

UNIVERSITY OF NAIROBI

FACULTY OF ARTS

DEPARTMENT OF SOCIOLOGY AND SOCIAL WORK

THE PREPAREDNESS AND CAPACITY OF THE NAIROBI
CITY FIRE SERVICE IN RESPONDING TO FIRE DISASTERS
IN THE CITY.

COURSE - CSO 698: PROJECT PAPER

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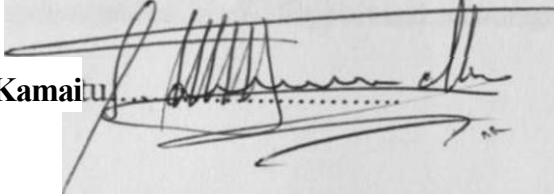
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Declaration

This is my original work and has not been presented for examination in any other institution.

Kagiri Kamaiu



Date

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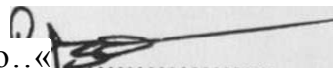
This paper was submitted for examination with our approval as University Supervisors.

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Dedication

This project is dedicated to my wife dear Rachel Wanjiru Kamatu and my dear children Mark Kamatu. Njeri Kamatu. Tanya Kamatu. Mumbi Kamatu and their cousin Tanya Njeri for their understanding, moral support and encouragement throughout the course.

Acknowledgement

I wish to express my sincere thanks to my supervisors Prof.E.K. Mburugu and Mr.B.Mutsotso for their guidance and patience without which I would not have completed this project.

I appreciate the contribution and all kinds of support accorded me by other lecturers and my friends throughout the study. To them all. I say thank you.

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Abbreviations

NADIMA - National Disaster Management Authority

N G O - Non -Governmental Organisation

US - United States

USFA - United States Fire Administration

C02 - Carbon Dioxide

Kshs - Kenya Shillings

NCC - Nairobi City Council

WMD - Weapons of Mass Destruction

NCBDA -Nairobi Central Business District Association

ABSTRACT

The study investigated the institutional capacity and state of preparedness of Nairobi City Council to suppress fire disasters in the city.

The study also focused on the Councils current preparedness against what ought to be focusing on training, tools, equipment, machines, communication gadgets and budgets.

The study was guided by three research objectives, namely:

- (i) To establish factors which inform the level of response towards fire outbreaks.
- (ii) To establish how city development has impacted on City Council of Nairobi fire services to the public
- (iii) To find out the working conditions of City Fire service personnel.

The study used qualitative and quantitative research methods. Qualitative data was obtained from key informants while quantitative data was obtained from junior staff of the Nairobi fire Brigade. Secondary data was obtained from documents in the department dealing with fire suppression

The study established that

- (i) The Nairobi Fire Brigade does not have an elaborate functional structure. The centralization of functions is a major hindrance in their operations.
- (ii) There is laxity in public education. The personnel education entry qualifications are very low and the number of staff members in the fire is also very low compared to international set standards.
- (iii) The current city planning is a major hindrance to efficiency of the fire Brigade operation. Emergency lanes, narrow roads, poor housing and construction are some of the major problems facing fire brigade.
- (iii) Low capitalisation of the fire Brigade has negated its ability to operate efficiently.

Finally the study established that the fire brigade is a fundamental service which should be given the first priority in the City's annual budgetary provisions and planning. It has proved important especially when it comes to dealing with fire and other related disasters which would have caused bigger damages if they were left unattended.

As well, it offers crucial education in terms of fire safety precaution measures as well as dealing with fire disaster itself.

Further it was found that the staff have low morale due to the poor working conditions .Given the poor state of the Nairobi Fire Brigade private fire fighters have emerged to fill in this gap

CHAPTER ONE: BACKGROUND AND PROBLEM STATEMENT

1.0 Background:

Disaster is any event [with or without warning] which causes or threatens: death or injury, damage or injury, damage to property or the environment, disruption to the community which, because of the scale of its effects, cannot be dealt with by emergency services and the local authorities as part of their everyday activities (Tucker, 1999).

Fire is a burning that produces heat or destructive burning (Oxford International Learners' Dictionary, 2004). Couless and Eskill (2001) note that for fire to be produced a chemical reaction involving oxygen, fuel and heat has to take place.

In ancient times, people believed that fire was the wrath of the gods and no attempts were made to form fire-fighting organizations as this was defying the gods. During the Roman times, the Romans did not appreciate the ill temper of the deity. Therefore, they formed what was probably the first organized band of fire fighters and called it *thefamilla publico*. They recruited the fire fighters from slaves. They used buckets, chains, and simple squirts in fire fighting.

The Romans invaded Britain with the fire fighting equipment for a period of 500 years and introduced fire fighting to Britain. The Romans then left with their equipment. This took Britain more than 1000 years to form another fire fighting organization. In 1666, there was the great fire of London, which prompted insurance firms to form fire-fighting organizations in 1667. In 1824, the James Braidwood Superintendent of London Fire Brigade was established. In 1938, Fire Brigades Act was enacted and it compelled the Local Authorities to provide for fire services. The Fire Services Act, which provided for the appointment of inspector, assistant inspectors and other officers to obtain information on how fire authorities discharged their responsibilities and to advise them on technical matters, was passed in 1947.

Nairobi Fire Brigade was established in the beginning of 1900. Provision for the establishment of fire service was made in 1906 and the first fire station was opened in 1907 along what is today known as Tom Mboya Street. The fire-fighting brigade composed of a one European and a handful of Africans with only one fire engine.

By the end of the year 2006, the Nairobi City Council fire and ambulance sendee had 115 officers, 3 fire stations 5 fire appliances and 4 ambulances. The brigade is organized on a three-watch system of an average 60 working hours a week.

In addition to its main function of fire fighting and fire prevention, a fire brigade may be called upon to deal with emergencies that are beyond the capacity of ordinary citizen. For instance, the people trapped in lifts, under vehicles or in machinery, in rescuing persons overcome by fumes, pumping out flooded premises and in other similar emergencies.

Nairobi became a city in 1906 (James, 1950). From the initial stages, the location of Nairobi was controversial. Since its foundation, Nairobi witnessed unprecedented population growth (Thorton. et al. 1948). The tremendous growth of the city even when compared to other Kenyan urban centres made Nairobi grow into a primate *city*.

Urbanization is one of the major challenges that Nairobi has to cope with in fighting fire disaster. Uncontrolled population growth has made planning sporadic, as it is hard to determine the number of people and consequently the right budget to provide for fire-fighting services. Equally limiting is the encroachment of the buildings on the road reserves and proliferation of slums'. The city is poorly planned. Not all spaces for instance, should be filled with buildings and petrol stations; there is a need for open spaces in case of fire and other emergencies.

By the year 2000, Kenya had no policy framework or national plan for disaster management

Disaster management provision can be found scattered among a wide range of different statutes and laws. Westgate (2000) observes that disasters tend to provoke short-term emergency response that appears to be forgotten until the inevitable next crisis occurs.

Recent disaster profiles in Kenya indicate many incidents of fire, which have occasioned great loss of life and resources. It is envisaged that in future the fire disasters may increase in terms of frequency, complexity, scope and destructive capacity (Fire Safety Policy of Kenya, Draft 2005).

In the year 2002, the Kenya government conceived a National Policy on Disaster Management with the objective of institutionalizing mechanisms of dealing with disasters as and when they occur. The policy provided for the enactment of an Act of Parliament to promote and facilitate coordination of disaster management through establishment of a National Disaster Authority (NADIMA).

The institutional framework proposed includes the establishment of a National Disaster Management Authority in the Office of the President, which is supposed to provide the necessary leaderships and coordination structurally. It consists of a Board of Directors and the Secretariat. The Authority consists of three departments, namely; Finance and Administration, Planning and Research, and Response and Recover}'. The Board of Directors comprises of the key stakeholders including the sectoral ministries, development partners. UN Agencies, local authorities and others (Republic of Kenya. 2002).

As the governments, NGOs and individuals increasingly become active in various phases of intervention i.e. mitigation, response, recover}'⁷ and reconstruction, the role of the government institutions entrusted with these responsibilities have come into sharp focus.

According to Drabek (1986). one of the social realities to be faced in disaster planning is that the general attitude towards disaster preparedness is characterised by both official and public apathy. In Kenya, public apathy as well economic constraints is reflected in the lack of political support for disaster preparedness. Programs have to be mandated by law and funded by the government.

Drabek observes that even when governmental bodies have adopted goals for disaster preparedness, the resources necessary to accomplish the goals have not always been **available**.

1.1 Problem Statement

This study was designed to analyse the extent of participation of Nairobi City Council Fire Engine services in the management of fire disasters in Nairobi, understand its role and readiness in responding to fires within the City.

In the years. 2002. 2003 and 2004, 352. 425 and 375 fires were attended to respectively. The number of casualties was 31 in 2002, 33 in 2003 and 50 in 2004 (Nairobi City Fire Services, 2003, 2005). Although the figures indicate an increase in the number of casualties, there is a marked stagnation in the ability to control and fight fires. The increase in the number of casualties implies that the threat of fire is real hence the relevance of the study at this time. The fact that casualties are on the rise raises concern.

There is lack of legal and institutional framework to guide establishment of fire brigades and fire stations in the country. Currently there are 175 Local Authorities in Kenya. Out of these. 12 have established fire brigades but less than five have basic capacity to carry out rescue operations (Republic of Kenya, Fire Safety' Policy of Kenya, and Draft 2005).

Not all fires are of similar magnitude hence the responses are certainly not uniform. Therefore, this study aimed to investigate the facts that inform the type of response

appropriate in a given incident. This is because fire has devastating consequences to society and therefore timely response is of essence for the safety of human life and property.

The frequency of fires in Nairobi city is a source of concern to all.

