify the minimum standards for constructed structures such as buildings. The main objectives of these codes are to protect public health, safety, and general welfare as they relate to the construction and occupancy of buildings and structures. Fire prevention can be achieved by strictly implementing regulations to improve building codes for example, the type of materials to be used, building safety regulations, provision of portable fire extinguishers, installation of fire and smoke detectors and fire alarms, and provision of emergency fire exits.

2.6. Fire Incidences in Markets: Zambian perspective

2.6.1. General Fire incidents

Fire episodes in Zambia are common and repeatedly have happened at different scales. The country in the past years has experienced fire accidents in some of the big buildings and offices. Some of them are, the gutting of Society house in 1997, Cabinet office was also gutted in 1997, Chisokone market in Kitwe in 1998, Indeni Oil Refinery was gutted in 2000 and Hydroelectric plant in Kafue Gorge was also gutted in 2008 (DMMU,2008).

Despite the effort by fire and rescue services some buildings were badly damaged. Fire incidents in residential buildings are also the order of the day. Consequently, fire and rescue teams face a lot of criticism from the public resulting from their slow response to fire emergencies, especially in residential areas. However, the perceived slow response, according to fire departments is attributed to poor or lack of proper residential planning. Some of the unplanned areas are not accessible or are difficult to access. Although there are sentiments of truth with regard to slow

response to fire incidents on the part of fire services poor or lack of accessibility in most of the residential areas is confirmed by the fact that 70 percent of urban areas in Zambia are not planned (National Assembly, 2012).

2.6.2. Fire Incidents in Urban Markets

"Markets" refer to shopping centres which often accommodate several retail businesses. They may also be referred to as retail outlets. These centres vary across the various continents. Markets are the main places where retail activities such as buying and selling take place (Addai, 2013). Urban markets in Zambia are not spared from fire accidents. From the recorded fire incidents, the fire cases in markets have been increasing. From way back in 1998 to date, Zambia has experienced fire hazards in several markets. In 1998, Chisokone market in Kitwe was gutted by fire resulting in the loss of property worth millions of Kwacha. Another fire incident happened again at the same market in 2012. On 4th July, 2017, City market in Lusaka was gutted by fire destroying properties worth millions of Kwacha. On 31st August, 2017, Masala market in Ndola popularly known as Kapalala market was also gutted after a lit brazier was left unattended to (Fire Brigade Report, 2017).

Market fires are one of the most prominent health and safety hazards faced by traders. The fires are often blamed on food sellers using open flames to cook on or on smoked fish sellers who leave smouldering ashes under their fish overnight. Sometimes electrical faults appear to be the cause. While some fires start out small, their severity is often exacerbated by a number of factors to do with the infrastructure, planning and design of the market. Many market stalls are constructed from wood, which makes them highly flammable. The Fire Fighting Services (FFS) also complain that access routes to the market are often blocked by the ad hoc placement of stalls and goods, which means that it can take a long time for firefighters to reach the fire. Once at the fire, the firefighters then have the problem of trying to access water. There are no easily accessible fire hydrants in most public markets. They have either been covered up by rubble, stalls and goods, or they have been sealed off by the private water companies that control water supply. The public markets also lack fire extinguishers despite the fact that regulations require local government to provide these in all official public markets. The effects of fire outbreaks in markets have been devastating. Most of these fires whether domestic, industrial, institutional,

commercial, vehicular, or bush come with devastating consequences, including loss of lives and properties (Phiri , 2015).

Management of fire outbreaks in markets is the responsibility of the local authority under the unit of the Fire Brigade. In Kitwe, the management of fire outbreaks is the responsibility of the Kitwe Fire Brigade which is a unit under the Kitwe City Council. This unit works together with the Department of Engineering services. The Department of Engineering services is accountable for the appropriate provision, supervision, coordination and management of all engineering works within Kitwe City in pursuant to the provisions of the Act, Public Health (Building Regulations) Act and other statutory provisions. The major responsibilities include life – saving and fire services, land surveys and road maintenance and regulating building standards (KCC, 2018).

2.7. Fire Fighting Equipment

The fire-fighting and rescue equipment are an integral part of economic development that safeguards the economic gains made in all sectors of the economy. Fire outbreaks have become a common phenomenon in almost all districts in the country for varied reasons. However, the response to such fire outbreaks has in the past been hampered by lack of power in adequate firefighting equipment. This is why Government, through the Ministry of Local Government, has acquired 42 fire-fighting and rescue equipment for all major districts across the country, especially those with higher population density and increased economic activity. Kitwe City Council is one of the benefiting Local Authority.

In his 2018 Ministerial statement to Parliament on the procurement of new fire trucks, Minister of Local Government of Zambia Hon. Mr. Vincent Mwale MP revealed that *Fire Trucks are custom-made specifically to respond to the challenges that our fire men and women have been facing over the years in terms of the terrain and operational areas. The new fire trucks were equipped with monitors which allow fire operators to fight fire from a distance of up to 70 metres irrespective of obstructions along the way. They not only offer added maneuverability in places which are difficult to navigate, but also have increased storage capacity for water and special foam. The fire trucks have storage capacity of 7,000 litres for water and 1,000 litres for foam. On the contrary, the older fire trucks being utilized had no provision for foam and only had a capacity for 5,000 litres for water. In addition, the fire trucks have improved extraction*

equipment for the rescue services. In addition to better capacity, the new fire trucks have stainless steel tanks as opposed to the polythene tanks that the old ones have. The durability of the trucks is further enhanced by the reinforced chassis and high ground clearance from the raised chassis (Ministerial Statement, 2018).

2.8. Sendai Framework (2015 – 2030) Priorities for action

Taking into account the experience gained through the implementation of the Hyogo Framework for Action which ended in 2015, and in pursuance of the expected outcome and goal, there is a need for focused action within and across sectors by States at local, national, regional and global levels in the following four priority areas: Priority 1: Understanding disaster risk. Priority 2: Strengthening disaster risk governance to manage disaster risk. Priority 3: Investing in disaster risk reduction for resilience. Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction (UN, 2015).

2.3.1. Priority 1: Understanding Disaster Risk

Policies and practices for disaster risk management at Chisokone market should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment. For example fire risks. Fire is a good for human beings, but it becomes a danger when it occurs where it is not needed. Several fire incidences at markets have been associated with electrical faults, illegal connections and sabotage. The fire incident can be prevented, mitigated and if not, the market community can get prepared to respond and reduce the impact of it. This priority gives Chisokone market community an insight on how to develop for pre-disaster risk assessment, for prevention and mitigation and for the development and implementation of appropriate preparedness and effective response to fire disasters.

2.3.2. Priority 2: Strengthening Disaster Risk Governance to Manage Disaster Risk

Disaster risk governance at Chisokone market is of great importance for an effective and efficient management of disaster risk. The indigenous knowledge of marketeers is more effective than imported and forced ideas. Developing local preparedness strategies for fire disasters at Chisokone market will be cheaper and sustainable. This priority gives Chisokone market community an opportunity to partner with Non-Governmental Organisations (NGOs) with a program to build capacity against fire disasters amongst marketeers.

2.3.3. Priority 3: Investing in Disaster Reduction for Resilience

Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of persons and their assets, as well as the environment. For example the construction of the Edgar Chagwa Lungu trading shelter at Chisokone market with concrete stalls will in a

way prevent the spread of fire once it happens to occur because wooden stalls which are agents of spreading fire will be removed from the market. Apart from that, the current plans to modernize the market with funding from the Chambers of mines entails that the market will have well fitted electrical appliances that would prevent fire outbreaks. This priority also gives the market the mandate to come up with a revolving fund to be used every time when a disaster strikes than depending on their business capital. In times of no disaster, the fund can be paid back as bonus to the contributors to boost their business. Risk transfer or insurance is another form in which marketeers at Chisokone market can invest in disaster reduction for resilience.

2.3.4. Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

The steady growth of fire disasters, including the increase of people and assets exposure at Chisokone market indicates the need to further strengthen disaster preparedness for response, take action in anticipation of events, integrate disaster risk reduction in response preparedness and ensure that capacities are in place for effective response and recovery at all times. For instance the procurement of adequate firefighting machines (fire tenders) by government will serve to enhance fire disaster preparedness at Chisokone market. Empowering women and persons with disabilities with soft loans is key in building resilience. Disasters in urban markets in Zambia have demonstrated that the recovery, rehabilitation and reconstruction phase, which needs to be prepared ahead of a disaster, is a critical opportunity to "Build Back Better", For instance, the case of City Market in Lusaka which has now taken long to be reconstructed after the 4th July 2017 inferno.

2.9. Fire Disaster Preparedness strategies

To reduce fire disasters, it is important to understand its risk components. Crichton (2008) conceives of disaster risk as the product of natural hazards, exposure and vulnerability. Hazard is the extreme natural physical event whose occurrence may adversely affect exposed and vulnerable people and assets. Exposure, on the other hand, is when persons or assets are in potentially dangerous areas. Vulnerability refers to the propensity of exposed people or assets to suffer adverse effects when impacted by an extreme natural event. Figure 2 below shows the risk triangle.

Figure 2 The Crichton risk triangle

Source: Crichton (2008)

In relation to the study focus of this paper, the Crichton triangle is very important in the sense that it will help the market community to understand the disaster risk and its management. Policies and practices for disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment. Such knowledge can be leveraged for the purpose of pre-disaster risk assessment, for prevention and mitigation and for the development and implementation of appropriate preparedness and effective response to disasters (UN, 2015)

Disaster risk can be reduced through systematic efforts to analyse and manage the causal factors of disasters, reducing exposure to hazards, lessening vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events. Disaster risk reduction measures are, therefore, thoroughly appropriate to help counteract the risks as they arise (UNISDR, 2011).

