AN INVESTIGATION OF FIRE EMERGENCY PREPAREDNESS IN KENYAN SCHOOLS: A CASE STUDY OF PUBLIC SECONDARY SCHOOLS IN NAIROBI

BY

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C50/63220/2010

THIS RESEARCH PROJECT IS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE MASTERS OF ARTS DEGREE IN SOCIOLOGY (ADVANCED DISASTER MANAGEMENT) IN THE FACULTY OF ARTS OF THE UNIVERSITY OF NAIROBI.

NOVEMBER 2016

DECLARATION

This Research Project is my original work and has not been presented to any college, institution or university other than the   University of Nairobi

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This Research Project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

This work is dedicated to my family

ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS AND ACRONYMNS

AP: Assembly Points

DEO: District Education Officer

EP: Emergency Plans

FD: Fire Disaster

FFE: Fire Fighting Equipment

FFF: Fire Fighting Facilities

FS: Fire Safety

ICFI: International Committee of the Fourth International

MOEST: Ministry of Education Science and Technology

NCST: National Council of Science and Technology

QUASOs: Quality Assurance and Standards Officers

SPSS: Statistical Package of Social Sciences Software

SSS: Specific School Stakeholders

UNISDR: United Nations International Strategy for Disaster Reduction

WCDR: World Conference on Disaster Reduction

ABSTRACT

An emergency is a situation that requires immediate attention, a situation that could lead to disaster if left alone or unattended. Fire is one such emergency. Fires in schools are of public concern due to its increased incidence, injuries, deaths and property loss. Existing literature indicates these incidences are on the rise all over the country and the risk is of schools being vulnerable to this even after the many occurrences is also still very high. This study sought to find this out. The study was guided by the following objectives; the adequacy of Fire Fighting facilities for fire disasters within the school premises; how secondary schools put in place fire safety plans as a measure of fire disaster preparedness and to establish if secondary schools trained teachers, ,workers and student on appropriate responses in case of fire. The study adopted Descriptive Survey method to collect data and employed Stratified Random Sampling to come up with the sample. Quantitative data was collected by means of questionnaire along with data collected through observation schedule. Data collected was analyzed through Descriptive Statistics and the results presented using Frequency Tables. Results of the study show that even though most schools have the Fire Fighting Equipment, due to inaccessibility of these equipment and lack of proper training of teachers, staff and students, most schools are not adequately prepared for Fire Emergencies. Based on the findings of the study it is recommended that school management should consider adding more Fire Fighting Equipment and make them easily accessible in case of an emergency. The study also proposes teaching staff, workers and students be trained in Fire Emergency response.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

The U.S.F.A. (2007) reports that the hospitality sector and educational institutions are highly exposed to risks of fire due to activities that takes place in such environment that includes smoking and use of candles might expose an organisation to risks of fire. Use of electronic appliances such as toaster, ovens or electric plates and discard of combustible materials such as used cigarettes and storage of towels and sheets in places where cleaning supplies are kept expose learning institutions to fire. These are mainly as a result of careless acts such as electrical faults and arson.

The Kenya Red Cross Society (KRCS) observes that secondary schools are vulnerable to disasters because of lack of specialized training such as fire drills, lack of appropriate Fire Fighting equipment, lack of adequate resources, lack of systematic disaster mitigation and response mechanisms (GOK, 2008). According to USFADC (2007), fire drills are the largest contributing factor to the safety of the students in school. Most fires in schools result from faulty electrical installations (USFADC, 2007). This could be blamed on failure to use qualified electrical Engineers, lack of inspection on the part of the ministry of education and failure on part of the school management to take inspection recommendation seriously regarding the investigated incidence (GOK, 2001, Otieno, 2010 and Muzungu, 2008). A study carried out in Siaya district Kenya, on fire disaster preparedness and Risk factors in boarding schools indicate that fires in 40 boarding

schools in 2008 were caused by faulty electrical installations, misuse of electrical appliances and arson (Kukali and Kabuka, 2009)

When Students go on rampage they have been known to set their institutions ablaze. This has been a cause of fire disasters in secondary schools in the whole world. In Africa, students' activism started being witnessed in the 1960s. Most of the students' riots were centered along political issues particularly nationalism and the struggle for independence (Levy, 1991). In Kenya students' riots have been on the increase. In 2001, 240 cases of strikes were recorded while 360 cases were recorded in 2008. In these cases young people were obsessed with burning, vandalism and destruction of their own institutions (Mwenda, 2008). In 2008 a form three student at Upper hill school in Nairobi died in a fire believed to have been sparked by students' unrest in the institution (Aluanga, 2008). Other incidents involving students' unrest include the October 25, 2003 classroom fires at Kinyui Boys Secondary School and the July 19, 2004 incident at Mbiuni High School in Machakos where a student died after colleagues' torched dormitories and classrooms and looted the food store.

Whereas, the government of Kenya has always put efforts to stem out the culture of students unrest in schools, the very nature of the unrests have taken a turn for the worse. Such incidences occurring in secondary schools raise doubts on the safety of children in school. Hazards that lead to fire disasters in secondary schools are factors that facilitate or increase the risk of occurrence of fire disasters but do not on their own cause the fires. They include policy formulation complexities and implementation hiccups (Kukali and Kabuka, 2009). For instance lack of national fire policy in Kenya has significantly

contributed to poor fire safety planning in institutions. According to (GOK, 2004) destructive fires experienced in Kenya have been either accidental or deliberate but nevertheless preventable if negligence is minimized and regulatory and institutional weaknesses addressed to this end. Poor management skills are partly to blame for cases of indiscipline that are rising sharply in secondary schools, which in some cases has led to several deaths and injuries. This has resulted to students' unrest being a hazard in issues of fire disasters. The absence of Fire Fighting equipment and emergency exits led to the high death toll during the Kyanguli Secondary School fire. Sixty eight boys lost their lives in this incident. According to the (GOK, 2008) Ministry of Education safety standards manual dormitories are the single most physical infrastructure, where learners spend the longest continuous period of time in a day.

It is therefore important to keep them clean and well ventilated. The manual gives the following specifications for dormitories; 1.2 meters wide space between beds, 2 meters wide corridor, admission to be based on bed capacity, doors to be at each end, be 5 meters wide and open outwards among others (GOK, 2008). Lack of knowledge and awareness of the risk factors reduce the level of fire disaster preparedness in institutions. Omuterema (2009) study on 'Mega stores fire preparedness, response and mitigation' A case study of Nakumatt fire disaster found that ignorance and lack of appropriate training for staff on fire safety and response is a major contribution to fire tragedies. Ignorance about scale of negative impact once fire disaster occurs is also contributory to negligent or casual approach to fire disasters. This ignorance has led to fire disasters in schools

1.2 Problem Statement

Fires in schools are a public concern because of the increased incidences, injuries and deaths of students not to mention the destruction of property. Even if schools may face other problems like strikes and indiscipline, these rarely result into deaths like fire disasters. Fires have occurred in almost all the 47 counties of the country. Without fire preparedness, schools will continue to lose lives, property and learning time. It was therefore important to carry out a study on fire disaster preparedness in secondary schools in Nairobi County in Kenya. The study established the adequacy of Fire Fighting facilities, assessed the compatibility of school building standards with corresponding policies, regulations and Acts regarding fire emergencies, fire safety plans of the school and whether schools train teachers, workers and students on appropriate responses to fire disasters.

1.3 Key Research Questions

i) What factors lead to fire emergencies in public secondary Schools in Nairobi County?

ii) Do public secondary schools in Nairobi County have adequate Fire Fighting facilities and equipment?

iii) Do public secondary schools in Nairobi County train teachers, employees and students on appropriate responses in case of fire?

1.4 Objectives

1.4.1 Main objective

The main objective of this study was to investigate fire emergency preparedness in secondary schools in Nairobi County.

1.5 Specific Objectives

The study endeavored to achieve the following specific objectives

i) To identify and analyze the factors leading to fire emergencies at public secondary Schools in Nairobi county

ii) To establish whether public secondary schools in Nairobi County have adequate Fire Fighting facilities and equipment.

iii) To determine whether public secondary schools in Nairobi County train teachers, employees and students on appropriate responses in case of fire.

1.6 Significance of The Study

The findings of this study will be important not only to schools management but also to management of other institutions. Since management make decisions every day, ideally, such decisions should be made on the basis of carefully thought evidence. This study will create awareness among the school management, teachers, workers and the students on what need to be done in order to make secondary schools prepared in case of fire, hence minimizing damage to property, injuries or death. Management in many organizations

schools included is eager to use invalid and unreliable evidence simply because it is easily available. In some cases, managers want evidence that supports an existing opinion or preference and this research will serve the purpose of ensuring that decisions are carefully made after considering the surrounding circumstances.