During fire outbreak within Nairobi there is a demonstrable lack of preparedness in provision of fire fighting services. Concerns from the public about fire machines arriving too late and often without enough water to contain the fire have been reported. Lack of adequate fire fighting tools or gears have also been reported. This study investigated these concerns from the public to ascertain their authenticity in addition to undertaking an audit of the existing preparedness against what it ought to be. Encroachment of building on the road reserves and proliferation of slums are often cited to have hampered fire-fighting efforts. Proper planning could significantly reduce these.

The study also sought to find out how planning and construction in the city have undermined fire-fighting services. What areas of the city are supposed to be void of structures? What are the authorities doing to ensure unfettered access to these areas in the time of need? These questions were important for this study because many times fire fighters have watched helplessly as property go up in flames due to lack of access. Besides that what are the local people doing to ensure that their areas of domain are accessible to road.

Fire fighting demands adequately trained personnel. It requires frequent retraining to update the personnel with the most relevant and technologically updated fire fighting knowledge. In this context, the study investigated the level of training of the fire fighting personnel and their working conditions. Besides, the study investigated the level of staff deployment over the year's vis-a-vis what it ought to be.

Adequate budgetary allocation is the engine, which drives all other aspects of fire fighting capacity. Personnel, facilities, organization among others cannot be achieved without

adequate financial resources. Consequently, this study will find out the level of budget allocation and how it is utilized.

The inability and unpreparedness of the Nairobi fire Brigade to fight fires appropriately has led to the emergence of private fire fighters especially security companies like G4S which is private and is more responsive and prepared.

1.2 Objectives

Broad Objective

To study the preparedness and ability of the Nairobi City Council Fire Brigade in responding to fire in the city'.

1.2.1 Specific Objectives

- 1) To establish factors which inform the level of response towards fire outbreaks.
- 2) To establish how city development has impacted on Nairobi City Council fire services to the public,
- 3) To investigate the working conditions of the city fire department personnel.

1.3 Research Questions

The study was guided by the following questions:

- 1) What are the responsibilities of Nairobi City Council to the government and the residents of Nairobi in provision of fire response services?
- 2) What are the basic requirements for fire fighting exercise in terms of personnel, tools and equipments, financial resources allocation and organizational set up?
- 3) What are the challenges undermining sufficient fire fighting service provision by the Nairobi fire brigade section, and what are the probable solutions according to the section?

1.4 Justification of the Study

Industrialization and consequent urbanization are aspects that cannot be avoided in modern world. Fire disasters are becoming more frequent and more destructive especially in urban areas where industries, slums and huge buildings are. Loss of life and property from fire is equally increasing as the risk of fire is on the rise. Hence as urbanization, industrialisation and slums increase, the risk of fire equally increase hence the design of this study.

In the years. 2002, 2003 and 2004, 352, 425 and 375 fires were attended to respectively. The number of casualties was 31 in 2002, 33 in 2003 and 50 in 2004. The increase in number of casualties is a clear indication of deteriorating situation that need to be addressed. Therefore, there was a need to carry out this study. This study is expected to assist the policy makers in both the central and local government on improving the fire fighting services. As well, this study would assist the future researchers and scholars into this subject.

1.5 Scope

This study investigated the following: the training levels of the fire section, response parameters during a fire disaster, the city growth over time and the fire incidents relationship, the human and capital resource allocation, adequacy, and the general state of preparedness to fight fires.

CHAPTER TWO: LITERATURE REVIEW

2.0 Background

Disasters disrupt people's livelihood, destroy infrastructure and planned use of resources, interrupts economic activities and retard development.

Although some information about fire as a disaster is available, substantive study on the institutional capacity of Nairobi as a local authority to fight fires and manage its consequences has not been carried out substantively.

This section will review the relevant issues from the work of other scholars related to this study of fire. It covers the following areas: fire as a disaster; administration and organizational structure; the institutional capacity of Nairobi City Council in prevention and suppression of fire; medical response by ambulances within the city of Nairobi; effective fire disaster management

2.1 Global Perspective

The Australian Fire Authorities Council (AFAC) has a national community safety know as the 'stay and defend or go early policy'. If it is likely that a bushfire will threaten a property, residents are encouraged to make decisions to leave early or stay and defend the property. Leaving early and staying and defending mean different things to different people. Responsibilities toward neighbours, whether people are renting or owning the house, and fitness levels all appear to be factors influencing people's decision making (The Australian Journal of Emergency, 2006)

The management of hazards requires an assessment of specific risk, including the probability of an event or process occurring and the potential resultant disasters.

In the US, the success of fire fighting depends on strict laws enforced, and concerned with the safety of fire fighting team. For example, smoke detectors - all houses and building institutions have installed smoke detectors in every room to detect fire. For instance, at the University of Virginia, the smoke detectors are located on the campus dormitories and are checked and reported monthly by the resident staffers who are students employed by the university to take care of the dormitories (Njeri Kamatu, 3rd Year, Systems Engineering Student in 2005).

"We are responsible to report all detectors that may require replacement as soon as possible in order to ensure safety during a fire outbreak. An alarm goes off if the detectors sense any sign of fire in a building"

The fire department's primary concern is that the fire fighters are safe before and after a fire incident. After various investigations, it was determined that the leading cause of fire fighting accidents was from crashes of privately owned vehicles of volunteer fire fighters on duty, fatality responding and returning to emergencies. As a result Washington DC department of homeland security's United States Fire Administration (USFA) and the National Volunteer Fire Council (NVFC) released the "*Emergency Vehicle Safe Operation for Volunteer and Small Combination Emergency Service Organizations Guideline*" and made it available online. This innovative, web based educational programme includes an emergency vehicle safety best practices, self assessment standard operating guideline examples, and behavioural motivation techniques to enhance emergency vehicle safety, they also launched heavy advertising campaigns to encourage the fire fighters to read the manual <http://www.nvfc.org/evsp/index.html> 17^m May 2005).

2.2 Definition and chemistry of fire

Thesaurus dictionary defines fire as blaze, conflagration, holocaust or inferno. Oxford Learners' Dictionary, low priced edition defines fire as a burning that produces heat or

destructive burning. Couless and Eskill (2001) notes that for fire to be produced a chemical reaction involving oxygen, fuel and heat has to take place.

Fuel for fire may be solid liquid or gas. The type and quantity of fuel determines the method to extinguish fire, fire burn vigorously in an environment of at least 20% oxygen. Without oxygen fire cannot burn. USAID & International Medical Corps (2001: II-4) notes that the three elements in proper proportion as will produce fire. Extinguishment is only possible when one of the three elements is missing. Fire is extinguished through starvation (denying fuel), cooling (removal of heat) and smothering, (removal of oxygen). Fire fighting and fire suppression mainly involves: (a) Putting out small fires before they become major fires, (b) Preventing additional fires by removing fuel sources and (c) Assisting with evacuations when necessary.

23 Fire as a Disaster

According to Webster's Dictionary, a disaster is any event that overwhelms existing resources. Oxford Learners Dictionary [Low Priced Edition] defines disaster as an event that causes great harm or damages and gives an illustration of fire as a form of disaster. USAID & International Medical Corps (2001 II—2) Implores further that disaster may be natural or caused by human action, may occur in any season and may cover a wide ranging geographical space. Fires, Earthquakes. Floods. Tsunami etc. are events that comprise disasters.

During and immediately after a disaster the first priorities of professional fire services are life safety and extinguishing major fires. Impassable roads, inadequate water supply, weather conditions, burning materials and inadequate resources to deal with the number of existing major fires may hamper these priorities.

According the USAID & International Medical Corps (2001: II—2). Putting out small fires before they become major fires, preventing additional fires by removing fuel sources and

assisting with evacuations where necessary play a fundamental role in fire fighting and fire prevention.

2.4 Classification of fires

USAID & International Medical Corps (2001: 11-23) notes that it is extremely important to identify the type of fuel so that the correct agent can be used to extinguish fire. USAID & International Medical Corps classifies fire into four major classes based on the type of fuel that is burning. These are:

1. Class A: Ordinary combustible solids such as paper, cloth, wood, rubber and some plastics.
2. Class B: Flammable or combustible liquids such as gasoline, oils kitchen grease, paints and solvents, kerosene, thinners etc.
3. Class C: Liquefier, petroleum gas, energized electrical equipment, such as appliances, switches, panel boxes and power tools.
4. Class D: Certain combustible metals such as magnesium, titanium, potassium and sodium. These metals burn at light temperatures and give off sufficient oxygen to support combustion. They may react violently with water and other chemicals.

2.5 Causes, consequences, prevention and extinguishment of fires.

There is a wide range of causes of fire. Below are some common causes as enumerated by Coules & Eskel (2001) & City Council. Nairobi (2003).

1. Combustible material left close to source of heat.
2. Faulty electrical wiring plugs and sockets that are in poor condition, overloaded or inadequately protected by fuses or other devices.
3. Electrical equipment left switched on when not in use.
4. Careless disposal of cigarette ends, matches etc.
5. Inadequate supervision of cooking activities.
6. Carelessness of contractors.

7. Obstruction to ventilation of heaters, machinery or office equipments
8. Accumulation of rubbish, papers and other materials that can easily catch fire
9. Misuse of potable heaters
10. Security, industrial process, such as painting cutting, welding and creating flammable dust

Consequences of Fires USAID & International Medical Corps (2001: 11-23) observes that fire is not generally selective, but its selectivity is based on availability or lack of oxygen, heat or fuel. It destroys anything regardless of worth: life and property are equally destroyed. Nairobi City Council. Manual on Nairobi International Trade Fair, 2003 enumerates financial (property) losses noting that fire in industries can severely interrupt production and disrupt the lives of those who depend upon the facility for a livelihood and wealth. Consequences that affect any industry and its community may include: (a) Suspension of production forcing customers to seek alternative supplies with which they remain after the production has resumed, (b) Destruction of business records which calls for more resources or one impossible to replace, (c) Insurance liabilities, as insurance is compelled to honour obligations to the clients with respect to loss of life properties or injuries, (d) Major financial losses if it the spreads to the neighbouring premises and (e) Loss of investment and time in court cases in case of a dispute over who should compensate who or dishonoured insurance covers.