UN (2006) states that Risk knowledge and early warning requires the collection and use of data on disaster risks, and hence the development and maintenance of capacities and infrastructure to observe, analyse and forecast hazards, vulnerabilities and disaster impacts. It requires developing

early warning systems that are people-centred, well integrated into decision-making processes and effectively disseminated. Early warning systems help to reduce economic losses and mitigate the number of injuries or deaths from a disaster, by providing information that allows individuals and communities to protect their lives and property. Early warning information empowers people to take action when a disaster closes to happening. If well integrated with risk assessment studies and communication and action plans, early warning systems can lead to substantive benefits.

Disaster awareness and knowledge on various protective behaviours have been shown to have a positive impact on risk perception (Drabek, 2012). Types of disaster awareness and knowledge include awareness and knowledge of hazard genesis, awareness and knowledge of the mechanisms of hazard exposure and awareness and knowledge of hazard adjustments avenues (Warmer et, al., 2012). Similarly, education on disaster is categorized into self-education, school education, and family education and community education. School education is most useful and forms a formidable basis in providing awareness and knowledge on disaster (Crichton, 2008). Awareness requires information-sharing systems and services, promoting dialogue and cooperation among scientific communities and practitioners, including disaster risk reduction in school curricula, and developing training and learning programmes on disaster risk reduction at a community level, for local authorities and targeted sectors. Finally, it requires strengthening research capacity and engaging the media to raise awareness. Public awareness is genuine learning in that individuals will be prepared to take actions to promote safety which may not always be in their own interest. They also point to the fact that ordinary people already have some knowledge of and experience in protecting themselves from disaster which is why risk communication should be in the form of dialogue (World Bank 2011).

The complexity of disaster management requires more complex multidivisional organizational structure, not only at government level, but at community level as well. Communities should be active participants in the decisions that affect their livelihoods. In other words they should be leaders in the implementation of prevention programmes. Community mobilisation will go a long way in curbing loss of lives, destruction to infrastructure and instilling a culture of prevention. The constant contact with the residents will make them to be more relaxed and give them an opportunity to ask questions and voice their concerns easily. Awareness raising

materials had to be structured in such a way that it will be understood by the community. And that can only be achieved when they are involved during the process.

Public awareness can be achieved through engagement with the media such as local newspapers, radio, television, public gatherings and schools. Schools are regarded as the focal points for raising awareness about disaster risk reduction according to the National Disaster Management Framework (DMMU 2005). Public awareness can be an effective tool, especially when it contains useful information relative to the community's life, such as evacuation routes and assembly points (Institute for Ocean Management 2007). Various methods can be used, such as poster competitions, in which the community can develop disaster risk reduction posters to raise awareness. This can promote common understanding of risks among local residents and government officials. Involvement of the community during disaster risk reduction campaigns can enhance their ownership of activities; build a culture of safety, and thus build resilient communities. Mobilizing the stakeholders will ensure enhanced public awareness, thus increasing community resilience (Drabek, 2012).Protecting critical public facilities and implementing recovery schemes and social safety nets is also necessary. It also involves promoting income diversification options, promoting financial risk sharing mechanisms and establishing public-private partnerships. Finally, it requires integrating disaster risk considerations in land-use planning and building codes, and incorporating disaster risk assessment in rural development plans.

Asian Disaster Preparedness Centre (2004) contributes that training a group of individuals from the community and providing them with the necessary equipment to act in case of a fire outbreak is essential. For example, in Ban Hatsady village, this was done by organizing a group of 24 community volunteers composed of youth, women, and men who acted as guards for the community against any threat of fire. Every local community should be encouraged to set up its own fire management system to reduce the effects and prevent the occurrence of fires, encompassing both prevention and control methods. It is therefore obvious that well trained, simply equipped, community-level fire volunteers can act as an effective solution to the high vulnerability of residents to fire hazards in Ghana Similarly, Germany uses volunteer service to mitigate the risk of fire outbreaks. The Fire Service Department (FSD) selects several individuals who are willing to voluntarily serve the community, then train and provide them with the

necessary equipment. These people should be alert as soon are there is a fire incident within their communities, and rush to the scene to start quenching the fire or prepare the way and resources prior to the arrival of fire service personnel at the scene (Simpson 2010).

Oteng (2015) states that Disaster preparedness for effective response requires a plan and programme to assess and strengthen existing policy, technical and institutional capacities including those for management and coordination; mechanisms for the coordination and exchange of information and early warnings; contingency planning and response readiness, such as evacuation and standby arrangements for the provision of essential services and supplies; and the periodic review, rehearsal and modification of the plan. Fire deaths and property losses could be eliminated or at least be curbed if regulatory authority could identify potential fire zones in advance for effective management. This however will require enhancing the capacity of relevant regulatory institutions in evaluating the proneness of existing buildings to fire accidents using appropriate risk analysis tools (Addai K, 2015). Measures to reduce the severities of damages of fire accidents can be appropriately deployed and effective prevention measures put in place if the potential of fire accident in any environment can be evaluated. One of the tools of fire risk analysis is the checklist. The checklist involves the listing of attributes affecting risk analysis and the identification of the presence or absence of specific fire accidents attributes. Other tools used for analysis are Fault Tree Analysis (FTA), Event Tree Analysis (ETA), Failure Modes and Effects Analysis (FMEA), Cause/ Effect Analysis, Functional Hazard Analysis (FHA). The conventional approaches used for hazard or risk analysis are Energy Trace Barrier Analysis (ETBA), Hazard and Operability Study (HAZOP), Subsystem Hazard Analysis (SSHA), System Hazard Analysis (SHA), Hazard Analysis Schedules (HAS), Multi-criteria Evaluation (MCE), Multi-criteria Decision Analysis (MCDs), and Failure Mode, Effects and Criticality Analysis (FMECA). A major requirement for effective fire prediction is the use of easy to use tool that can perform well the face of limited and imprecise data (Ayarkwa J, 2010).

Parties to the United Nations Framework Convention on Climate Change (UNFCCC) have increasingly expressed more interest in knowledge and understanding of comprehensive risk management approaches including risk transfer instruments such as insurance to address loss. The recent UNFCCC climate negotiations in November 2013 (the 19thConference of the Parties) established at the Warsaw International Mechanism that will work on identifying appropriate

responses to negative climate change impacts including slow-onset events. One of these responses is insurance as a risk management tool. Insurance provides many benefits to stakeholders- ranging from regions, national governments and communities, to households and individuals. When confronted with covariant risks associated to climate impact, risk transfer tools can provide surety to governments to finance residual risks after effective risk reduction measures have been implemented. Risk transfer tools such as insurance, are designed to transfer risk to a third party – reinsurance company or capital market.

Numerous international initiatives have focus on reducing, pooling, and sharing climate-related disaster risk, particularly through risk financing approaches for transferring private and public sector risks from local and national levels to a global scale (World Bank, 2011). The ultimate goal of such strategies is to create a less risky distribution of people and assets within a country or, where people and assets are exposed, to make sure that adequate measures are in place to protect them from hazards (Mitchell, et al., 2012). Therefore creating a platform where each state is responsible for its citizens' safety and protection, and ultimately reducing the need for international involvement in emergencies, and guarantee greater dignity for the beneficiaries than aid appeals. Given that background risk sharing has played in managing disasters, it is not surprising that scholars highlight insurance as a policy tool that can provide timely financial relief to aid the financial recovery of victims of disasters (Warner et al., 2012; Cimato & Mullan, 2010). In simple terms, insurance allows individuals to transfer their risks to an insurance company by paying a fee (premium), with the company agreeing to reimburse part or all losses that the individuals may incur should a specified event occur.

Building codes are rules that specify the minimum standards for constructed structures such as buildings. The main objective of these codes is to protect public health, safety, and general welfare as they relate to the construction and occupancy of buildings and structures. Fire prevention can be achieved by strictly implementing regulations to improve building codes for example, the type of materials to be used, building safety regulations, provision of portable fire extinguishers, installation of fire and smoke detectors and fire alarms, and provision of emergency fire exits (Simpson 2010).

2.10. Disaster Preparedness in Zambia

2.7.1. National Disaster Management Policy

In 2015, Zambia revised the Disaster Management policy (DMP) of 2005. The vision of the policy is to *"have sustainable 'safety net' for protection of the citizenry, its assets and the environment from disasters".* The key guiding principles for this policy are that: a) Government bears the primary responsibility of protecting its people, infrastructure and other national assets from the impact of disasters. b) Disaster prevention, preparedness and mitigation are integral parts of mainstream disaster management into development efforts at community, district, provincial and national levels. c) The development and strengthening of capacities to prevent and reduce or mitigate the effects of disasters are top priorities for the Government of the Republic of Zambia. d) Effective national Early Warning System is key in the success of disaster prevention, preparedness and mitigation as well as response. e) Promotion of sustainable development among vulnerable communities improves their resilience, thus making them contribute more to the national development. f) Effective environmental management promotes sustainable development. g) A national culture of prevention and preparedness is an essential component of multi-sectoral approaches to disaster risk reduction. h) Training and information management are key in disaster management. i) Simulation exercises are cardinal in enhancing disaster management preparedness. j) Disaster effects are gender selective, affecting mostly women, children and elderly, hence gender consideration in disaster management shall be prominent at all levels. k) Risk assessment and mapping are key to effective disaster management. l) Disaster Management is the responsibility of every Zambian citizen (DMMU 2015).