This study will serve as a starting point in courting support for the Fire and Rescue Services Organizations from both the Kenyan Government and its Cooperating Partners. The study will also assist in identifying what requires to be done in aiding the Fire and Rescue Services Organizations to turn around their operations through the development of the Action Plan. Furthermore, the government can inculcate some content of this research into the syllabus to be studied by both high school and college students. It may also use such information in formulation of policies regarding emergency preparedness in institutions.

This study aimed to close gap in the knowledge about fire emergency preparedness in Kenyan secondary school. It will thus be important to other researchers and scholars interested in learning more about fire emergency preparedness in Kenyan schools. It will enable them to advance their knowledge in this arena even though they may not have the intention of applying it to existing problems.

1.7 Scope and Limitation of the Study

This study was carried out in 34 secondary schools in Nairobi County. The target population was headteachers of these schools. The study mainly focused on Fire Fighting equipment and facilities, factors leading to fires in secondary schools, compatibility of

school building standards with corresponding policies, regulations and Acts regarding fire emergencies, fire safety plans of the school and whether schools train teachers, workers and students on appropriate responses to fire disasters.

The researcher encountered various limitations while undertaking this study. First and foremost, the time and financial resources available was not enough to effectively perform the study. The researcher therefore sampled only 34 secondary schools in Nairobi County.

The researcher was not in a position to control the attitudes of the respondents. However, the researcher explained the importance of this study in an attempt to have a positive attitude by the respondents. Additionally, the respondents were assured that their identity would not be revealed and this increased the chances of getting accurate information from the respondents.

Finally, the researcher recognized the fact that disaster management is multi sectoral and multi disciplinary in nature, involving different sectors such as Ministries, government departments, local Government to mention just a few. Therefore, the greatest limitation was a cross sectional majority of data that was collected. To avoid that, the researcher made sure that the data collected was more focused on preparedness, mitigation and prevention of fire emergencies only.

CHAPTER TWO: LITERATURE REVIEW & THEORETICALFRAMEWORK

2.0 Introduction

This chapter deals with review of related literature of this study. Specifically, review focused on school emergency plans, fire vulnerable places in schools places, measures that can be put in place to minimizing the spread of fire, training that can be offered to teachers, students and all individuals in order to make appropriate responses in case of fire and the appropriateness of schools buildings designs in case of a fire as well as the theoretical framework

2.1 Literature review

2.1.1 The Concept of Fire Disaster Preparedness in Schools

According to Makhanu (2009) schools around the country have failed to emphasis on installing fire protection equipment, alarms, and first-aid and Fire Fighting. Akali, Khabamba and Muyinga (2009), little efforts have been made to save schools from exposure to fire incidences. Kumba (2008) observes that the Education Ministry has put in place rules to improve safety in secondary schools. Schools have been asked by the government to designate a safety committee but, most schools have not complied.

Makhanu (2009) observe that firefighting tools and lifesaving machines ought to be displayed in a place where they can easily be accessed. Teachers and students should be reminded on a routine basis concerning the presence and use of fire extinguishers.

Mwenga (2008) studied the importance of disaster preparedness among secondary schools in Kyuso District, Kenya. The results showed the existence of inadequate firefighting tools in schools. Similarly, Lucheli and Masese (2009) found that cost of firefighting equipments discouraged most schools from accessing these equipments in the North-Rift. Lucheli and Masese (2009) noted that schools lacked fire extinguishers and the few available were in bad condition.

2.1.2 Adequacy of Fire Fighting Equipment in Schools

Inadequate funds and failure to understand the importance of firefighting equipments discouraged schools from utilizing these equipments in developing countries (Shaw, 2002). Ians (2010) found that disaster preparedness was not a priority to most schools in India. Most schools were concerned about the number of students they admitted, little efforts was shown concerning safety norms.

2.1.3 Compatibility of School Building Standards with Corresponding Policies, Regulations and Acts Regarding Fire Emergencies

Safety measures of fire are planned at the preliminary stages when the construction of a building commences, they occupants of such building are educated on the safety measures including the loss that can be caused by fire (Rowan, 2001).

In such a case materials to put off fire might be inadequate and this might limit firefighting and thus risking loss of property and lives through fire (Marion & Maingi, 2010).

Oduor (2012) observes that the Education ministry made suggestions that classrooms should accommodate up to 40 students to minimize overcrowding and to provide a favourable environment for students to learn. Fire calamities are popular in learning institutions locally (MOEST, 2001). Fire exposure to institutions of learning can be attributed to several factors such as failure to have safety procedure such as lack of exit points, lack of firefighting tools and inadequate Fire Fighting facilities among others.

More badly, studies MOEST (2001) note the culture of unrests is planned and performed to cause harm and destruction of property and human life. There's a need to get ready for disaster and minimization of risks in educational institutions as a way to raise awareness especially on disasters that cannot easily be predictable such as fire. Preparation for disaster and management of risk empowers educational organisations to mitigate fire related disasters; this means that there are various strategies that these institutions can utilize to improve on their preparations to disasters.

2.1.4 Fire Safety Plans in Schools

White (2011), the system of fire safety should include plans for emergencies stipulating the procedures and processed that should be followed to respond to cases of emergencies such as fire, terrorism and violence. Safety of students is of great significance in a learning institution since it guarantees parents and the stakeholders' confidence and trust of a secure environment for students. In their study, Nakitto and Lett (2012), found that most schools in Uganda did not have fire safety plan. This led to suggestions by the Ministry of Education and management of the school to set safety policies.

Ndiang'ui (2006) found that fire exposure to schools in Kenya was inclined by administrative outline of most schools. There lacked warning signs, disaster preparations plans, fire drills and first aid tools. The study made a proposal on the need to have safety plans to mitigate any form of risks and to counter disaster.

2.1.5 Training of Teachers, Workers and Students on Fire Safety

Makhanu (2009) explains the lack of a fire department in education institutions. This was thought to have been caused by religion (on the belief that God takes care of unpredictable calamites) and negligence. Recommendations were made on the need to educate students on safety measures, what do to incase a disaster strikes and the preparations to make to mitigate the magnitude of occurrence of a disaster.

Makhanu (2009) insists that staff members should have a copy of written instructions on the steps to follow whenever there is a disaster. In larger educational institutes, a specific person is held accountable to organize and train employees on how to conduct themselves in the event of fire. Fire safety policy guidelines require that schools should participate in fire drills at least twice per term.

Kukali (2009) notes that lack of basics concerning fire safety or the measures to take in the event of a calamity include blaming large number of fatalities. Staff and students should participate in fire drill constantly to gain skills and to understand the dynamics of fire calamities what to expect and how to counter fire emergencies efficiently. In most cases, this rarely happens in the local schools. They tend to wait until something happens when then they engage in unnecessary blame game.

2.2 Theoretical Framework

2.2.1 Systems Theory

The study employed a sociological theory and in particular the systems theory as suggested by Peter Senge as individual motivation stems from systems demand. Senge, (1990). The systems theory is based on the fundamental of a very deep and persistent commitment to 'real learning. It is important for everyone to get prepared of making a mistake. If it was pretty obvious what people ought to be doing, then they could already be doing it. People should look for appropriate of dealing with problems other than doing nothing; this is achievable through sharing of ideas and planning what to do. In so doing, this cultivates a culture to solve problems which is based on the understanding that there exists a problem and a solution can be found.

In line with this study, it is important for organisations to accept change and embrace it to reap better results. Calamities caused by fire are severe hence they might lead to loss of life and destruction of property, it is therefore important for educational institutions to take protective measures and prevent any form of loss that might emanate from fire. It is obvious that most people fear introduction of change however, it most cases change is perceived to be good at all times since it seeks to improve the current situation on account of some weaknesses observed in the present situation (Senge 1990)

2.2.2 Protection Motivation Theory (PMT)

Protection motivation theory (PMT) model was anchored in the systems theory. PMT is a health behaviors-change model, which explains how individuals adopt protective measure when a disaster strikes (Rogers, 1983). This theory elucidates about the fear that arise

from communication that exposes individuals against an outcome that is risky (Perloff & Bay, 1991).

This theory points out that the people intent to protect themselves from any of harm is influenced by four beliefs that include risk severity, vulnerability, perceived efficacy and self-efficacy. The theory notes that people's intent to protect themselves are weakened by perceived costs of minimizing reduction of risk behaviour and perceived gains to oppose risk-enhanced behaviour (Pechmann, 2003). Going by this study, the administration of most schools might perceive fire disaster as risky and thus make plans to equip the schools with Fire Fighting equipment. However, they might be limited by finances and this implies that they would be forced to use fewer strategies for fighting fire disasters thus increasing their level of fire disaster unpreparedness.