Other major losses according to Nyamwaya (2003) are (a) Loss of life: Children and the disabled are more vulnerable once they are usually unable to escape fire outbreaks and mostly bum to death, (b) Loss of body parts, injuries and incapacitation: As victims escape fire or fight fire to salvage life or property, accidents may occur and one falls victim in the process, (c) Psychological trauma suffered by the victims, dependants or relatives of the disaster.

Fire Prevention: According to International Medical Corps USAID manual on community education and disaster preparedness (CEDP). program. Danger from fire, how to protect you. and family and home, fire prevention is possible through:

- . Electrical appliances: Unless certain that electrical appliance has to be left on. it should be switched off and unplugged when not in use. The right number of adaptors that can be accommodated by a socket should be used. The correct wiring and fiise should always be put correctly.
- . Smoking: Lit cigarette or air pipe can be deadly and should always be attended; one should not fall asleep with a lit pipe or cigarette.
- . Frying pans: pans are the most common causes of fire at homes. They should not be more than one-third full of fat or oil. should never be left unattended.
- . Open fires: There should always be fireguard round an open fire.
- Cookers: Saucepan should be in a safe position on the cooker, should be used with care and left out of rich of children they should always be attended.
- . Children: Because of their natural curiosity, children can be at great risk children should be left in a room with portable heaters, cookers or open fire.
- Bedtime routine: Since many fires at home start at night, one should ensure there is bedtime fire safety routine.
- . Heaters: These should be kept away from the furnishings clothes etc.

Table 1. Extinguishing Fire:

	Fire type	Extinguishing	
		Agent	Method
A	Ordinary Solid materials	Water foam	Removes heat and heat
		Dry chemical	Breaks chemical reaction
B	Flammable Liquids	Foam CO2	Removes air
		Dry chemical Halon	Breaks chemical reaction
C	LPG Flammable Gases	Foam	Removes air
		CO2	Removes air
D	Combustible Metals	Special Agent	Usually Remove air
			-
E	Electrical Equipment	CO3	Removes air
		Dry Chemical Halon	Breaks Chemical reaction

Source: SAID &International Medical Corps (2001:11-25)

Fire fighting Resources:

1. Portable fire extinguishers: These are available tools for putting out small fires
2. Interior wet standpipes: These should be available in commercial buildings or apartment buildings for use by occupants or tenants, other type includes, hose reel tubing, wet rising main and automatic sprinklers installation.
3. Confinement: In interior spaces, the ability to confine the fire by closing doors is a valuable resource. This restricts the spread of smoke and heat during the escape.
4. Creative Resources: These are materials at hand such as swimming pool or dirt, sand and grains, shovels, etc.

2.6 Past Fire Incidents

Table 2: Fire and rescue incidents attended by Nairobi city fire service between 1998 and 2004

	1998	1999	2000	2001	2002	2003	2004
Number of calls	787	725	642	430	574	643	588
Fires attended	426	529	433	303	352	425	379
Casualties	761	24	61	38	31	33	50
Financial loss (Ksh)	39,903,613	98,370,090	10,682,358	3,790,195	4,303,395	4,247,821	4,419,406

Source: Nairobi City Fire Services, (2003) & Nairobi City Fire Services (2005)

This shows that the city council of Nairobi incurs enormous cost in the fire fighting services. There is no relationship between the number of calls received and the numbers of the fire attended to but the number of calls seeking for fire services are almost twice the number of fires attended to. It is therefore clear that there is a problem in response to emergency calls.

tA&1

2.7 Administration and Organisational Structure:

The structure of an organisation consists of relatively fixed relationship among jobs and groups of jobs. The form and structure is created by managerial decisions, which define jobs, group jobs into departments, determine size of the groups and delegate authority to the manager. The resultant structure of jobs and authority determine to a considerable degree the activities and behaviours of people who perform the jobs.

Gibson, in the bureaucratic theory argues that effective organisation structures tend to be at one extreme of the continuous specialized jobs, homogenous departments, narrow spans of managerial control and centralized authority (Gibson, 1973: 65)

The Administration and Organisational Structure of Fire Brigade Section

Fairfax County, Virginia: The Fairfax County fire and rescue department was established in 1949. It is a combination career and volunteer organisation providing fire suppression, emergency, medical, technical, rescues, fire prevention and educational services to more than 960.000 citizens. Its vision is a dedication to being the best community-focused fire and rescue department working as a team to ensure safe and secure environment for all those entrusted to their care. Its mission is commitment to providing emergency and non-emergency services to protect the lives, property, and environment of their community. (<http://www.fairfaxcountv.gov/ps/fr/homepage.htm>).

In its statement of core values, the fire and rescue department believes that the pursuit of excellence and demonstrating high professional standards are critical to its work. To ensure the best possible service for its community, the fire and rescue department supports continuous training and encourage professional development. Health and safety are essential to fulfilling the fire and rescue departments' mission. The department is aware that Fairfax County is a diverse community and therefore commits to meeting the ever-changing needs. The department believes that communication is essential to its cohesiveness and performance. Integrity is another core value; it is committed to honesty and accountability. No request or inquiry goes unanswered (<http://www.fairfaxcountv.gov/ps/fr/homepage.htm>)

Nairobi City Council Fire Service section

The Nairobi City Council incorporated by an Act of Parliament on January 1, 1964, runs services that cater for Nairobi residents. Although most of the council's services are independent, the minister for local government must approve some of its programmes. The Mayor, a political head, heads the Nairobi City Council. It has eleven departments. The town clerks' department, which is involved with coordination and implementation of policies, overall general administration. The City Treasurers department is involved with financial advice and control. Others are water and sewerage, city education, city inspectorate, city engineers, city planning and architecture, social services and housing.

public health, environment and housing development departments (City Council of Nairobi, Manual on Nairobi International Trade Fair, 2003).

The Fire Brigade is a section under city engineers department and has several other sub-sections. It falls under the ministry of local government in the current set up of the government of Kenya. See the organisational set up below.

Mission and Vision

Mission

"To provide and manage quality, equitable and sustainable socio-economic and physical infrastructure services to the residents of Nairobi through efficient resource, mobilization, utilization and good governance"

Vision

"To make Nairobi a modern, secure city that is a world leader in provision of fire services"

The fire service is guided by the vision of the City Council of Nairobi. The council envisages being the best managed local authority in Africa and the world at large, renowned for efficient service delivery and management of all resources. The council's mission is to provide efficient quality service to the satisfaction of residents of Nairobi as well as its visitors while spurring business and socio-economic activities.

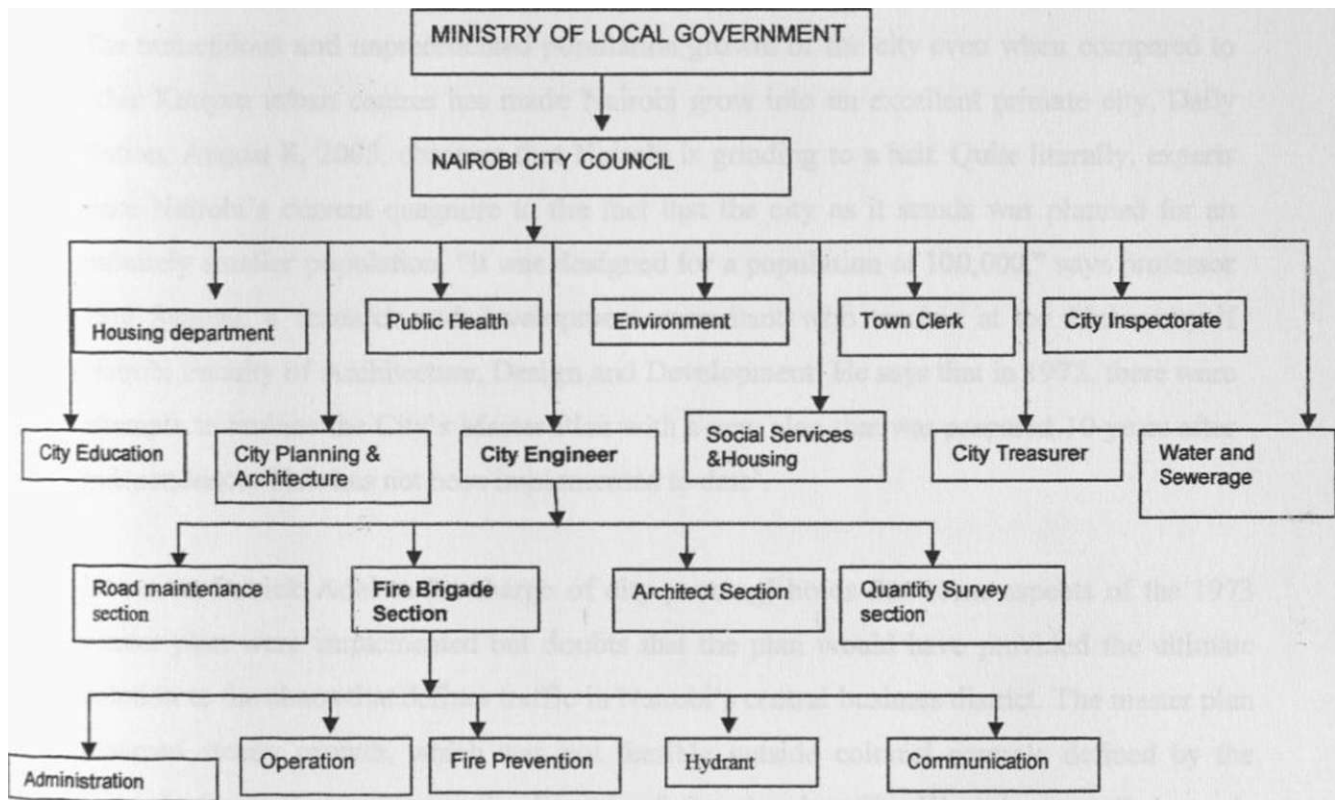
This is intended to be achieved through a professional, faithful and well-motivated workforce and sound management practices while ensuring justice for all.