2.7.2. Disaster Implementation Framework in Zambia

The government's efforts towards disaster management began with the establishment of the institutional arrangement for National Disaster Management Regime by an Act No. 13 of 2010. The overall responsibility for National Disaster Management shall remain in the office of the Vice President while the implementation of disaster management activities and programmes in the country shall be done through the Disaster Management and Mitigation Unit (DMMU). DMMU shall exercise its responsibilities through the National Disaster Management Council (NDMC), Disaster Management Technical Committee (DMTC) and appropriate broad-based committees at Provincial, District and Satellite levels (DMMU 2015)

2.7.3. Disaster Risk Management Cycle in Zambia

The disaster risk management cycle in Zambia consists of four phases: Prevention/Mitigation and Preparedness in the pre-disaster stage, and Response and Rehabilitation/Reconstruction in post-disaster stage. In the "Prevention/Mitigation" phase, efforts are made to prevent or mitigate damage (e.g. construction of new markets with modern buildings). Activities and measures for ensuring an effective response to the impact of hazards are classified as "Preparedness" (e.g. emergency drills and public awareness) and are not aimed at averting the occurrence of a disaster. "Response" includes such activities as rescue efforts, first aid, firefighting and evacuation. In the "Rehabilitation/Reconstruction" phase, considerations of disaster risk reduction should form the foundations for all activities as shown in the figure below. Taking appropriate measures based on the concept of disaster risk management in each phase of the disaster risk management cycle can reduce the overall disaster risk (UNISDR, 2011).Figure 3 below shows the disaster management cycle.

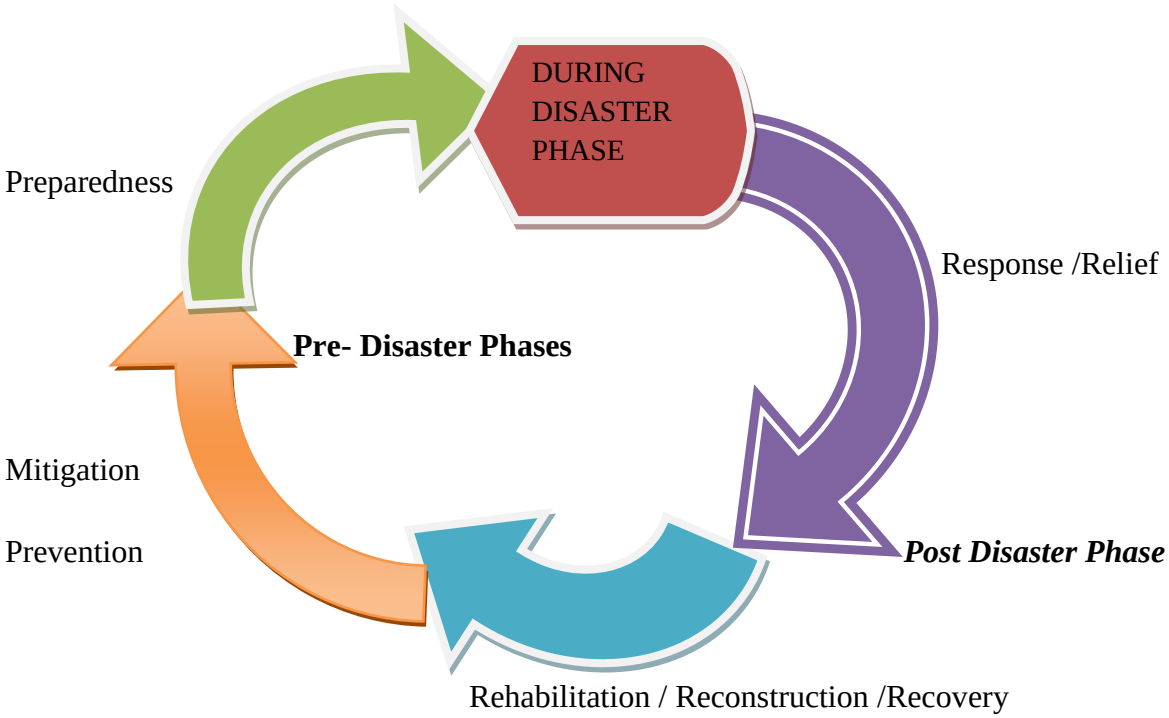

Figure 3 Disaster Management Cycle in Zambia

Source: (DMMU, 2015)

2.11. Challenges to implementation of Disaster Risk Reduction strategies

Building motivation among community members is not an easy task. In general, community members lack the enthusiasm to participate in meetings and urban governance. There are some different explanations to this phenomenon; people feel that their involvement doesn't matter, that it will have no real impact, they lack the required skills, they don't have time, or the appropriate format or method is not being used (Pasteur 2010).

Managing risk require ownership from not only the officials but also people living within the community. It has shown to be essential to provide those at risk with some control over the situation. If people feel that they have little control over the situation it often results in undermining their attempts to reduce the risks impacting on their day- to-day life (Lavell 2008).

Human behaviour is playing an essential part in the risk shaping of the community. However, it is difficult to fully understand whether peoples' behaviour is due to lack of education, lack of consideration or lack of options. There have been very different theories as to why people put themselves in hazardous positions, from desperation to strategic motivations. If a community is struggling with day-to-day challenges, disaster risks are unlikely to be considered important and long-term perspectives are not necessarily a part of any decision-making. Risks that are considered acceptable are not necessarily reflecting the actual risk level, but the subjective determination (Practical Action 2009).

A major barrier to the adoption and enforcement of building codes is the belief that government should not have a role in regulating private-sector development. Many of the individuals and groups who are actively opposing state adoption of current safety and energy codes present a variety of reasons why building codes are misguided when, in fact, they are articulating a personal philosophical belief that they just don't want the government to tell them how to run their business. This view contrasts sharply with the expectation of most citizens that their government should at least protect public health and safety. Political philosophies are generally indifferent to opposing philosophies.

2.12. Summary

This chapter reviewed literature related to disaster risk preparedness strategies in relation to urban markets. It started by looking at the concept of disaster risk preparedness. Thereafter, the chapter discussed disaster risk preparedness in markets at global level before discussing disaster

risks in markets. Finally the chapter discussed disaster risk preparedness strategies in Zambia as well as challenges faced in implementing disaster risk reduction strategies. International documents on disaster risk reduction such as the Sendai framework (2015 – 2030) were cited in relation to disaster reduction. The fire hazards and sanitation issues were discussed with global and African perspective citing different fire and poor sanitation incidents in urban markets at global and regional levels. The next chapter will present the methodology for data collection to answer questions paused in this dissertation.

CHAPTER THREE

METHODS AND MATERIALS

3.1. Introduction

This chapter provides research methods, processes and instruments implored for data collection, analysis and presentation. It stipulates the research type used the unit of analysis covered and the sources of data.

3.2. Study area Location and Description

3.2.1. Location

The study area was Chisokone market in the Central Business District (CBD) of Kitwe, Zambia. The city of Kitwe has an estimated population of 410,548 people (CSO 2010).Kitwe district is located in the central part of the Copperbelt and lies between latitude 120° and 130° South and longitude 280° and 290° east. The district sits on a plateau with an altitude of over 1,295m above sea level. The district covers an area of 777km^2 and is bordered by Luanshya, Lufwanyama, Kalulushi, Mufulira and Ndola. It shares an international border with Democratic Republic of Congo (KCC Environmental Outlook Report, 2011).

3.2.2. Description of study area

Since the colonial era, mining of copper and cobalt has been the major economic base of the city of Kitwe until recently when the Copperbelt province in Zambia has experienced mine closures following privatization policies and the global financial crisis. Among the adverse effects of mine closures on the city‘s welfare include unemployment, infrastructure decay and urban poverty which rates at 68% (FNDP, 2005). In Kitwe, the majority of the informal traders operate from Chisokone market. Its haphazard beginning has manifested and impacted in its current internal structure such as lack of access roads, infrastructure services and others. Chisokone market is home of various goods being sold there ranging from clothes (both new and second hand), Fish, Dried Kapenta, Dried Fish, Fresh Meat, Vegetables, Beans, Groundnuts, Cassava among others. The market is divided into four sections namely; Chisokone A for fish and Kapenta, Chisokone B for Vegetables and clothes, Chisokone C for Beans, groundnuts, Cassava and second hand clothes, Chisokone D for furniture and Hardware. Chisokone market originated as a small vegetable shop in the 1930s which has expanded in physical terms as a non-gazetted

market place and its coverage area is approximately 8 hectares (80,000m²) therefore is one of the biggest and busiest market in Kitwe (KCC Environmental Outlook Report, 2011).According to Impact Assessment report of Increasing Population (2016), Chisokone market in Kitwe is second largest trading place after Soweto market in Lusaka with a population of 15,000 traders selling their merchandise in market stalls. The figure below shows the location of Kitwe in Zambia.

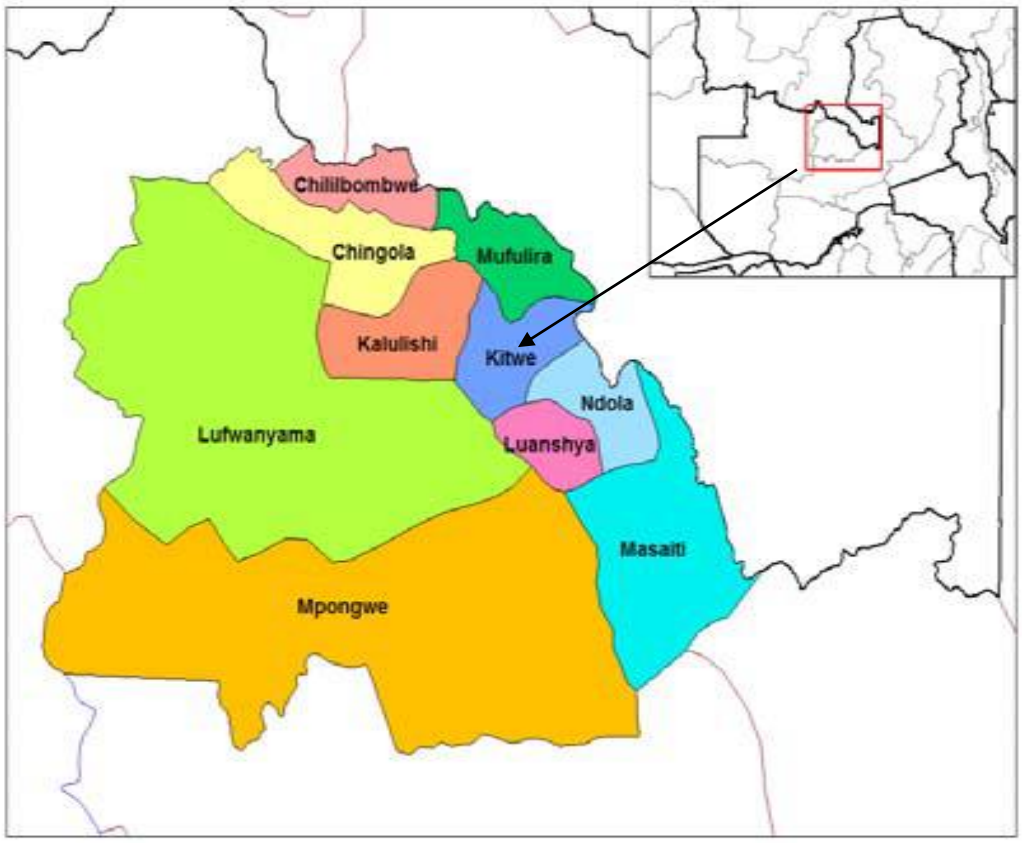

Figure 4 Location of Kitwe Town, Copperbelt Province, Zambia

Source: http//wwwafricaimpact.com/Africa/map

3.3. Research Design

The research design for this study was qualitative. Qualitative data was collected by reviewing literature, observations, conducting interviews through questionnaires and consultations with members of Chisokone market in Kitwe and key stakeholders such as the local authority and market associations.