2.2.3 Risk Reduction Approach

Terms and definitions

Capacities –these include resources these might be both tangible and intangible resources to enable an organisation to recover from calamities.

Disaster – is a calamity that affects property and lives of people.

Disaster Risk Reduction – approaches or measures that are put in place to minimize a disaster or exposure to risky activities.

Emergency Response –an efficient way to respond to disaster that seeks to mitigate the magnitude of the loss.

Hazard –occurrence of an event that can easily cause injury or damage to property and the surrounding.

Mitigation – Measures put in place prior the occurrence of a disaster aimed at minimizing effect of disaster.

Preparedness – actions taken by an individual or organisation to prepare and respond to a calamity.

Rehabilitation –rebuilding of social structures and livelihoods damaged by a calamity to minimize the effect of such as a calamity in future.

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 Risk – the livelihood of occurrence of an event that might lead to suffering or loss

Vulnerability –a situation that minimizes the people's capability to respond to calamities

The aim of this approach is to look at social change and the risks associated with it. It seeks to identify ways in how man is supposed to recover from these disasters. Here it is argued that changes both man-made and natural that take place in society expose man to a number of natural and technological risks such as fire, pollutions, droughts, earthquakes, wars floods etc.

The focus here is on how man is supposed to recover these disasters and especially the immediate recovery after a disaster has struck.

The Disaster Cycle
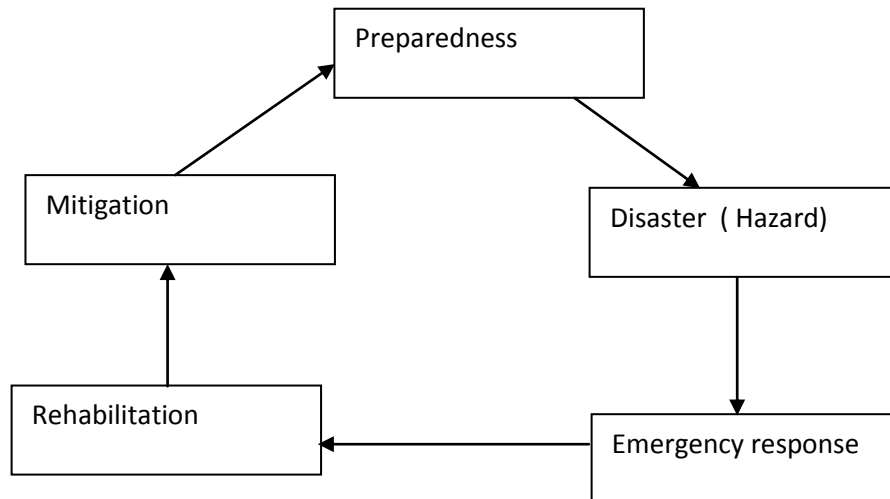
Most of the time we concentrate on relief reconstruction and rehabilitation for example in the case of fire disasters in schools, but this is a reaction as opposed to being proactive and making them prepared for the disaster and giving them the capacity to recover from the disaster.

2.2 The Disaster Cycle The Disaster Cycle is a widely used model to depict a trail of event that follows natural or artificial calamity.

Emergency Response Phase – these consists of activities that are meant to save and preserve lives.

Rehabilitation - This phase is also referred to as early or late recovery that entails restoring housing livelihoods, infrastructure and social systems.

Mitigation and Preparedness – look for pre-disaster activities assuming future occurrence of a peril seeking to minimize the scale of suffering next time.

2.3 Conceptual Framework on Fire Disaster Preparedness in Schools

The conceptual framework gives a outline of how study variables relate. In this research, dependent variable is disaster preparedness (fire) in schools. The independent variables include Fire Fighting equipment, school buildings, fire safety plans and training of teachers, workers and students on fire disaster management.

Figure 2.1 Conceptual Framework

Independent variable   Intervening variable   Dependent variable

```
┌─────────────────┐
│ Awareness and or│
│ experiences of  │
│ fire disasters  │
└─────────────────┘
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┌─────────────────┐
│ Fire safety plans│
└─────────────────┘
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┌─────────────────────┐
│ Fire emergency      │
│ preparedness        │
│   ▪ Fire Fighting   │
│     equipment       │
│   ▪ School          │
│     buildings       │
│     fire escape     │
│     facilities      │
└─────────────────────┘
```

```
┌─────────────────┐
│ Training on fire│
│ emergency       │
│ preparedness    │
└─────────────────┘
```
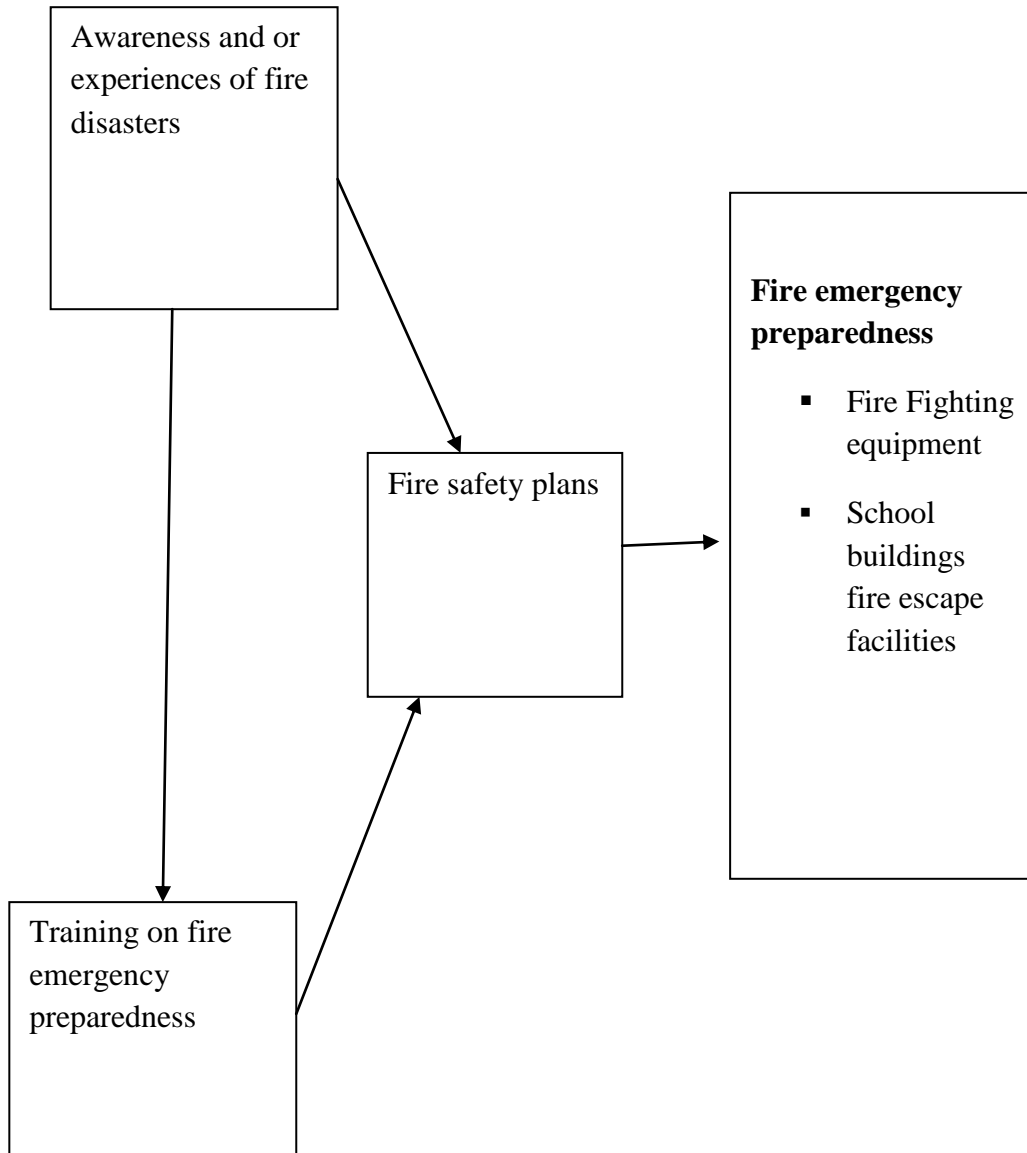
2.4 Summary of literature Review

The reviewed literature revealed that fire disaster preparedness is essential in all secondary schools and those losses, injuries or even fire related deaths can be averted if schools put in place measures to contain fire incidents. While some schools have bought Fire Fighting equipment and adjusted their structures to help fight fire disasters, others have not. Some of the schools with equipment have not fully trained teachers and learners on the way to use them making the schools unprepared for fire disasters. This implies that there is still a knowledge gap as far as fire disaster preparedness of schools is concerned. That made imperative to carry out this study.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter gives a description of how the research methodology was executed. In it is the design that was applied to find out the association between variables , how data was collected and how it was analyzed and presented.