According to the City Council of Nairobi. Manual on Nairobi International Trade Fair. 2003. the administration of the fire Brigade section comprises of,

1. Chief Fire Officer as the head

2. Assistant chief fire officer
3. Divisional fire officers
4. Assistant divisional fire officers
5. Station officers
6. Non-commissioned officers
7. Firemen/ Fire engine drivers

Figure 1: Organization Structure of the Nairobi City Council



Source: City Council of Nairobi, 2003

2.8 The Institutional Capacity of the Nairobi City Council in Prevention and Suppression of Fire Disaster.

According to Webster's Third New International Dictionary, capacity is the power or ability to hold, receive or accommodate; facilities for production or service; in service or in production with all facilities utilized. It is far more satisfactory to view an organisation as a system with needs and examine the extent to which it uses its resources for optimum need satisfaction (Silverman. 1970)

Planning: The city of Nairobi is growing very fast both in physical size and population. The tremendous and unprecedented population growth of the city even when compared to other Kenyan urban centres has made Nairobi grow into an excellent primate city. Daily Nation. August 8. 2005, observes that Nairobi is grinding to a halt Quite literally, experts trace Nairobi's current quagmire to the fact that the city as it stands was planned for an infinitely smaller population. "It was designed for a population of 100,000," says professor Paul Syagga, a research and development consultant who teaches at the University of Nairobi Faculty of Architecture, Design and Development. He says that in 1973, there were attempts to replace the City's Master Plan with a new plan that was prepared 10 years after independence. This has not been implemented to date⁴.

However, Patrick Adolwa [in charge of city planning] holds that some aspects of the 1973 master plan were implemented but doubts that the plan would have provided the ultimate solution to the chaos that defines traffic in Nairobi's central business district. The master plan assumed steady growth, which was not feasible outside colonial controls defined by the Kipande (pass) system, argues the director of city planning. The Kipande controlled people movement and their residence; this is not workable in post independence context. Since it not possible to predict Nairobi's population, planning is sporadic such that it is hard to determine the number of people there are at a given time.

The situation is compounded by the fact that the population census is conducted after even' 10 years with no clear means to determine the city's population in between. What Nairobi City Council works with are the population estimates that make it hard to determine the

numbers and the budget to work with in the daunting task of providing services such as housing, fire stations. etc. The planning chief points out at urbanisation as a major challenge that Nairobi has to cope with. Although most urban centres in the country face the same challenge of rural-to-Urban migration. Nairobi experiences the problem in a unique way. When there is an outbreak of fire in parts of the city, fire engines have always been blamed for arriving after the fire has consumed everything. The fire brigade may receive the alarm on time but the fire engine cannot wriggle through the congested roads to arrive on time. Professor Syagga blames it on encroachment of building including factories right up to the road even when it was common knowledge that township such as Mlolongo, Athi River, and Kitengela were fast growing. In spite of the requirement to have a 20-meter buffer, between the road and any buildings, the city council approved buildings right up to the road (Daily Nation, August 8. 2005).

The Role of the Nairobi City Council Fire Brigade Section: The fire brigade offers the following services to Nairobi residents (City Council of Nairobi. 2003):

- Fire prevention services
- Enforcing regulation in accordance to building code
- Fire fighting within the city and its environs
- First aid and accident rescue services and other humanitarian services that the service may be called upon to undertake
- Training of fire fighters for the Nairobi City Council, other local authorities, learning institutions and private firm.

Training: Every major accident or disaster has a unique characteristic. However, we are expected to manage accidents and disasters quickly and efficiently, maximizing the loss of human life and property. Ndirangu (1999) observes that this is made possible through:

Analysis: many things can be learnt from a major accident/disaster. Therefore, it is an important factor that even' accident/disaster is analyzed and evaluated very carefully and result of each study distributed and shared.

Exercise: training and exercise are crucial and should be performed both as a minor exercise around a table, in class and in the field in realistic surroundings. The person involved in the real situation, the police and ambulance should be present.

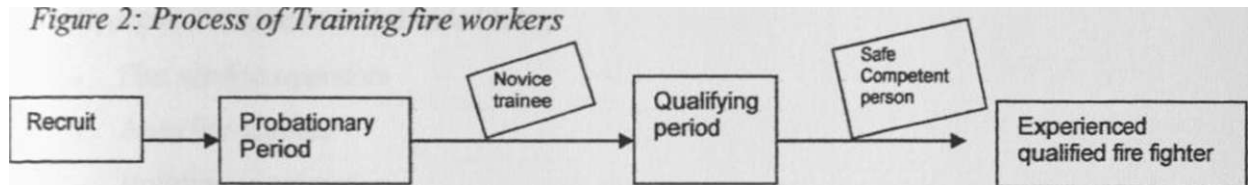
Experience: It is important that the people expected to handle a major disaster/accident have gained experience from their daily work with minor accidents. Although major incidents are different and more complex than minor ones, certain patterns are similar. Therefore, persons with experience and training will be better equipped to cope with the next disaster.

Nyamwaya. (2003) notes that in spite of clear fire evacuation procedure displayed at convenient locations, occupants of the buildings are not exposed to sufficient practice. Seventy-five percent of the population is unable to demonstrate the use of fire fighting appliances installed in the buildings. For economic reasons, employers do not allow the employees to practice with fire extinguishers and most of the equipment is only procured to hoodwink any would be inspectors from insurance companies or the city fire department.

According to the Institute of Fire Engineers, (1997: 43), training must satisfy two competing priorities:

It must be realistic enough to train fire fighters in situations, which are likely to be met at the incident, and must do this without exposing them to unnecessary risks. It is here where training staff should apply cost benefit analysis as a part of brigade training policy. The benefit is production of safe and competent personnel, trained fire fighter, experienced in likely fire ground scenarios. The cost is the exposure of the personnel undergoing training to controlled risks. In its monograph on risk assessment for the emergency sendees, the Institute emphasizes that the central role of training is ensuring the transition of the recruit through the probationary and qualifying periods to become an experienced, qualified fire fighter i.e. safe and competent. This is illustrated in figure 2.

Training Firemen Process



Source: Institute of Fire Engineers, 1997

Risk Assessment in Training: Risk assessment as part of training procedures serves a very useful function. It may help identify areas, which, although safe enough under relatively controlled conditions of training, may become unsafe operationally. Particular procedures may require special competence or experience as a means of controlling risk. The result of safe but realistic training may become system of work. This represents one of the main objectives of risk assessment during training itself, apart from ensuring the safety of those being trained and the instructors doing the training.

The NCC conducts fire and ambulance brigade daily programme. The program consists of drills, special instruction on knots and lines, fire fighting apparatus and their use and building and construction. In addition strategies of search and rescue/resuscitation, method of entry first aid and fire service standing instructions among others are included in the thirty-lecture training (Nairobi Fire Brigade 2002).

In addition to the NCC programme, the NCC fire fighting personnel attend well established training through the Institute of Fire Engineers. The training is carried out at four different levels: (a) Preliminary (b) Intermediate (c) Graduate-ship and (d) Membership. The syllabuses against these levels provide a stepwise progression through the examinations.

According to the Institute of fire Engineers. (2002) the examination subjects are grouped and then subdivided into four general disciplines as follows:

1. Fire Engineering Science
- 2. Fire safety**
3. Human resource management
4. Operations which are subdivided into;
 - Fire service operators
 - Aero fire studies
 - Building construction
 - Fire investigations
 - Marine fire studies
 - Petrol-chemical fire studies
 - Disaster planning and emergency management
 - » Communication

2.9 Other Stakeholders Involved in Fire Disaster Suppression in Nairobi

The city council is the state department that is entrusted with provision of fire suppression services within Nairobi. The Ministry of Roads and Public Works has a pool of highly trained officers, who inspect public facilities, advise on fire prevention measures; investigate fire cases, and record fire statistics. However, the services have sometimes been overwhelmed, inadequate or inefficient and reinforcement has in most instances been called. Some major businesses, public/private sensitive areas have provided their own fire services, which are contracted in case the city' council fire brigade is overwhelmed. Nyamwaya. (2003) indicates the following as other service providers

1. Kenya Railways fire services: Provide safety' within the railway stations, goods sheds, and workshops and wagon yards.
2. Department of Defence (DOD) fire services This is for military control and suppression of fire in the military camps. However, they reinforce the city council services in case of a big fire. The services are found at Eastleigh or Kahawa station.

3. **Aerodrome Fire Services:** These provide for services at the Airports and the environs. However, these services respond to needs outside the airport and reinforce other fire suppression service providers. International Civil Aviation Authority (ICAA) mandates such services to be provided.

2.10 Effective Fire Disaster Management

The string of fire incidents amounting to loss of life and property within Nairobi is a clear indication that the city council is unable and not well prepared to deal with fire disasters. The East African Standard, March 11, 2004 suggests that the city council should be replaced with a board of experts and key stakeholders. Alternatively, a good and qualified, highly experienced private company should run the city. The current law empowers the government to set aside Nairobi and Mombasa as special administrative zones to be ran by special, professional authorities.

The article further argues that for effective fire protection, a committee of experts and stakeholders should be set up, generously funded and given executive authority to modernise the Nairobi fire station and others all over the country. This committee should consider and select for implementation cures against massive losses, which have occurred from easily preventable and controllable fires.