3.4. Target Population

The market has an approximate population of about fifteen thousand (15,000) people (KCC, 2016). The target population for the study was 120 respondents.

3.5. Sampling Methods

A cross – sectional study design was used and a sample of 120 respondents was selected through stratified, random and purposive sampling techniques as follows: All the four market sections were picked. 108 marketeers and customers were randomly sampled from the four sections as the area (Chisokone) has no defined pattern of shopping units. 27 respondents were randomly sampled from each section. Purposively, twelve key stakeholders from Kitwe City Council, Market Associations and Disaster Management and Mitigation Unit (DMMU) were interviewed giving the number of the sample size of One hundred and twenty 120.

3.6. Data Collection Methods

Data collected were from primary and secondary sources. Primary data were collected using administered questionnaires and self-administered questionnaires. Administered questionnaires were used for twelve (12) stakeholders from Kitwe City Council, DMMU and Market Associations from Chisokone Market while self-administered questionnaires were used for the One hundred and eight (108) marketeers and customers. Observations were also made. Secondary data were collected using published journals on Fire Disaster Preparedness strategies, internet, books and government reports.

3.7. Data Analysis

Data collected were first verified for accuracy, consistency and completeness before it was coded. The data was then cross- tabulated using Microsoft Excel to enable the responses to be statistically analyzed. Descriptive Statistics was used to analyze data by way of percentages and mean and presented by use of charts and graphs. The Analysis was done by Tables, Percentages, Charts and graphs as per responses in the questionnaires. Information on Disaster risks at the market, Information on strategies for Fire Disaster Preparedness, Information on challenges faced in implementing the strategies at the market and efforts being made at the market to improve the situation were analysed.

3.8. Ethics

Respondents were assured that information provided was for academic use only and confidentiality and privacy was also assured. Personal and business details of respondents were not included in the report.

CHAPTER FOUR

RESEARCH FINDINGS

4.1. Introduction

This chapter will dwell on the analysis and findings from the information collected using questionnaires filled by stakeholders, marketeers, customers and observations made by the researcher. The information collected are divided in four major areas namely; Fire risks at the market, disaster preparedness strategies against fire outbreaks at the market, Challenges faced when implementing disaster preparedness strategies and efforts made to reduce fire exposure. The results are presented in sections below.

4.1.1. Sex of Respondents

The respondents were asked about their gender. Figure 5 below shows the proportion in terms of gender of the respondents. Research findings revealed that of the total 120 respondents sampled, 60 (50%) were males and 60 (50%) were females. See the figure below.

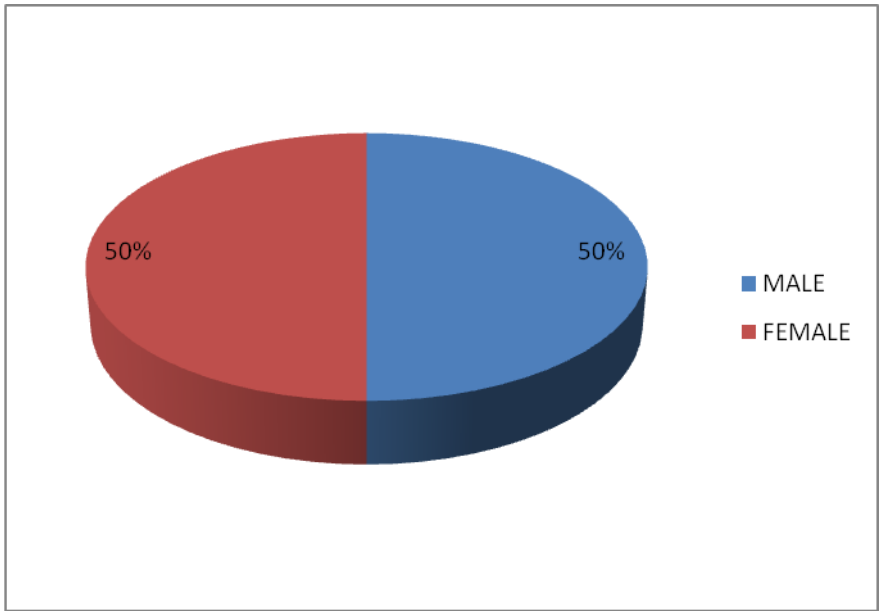

Figure 5 Sex of Respondents

Source: **Field data (2018)**

From the study, it can be concluded that the data collected was not biased against gender as gender balance was effectively covered.

4.1.2. Age Distribution of Respondents

The respondents were asked to indicate their ages. The findings of the study were as presented in the table below.

AGE GROUP	FREQUENCY (%)
14 - 20	8
21 -30	17
31 - 40	32
41 - 50	18
ABOVE 50	25
TOTAL (%)	**100**

Table 1 Age Distribution of Respondents

Source: **Field data (2018)**

Results of the study showed that the age distribution of the respondents varied from 14 to above 50 years. The majority were those in the age group between 31 to 40 years who constituted 32% respondents followed by those above 50 years of age who constituted 25% respondents. Thirdly were those from 41 to 50 years who were 18% followed by those ranging from 21 to 30 years of age who had 17% respondents and lastly those in age range of 14 to 20 had 8% respondents. All the age groups studied were expected to have knowledge of Disaster Preparedness strategies against fire outbreaks at the market because they are already engaged in business activities either as owners, managers or businessmen and women and customers. From the study it can be concluded that majority of the respondents were adults hence could have a reliable knowledge that was being sought.

4.1.3. Household Size of Respondents

The study showed that the size of the households of the respondents varied from 1 to above 9. The majority (42.5%) was those households from 4 to 6 followed by those from 1 to 3 who constituted 32.5% while 7 to 9 had 16.6% and those above 9 had 8%. See the table below.

HOUSEHOLD SIZE	FREQUENCY (%)
1 - 3	32.5
4 -6	42.5
7 -9	16.6
ABOVE 9	8
TOTAL (%)	**99.6**

Table 2 Household Size of Respondents

Source: **Field data (2018)**

4.1.4. Level of Education of Respondents

The respondents were asked to give their academic levels. The study revealed that the education levels of respondents ranged from Primary (14%), Secondary (33%), Tertiary (25%) and others (28%).Majority of the respondents with 33% were secondary school graduates. 28% of respondents had attained other levels of education, 24% were tertiary graduates while only 14% of them were primary school leavers.

From the study it can be concluded that majority of the respondents were secondary school graduates with 33%. See the figure below.

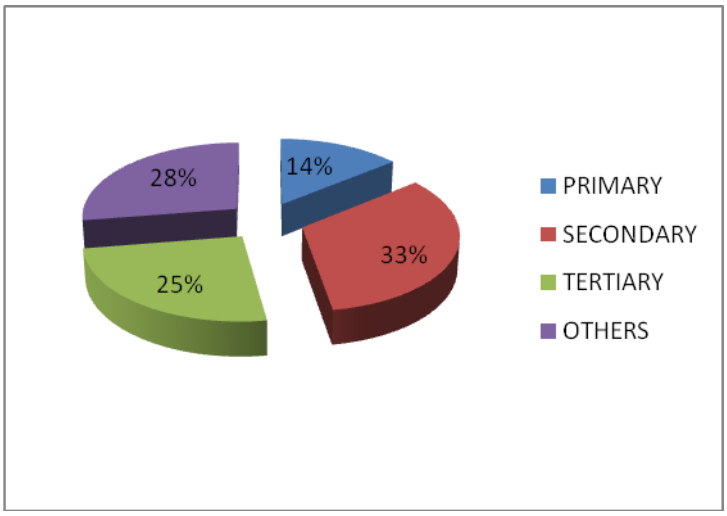

Figure 6 Level of Education of Respondents

Source: **Field data (2018)**

4.1.5. Length of Business at the Market

The question sought to get the length of respondents doing business at the market. The Figure below shows the responses obtained.