3.1.1 Site description

The study took place in 34 public secondary schools in Nairobi County. These involved an observation of Fire Fighting facilities and equipment such as fire extinguishers, water mist Systems, fire blankets, fire hoses and connectors, fire hose reels, fire hydrant valves. It also involved an analysis of the way the school buildings are constructed with emergency doors, spacing to allow fire brigades, combustible materials etc. Programs of training teachers, students and subordinate staff on fire disaster management were also looked into**.**

3.2 Research Design

According to Burns and Grove (1997), the research design of a study is the end result of a series of decisions made by the researcher concerning how the study will be conducted. The design is closely associated with the framework of the study and guides planning for implementing the study. It is a blueprint for conducting the study that maximizes control over factors that could interfere with the validity of the findings.

3.2.1 Unit of Analysis and Units of Observation

The unit of analysis was fire emergency preparedness in public secondary schools in Nairobi County. The study analyzed Fire Fighting equipment such as Fire extinguishers, water mist systems, fire blankets, fire hoses and connectors, fire hose reels, fire hydrant valves. The study also analyzed training programs on disaster management available for teachers, students and subordinate. Units of observations were the head teachers in public secondary schools in Nairobi county.

3.3 Target Population of the Study

A population is a collection of units possessing similar traits. Polit and Hungler (1999) differentiate between target population and the accessible population. The target population includes all cases that an investigator would consider to make generalization. The accessible population includes all the cases that meet the set out criteria and accessible to the researcher.

Target population for this study consisted of all public secondary schools in Nairobi County. The District Education Officer, 2013 places this at 118 schools. These schools (that were represented by the head teachers) made the target population of the study.

3.4 Sample Size and Sampling procedure

Sampling is a representation of a whole population (Polit & Hungler 1999). In stratified sampling technique the researcher makes an identification of sub-groups in the population while selecting from each sub group (Oso & Onen, 2005).

The sample for the study was selected as follows. First, a list of the 118 public secondary schools in Nairobi County as from the District Education Officer. Seventeen stratum based constituencies that make up Nairobi County were also developed. These included westlands, Dagoreti North, Dagoreti South, Langata, Kibra, Roysambu, Kasarani, Ruaraka, Embakasi South, Embakasi North, Embakasi West, Embakasi East, Embakasi Central, Makadara, Kamukunji, Starehe and Mathare (see map of Nairobi County below). Each school was then put in a ping-pong ball and the ball put in its respective constituency. The constituencies were mutually exclusive i.e. every school in the target population was assigned to only one constituency. They were also collectively exhaustive as no school in the population was excluded. For each constituency (stratum), the balls were put into a large barrel and mixed up, and then two balls were randomly selected. The balls were opened and the names of schools found were noted to form the sample of the study. This was repeated for all the seventeen constituencies to form a sample of 34 schools.

Kothari (2004) added that a bigger sample better represents a population. In this case, 34 schools which were 25% of the target schools were selected. In each school, the head teacher was interviewed.

3.5 Methods of Data Collection

Data collection, according to Burns and Grove (1999), is the accurate and systematic gathering of information relevant to the specific objectives and questions of a study. The study variables are measured using a variety of techniques such as observation, interviews, observation schedule and questionnaires.

3.5.1 Collection of Quantitative Data

Quantitative data was collected by means of questionnaires administered to the head teachers. The questionnaires had both open ended questions that require written responses and closed-ended questions providing predetermined options. Questionnaires were preferred since the wording and sequence is fixed and identical to all respondents. Observation schedule were also be used for data collection. The service of an expert statistician was obtained to facilitate the coding and quantification of data from the completed questionnaires.

3.5.2 Collection of Qualitative Data

A variety of qualitative methods of data collection were employed in this study. These included observations, textual or visual analysis (e.g. from books or vides) and unstructured interviews. These were used to describe the context and phenomenon of fire emergency preparedness in Kenyan schools.

3.6 Validity

The content validity of the questionnaire that was used in this study was determined by the literature review as well as by the judgment of the lecturer in consultation with a statistician.

Face validity of the instrument was determined by an expert statistician and lecturers at the University of Nairobi.

3.7 Reliability

Research experts and a statistician assessed the instrument and the homogeneity of the variables before it was used. Reliability was further ensured through conducting a pretest.

3.8 Ethical Issues

According to Streubert and Carpenter (1999), ethical principles must be followed when doing research. The principle of autonomy stipulates that the right to self-determination and full disclosure (Polit & Hungler 1999). Self-determination principle means that participants enjoy rights to make an independent decision on the kind of responses to give without being influenced. They give information on their consent. The researcher first obtained the consent of the area government authorities which included the county government and education officers.

3.9 Methods of Data Analysis

Since the questionnaire contained both structured and unstructured questions, data was analyzed both qualitatively (for the unstructured sections) and quantitative (for the structured sections).

Data from the structured questions in the questionnaires was translated into numerical codes by the researcher, and data capture was done by statistical analysts using the SPSS (version12). Data was then presented using tables, pie charts, and bar graphs.

3.10 Operational Definitions

This study analyzed fire preparedness in secondary schools in Nairobi County. The variables examined included adequacy of Fire Fighting equipments, training of teachers, students and employees regarding disaster management. All were variables are objective. The fire equipment adequacy was measured by the number of such equipment and their effectiveness and efficiency. Training was measured by the number of courses offered to students, teachers, availability of evacuation plan and availability of assembly points.

3.11 Summary

This chapter presents the methodology that was adopted in undertaking the study. The study adopted descriptive survey design. The target population of the study was all public secondary schools in Nairobi County. However, the researcher used stratified sampling technique to select the schools that were included in the sample. 30 head teachers from the selected schools formed the sample of the study as it was impractical to conduct the study on the entire target population given the concept of convenience, resource constraints and accuracy. Primary data was collected using a structured questionnaire that was completed by the respondents and returned to the researcher. The data was then analyzed using SPSS program.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter deals with data analysis, interpretation and presentation. The results are presented based on the objectives of the study. The data was analyzed using descriptive statistics with the help of Statistical Package for Social Sciences (SPSS). The data analyzed is presented using frequency tables. Interpretation of the findings is given.

4.2 Questionnaire Return Rate

The sample population constituted 34 headteachers. All of them returned filled questionnaires. This implies that the response rate was 100%.

4.3 Social and Demographic Information of The Respondents

This item sought for the head teachers gender, working experience, highest academic qualifications.

4.3.1 Distribution by Gender

The head teachers were asked to indicate their gender and the results are as summarized in Table 4.1

Table 4.1 Gender Distribution

Gender	Frequency (n)	Percentage (%)
Male	23	66.7
Female	11	33.3
Total	**34**	**100.0**

As shown in Table 4.1, most head teachers (67.6%) were male. The remaining 32.4% were females. This shows that there were more male headteachers than female headteachers. This could be because most institutions in Kenya are headed by males, schools included.

4.3.2 Teaching Experience

The headteachers were asked for how long they had been teaching and their responses are as summarized in table 4.2 below.

Table 4.2 Teaching Experience

Duration in years	Frequency (n)	Percentage (%)
0-5	6	17.6
6-10	12	35.2
Over 10	16	47.2
Total	**34**	**100.0**

As evidenced in Table 4.4, majority of the headteachers (47.2 percent) have taught for more than 10 years. When asked for how long the principal has been a head teacher, 22.2 percent said less than 5 years, 33.3 percent said between 6 and 10 years while 44.4 percent said above 10 years. This shows that most headteachers have led the school for more than 5 years hence understand issues to do with fire safety in the school well. When asked for how long they have served in the current school, 44.4 percent of the headteachers said less than 5 years, 33.3 percent said 6 to 10 years while the remaining 22.2 percent said more than 10 years. This means that most headteachers have been in the current station for long enough to understand fire disaster preparedness in the station. This shows that most headteachers have led the school for more than 5 years hence understand issues to do with fire safety in the school well. When asked for how long they have served in the current school, 44.4 percent said less than five years, 33.3 percent said 6-10 years while the remaining 22.2 percent said they had served in their current station for over 10 years.