Risk Assessment in Fire Services

Risk assessment in fire service was carried in some form or other since the fire services act 1947. This imposed requirement on chief fire officers to acquire information relevant to brigade operation within the fire authority area. The exclusivity to the fire fighting was removed by the fire services act 1959. Risk assessment with slightly different emphasis is also carried out as a means of fighting fire and its consequences through the powers conferred under the fire precautions act, 1971. Within the service, inspections carried out under section 1 (i) (d) of the fire services Act 1947 have traditionally provided the basic

hazard data on which assessment of risk are founded This introduced legal basis for the requirement to carry out the formalised risk assessment. Having analysed the risks control measures can be put into place to reduce the risk or even to eliminate it.

Risk assessment is a requirement of the management of health and safety with an objective to identify risks and take steps to control them by providing suitable and adequate preventive and/or protective measures and clarifies their relative importance and priority. Risk assessment is a process of identifying hazards and controlling risks. It involves looking for hazards, deciding who might be harmed, evaluating the risks, deciding whether the existing measures are adequate recording findings, reviewing the assessment and revising it as appropriate (Health and Safety Executive, 1997: 36-7).

Hazards exist merely by virtue of their potential ability to harm, irrespective of where it is located or prevailing circumstances. Either it exists or it does not. Identification of risk is primarily an operational exercise undertaken by trained personnel.

Problems of hazard identification may arise with apparently low risk sites such as agricultural or domestic premises, when these contain unusual hazards (Institute of Fire Engineer. 1997)

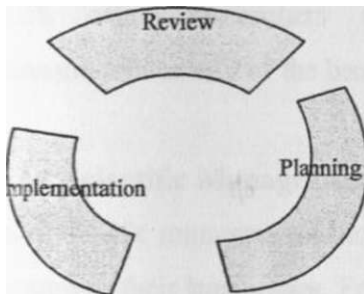
Element of Command and Control

In the command and control of fire and rescue services, a system should be established to safeguard life, property and environment. The system consists of individuals in different positions and technology in the form of equipment or an entire technical team. In fire and rescue service command and control deals with capabilities of (a) selecting the missions to be executed, (b) accomplishing the selected missions, (c) review of the accomplished mission (Raddnigsverket. 2002).

For a command and control, systems to function continuously it should be organised according to classic models (planning cycle.) Planning cycle is a continuous cycle

of planning implementation and review. The model is built on the assumptions that the command and control is a continuous process that progressively steers the organisation towards its objectives.

Figure 3: Command and Control System



Source: Raddnigsverket, 2002

The planning cycle is a model that clarifies command and control phases. It consists of planning, implementation and review, and then it return to planning for the next cycle and so on.

The cycle is continuous, and as such, the length of the phases may vary from cycle to cycle. Planning of a new phase can begin before implementation is fully completed. Review is a continuous parallel process (Raddnigsverket. 2002).

Some Of The Problems Which Hinder the Smooth Fire Operation In The City, are;

- Late calling and giving wrong address of the fire
- Ineffective transport and communication: issues such as poor road infrastructure, telephone network, traffic jams, inaccessibility to slums largely undermine effective fire fighting

Disrespect of the service particularly from the drivers who do not give way to the fire machines

Unplanned and poor constructed building

2.11 Theoretical Framework

Theories enable the researchers to connect a single study to the immense knowledge base to which other researchers contribute; this increases researcher's awareness of interconnections and of the broader significance of data (Neumann, 2000: 60-61)

2.11.1 Scientific Management

The scientific management movement began as the search of practical men for better ways of running their businesses. Fredrick W. Taylor spearheaded it and it emphasized concepts of measurement. Taylor was concerned with certain conditions, which he saw as problems of the industry of his time. Among these were: (1) Unclear concepts of managerial responsibility (2) Lack of measured standards for defining the workers tasks and (3) Widespread inefficiency of labour and systematic "soldiering" of workers on the job. Taylor believed that in order to overcome the problem he observed, managers should accept special responsibilities for planning, directing, and organizing work.

He deemed it essential more over to separate the planning of work from its executors so that each individual could work to his best efficiency and could be compensated accordingly. He thought that management should develop a science of doing work and that each kind of work had its own "science" (McFarland. 1954:588)

Classical theory of scientific management sees workers as motivated by economic rewards and the organization characterized by a clearly defined division of labour with highly specialized personnel and by distinct hierarchy of authority (Etzion. 1964). To elucidate on control and precise directions while at work. Taylor discussed shovelling of coal which led him to develop rules about the kind of shovel to use. the way to stand, the angle at

which the shovel should enter the coal and how much coal to pick in each motion. Scientific management left workers with as few independent decisions as possible, thus a separation of mental and manual was established. The management used its monopoly over work related knowledge to control each step of labour process. (Ritzer, 1996:302).

Through such mechanisms as the specialization of work, scientific management and machines, management has been able to extend its control over manual works. Scientific management is now seen to be invading the office. Clerical tasks have been scientifically studied, and as result of that research, they have been simplified, routinized and standardized. In addition, mechanisation is also finding its way into office through the computer and computer related equipment (Ritzer, 1996:303)

2.11.2 The Modern World as a Risk Society.

According to Ritzer (1996), Ulrich Beck feels that the contemporary world is both a risky society and an industrial society where many of the risks are traceable to industrial development. Beck notes that the central issue in contemporary world is risk and how it can be prevented, minimized or channelled. Risks are centred in poor nations while the poor nations are able to push many risks as faraway as possible.

However, neither rich nations nor the nations that produce risks are safe from risks (Ritzer, 1996: 573).

Giddens (1990) on the other hand observes that socialization process creates some ontological security and trust. This trust tends to be buttressed by series of routines that we encounter on day-to-day bases. However, he observes that there are new and dangerous **risks** associated with modernity that always threaten our trust and threaten to lead to pervasive ontological insecurity. Some of the risks are traceable to our efforts to manage **our** material environment. There is painful awareness that the expert systems are limited in their ability to deal with these risks. These risks give modernity the feeling of a runaway juggernaut and fill us with ontological insecurity (Ritzer, 1996: 570).

However, rather than giving up to, Giddens suggests that the society should be realistic and address the risks head on. Giddens accords importance to the role that social movements can play in dealing with some of the risks of the modern world and pointing us toward a society where those risks are ameliorated (Giddens. 1990)

Establishment of the fire station is recognition of the potential for risk in form. The risk of fire in the modern world is even common hence the theory is relevant. Most urban dwellers even face the threat of fire and are more concerned with safety, which is the basis of the theory of risk. The study will evaluate the effort, which the NCC has put in place to address the growing risk in the modern society. The study will establish whether the Nairobi City Council has adapted to the eminent risk whose magnitude increases daily in Nairobi city.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

The purpose of this section is to outline the approaches, which will be used to obtain research data, how data will be analysed and presented. The study was an exploratory one intended to establish institutional capacity of the Nairobi City Council to suppress fire disaster. The study used combination of qualitative and quantitative data collection methods to complement and countercheck the data. Most case study researchers involve use of more than one method of data collection, but this derives from the tendency for qualitative research that typically employs two or more sources of data to be intensively used (Bryman 1989:174).

In this study, quantitative survey helped in documentation of facilities and resources that are available to the Nairobi City Council for fire disaster suppression. It was concerned with selected areas that have experienced fire incidents within Nairobi. The following factors were considered: units of the study, sampling procedure, case study, data sources, and data collection methods and data analysis.

3.1 Units of Analysis

The important part in collection of data is the selection of units to which data relate. According to Schutt (1966). the unit of analysis for study represent level of social life on which research question is focused such as individuals, groups or nations. We do not understand the variable in the study until we know which units of analysis they refer. In this study, the units of analysis consisted of Nairobi Fire Service section and its staff and equipments and premises with its readiness and ability to control fire disasters. I also looked at the premises both where fire disasters have never occurred and have occurred.

3.2 Unit of Observation

In this study the unit of observation was the material working conditions and tools for the fire Brigade

3J Sampling Design

Sampling design explains how cases are selected for observation, (Singleton et al, 1988:137). The study used purposive sampling. In this sampling procedure, researchers use their knowledge of the population to select sampling units in an attempt to obtain a sample that appears to be representative of the population. I purposively interviewed the Nairobi City Council staff.

The study used purposive and non-probability sampling particularly the snowballing technique to identify key informants from the city fire services and other fire suppression service providers. Singleton et al (1988) notes that in many instances, this form of sampling is either more appropriate or practical than probability sampling or is the only viable means of case selection.

Senior members of staff such as managers, junior members of staff such as supervisors, clerical staff and fire marshals (fire fighters) were interviewed.

In total 50 members of staff were interviewed using a questionnaire.

3.4 Sources of Data

Researchers draw on four types of historical evidence or data: primary source, secondary source, running records and recollections. Traditional historians rely heavily on primary sources; historical comparative researchers often use secondary sources or the different data types in combination (Neumann, 2000:395).

This study has used both primary and secondary data sources. Primary data was obtained from the Chief Fire Officer, fire fighters and all other officers in this section. Private fire service providers were also interviewed using a key informant guide.

This study employed quantitative and qualitative techniques of data collection. Quantitative methods included the use of both open ended and closed questionnaires. The questionnaire was used to glean data from the management of the city sections responsible for fire fighting. The qualitative approach utilized key informant guide.

3.5 Tools of Data Collection

This study employed four tools of data collection namely: observation, questionnaire, secondary sources and interview guide.

- **Observation Guide**

The classic method of scientific study is observation, which can be learned by observing what people actually do and how they do it. As a research method for social scientists, observation involves more than just looking at what is going on. Observation was carried out both formally and informally. Observation about the staff was made on their living quarters and their personal protective equipment like clothing. Observation was also made on fire fighting vehicles, staff transportation, hydrants and alleys- all factors which are crucial about state of preparedness.