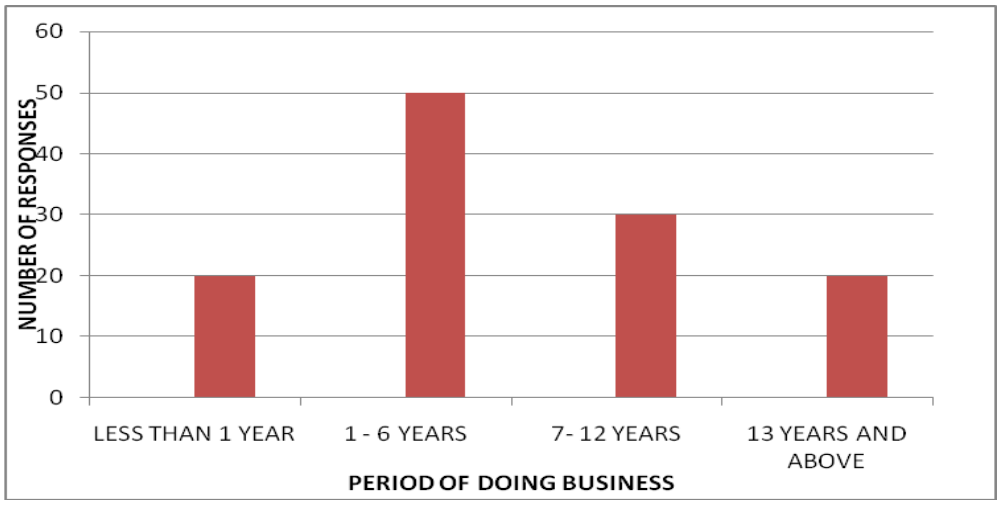

Figure 7 Length of Business at the Market

Source: **Field data (2018)**

The research showed that the length of respondents of doing business at the market varied from less than 1 year to above 13 years. A total of 20 constituted those respondents who had conducted business at the market for less than 1 year, 50 for those who have been at the market from 1 to 6 years, 30 for those who have been at the market from 7 to 12 years while 20 for those from 13 years and above. It was concluded that majority respondents (30) did business at the market from 7 to 12 years and this meant that they were knowledgeable able the issue at hand.

4.1.6. Fire Risks at Chisokone Market

The respondents were asked to identify fire risks at the market. The figure below shows the types of fire risks available at the market as shown by the number of responses.

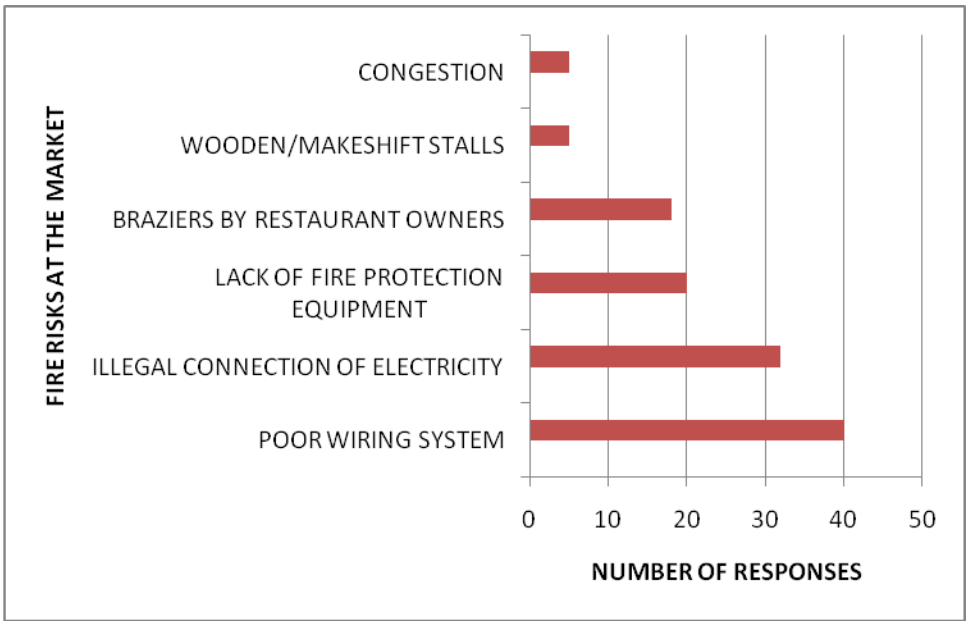

Figure 8 Fire Risks at Chisokone Market

Source: **Field data (2018)**

From the total number of 120 respondents studied, majority 40(33%) stated that there was poor wiring system in majority buildings at the market followed by illegal connection of electricity 32(27%).Lack of fire protection equipment was third 20(17%), followed by Braziers from restaurants 18(15%), while Wooden stalls 5(4%), and Congestion 5(4%) had the least responses.

From the above study, it was concluded that poor wiring systems and illegal connections were the main contributors to fire outbreaks at the market.

4.1.7. Impact of Fire Risks on the Livelihoods of people

The respondents were asked to give their views on the impact of fire risks on the livelihoods of people at the market. The figure below shows how respondents responded to the question. The study revealed that the impact of Disaster risks on the livelihoods of the people varied from very low to very high. Very high was highest (42%), High (25%), moderate (17%), Low (9%) and very low (7%).

It was concluded that fire risks impacted very high (negatively) on the livelihoods of the people at the market.

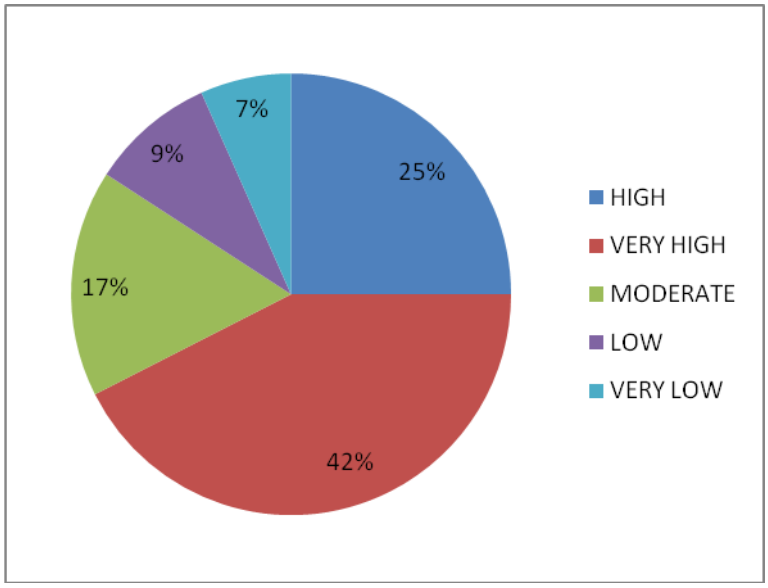

Figure 9 Impact of Fire Risks on the Livelihoods of People

Source: **Field Data (2018)**

4.1.8. Disaster Preparedness Strategies against fire outbreaks at the Market

The respondents were asked to state preparedness strategies against fire outbreaks implemented at the market. The figure below shows how respondents responded to the question.

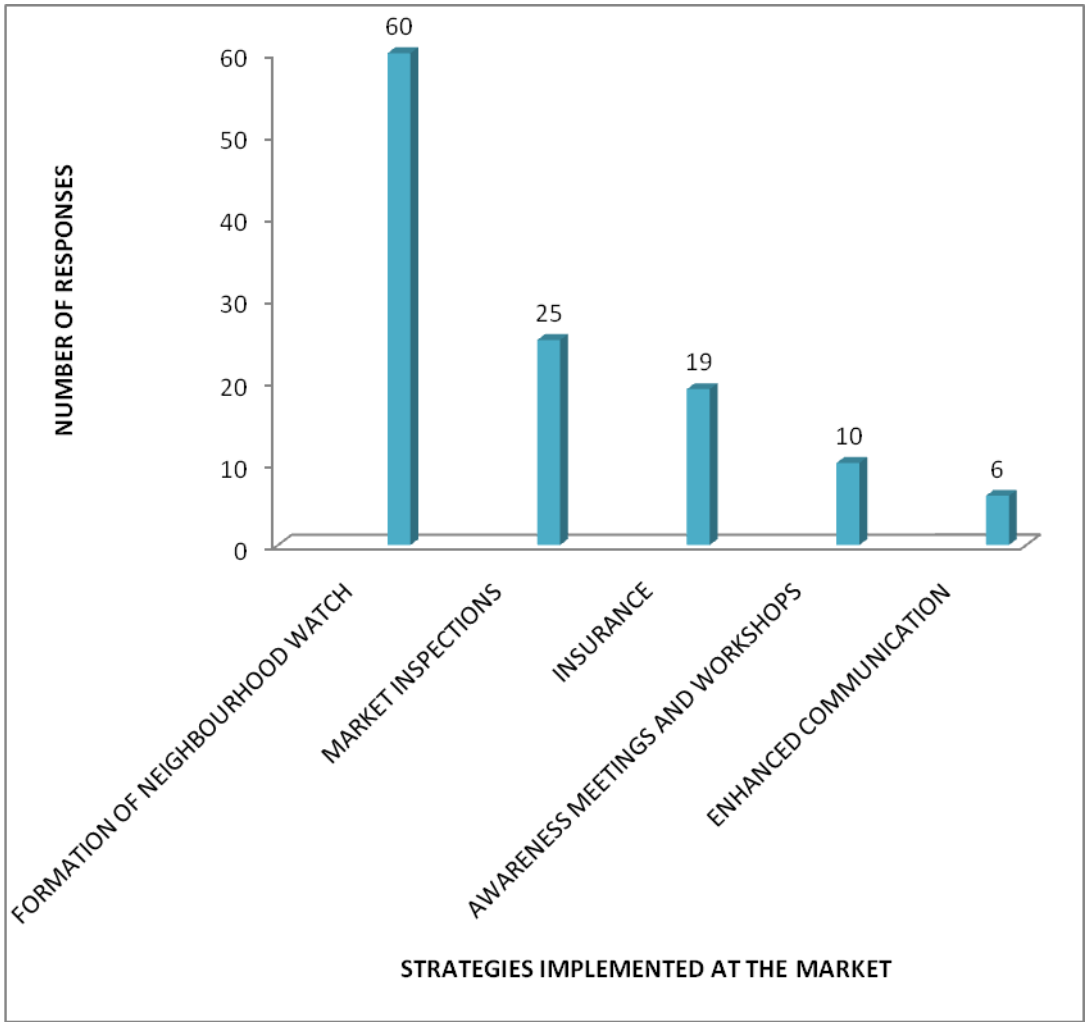

Figure 10 Disaster Risk Preparedness strategies against fire outbreaks at the market

Source: **Field data (2018)**

The study revealed that Disaster Preparedness Strategies against fire outbreaks varied from encouraging insurance amongst marketeers, formation of neighborhood watch, market inspections, market meetings and enhanced communication. Of the revealed strategies, formation of neighborhood watch scored the highest score of responses given by respondents 60 (50%), Followed by Encouraging Insurance 25 (21%), Market Inspections 19 (16%), Market meetings 10 (8%) and Enhanced communication 6 (5%).