4.3.3 Level of Education

The head teachers were asked to state their level of education. Table 4.5 below presents their responses. As shown in the table, 5.88 percent said that they have certificates, 8.82 percent said that they have diplomas, 50 percent reported that they had attained bachelors degrees, 32.35 percent said that they had masters degree while the remaining 1 percent stated that they had acquired other academic qualifications not stated in the questionnaire. This shows that most head teachers who took part in the study were well educated and thus understood fire disaster preparedness well.

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Table 4.3 level of Education

Level of Education	Frequency (n)	Percentage (%)
Certificate	2	5.9
Diploma	3	8.8
Degree	17	50.0
Masters	11	32.4
Others	1	2.9
Total	**34**	**100.0**

4.4 Adequacy of Specific Fire Fighting Equipment

The headteachers were asked about the adequacy of specific Fire Fighting equipment and their responses are recorded Table 4.6. As shown in Table 4.11, most headteachers indicated that specific Fire Fighting equipment was not adequate. The most adequate Fire Fighting equipment was reliable water supply and fire exits. The others were mainly inadequate or very inadequate. This was an indication that most schools are unprepared for fire disasters when it comes to adequate Fire Fighting equipment.

Table 4.4 Adequacy of Specific FFE

Fire Fighting equipment	Adequate		Inadequate		Very Inadequate		TOTAL	
	F	%	F	%	F	%	F	%
Fire hydrants	0	0	23	67.65	11	32.35	**34**	**100**
Fire extinguishers	0	0	23	67.65	11	32.35	**34**	**100**
Fire resistive material	0	0	23	67.65	11	32.35	**34**	**100**
Fire exits	23	67.65	8	23.53	8.82	11.1	**34**	**100**
Fire protection devices	6	17.65	19	55.88	9	26.47	**34**	**100**
Fire blankets	12	35.3	7	20.58	15	44.12	**34**	**100**
Fire escape ladder	0	0	15	44.12	19	55.88	**34**	**100**
Heat/smoke detectors	4	11.76	7	20.58	23	67.64	**34**	**100**
Fire alarm	7	20.59	10	29.41	17	50	**34**	**100**
Fire hose and nozzles	0	0	8	23.53	26	76.47	**34**	**100**
Fire fighters' outfits	4	11.76	7	20.58	23	67.66	**34**	**100**
Fire sand bucket	11	32.35	0	0	23	67.65	**34**	**100**
Breathing apparatus	7	20.58	0	0	27	79.42	**34**	**100**
Reliable water supply	22	64.7	2	5.88	2	5.88	**34**	**100**

4.4.1 Inspection of Fire Fighting Equipment

When asked about how periodically Fire Fighting equipment are checked, the head teachers and teachers responded as shown in Table 4.7

Table 4.5 Inspection of Fire Fighting Equipment

No. of inspections	Frequency (n)	Percentage (%)
Once per term	8	23.5
Once per year	10	29.5
Once every two years	8	23.5
Never	8	23.5
Total	**34**	**100.0**

As shown in Table 4.7, majority of the headteachers reported that the Fire Fighting equipment was inspected at most once per year. There were also a significant number of head teachers who reported that the Fire Fighting equipment was never inspected. This shows that in case of a fire disaster, even the head teachers might not know whether the Fire Fighting equipment is still in a working condition because they are rarely inspected. This shows lack of fire disaster preparedness.

4.4.2 Fire Fighting Equipment to be added for better Fire Disaster Preparedness

Most of head teachers, teachers and students suggested an addition on fire exits, reliable water supply, fire extinguishers, smoke detectors among others for schools to be better prepared for fire disasters.

4.5 Fire Safety Plans and Fire Disaster Preparedness

The head teachers suggested the following ways to improve fire disaster preparedness in relation to school buildings. Fire extinguishers should be easily accessible, windows should not be grilled, exits should be cleared of obstructions, fire extinguishers should be increased and doors should open outwards and increase in the size of doors.

4.5.1 Evacuation Plans in the School

The head teachers were asked whether the school has evacuation plans in the event of fire disaster and they responded as presented in table 4.8 below

Table 4.6 Evacuation Plans in The School

Response	Frequency (n)	Percentage (%)
Yes but it has never been used	4	11.8
Yes and it has been used	15	44.1
No but there is a plan that it will be made	15	44.1
TOTAL	**34**	**100.0**

Upon asked if the schools have evacuation plans, 44.1 percent said that they have such plans and have been used, 44.1 percent said that they do not have such plans but there is a plan that will be made while the remaining 11.8 percent said that they have such plans but they have never used them. The ones that did not have evacuation plans reported that plans were in line to have such plans. This was an indication that headteachers are making efforts to improve fire disaster preparedness in schools.

4.5.2 Effectiveness of Emergency Plans for Fire Disaster

When asked on the effectiveness of the emergency plans for fire disaster, the head teachers responded as shown in table 4.9

Table 4.7 Effectiveness of Emergency Plans for Fire Disaster

Effectiveness	Frequency (n)	Percentage (%)
Effective	8	23.5
Moderately effective	15	44.0
Ineffective	8	23.5
Very ineffective	3	9.0
TOTAL	**34**	**100.0**

As shown in Table 4.25, most headteachers (44 percent) reported that emergency plans in case of fire were moderately effective. This implies that even if schools have emergency plans, in case of a fire disaster, such plans may not effectively help them. This shows inadequate preparedness in fire disaster management.

4.5.3 Evacuation Plans for Vulnerable Persons

When asked whether the schools have evacuation plans for vulnerable persons, all the head teachers said that their schools do not have such plans. This is a clear indication that most schools do not consider the physically challenged as far as fire disasters are concerned.

4.5.4 Fire Alert Procedures

When asked whether the schools have fire alert procedures, 33.3 percent of the head teachers said yes while 66.7 percent said no. The implication is that in most of the schools, if a fire broke out, the students, teachers and non teaching staff may not know what to do because of lack of fire alert procedures. This is lack of fire disaster preparedness.

4.5.5 Number of Assembly Points in case of Fire Disaster

The head teachers were asked the number of assembly points that their schools have. Their responses are presented in table 4.10 below.

Table 4.8 Number of assembly points in case of fire disaster

Assembly points	Frequency (n)	Percentage (%)
No Assembly Points	25	73.5
Have Assembly Points	9	26.5
TOTAL	**34**	**100.0**

As shown in the table, 73.5 percent of the head teachers said that there were no assembly points in their schools while the remaining 26.5 percent said there were assembly points. This implies that in most schools, the stakeholders would not where to assemble in case a fire broke out. This shows lack of fire disaster preparedness.

4.5.6 Times Teachers and Students are reminded of the Evacuation Plan

When asked how often teachers, non teaching staff and students reminded of the evacuation plan, the head teachers, teachers and students responded as shown in Table 4.11

Table 4.9: Times teachers and students are reminded of the evacuation plan

No. of times	Frequency (n)	Percentage (%)
Yearly	23	67.6
Half yearly	8	23.5
Never	3	8.8
Total	**34**	**100.0**

When asked about how often teachers, non-teaching staff and students are reminded of the evacuation plan; majority of the head teachers (67.6%) said never, 23.5 percent of the head teachers said yearly and 8.8 percent said half yearly. The implication is that even if schools have evacuation plans, they might not help school stakeholders in case of a fire disaster because they are rarely reminded of the same.

4.5.7 Improving Fire Safety Plans for Better Fire Disaster Preparedness

The head teachers, teachers and students were asked about the ways of improving fire safety plans for better fire disaster preparedness and they suggested that they should be

made aware of evacuation plans, all stakeholders should be reminded of evacuation plan, assembly points should be identified and stakeholders notified, schools should have fire alert procedures and schools should have many assembly points in case of a fire.

4.5.8 Improving Fire Safety Plans for Better Fire Disaster Preparedness

The head teachers were asked about the ways of improving fire safety plans for better fire disaster preparedness and they suggested that they should be made aware of evacuation plans, all stakeholders should be reminded of evacuation plan, assembly points should be identified and stakeholders notified, schools should have fire alert procedures and schools should have many assembly points in case of a fire.

4.6 Training on Fire Safety

4.6.1 Teachers and Students Training on Fire Safety

On whether the members of the staff have been trained on fire safety, majority of the head teachers (77.8%) said no while 22.2 percent of the head teachers said yes.