- **Questionnaire.**

Questionnaires were administered to low level staff in the fire Brigade service. In total 50 junior staff were interviewed.

- **Interview Guide**

An interview guide lists the questions or issues that are to be explored in the course of an interview. An interview guide was prepared to ensure that the same basic lines of inquiry were pursued with each person interviewed. The interview guide had topics or subject areas within which the interviewer was free to explore, probe and ask questions. Thus the interviewer remained free to build a conversation within a particular subject area to word questions spontaneously and to establish a conversational style but with the focus on a particular subject that has been predetermined. (Patton 2001:343).

In this connection therefore, interview guide was deployed during key informant interviews with senior staff from city hall. These included Chief Fire Officer, Assistant Chief Fire Officer, Divisional Fire Officers, Assistant Divisional Fire Officers, Station Officers, non-commissioned officers and fire-men/fire engine drivers.

- **Secondary Data**

This is the use of available statistical data or records. The use of already collected data has the obvious advantage for the social researcher of being economical. But such data have other advantages in social research too. A major one is the fact that much information of the sort is collected repeatedly thus making possible the determination of trends over time. Another is that the gathering of information from such sources does not require cooperation of the individuals about whom information is being sought, as does the use of questionnaires, interviews etc. Claire Sellfiz et al (1976).

In this study secondary data was extracted from the journal on fire, lecture notes from fire staff, newspaper cuttings and the Nairobi City Council records. These were important in supplementation of qualitative and quantitative data.

CHAPTER FOUR: PRESENTATION AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter discusses the findings that emanated from quantitative and qualitative data **collected** using various research instruments. A total of 50 respondents were interviewed by **use** of questionnaire that gave the chronological order of asking questions. The questionnaire was administered to the 50 junior staff of the Nairobi fire Brigade. There was **also** a Key Informants guide that was administered to managers at the Fire Brigade and to private fire fighters.

Table 3: Interview composition and locations.

Place of the study	Instrument used	Number interviewed
Nairobi City Council Fire Brigade Junior staff	Questionnaire	50
Nairobi City Council Fire Brigade management staff and private fire service providers	Interview guide (Key Informants)	9

The findings are presented in both table and graphic forms. Analysis of quantitative data **has** been done by use of Scientific Package for Social Sciences (SPSS 15.0). This package **set** a base for use of statistical methods to summarize and collate data according to underlying themes received from the responses applying rules of descriptive statistics. In addition, patterns in the data were modelled in a way that accounted for randomness in the observations, and then used to draw inferences on the subject of study.

This chapter covers demographic characteristics of respondents (Age, Gender and Education level of respondents), Fire sources and fire handling by the general public, threats to fire handling, Public opinion on effectiveness of fire handling by Nairobi City Council Fire Brigade, fire experiences and way forward in fire prevention and handling.

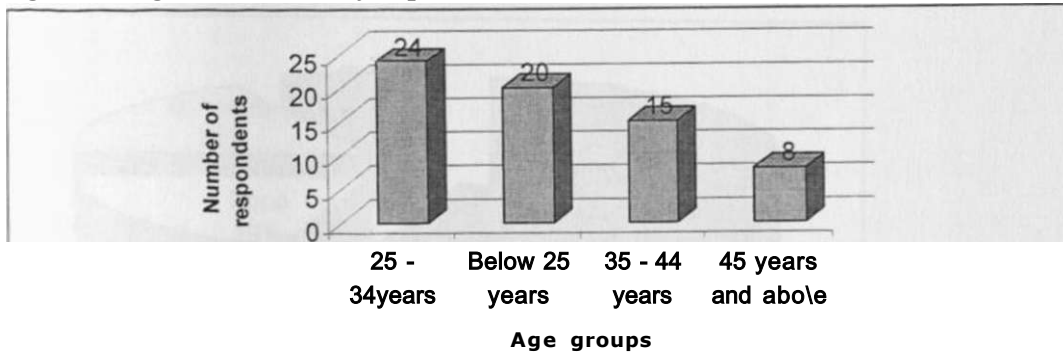
4.2 Demographic characteristics of respondents

This section presents the characteristics of respondents in this study. These characteristics were composed of age, gender and highest level of education attained by respondents. The rationale behind knowing these attributes is to aid in understanding the responses received and the reasons behind information received.

4.2.1 Age of respondents.

This study attempted to include respondents of various ages. These ages were later organized into groups of below 25 years, 25 - 34 years, 35 - 44 years and above 45 years. The age distribution is well illustrated by Figure 4. This distribution is presented in order of responses received such that the age group with more representation appears first.

Figure 4: Age distribution of respondents.



From Figure 4, most of the respondents were between ages 25 and 34. This accounted for 24 respondents and formed 35.8% of the sample. The same age cluster forms 13.8% of Kenyans (Government of Kenya, 1999). The study focused much on this age group because it is the group considered to be vibrant and able to respond to fires efficiently. It was then

followed by those below 25 years who were 20 and formed 29.9% of the total sample. This age group forms 9.9% of the total population in Kenya (Government of Kenya, 1999). Most (65.7%) of those interviewed were below 35 years. This is an energetic group that can be very instrumental in the control of fire spread and they form a group that can easily be taught ways of avoiding fire outbreaks and in case of an outbreak, they would be useful in containing it.

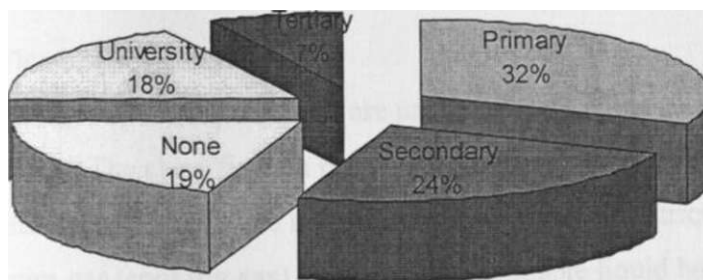
4.2.2 Gender of respondents.

The study attempted to achieve gender parity because fires can be caused by any person knowingly or unknowingly. Most of the respondents were male because fire fighting is traditionally a male role.

4.2.3 Level of education.

The study was also keen to understand respondent's education level because this is a measure of social stratification and so much determines social mobility and ability for up-take of additional knowledge. The respondents were asked to state their highest level of education attained. The responses varied as in shown in Figure 5.

Figure 5: Level of educational of respondents



From Figure 5, it is evident that majority of 32% of the respondents had only completed primary level of education. It also tells that 24% had completed secondary level of education. Those who completed tertiary (middle level colleges) level of education and University accounted for 25% of the total number of respondents. This implies that a good

number of respondents are resourceful and can be relied upon if need may be to mobilize and participate in capacity building within their communities. They can also be relied upon to forward recommendation on policy issues.

4J Perceptions of fire Brigade staff of General Causes of fire in Nairobi

This section explores various sources and causes of fire, fire handling and precaution knowledge of the public and public experiences with fires. It seeks to establish what causes most fires as mentioned by respondents.

4.3.1 Sources and causes of fires

Most respondents indicated that fuels used for cooking was the major cause of fires that the Brigade fights. Careless handling of the fuels during cooking and lighting was the main trigger. Other fuel causing fires mentioned were charcoal, kerosene and cooking gas.

According to Red Cross Society(2009), "each of us has some type of fire hazard in our homes, at work or even at school. It is therefore important to identify the potential fire hazards present so as to put in place fire prevention strategies"

According to fire fighters most of the members of the public do not know what to do in case of a fire hence the need for public education.

4.3.2 Fire classification

There are fire classifications that are usually based on the cause and the fuelling mechanism. The classification makes it possible to get right equipment in quelling the fire. The classifications are done into three groups namely electrical hazards, liquefied petroleum gas (cooking gas) hazards and flammable liquid hazards. Incompatible materials stored in close proximity to each other may also cause fires (Kenya Red Cross Society, 2009).

Table 4: Precautionary fire control measure suggested.

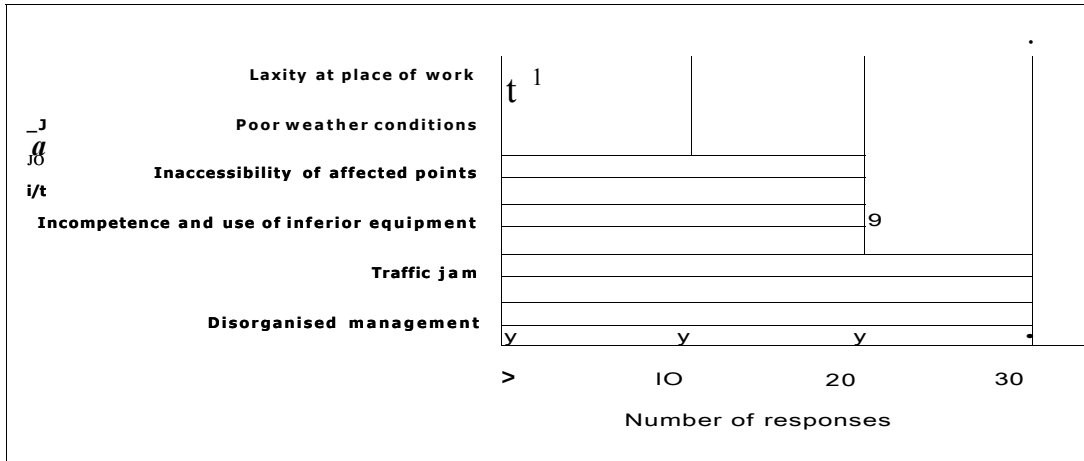
Precaution undertaken	Frequency	Valid Percent
Switching off electrical appliance after use	27	54
Educating other people on fire safety measures	5	10
Having access routes to structures	4	.8
Raising alarm in case of fire/ putting fire off	2	4
Building on more fire brigade agents and informing public on emergency numbers	4	8
Having fire extinguisher at home	3	6
Reducing number of people staying in one household	2	4
Arranging the house well	3	6
Total	50	100

Apart from the two major precautionary measures, they also mentioned access to fire outbreak spots, raising alarm in case of fire/ putting fire off, building on more fire brigade agents and informing public on emergency numbers, having fire extinguisher at home, reducing number of people staying in one household and arranging the house well.