From the study, it was concluded that the most used strategy at the market against fire outbreaks is the formation of the neighborhood watch followed by insurance.

4.1:9. Stakeholder's contributions to Development of Strategies

The respondents were asked to give their views on the contributions of stakeholders to the development of preparedness strategies. The figure below shows how respondents responded to the question.

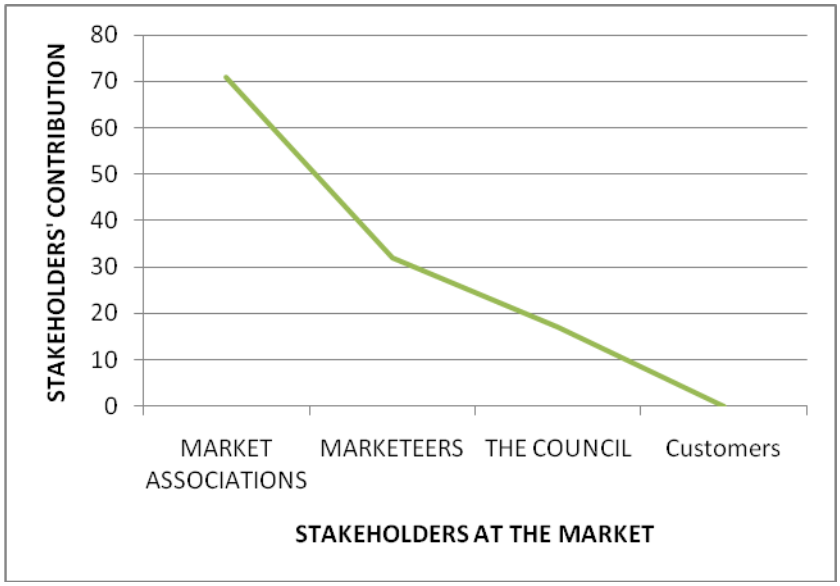

Figure 11 Stakeholder's contributions to Development of Strategies

Source: **Field Data (2018)**

Out of the 120 respondents studied, market associations scored 71(59%) Marketeers (traders) scored 32 (27%) while the Council recorded 17 (14%) with customers 0.

From the study, it can be concluded that market associations have contributed more to the development of preparedness strategies against fire at the market than any other stakeholder.

4.1.10. How the Strategies have been executed at the Market?

The respondents were asked to state how the strategies have been executed since being developed. The table below shows how respondents responded to the question.

CATEGORY	FREQUENCY (%)
FAIR	18
GOOD	16
VERY GOOD	58
EXCELLENT	8
TOTAL (%)	**100**

Table 3 How the Strategies have been executed at the Market?

Source: **Field data (2018)**

The study revealed that the execution of the strategies at the market ranged from fair, good, very good and excellent. Of the four categories, very good recorded the highest responses 70 (58%) followed by fair 21 (18%), good 19 (16%) and excellent 10 (8%).From the above study, it was concluded that the strategies put in place fire disaster preparedness were being well followed.

4.1.11. Response of Marketeers and Customers in Implementing Strategies

The respondents were asked to state the response of customers to implementing the strategies. The figure below shows the respondents' responses to the question.

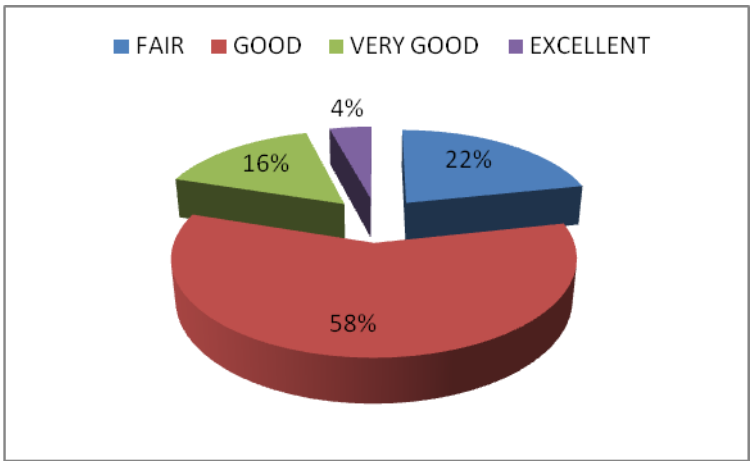

Figure 12 Response of marketeers and customers in implementing strategies

Source: **Field data (2018)**

The results of the study showed that response levels of marketeers and customers in implementing strategies ranged from fair, good, very good and excellent. Good recorded the highest percentage (58%), followed by Fair (22%), Very good (16%) and Excellent (4%). From the above study, it can be concluded that the response of compliance to the set strategies among the marketeers and customers is good.

4.1:12. Challenges faced in implementing Strategies

The question sought to identify challenges faced when implementing preparedness strategies. The figure below shows the responses from the respondents.

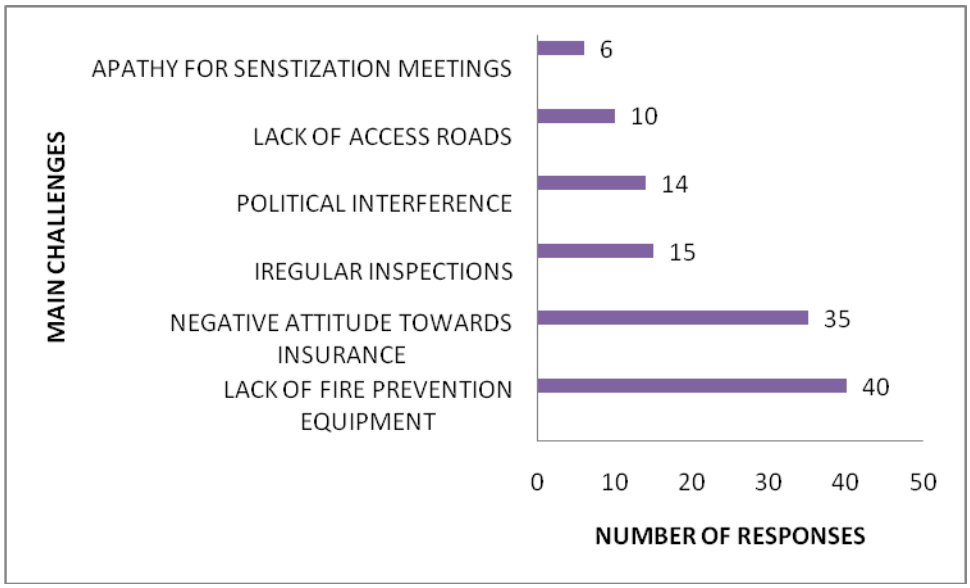

Figure 13 Challenges faced in implementing Strategies

Source: **Field data (2018)**

The study revealed six (6) main challenges faced in implementing preparedness strategies against fire at the market. These include; Lack of fire disaster kit, Negative perception about insurance, irregular inspections, political interference, Lack of access roads for fire engines and Apathy towards meetings. From the above study, it was concluded that lack of fire disaster kit was a major challenge at the market 40(33%) for successful implementation of the strategies followed by negative perception towards insurance 35(29%). Irregular inspections scored 15(13%).

Political interference 14(12%) while lack of access roads for firefighting engines scored 10(8%) and apathy for sensitization meetings recorded 6(5%).

4.1:13. Extra efforts made to reduce Exposure

The respondents were asked to state extra efforts that have been put in place to reduce exposure to fire disasters at the market. The responses from the respondents are shown in the figure below.