4.6.2 Reasons for Training on Fire Safety

Of the headteachers who took part in the study, majority (78.8 percent) said that teachers and students were not trained on fire safety while 22.2 percent reported that teachers are trained on fire safety because fire disaster can occur at any time. The head teachers who said they have not trained their members of staff said that there has never been a need to train them (22.2 percent) while 22.2 percent said there are no materials to teach them with and 11.1 percent said that there has never been a plan to train them but now there

will be. The teachers reported that the training on fire safety is done because it is required by the ministry of education while the reasons for not training were that there has never been a need to train them (42.9 percent) and that, education officers do not check (17.9 percent). Of the students who participated in the study, 50.5 percent said that there has never been a need to train them, 39.4 percent said that there are no materials to teach them with while 39.4 percent gave others reasons. This shows that school managers have not yet taken the issue of fire safety to the teachers and students' level. Given that in most of fire disasters in schools are in the dormitories and at night, it would only be prudent to train the students on fire safety. Failure to do that is a sure sign of fire disaster unpreparedness.

4.6.3 Training of Specific School Stakeholders on Fire Safety

The findings in Table 4.12 showed that students, teachers and the non teaching staffs have not been trained on fire safety. In most schools, new teaching and non-teaching staff members were not taken around the primary escape routes of the school and most schools did not provide new individuals in the school with a personal copy of prepared written instructions on what to do in case of a fire. Failure to train the teachers, non-teaching staffs and students on fire safety shows fire disaster unpreparedness.

Table 4.10: Training of specific school stakeholders on fire safety

TRAINING ON FIRE SAFETY	A		D		SD		TOTAL	
	F	%	F	%	F	%	F	%
Students in the school have been trained to fight fire	15	44.1	0	0.0	19	55.8	**34**	**100**
New teaching and non-teaching staff members taken around the primary escape routes of the school	11	32.4	4	11.8	19	55.9	**34**	**100**
Some individuals in the school are provided with a personal copy of prepared written instructions on what to do in case of a fire	7	20.6	8	23.5	21	61.8	**34**	**100**
Head teacher is trained in fire disaster management	7	20.6	15	44.1	12	35.3	**34**	**100**
Teachers are trained in fire disaster management	0	0.0	22	64.7	12	35.3	**34**	**100**
Kitchen staffs are trained in fire disaster management	14	41.2	9	26.5	11	32.3	**34**	**100**
Lab technicians are trained in fire disaster management	11	32.4	14	41.2	9	26.4	**34**	**100**
School drivers are trained in fire disaster management	11	32.4	11	32.4	12	35.3	**34**	**100**
School security personnel are trained in fire disaster management	0	0.0	22	64.7	12	36.3	**34**	**100**
School nurse is trained in fire disaster management	11	32.4	15	44.1	8	23.5	**34**	**100**

4.7 Results of the Observation Schedule

The results of the observation schedule are as summarized in Table 4.13

Table 4.11 Results of the observation schedule

Particulars	Details per school
Number of teachers, workers and students	Teachers 20-34 workers 9-22 students 300-634
Number of Fire Fighting equipment	Less than 13
Fire Fighting equipment in working condition	Less than 13
Types of Fire Fighting equipment	Extinguishers, fire alarms
Number of buildings	Between 8 and 55
Number of fire exits per building	One to three exits
Number of emergency doors per building	None or one
Number of copies of fire safety plans	None or one
Number of people with fire safety plans	None or one
Number of trained people on fire safety	Less than three
Number of people who can do first aid	Between one and 150
Fire safety procedure	None or one

As shown in Table 4.13, most schools had 20 to 34 teachers, 9 to 22 workers and 300 to 634 students. However, despite the number of people in the schools, the number of Fire Fighting equipment was low with most schools having 5 while the ones with the most Fire Fighting equipment had 13. This is not proportional to the number of people in the schools. Out of the Fire Fighting equipment in a school, 3 on the lower side and 13 on the higher side are in working condition. This implies that there are schools with Fire Fighting equipment which are not in a working condition and this shows fire disaster unpreparedness. The most mentioned Fire Fighting equipment in schools is fire extinguishers and fire alarms. The number of buildings in the schools ranged between 8 and 55 while the number of fire exits per building was 1 to 3. The number of emergency doors per building was either none or 1. Most schools had no copies of fire safety plans and the ones that had most copies had only one. The number of trained people on fire safety was 3 per school at most. This is a very high level of fire disaster unpreparedness. The numbers of people who can do first aid in case of fire were less than 5 in most schools. However in one of the school 150 people could do first aid as a result of being trained by St. John's community. Most schools had no fire safety procedure and the ones which had, had only one. According to the observation schedule, most schools are not fully equipped to deal with fire disaster. This is in terms of Fire Fighting equipment, safety plans and skills. This implies that most school in Nairobi County are not prepared in case of fire disasters

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary, conclusions and recommendations of the study as well as suggestions for further study.

5.2 Summary

It has emerged that most schools in Kenya have no capacity to handle emergencies like fire, and are yet to even implement safety standards manual produced in 2008 by the ministry of education. In Kenya, school fire disasters have been reported in Nyeri high School, Giakanja Boys Secondary School and Endarasha High School among others. Fires in schools are a public concern because of the increased incidences, injuries and deaths of students not to mention the destruction of property. Even if schools may face other problems like strikes and indiscipline, these rarely result into deaths like fire disasters. From the literature in the background, it is clear that schools seem not well prepared for fire disasters. The research adopted a descriptive survey. The target population for this study consisted of the 118 public secondary schools in Nairobi County. This study employed stratified sampling technique to obtain the sample population of 34 principles. Data was collected by means of questionnaires administered to the head teachers and data collected from respondents was analyzed through

descriptive statistics. The results were presented using frequency tables and the findings are as discussed in the following paragraphs.

5.3 Major Findings

According to the findings of the first objective majority of the head teachers reported that the Firefighting equipment in schools is inadequate. The equipments which were more adequate were water supply, fire alarm, fire extinguishers and fire exits. This shows that most schools have inadequate Fire Fighting equipment and the administration, staff, non-teaching staff and the students are still likely to suffer in case a fire broke out.

The findings also showed the Fire Fighting equipment is rarely inspected. This shows that in case of a fire disaster, even the school stakeholders might not know whether the Fire Fighting equipment is still in a working condition because they are rarely inspected. This is supported by Akali, Khabamba and Muyinga (2009) who found out that Fire Fighting equipment is rarely inspected or serviced. This shows lack of fire disaster preparedness

.

The second objective was to determine the extent to which school buildings are constructed in relation to policy provisions pertaining to fire disaster preparedness. It was found out that fire exits are there but most respondents reported that they are not easily accessible meaning that they might still not help them in case of a fire disaster. Most respondents reported that there are fire extinguishers but their inaccessibility may not help the students, teachers or non-teaching staff in case of a fire disaster. Most schools have not used combustible materials for decorations which is a positive when it comes to fire disaster preparedness. In addition, most schools have taken caution as far as grilling of windows in concerned and this is a sign of fire preparedness. This is supported by Marion and Maingi (2010). Most doors in school buildings swing inwards which is very dangerous in case of a fire disaster inside the buildings. In majority of the schools, the boarding facilities have been designed in a way that they cannot lock students inside incase of fire disaster but this is not the case as far as classrooms are concerned.

This is in line with Oduor's (2012) study. Most schools halls also lack emergency doors and fire extinguishers. However, in as far as the kitchen, offices and laboratories are concerned, most head teachers and teachers indicated a high level of fire disaster preparedness.

Findings on the third objective showed that majority of schools have evacuation plans but they have never used them. Having such plans is supported by White (2011) who highlighted that fire safety plans are important as they increase the level of preparedness in case of a fire disaster. However, in the schools in Nairobi count, such plans have never been used. This is in line with Nakitto and Lett (2012) who found out that; schools in Uganda had no fire safety plans. However, it is contrary to White (2011) who highlighted that schools should have fire safety plans outlining what should be done in case of a fire disaster. As far as evacuation plans are concerned, most schools do not remind the immediate stakeholders of the plans may mean that the plans may not help them in case of fire disaster. This shows ill-preparedness incase of fire as supported by Niangui (006)

The fourth objective showed that most members of staff and all students have not been trained. This is in line with Makhanu's (2009) and Kukali's (2009) findings. Majority of schools do not have having some individuals in the school personal copy of prepared written instructions on what to do in case of a fire. Of the school stakeholders trained on fire safety are laboratory technicians, school security and school nurse. However, majority of the other stakeholders are not trained. All these show that school stakeholders lack in the necessary skills of fire disaster management and hence in case of a fire

disaster, most of them may not know what to do. This is lack of fire disaster preparedness.