4.3.3 Setbacks to fire fighting.

Fire fighting in Kenya has not been an easy task because most of the issues that affect a successful fire fighting have external influence. Some of the external influences include traffic jam, narrow roads, non supportive communities, mushrooming of illegal structures and so on. The respondents were asked to state some of perceived setbacks to efficient and successful fire fighting. The responses received were collated and presented in Figure 6. Each respondent was allowed to mention more than one response. A total of 88 responses were received.

Figure 6: Perceived setbacks to successful fire fighting.



All the respondents attributed setbacks in fire fighting to disorganised management. Traffic jam was also mentioned as a major contributor as well as incompetence of staff and the use of inferior equipment in fire fighting. The other serious issue that contributed to setbacks was the inaccessibility of fire points.. Others mentioned included poor weather conditions and laxity at the place of work.

Interview with key informants at NCC Fire Brigade brought out the difficulties experienced by the fire men. They mentioned that the fire department experiences a lot of challenges as they execute their duties. For instance, there was an overwhelming transport problem. The ever presence of traffic jams and poor road network poses a major problem to firemen. The public hooliganism is also a big problem; some drivers are adamantly ignorant in the sense that despite the fire vehicles sirens they wouldn't give way. Likewise the public also stone the firemen and / or their vehicles claiming lateness yet the road is not meant for firemen alone. The numbers of fire stations in Nairobi are too few. This leads to longer distance to be covered to reach the fire points. Poor weather conditions also pose a problem. Some roads have no tarmac; have potholes making it difficult to reach their destination as quickly as they wish.

Crowded structures like those in most slums and the unplanned construction of structures in

the city make it very difficult to access some areas in Nairobi. Overhead electricity cables also pose another challenge. Some are too low making it difficult for the passage of their **vehicles**. Some fire hydrants are sometimes tampered with to a point that they are useless. Another challenge was the centralization of fire services. Misinformation or lack of public awareness is another challenge.

There're difficulties for the public to reach their offices because most of them (public) are ignorant of the telephone numbers on which they can reach the fire team. It's also difficult to determine the causes and sources of fire in some instances.

Poor financing of their department is also a problem making it difficult to purchase modern and more efficient machines.

Despite the setbacks that the respondents mentioned, when asked to comment on the competence of NCC Fire Brigade, They had the following comments; Disorganization and lack of expertise at 26, (52%), take time to reach fire point at 9, (18%), lack of modern fire fighting equipment at 8, (16%), lack of adequate training for fire fighters at 4, (8%) and are corrupt in their dealings at 3, (6%).

Other disparities mentioned were budgetary allocation and amount actually awarded. The budget allocation is never enough. It's based on the daily city Council Collection and so in **case** there is under collection the fire Brigade department faces stiff financial shortages in **their** day to day operations. These shortages force them to charge on services which are supposed to be free of charge e.g. regular inspection of buildings and building plans. From **the** records, financial shortages are clearly shown, for instance, in the financial year 2006/2007 the approved budget allocation was 38, 806, 857 but the actual figure allocated **was** only 2,600,316 which is only 7% of the total approved budget according to the Report on improvement of fire services.

The disparity between the approved and actual figures is a clear show of financial shortages within the department. This makes it impossible to carry out some of the intended

operations; some are done half way while others are just not done. The low budgetary allocation has been the trend at the City Council of Nairobi ever since it was established.

4J.4 Effect of unplanned constructions on fire fighting.

The stretch in public resources that could be attributed to rural urban migration has seen the city of Nairobi grow faster than the improvement on social facilities like roads and general infrastructure, drainage system, prudent planning and availability of land for development. As a result of all these, the public have taken advantage to construct illegal structures not only in residential estates but also within the city centre. Vehicles are packed anywhere anyhow adding problems to the already existing ones.

Nairobi City Council has embarked on demolition of illegal structures in the city and surrounding estates. The respondents were asked to air their opinion on steps being taken by NCC to control upsurge of unplanned structures. Their comments were collated and are presented in Table 5.

Table 5: Respondents' Comments on action taken by NCC to remove unplanned structures.

Comments	Frequency	Valid Percent
Good work, should continue	25	50
Give notices before demolition	12	24
Use of choppers to fire points instead of demolishing slum structures	6	12
NCC slow on implementation of the process	5	10
Demolition interfering with the livelihood of poor citizens	1	0.2
Train their officers to carry out demolition professionally	1	0.2
Total	50	100

It is encouraging to see in Table 5 that most respondents were happy with the move and hoped for its continuity. This accounted for 33, (66%) of the responses received. Another group of 17, (34%) also supported the steps being taken but were of the view that notices

are given before the demolitions are affected. A few others mentioned; use of choppers to fire points instead of demolishing slum structures, demolition interfering with the livelihood of poor citizens, need for NCC to slow down on implementation of the process and the need to train their officers to carry out demolition professionally. Besides the few reckless and careless opinions expressed, most of the public demonstrated support for the process and would be happier to see it continue.

The Nairobi City is poorly planned leading to various problems. For instance, this has led to poor, road net-works. Some roads are very narrow to a point that the fire Brigades wide vehicles can't pass through. This has also contributed to traffic jam which is a major problem to them. Poor planning has also led to informal settlement especially in slums making it very difficult to reach an accident point because structures are erected on road reserves. Inside the Central Business District the backstreets which are supposed to act as emergency lanes for escape and their passage are very narrow and often occupied by parked vehicles and lately kiosks.. The fire hydrants are also sometimes obstructed by illegally built structures and at times parked vehicles.

Likewise political interference in city planning have also led to erection of structures on road reserves and spaces meant to be left void of structures to ease movements and to act as assembly point. Poor building materials and lack of inspection of new and existing building has also led to the increment of accidents in the city.

To ensure easier movement during emergency, certain areas are supposed to be left void. These include emergency lanes at the back of buildings. Houses that house more than 20 people must have an assembly point with enough space where first aid and roll -calls can be carried out.

4.4 Factors that determine the type of response towards a fire.

Generally, this depends upon the information that is received from the victim or the person who informs about the fire incidence i.e. he/she will tell about the cause of fire and the nature of fire. Automatically the firemen would classify the fire i.e. put it under a particular class in which each class of fire would need special agents. For instance if it's chemical fire the firemen would need dry powder.

Likewise, the location would also dictate the response. For long distances outside the city centre there's need to use high speed vehicles. The road network is also a main factor to consider. In case there's traffic jam (peak hour) there's need to use an alternative route other than the main road.

4.5 Ways in which the fire brigade ensures efficiency in their day to day operations

Every disaster needs to be managed quickly and efficiently so as to minimize loss of life and property. To ensure efficiency, the fire brigade department has a regular check up on their machines to certify their capacities at the start of every shift. Servicing and testing of the machines is also a daily routine activity which is done by their qualified mechanics. They also ensure that the tankers are filled with water and other fire fighting agents are in order, this enables them to leave the station in the shortest time possible if there is an emergency.

Every fireman attends the daily fire drills with the aim of refreshing on the existing techniques in fighting fire. In case of new facility, this is the best time they are appraised about fire department has the necessary equipments and facilities to deal with all types of fire at any time. The training that they undergo and the daily experiences uplifts their capacities to deal with different types of fire. Their experience and professionalism is a key determinant in dealing with all fires.

4.6.1 Entry qualifications into the profession

Fire fighting is a profession that requires informed individuals and for that reason an individual must have attained at least a mean grade of D plain in the secondary school education. The candidate must also be physically fit, highly disciplined, committed, and trainable and of sound mind. These qualifications are too low .However, the City Council has also realized this and they are revising the minimum entry point to a better grade. They have realized that disaster management does not only require physical strength but also some intelligence.

Table 6: Level of total education of Nairobi Fire Brigade employees

Level	No	%
¹ Primary	20	13
Secondary	127	82
College	7	5
Total	154	100

The current number of staff in the fire brigade is 154. With the increasing population in Nairobi and the rising cases of fire incidents there is need to increase staff and equipment. There is need to have 15 fire stations with each having at least 50 personnel because according to the World standards the ratio is 1 No. station to 200,000 people. So with a population of 3million people 15 fire stations would serve more efficiently and effectively.

Currently Nairobi as a city has only 3 fire stations viz. Tom Mbova Street, Enterprise Road and the one at Ruaraka in Kenya Breweries.

4.62 In-Service Training,Local and Overseas

This is done continuously. There are daily drills at the start of every shift where the firemen refresh on their skills and in case of new course, equipment or facility and technique this becomes an important chance to inform the firemen. There is also post - incident training sessions e.g. short inductions on how to use knots, ladder and on communication science. Through the internet, the firemen also obtain knowledge /techniques on improvements in fire fighting profession. The courses offered during in service training included; Induction Fire Fighting Basic Fire Prevention, Hydraulic Platform Course, Control Room Course, Leadership Course, Industrial Basic Fire Fighting Course, Elementary Fire Fighting Course (Nairobi, Machakoes ,Kajiado) Firemen, Elementary Fire Fighting Course (Nairobi & Machakoes Municipal), Refresher Course, Breathing Apparatus, Basic Fire Fighting Course (Nyeri & Nairobi Firemen), Disaster Preparedness & Management, Incident Command System Courses International Mine Action Training Centre Embakasi, Emergency Preparedness and Business Continuity Management, National Disaster Planning and Response, Structural Fire Fighting Course Malaysia, Fire Fighting Courses In Japan and Fire Fighting Courses In Brazil.