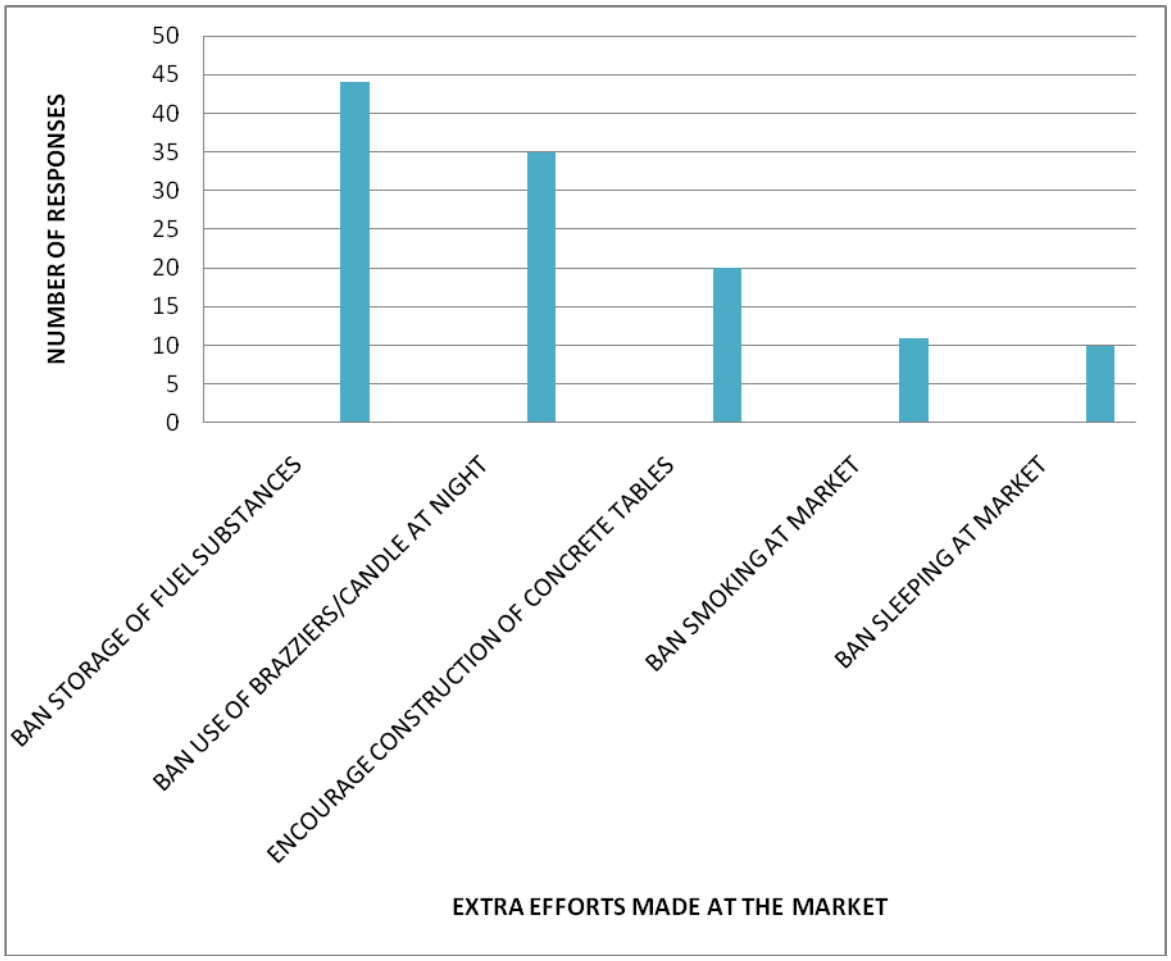

Figure 14 Extra efforts made to fire reduce exposure

Source: **Field data (2018)**

The study revealed that apart from the strategies being put in place at the market to reduce exposure, there are also extra efforts made ranging from Ban on the storage of fuel substances with the highest score of responses 44(33%) followed by Ban on the use of Braziers at night

35(29%), encouraging construction of concrete pillars 20(17%), Ban on smoking at the market 11(9%) and Ban on sleeping at the market 10(8%).

4.2. Summary

Chapter four addresses some questions posed in the previous chapters. The chapter analysed the information collected from the Local Authority, Market Associations, Disaster Management and Mitigation Unit (DMMU), Marketeers and Customers. The data collected were divided into four main areas, (1) Fire risks at the market which included poor wiring, illegal connection of electricity, among others. (2)Disaster preparedness strategies against fire outbreaks (3) Challenges faced when implementing preparedness strategies and (4) other efforts being put in place to reduce exposure to fire disasters. The information analyzed in this chapter will be used in the next chapters for drawing plans, conclusion and recommendation for better disaster preparedness against fire in urban markets.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1. Introduction

The findings in the preceding chapter revealed clearly the level of disaster preparedness against fire outbreaks at Chisokone market in Kitwe in terms of, mitigation, prevention and preparedness. Though the mitigation and prevention were not the core component of this study, it was clear that it is difficult to draw a line between mitigation, prevention and preparedness, especially in dealing with fire disaster safety in markets. The implementation of all components is a process which depends on each other, and need to be viewed as a whole. This chapter presents the discussion of findings of the study.

5.2. Discussion of major findings

The first major objective of this study was to identify Disaster Risks at Chisokone market in Kitwe. Data analysis and interpretation revealed that majority of respondents identified six (6) fire risks including; Poor wiring system, illegal connection of electricity, lack of fire protection equipment, Braziers from restaurants, wooden stalls and congestion. 33% of the respondents considered poor wiring system as a major fire risk at the market as supported by Anaglatey (2013) that one of the main causes of fire outbreak in Ghana has been electrical problems resulting from faulty wiring and misuse of electrical gadgets. According to Simpson (2010), electrical faults originate from poorly designed and poorly constructed electrical circuits, and the electrical wiring found in many domestic buildings in Ghana is designed not by an electrical engineer, but by an artisan with scant knowledge of electrical circuit design. Electrical cables are commonly found strewn haphazardly on the ceiling of most domestic buildings, and when the cables' insulation deteriorates with time, short circuitry occurs, resulting in fire outbreaks. Causes of naked flames are defined by Simpson to include cooking (e.g., kerosene stoves, electric cookers, gas cookers, and coal pots), lighting devices (e.g., candles lanterns), cigarettes, and lighted mosquito coils. 27% of the respondents sighted Illegal connection of electricity by some shop owners as second fire risk at the market. Illegal connection of electricity entails the connection of electricity without permission from authorities. Illegal tapping from the national grid are some of the possible causes of fire outbreaks (Boateng, 2013).

The third most fire risks at the market were lack of fire protection equipment at the market as stated by 17% of the respondents. One respondent repeatedly said, "*The distance is too long (approximately 5km) enough to cover for fire fighters to stop the fire. The market has no fire assembly point*." According to Twaum – Barima (2014), fire extinguishers and sand buckets are the most known fire protectors in most of the markets in Ghana.

Others include, Braziers left on by restaurant owners after business15% of the respondents. Congestion was yet another risk at 4% of respondents .The study reviewed that congestion at the market makes accessibility to the affected building within the market by the fire tenders difficult since there is only one way in the middle of the market because all spaces where other access roads could be created were occupied by stalls (field data, 2018). Other finding on fire risks at the market was increase in wooden stalls at 4%. The study revealed the need for the development and implementation of disaster preparedness strategies against fire outbreaks at the market.

The second objective of the study was to establish Disaster Preparedness strategies against fire outbreaks at Chisokone market in Kitwe. Data analysis and interpretation showed that the market mostly through Market Associations has developed strategies to reduce exposure of the people and property as opposed to aftermath reactions and expensive approaches as noted by Tarrant (2002) that "Disasters are a major drain on all societies, but they are particularly devastating for developing countries". Due to economic challenges being experienced in Zambia to put up a number of strategies proved too much of a task at the market. The market managed to put up the following easy to manage and cost effective strategies; the formation of the neighborhood watch. The study also revealed that marketeers were encouraged to insure their businesses with various insurance companies against disasters. The study also revealed other strategies such as carrying out regular market inspections of electrical connections, conducting meetings every last Friday of the month to discuss the safety of the market. This is meant to intensify public education campaign among the market residents regarding fire prevention and safety measures because it was highlighted that most fires actually occurred out of ignorance and negligence on the part of the marketeers. Others include enhanced communication between the fire brigade departments with the market authorities by opening hotlines. As revealed in the study the execution of the strategies at the market is above average.

The third objective of the study was to determine the challenges being faced in implementing the Disaster Preparedness strategies at Chisokone market in Kitwe. Data analysis and interpretation showed that the market community faced challenges such as political interference in the administration of the market especially in the area of allocation of trading space. Some respondents openly accused Political Party cadres of allocating trading places at the market anyhow without order hence filling up all the access roads left for fire tenders in case of fire outbreaks. The other challenge faced by the market is that of negative attitude towards insurance by the marketeers. Information from the respondents shows that all the time when fire accident occurs at the market, non-affected members of the market and well-wishers come to give assistance to the affected marketeers in terms of stating up capital. Others feared to subject their money to satanic acts once they agreed to insure their businesses. Marketeers are affected by the loss of their properties and suffering psychologically. Nothing is paid back to them in the real value, therefore the loss is real. If the markets were insured, compensation would be taken into account in real terms. Apathy on the part of the marketeers and customers in attending meetings aimed at sensitizing them on the need for improving safety against fire disasters at the market. Majority of the respondents (33%) revealed that there is lack of fire disaster kits such as fire extinguishers. Other challenges include; lack of regular inspections of electrical connections by council authorities and lack of access roads for fire machines in the market due to congestion.

The fourth and final major objective was to analyse extra efforts being made by the Local Authority and Market Committees to reduce exposure to fire disasters at the market. Data analysis and interpretation showed that a number of efforts were being made aimed at reducing exposure of the people and property to fire disasters. These efforts include; the Ban on storage of fuel substances at the market, construction of new shelters with concrete pillars for example the Edgar Chagwa Lungu now under construction, Ban on smoking in the market, Ban on people sleeping at the market and Ban on the use of Braziers at night.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

The study analysed the disaster risk preparedness strategies against fire at Chisokone market in Kitwe. This was in relation to the fact that fire had on various occasions occurred at the market resulting into fatalities and loss of property and hence market stakeholders could act on these premise to put in appropriate preparedness strategies.

In light of the findings of the study, the following conclusions were drawn;

It was concluded that the market has a number of fire risks which include: Poor wiring followed by Illegal connection of electricity by some shop owners. Other risks included the using of braziers and candles at night, lack of fire protection equipment, and increase in the number of wooden stalls and congestion.

The Formation of the neighborhood watch also known as Community Crime Prevention Unit (CCPU) was a major preparedness strategy aimed at providing security to items left in the market and ensuring that no one is using fire in the market at night. The committee also ensures that substances that can cause fire outbreaks at the market were eliminated. Insurance is yet another strategy being used at the market aimed. Other strategies implemented include; Market Inspections, Awareness meetings and Enhanced Communication with the fire brigade department.

Despite forming the above strategies by the market community, it was concluded that the market faced a number of challenges in implementing such measures. Lack of fire prevention kit such as fire extinguishers was a major challenge at the market followed by negative perception of marketeers about insurance. Others were lack of regular inspections against illegal electrical connections of electricity by the council despite collecting daily levies, apathy on the part of the marketeers and customers in attending meetings aimed at improving safety at the market and lack of access roads for firefighting equipment at the market.

Despite facing such challenges, in the quest to implement the strategies, it was concluded that the market community was doing extra efforts aimed at preparing the market community for any fire disaster eventuality. Such efforts include: Ban on storage of fuel substances at the market; embarked on the construction of new shelters with concrete tables as opposed to wood ones for example the Edgar Chagwa Lungu now under construction, Ban on smoking in the market as well as Ban on people sleeping at the market.