5.4 Conclusion

The study concludes that schools' Fire Fighting equipment are inadequate hence contributing to fire disaster unpreparedness. The Fire Fighting equipment available in most schools is fire extinguishers, fire alarms and fire exits. The other Fire Fighting equipments are very inadequate and the head teachers proposed that they should be added. Schools have made effort to improve fire disaster preparedness but their preparedness in still poor and needs to be improved. The kitchen, laboratory and offices have the necessary equipment for fire disaster. However, fire extinguishers were found not to be accessible; exits are there but have obstructions and classroom doors mostly and inwards. Schools are not well prepared in fire disaster management because most school stakeholders are not trained in the same. Majority of schools do not have individuals in the school with a personal copy of written instructions on what to do in case of a fire disaster

5.5 Recommendations

The researcher recommends the following:

i)   proportional to the number of buildings and people in the schools. It is also recommended that the Fire Fighting equipment in schools should be inspected more often to ensure that they are always in a working condition.

ii)   Based on the findings from the second objective, it is recommended that fire extinguishers should be easily accessible, windows should not be grilled, exits

should be cleared of obstructions, fire extinguishers should be increased and doors should open outwards.

iii)   Based on the findings from the fourth objective, it is recommended that all stakeholders should be trained in the same. They should as well be trained on how to use the fire equipment in school in case of a fire disaster. All stakeholders should also be trained on how to handle fire casualties. Fire Fighting experts should also be invited in schools to talk to the stakeholders on fire disaster management.

5.6 Suggestions for Further Research

The researcher suggests that:

i)   A similar study should be done in other areas in Kenya to check on fire disaster preparedness in schools as cases of fire disasters are on the rise in Kenya.

ii)   There should be a comparative study on fire disaster preparedness in the private and public schools in Kenya.

iii)   A study to establish the level of risk of fire disasters in schools in Kenya should also do carried out.

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APPENDICES

APPENDIX 1: INTRODUCTION LETTER

Isaiah Nyariki

P.O Box 3497

Nakuru, Kenya

Tel: 0721811517

To …………………………………………………….

Dear Sir or Madam,

REF: REQUEST FOR PARTICIPATION IN RESEARCH STUDY

I am a final year Master of Arts student in university of Nairobi. I am specializing in Advanced Disaster Management. I am currently undertaking research study on the level of fire disaster preparedness in secondary schools in Nairobi County.

I would be grateful if you could spare some time and complete the enclosed questionnaire. Your identity will be treated with utmost confidentiality. Your timely response will be highly appreciated.

Yours faithfully,

Isaiah Nyariki

APPENDIX 2: RESEARCH QUESTIONNAIRE

My name is Isaiah, a final year student in the University of Nairobi. I am carrying out a study on fire disaster preparedness in schools in Nairobi County. The information collected will help to gauge the level of preparedness in fire disasters in schools. Kindly respond honestly and accurately to questions listed below. Your identity will be treated with utmost confidence and the information collected will not be used for any other purpose other than which pertains to this research.

Section I: Demographic Information

Please provide the information about you and your school. Tick appropriately (√).

1. Please indicate your gender

   Male ( ) Female ( )

2. For how long have you been a teacher?

   0-5yrs ( ) 6-10yrs ( ) Above 10yrs ( )

3. For how long have you served in the current station?

   0-5yrs ( ) 6-10yrs ( ) Above 10yrs ( )

4. Kindly tick your academic and professional qualifications as applicable below.

   Certificate ( ) Diploma ( ) Degree ( ) Masters ( ) Others ( )

5. What category is your school? Tick as appropriate.

National ( )

County ( )

District ( )

Section II: Fire Fighting Equipment

6. Are the Fire Fighting equipment in your school adequate?

Yes ( ) No ( ) I don't know ( )

7. Kindly indicate the level of adequacy of the following Fire Fighting equipment in your school

STATEMENT	Very adequate	Adequate	Inadequate	Very inadequate
Fire hydrants				
Fire extinguishers				
Fire-resistive materials				
Fire exits				
Fire protection devices				
Fire blankets				
Fire escape ladder				

Heat/smoke detectors				
Fire alarm				
Fire hose and nozzles				
Fire fighters' outfits				
Fire sand bucket				
Self contained breathing apparatus				
Reliable water supply				

8. How periodically is Fire Fighting equipment inspected?

Once per term ( ) Once per year ( ) Once every two years ( ) Never ( )

9. Kindly suggest three Fire Fighting equipment which needs to be added in the school to improve fire preparedness in terms of adequacy of Fire Fighting equipment

....

Section III: School Buildings and Fire Safety

10. Are there fire exits in your school?

Yes and they are accessible to all ( )

Yes but they are not easily accessible ( )

I don't know ( )

No but there is a plan that they will be installed ( )

No and there is no plan in the near future for their installation ( )

11. Kindly indicate your level of agreement to the following statements in relation to school buildings and fire safety where: Strongly Agree = SA, Agree = A, Disagree = D and Strongly Disagree = SD

STATEMENT	SD	A	D	SD
Students in the school have been trained to fight fire				
New teaching and non-teaching staff members taken around the primary escape routes of the school				
Some individuals in the school are provided with a personal copy of prepared written instructions on what to do in case of a fire				
Head teacher is well trained in fire disaster management				
Teachers are adequately trained in fire disaster management				
Kitchen staffs are well trained in fire disaster management				

Lab technicians are well trained in fire disaster management				
School drivers are trained in fire disaster management				
School security personnel are well trained in fire disaster management				
School nurse is well trained in fire disaster management				

12. Please suggest three ways in which the school buildings can be improved as a strategy for ensuring fire safety

....

Section IV: Fire Safety Plans

13. Does your school have an evacuation plan in the event of fire?

Yes but it has never been used ( )

Yes and it has ever been used ( )

I don't know ( )

No but there is a plan that it will be made ( )

No and there is no plan that it will be made in the near future ( )

14. How effective are the emergency plans for fire disaster in your school?

Very effective ( ) Effective ( ) moderately effective ( ) Ineffective ( ) Very ineffective ( )

15. Does your school have evacuation plans for vulnerable persons (e.g. physically disable persons) in case of fire Yes ( ) No ( )

16. Does your school have fire alert procedures? Yes ( ) No ( )

17. How many assembly points does your school have in case of fire?

None ( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( )

18. How often are the teachers, non-teaching staff and students reminded of the evacuation plan in case of fire?

Yearly ( ) Half yearly ( ) Per term ( ) Monthly ( ) Weekly ( )

Never ( )

19. Kindly propose three ways fire safety plans should be improved in your school

....

Section V: Training on Fire Safety

20. a) Have members of your teaching and non teaching staff been trained or equipped to fight a fire? Yes ( ) No ( )

b) If yes in (a) above, give main reason

Fire disaster can occur any time ( )

It's a preventive measure to avoid damage, injuries and death ( )

It is required by the ministry of education ( )

Educators feel safer when the staffs are trained on fire safety ( )

Any other (specify)..

c) If no in (a) above, tick the most applicable response

There has never been a need to train them ( )

Education officers do not check ( )

There are no materials to teach them with ( )

They are not willing to be taught ( )

Any other (specify)..

21. Kindly indicate your level of agreement to the following statements in relation to training in fire disaster management where: Strongly Agree = SA, Agree = A, Disagree = D and Strongly Disagree = SD

STATEMENT	SA	A	D	SD
Students in the school have been trained to fight fire				
New teaching and non-teaching staff members taken around the primary escape routes of the school				
Some individuals in the school are provided with a personal copy of prepared written instructions on what				

to do in case of a fire				
Head teacher is well trained in fire disaster management				
Teachers are adequately trained in fire disaster management				
Kitchen staff are well trained in fire disaster management				
Lab technicians are well trained in fire disaster management				
School drivers are trained in fire disaster management				
School security personnel are well trained in fire disaster management				
School nurse is well trained in fire disaster management				

22. Propose three ways in which training on fire safety can be improved

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APPENDIX 3: OBSERVATIONAL SCHEDULE

Details	Details
Number of teachers, workers and students	
Number of Fire Fighting equipment	
Fire Fighting equipment in working condition	
Types of Fire Fighting equipment	
Number of buildings	
Number of fire exits per building	
Number of emergency doors per building	
Number of copies of fire safety plans	
Number of people with fire safety plans	
Number of trained people on fire safety	
Number of people who can do first aid in case of fire	
Fire safety procedure	