From the information contained in this dissertation, the researcher can confirm that the aim of the study "to analyse Disaster Risk Preparedness strategies against fire at Chisokone Market in Kitwe to ensure safety at the trading place," was achieved.

6.2. Recommendations

In light of the above conclusions, it was recommended that;

1. The Government should consider putting up a health post container near the market which will provide emergency health services to the affected marketeers before being rushed to Kitwe Teaching Hospital for specialist treatment which is approximately 7Km from the market.

2. The Government should help the market to find serious cooperating partners such as NGOs and Companies which would be able to provide expert knowledge and fire prevention equipment at the market.

3. There is need to install the fire prevention equipment in all the buildings at the market by the local authority and shop owners.

4. Fire safety measures should be enhanced through fire safety programs, such as emergency procedures/evacuation drills, regular fire safety inspection, maintenance and servicing of fire equipment by both market authorities and the local authority.

5. The shop owners and market managers should invite fire experts to give talks of fire safety and the need for having firefighting equipment in their shops.

6. ZESCO should install pre-paid metres at the market to avoid illegal connection of electricity.

7. Government and Market Associations should find a common understanding of re-designing and modernizing the market to a required standard.

8. Further research needs to be carried out to determine the compliance level on preparedness and mitigation measures adopted by market authorities.

6.3. Conclusion

Disaster preparedness is a stage which carry important role on the way the affected community will respond to emergency incidents. According to the definition, Preparedness is a state of taking measures to reduce to the minimum level possible, the loss of human lives and other damages, through organizing of prompt and efficient actions of response and rehabilitation. In other words preparedness is to put in place the necessary measures for effective and timely response to an event, the ability to predict, respond to and cope with the effect of a disaster (ISDR, 2006).The study has revealed several issues pertaining to disaster risk preparedness strategies against fire at Chisokone market in Kitwe. On one hand, the study has revealed strategies that are being implemented at the market to reduce exposure against fire and on the other hand, the study has revealed challenges faced in implementing the strategies. It is a common knowledge that fire disasters may happen anytime and cause losses of life and properties. At some time, human beings console themselves that the disasters are God's plans and therefore human beings cannot stop them. This way of thinking has resulted into remarkable negligence and unpreparedness especially in relation to government properties, including markets. Unpreparedness has led to some institutions including markets closed by relevant authorities due to lack of funds to reconstruct new facilities after a disaster experience. For example, the City market in Lusaka which has remained closed to date after the fire outbreak in 2017.

Every strategy aimed at reducing exposure of the people and property to fire disasters at Chisokone market in Kitwe is fast becoming a learning curve and leading to perfection in terms of safety at the market in this era when fire incidences have become rampant and wide spread. The aim is to make the whole process a continuous practice in readiness of any eventualities. It is hoped that in case of any fire disaster, the loses will not be that big, especially the human loss and property at the market. It is the hope of the researcher that all other institutions not only markets can embrace the disaster risk preparedness strategies and make this world above all Zambia a bit safer to live in. It is the hope of the researcher to see disaster preparedness becoming a culture in all public institutions big or small.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE (Market Association Leaders, Local Authority, DMMU)

MULUNGUSHI UNIVERSITY

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES (SANR)

PROGRAM: MASTER OF DISASTER STUDIES

ADMINISTERED QUESTIONNAIRE

TOPIC: ANALYSIS OF DISASTER RISK PREPAREDNESS STRATEGIES AGAINST FIRE IN URBAN MARKETS IN ZAMBIA: a case study of Chisokone market in Kitwe.

Dear Respondent,

I am Brian Mwila, pursuing a Master's degree in Disaster Studies at Mulungushi University undertaking a research on the above topic as part of my academic requirement. You have been randomly selected to take part in this research by answering this questionnaire. Kindly answer all questions in this questionnaire. Be assured of the complete and utmost confidentiality of the information you will provide. This study is purely for academic purposes.

Your cooperation to this request will be highly appreciated.

Yours Faithfully,

BRIAN MWILA**CELL: 0979618255**

INSTRUCTIONS

1. Tick the appropriate option
2. Do not write your name on the questionnaire.
3. Kindly answer all questions.

SECTION A

BACKGROUND INFORMATION

1. **SEX/GENDER**

A. Male ☐ B. Female ☐

(i) What is your age group?

A. 14-20 ☐ B.21-30 ☐ C.31-40 ☐ D.41-50 ☐ .50+ ☐

(ii) What is the size of your household?

A. 1-3 ☐ B. 4-6 ☐ C. 7-9 ☐ D. 9+ ☐

(iii) What is your level of Education?

A. Primary ☐ B. Secondary ☐ C. Tertiary ☐ D. Others ☐

iv. Are you working?

YES ☐ NO ☐

V. For how long have you been with the current institution?

A. Less than 1year ☐ B.1 – 6years ☐ C. 7 -12years ☐ D. 13years+ ☐

Vi. What is your position in the institution?

……

……

vi. What is the brief history of Chisokone Market?

……
……
……
……
……

SECTION B

IDENTIFYING FIRE RISKS AT CHISOKONE MARKET

1. What is a Risk?

   ……
   ……
   ……
   ……..

2. Are there Fire Risks at Chisokone Market?

A. Yes ☐ B. NO ☐

3. If YES, what are these Risks? Kindly list them

……
……
……
……
……

4. What is the impact of these Risks on the livelihoods of people?

High ☐ Very High ☐ Moderate ☐ Low ☐ Very Low ☐

SECTION C

ESTABLISHING DISASTER RISK PREPAREDNESS STRATEGIESAGAINST FIRE AT CHISOKONE MARKET

5. Are there any strategies available to reduce the impact of Fire Disasters at the Market?

YES ☐ NO ☐

6. If YES, Kindly, List them

……

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7. How did you develop these strategies?

……

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……

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……

8. How well have you been able to execute them?

Fair ☐ Good ☐ Very Good ☐ Excellent ☐

9. What is the response of the Marketeers and customers in implementing strategies?

Fair ☐ Good ☐ Very Good ☐ Excellent ☐

SECTION D

DETERMINING CHALLENGES IN IMPLEMENTING STRATEGIES

10. Do you face challenges when implementing these strategies?

YES ☐ NO ☐

11. If YES, what are these challenges? Kindly, List them.

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SECTION E

ANALYSING EFFORTS MADE AT THE MARKET TO REDUCE EXPOSURE TO FIRE DISASTERS

12. Are there any efforts in place at the market to reduce exposure?

YES ☐ NO ☐

13. If YES, Kindly, list them.

……

……

……

14. Other than the efforts mentioned above, what else do you think can be done to improve the situation?

……
……
……

15. Do you have anything more to say about the issue at hand?

……
……
……

Thank You.

BRIAN MWILA

0968/0955-767766

0968852278

1.2. APPENDIX 2: INTERVIEW GUIDE FOR MARKETEERS

i. What is your age group?

A. 14-20 ☐ B.21-30 ☐ C.31-40 ☐ D.41-50 ☐ E.50+ ☐

ii. What is the size of your household?

A. 1-3 ☐ B. 4-6 ☐ C. 7-9 ☐ D. 9+ ☐

iii. What is your level of Education?

A. Primary ☐ B. Secondary ☐ C. Tertiary ☐ D. Others ☐

. iv. How long have you been trading at Chisokone market?

1 – 2 years ☐ 3- 4 year ☐ 5-6years ☐ 7 – 8 years ☐ 9 -10 years ☐

10 years^{+} ☐

1. What is a Risk?

……

……

2. Are there any Fire Risks at the market?

YES ☐ NO ☐

3. If YES, what are these fire risks?

……

……

……

4. What impact do these Risks have on the livelihoods of people of Kitwe?

High ☐ Very High ☐ Medium ☐ Low ☐ Very Low ☐

5. What is being done in the Market to reduce the impact of these risks?

……

……

……

6. What is your contribution to these activities/strategies conducted in the market?

Fair ☐ Good ☐ Very Good ☐ Excellent ☐ Bad ☐ Very Bad ☐

7. Are there challenges faced when implementing these strategies?

YES ☐ NO ☐

8. If YES, What are these challenges? Mention them.

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9. What efforts are in place to reduce exposure?

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10. Do you have anything else to say about the issue at hand?

……

……

……

1.3. APPENDIX 3: INTERVIEW GUIDE FOR CUSTOMERS

(i) What is your age group?

A. 14-20 ☐ B.21-30 ☐ C.31-40 ☐ D.41-50 ☐ .50+ ☐

(ii) What is the size of your household?

A. 1-3 ☐ B. 4-6 ☐ C. 7-9 ☐ D. 9+ ☐

(iii) What is your level of Education?

A. Primary ☐ B. Secondary ☐ C. Tertiary ☐ D. Others ☐

1. How long have you been shopping at Chisokone Market and why?

Below 2 years ☐ Between 3 and 5years ☐ Between 6 and 8years ☐ Above 10 years ☐

2. Are there Fire Risks at Chisokone Market?

YES ☐ NO ☐

3. If YES, Kindly, mention them.

……

……

……

4. Do you agree or disagree that firerisks have an impact on the socio-economic development of Kitwe?

Agree ☐ Strongly agree ☐ Disagree ☐ Strongly disagree ☐

5. Do you know of any strategies put in place at the market to reduce the impact of fire disasters?

YES ☐ NO ☐

6. If YES, Kindly, mention them

……

……

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……

7. How well do you think they have been executed?

Fair ☐ Good ☐ Very Good ☐ Excellent ☐ Bad ☐ Very Bad ☐

8. What is your role in implementing such strategies?

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9. What challenges do you think the Market faces in implementing these strategies?

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10. What would you think would be the reason for such challenges?

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11. What do you think can be done to improve the situation?

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……

……

12. What would be your final comment on the issue at hand?

……

……

……

SOME WOODEN STALLS AT CHISOKONE MARKET IN KITWE