APPENDIX 4: BUDGET

|	Cost category	Amount in Kenya Shillings
1	Transport to and From Nairobi (2 trips)	2,000
2	Overnight stay in Nairobi (inclusive of food)	3,000
3	Printing of questionnaires and observation sheet	2000
4	Use of computer and associated resources e.g. electricity	500
5	Report binding (3 copies)	2,000
5	Contingency (5%)	3,850
	Total budget	**13, 350**

APPENDIX 5: PUBLIC SECONDARY SCHOOLS IN NAIROBI COUNTY

1   20401001   AQUINAS HIGH SCHOOL – Boys Boarding

2   20401002   HIGHWAY SECONDARY SCHOOL – Boys Day

3   20401003   HURUMA GIRLS' HIGH SCHOOL – Girls Day & Boarding

4   20401004   OUR LADY OF MERCY SECONDARY SCHOOL SOUTH B – Girls
    Day

5   20401005   OFAFA JERICHO HIGH SCHOOL – Boys Boarding

6   20401006   NILEROAD SECONDARY – Girls Day

7   20401008   ST. TERESA'S BOYS SECONDARY SCHOOL – Boys Day

8   20401008   MAKONGENI SECONDARY SCHOOL – Mixed Day

9   20401081   RUARAKA HIGH SCHOOL – Mixed Day

10   20401084   BURUBURU GIRLS SECONDARY SCHOOL – Girls Boarding

11   20401088   OUR LADY OF FATIMA SECONDARY SCHOOL – Mixed Day

12   20401233   BABA DOGO SECONDARY SCHOOL – Mixed Day

13   20401258   C.G.H.U SECONDARY SCHOOL – Mixed Day

14   20402001   EASTLEIGH HIGH SCHOOL – Boys Day

15   20402003   MAINA WANJIGI SECONDARY SCHOOL – Mixed Day

16   20402004   UHURU SECONDARY SCHOOL – Boys Day

17   20402005   KAMUKUNJI SECONDARY SCHOOL – Mixed Day

18   20402006   O.L.M SHAURI MOYO GIRLS SEC. SCHOOL – Girls Boarding

19   20403001   JAMHURI HIGH SCHOOL – Boys Day

20   20403002   PARKLANDS SECONDARY SCHOOL – Boys Day

21 20403003 PUMWANI SECONDARY SCHOOL – Boys Boarding

22 20403004 NGARA GIRLS' HIGH SCHOOL – Girls Boarding

23 20403005 ST TERESA'S GIRLS SECONDARY SCHOOL – Girls Day

24 20403019 NDURURUNO SECONDARY SCHOOL – Mixed Day

25 20403024 MURANG'A ROAD MIXED DAY SECONDARY SCHOOL Mixed

26 20403026 PUMWANI GIRLS SECONDARY SCHOOL – Girls Day

27 20404001 LANG'ATA HIGH SCHOOL – Mixed Day

28 20404022 KAREN ' C ' SECONDARY SCHOOL. – Mixed Day

29 20404024 OLYMPIC HIGH SCHOOL – Mixed Day

30 20404025 RAILA EDUCATIONAL CENTRE – Mixed Day

31 20405001 DAGORETTI HIGH SCHOOL – Boys Boarding

32 20405002 UPPER HILL SCHOOL – Boys Boarding

33 20405003 MOI GIRLS' SCHOOL NAIROBI – Girls Boarding

34 20405004 PRECIOUS BLOOD RIRUTA – Girls Boarding

35 20405005 MUTUINI HIGH SCHOOL – Boys Day

36 20405006 RUTHIMITU SECONDARY SCHOOL – Mixed Day

37 20405007 NEMBU GIRLS HIGH SCHOOL – Girls Boarding

38 20405008 RUTHIMITU GIRLS SEC SCHOOL – Girls Day

39 20405009 DAGORETTI MIXED SEC SCHOOL – Mixed Day

40 20406001 PARKLANDS ARYA GIRLS HIGH SCHOOL – Girls Boarding

41 20406002 STATEHOUSE GIRLS H. SCH – Girls Boarding

42 20406007 KANGEMI HIGH SCHOOL – Boys Boarding

43 20406009 HOSPITAL HILL HIGH SCHOOL – Mixed Boarding

44	20406011	ST. GEORGE'S GIRLS' SECONDARY SCHOOL – Girls Boarding
45	20406012	NAIROBI MILIMANI SECONDARY SCHOOL – Boys Day
46	20406018	LAVINGTON MIXED SECONDARY SCHOOL – Mixed Boarding
47	20406019	HIGHRIDGE MIXED SECONDARY SCHOOL – Mixed Boarding
48	20407002	KAHAWA GARRISON SECONDARY SCHOOL – Mixed Day
49	20407004	KAMITI SECONDARY SCHOOL – Mixed Day
50	20408001	KAYOLE SECONDERY SCHOOL – Mixed Day
51	20408007	EMBAKASI GIRLS SECONDARY SCHOOL – Girls Boarding
52	20408014	PETER KIBUKOSYA SECONDARY SCHOOL – Mixed Day
53	20408015	KAYOLE SOUTH SECONDARY SCHOOL – Mixed Day
54	20409001	DANDORA SECONDARY SCHOOL – Mixed Day
55	20409002	MUHURI MUCHIRI BOYS HIGH SCHOOL – Boys Boarding
56	20409003	HON. DR. MWENJE SECONDARY SCHOOL – Mixed Day
57	20409004	USHIRIKA SECONDARY SCHOOL – Mixed Day
58	20409005	JEHOVA JIRE SECONDARY SCHOOL – Mixed Boarding
59	20409006	DRUMVALE SECONDARY SCHOOL – Mixed Boarding
60	20409007	ST. GEORGE ATHI SECONDARY SCHOOL – Mixed Boarding

APPENDIX 6: Map of Nairobi County
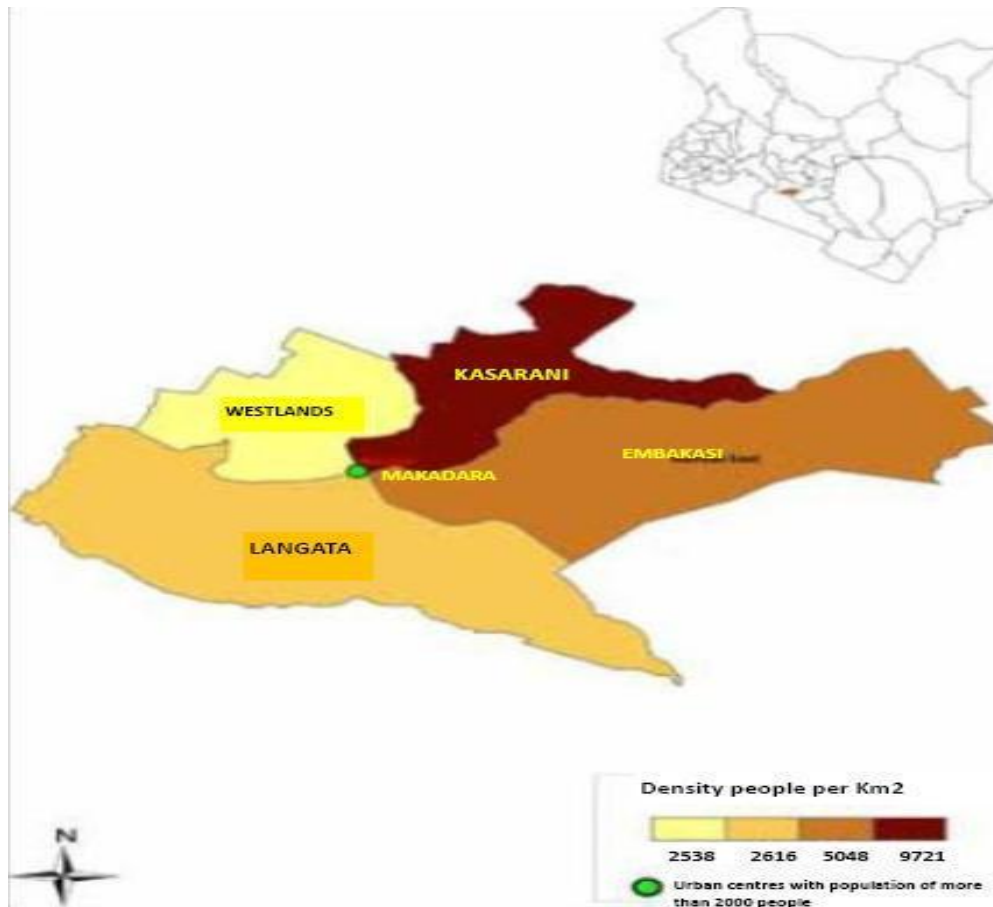
Source: Adopted From Google Maps (2015)