4.7 Inspection of existing buildings

The existing buildings are supposed to be inspected on a monthly basis to ensure that they are equipped with the appropriate fire fighting equipments. Some of these equipment include, portable fire extinguishers, escape routes, signs showing escape routes alarms, fire detectors (heat and fire detectors) dry and wet agents, hose pipes, roof water tanks etc.

New building plans have to pass through fire Brigades compliance office to ensure their safety. The office also offers extra advices, e.g. alternative escape routes and proper lighting.

A compliance certificate is issued once the building plan meets all requirements.

Before a building is occupied there is a final inspection to ensure all the structural requirements are met upon which an occupational certificate is issued. In case of no-

compliance there are legal procedures to be taken. However, a survey carried out by Nairobi Central Business District Association showed that only 30 percent of buildings in Nairobi have complied with fire prevention requirements.

NCBDA Chairman yesterday said a spot check carried out of 30 buildings only four complied or had reached near compliance with the regulations. There were no available certificates of inspection⁸.

4.8 Public Education

Sometimes the firemen use forced entries and even demolish some structures to get to the fire point due to this they carry out public education on the need for proper housing and adherence to building plans so as to ease accessibility of different points in case of fire. There is need for continued education on awareness concerning safety measures in shows, chiefs' barazas, and schools and at accident point. This includes creating awareness on the need to have fire fighting equipments in their buildings. The slum upgrading projects being canied out is a great improvement in terms of accessibility of different parts of the city especially in the slums.

In public education they teach people on actions to be taken upon discovering a fire:

What to do,

- (i) Evacuate in an orderly manner without panic via the nearest exit which is not affected by smoke; restrict spread of fire and smoke by closing doors and windows; warn others as you leave.

What Not To Do

- (ii) Do not re-enter the building once you are out; Do not run; Do not scream or make unnecessary noise; do not laugh or talk loudly; Do not cause confusion;

Do not return to your room for clothing, valuables, papers etc.

Methods used include films, demonstrations and slides.

4.9 Agents used in putting off fire

The agent used to put off a fire depends on the type and the cause of fire. Basically, water is used in almost all types of fire. For instance fire caused by wood, stoves, candles, arson, depending on what is burning there's direct use of water. Fires like those caused by electricity faults, the procedure is that power is cut off first before powder or even carbon dioxide are used next. Petrol-caused fires are countered with the use of foam and dry sand cooling blankets for small fires. Other agents that exist in the market include-carbon dioxide, dry and wet powders, and fire extinguishers foam compound.

These agents are very effective. For instance dry powder, carbon dioxide and foam are very **effective** and efficient when used in the manner and for the right purpose. Water and dry **sand in** a petrol caused fire are also effective while smothering blanket is good in small fire **before** it spreads.

4.10 Training

The fire fighters have undergone several training courses which include - basic fire fighting (elementary) breathing apparatus, fire safety and prevention, inspection cause first aid, fire apparatus, control room operations, fire operations, leadership cause and weapon of mass destruction course. Most of the firemen in Nairobi department have undergone most of these courses with basic fire fighting and fire safety and prevention being the main courses. According to the Institute of Fire Fighting (2000) there are several examination subjects.

These are Operations and Fire Safety, First Aid and Weapons of Mass Destruction (WMD) **With** regard to preparedness in fire disaster management the training that firemen go through **is** very effective. They have acquired the basic/necessary skills to deal with all **types** of fires and other related disasters thus saving lives and property which rather would **have** perished. The training empowers them with knowledge and confidence in their day to **day** work.

Generally, there are no new fire fighting techniques but there are always improvements in the existing techniques. There has been a standardization of the fire fighting equipments for better results in fire fighting. Of late the Nairobi fire department has acquired new tankers with high speed, power pumps and a fairly narrow to suit the narrow avenues in the city. Fire fighting drills is a daily routine practice whereby the firemen get to know of any new device/ equipment and how to use them. Mainly they refresh on the existing skills and techniques because there're no new ones that have emerged.

They also do these drills once there are invited by different organizations e.g. companies. They emphasize the role of education to the public or workers in these companies on different fire safety measures like the right use of fire extinguishers, what to do in case of fire or any other accident, first aid training etc. At times the firemen may encounter new fire fighting equipments installed in these building. For instance big companies have installed in their building modern and more effective heat and smoke detectors.

4.11 Terms and conditions of service/work

Fire fighting is a risky profession. The firemen normally risk their lives as they execute their duties. They complain of little risk allowance which is only Ksh.500 in a month. They have no insurance cover and the salaries are not only low but also irregularly dispatched. The amount received is not commensurate with their responsibilities.

The safety of firemen is also a risk. The safety devices in use are old fashioned worn out and often limited thus increasing the risks of getting injured. Public hooliganism is also a big liability to the firemen. Their un co-operative attitude results to stoning causing injuries.

4.12 City planning

Initially the city plan was in a position to cater for safety and efficiency during crises but

the plan can't be used in the present situation because it was meant for small population. For instance, the tower in the Tom Mboya Street fire station was used for surveillance in the whole of Nairobi city which by then constituted the CBD alone. The other plans which have come up haven't really taken care of emergency lanes, assembly point and other structures like roads and public facilities.

4.13 Safety Measures

The Nairobi fire brigades have several safety measures to ensure readiness in their work. For instance they have ensured that the emergency lanes in the city are void of structures and parked vehicles so as to ease movement and serve as escape routes in times of fire and other related incidences. The inspection of new buildings and the existing buildings are also an important safety measures.

Likewise the firemen are always ready in case of emergency. They work in shifts to increase effectiveness with all their equipment/facilities being checked and tested regularly. They ensure proper servicing of their facilities and machines. The department is also very keen on emergency lanes and assembly point. Each building is compelled to have this assembly point; the emergency lanes are clearly visible because they are vacant.

There is also an elaborate public education program intended to inform the public about safety measures against fire.

The city planners are at present very keen so that no building is erected in an inappropriate place. Also the outgoing slum upgrading programme will have a big positive impact in their work. This will ease their and everyone's movements.

4.14 Budgetary Provisions: Equipment Stock Level

In the financial year 2007/2008 there were plans to purchase equipment as tabulated here below:-

Table 7a: Planning and implementation bottlenecks.

Financial year	Item budgeted for	Purpose	remarks
2007/2008	2 No. utility vans	Hydrant, inspection and fire prevention	Not purchased
2007/2008	1 no pick-up	Transporting personnel and inspection team for building fire safety requirements.	Not purchased
2007/2008	1 no.3 ton mini bus	Transporting staff for training and inspection	Not purchased
2007/2008	2 no classroom	Training facility	Not built

Table 7b: The current stock level of the new equipment is as follows:

Description of equipment	Stock	Purpose
Foam Tender	1 No.	Smothering fires
Water tender	2 No.	Putting out fire
Water tanks	2 No.	Helping drawing out water for fire engines.
Rapid Intervention Vehicle	1 No.	Transporting staff to answer emergencies
Ambulance	2 No.	Back-up transport for the injured to hospitals

Source: Nairobi City Council 2009

4.15 Hydrants

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There are about 4500 water hydrants in Nairobi but those that are serviceable are less than 500; and some of those which may be serviceable cannot discharge water owing to the low

pressure in pipes. Others are buried by contractors, for example Hydrants on Nyota Lane near the Nairobi Bus Station have been buried as there is a hotel built on the hydrant area. Target for inspecting and servicing the hydrants in the city is about 29 per month but not even 10 are serviced per month.

When the January 29, 2009 Nakumatt fire disaster happened, the city council fire brigade acted swiftly but they soon started running out of water.

Most of the fire hydrants in the city centre do not work and fire fighters putting out the inferno that engulfed Nakumatt down town had to get water from Nyayo Stadium about three kilometres away. It was indicated that the hydrants hadn't worked for twenty years. In the Nakumatt Fire disaster the public responded by assisting the overwhelmed fire fighters and neighbouring businesses such as the Nation offered their hydrants and fire hoses to the fire fighters, who frequently ran out of water. G4S security firm, the military and the Kenya Airport Authority all sent their best men and fire engines to help.

The key informants confirmed the weakness of the Council in fighting fire disasters. At the same time a key informant admitted the NCC being overwhelmed by the Nakumatt fire. He indicated that only five of their fire fighting engines were at the scene while three were in the garage. This further confirmed ill preparedness of the fire department.

The city council was the first to arrive at the scene in a record five minutes and even with combined effort of the private companies, the fire was just too big said the key informant.

The key informant further said that the government has to realise it does not have adequate equipment to battle fire in the city

For example traffic jam, poor road conditions especially during rainy seasons, public hooliganism especially those who stone firemen and their vehicles including ignorant public drivers who ignore their sirens. There are also difficulties in accessing certain places in the city in times of fire accidents especially in slums.

Another problem is caused by lack of the brigade's telephone numbers that they can accessed through. Where the public does not have their numbers the only way they can

reach them is through the police hotline (999) which sometimes goes unanswered.

In the Nakumatt fire disaster on January 29, 2009, twelve fire engines rushed to the scene in quick succession after the fire outbreak, only for most operators to realize they had no water.

4.16 Summary of findings.

This section aims at summarising the findings of the study. It is from these findings that informed conclusions can be derived. The study covered a total of 50 respondents interviewed by questionnaire and 11 key informants. The findings were as follows:

- Fuels that are mostly used are charcoal, gas, kerosene and firewood.
- Most members of the public were reported not to know the telephone number to call in case of fire out break
- Major setbacks are attributed to disorganized management, crowded unplanned structures, uncontrolled packing and traffic jam within the city. Minimum budgets awarded also contribute to the setbacks.
- According to most opinions, major causes of fires are electrical faults, stoves through paraffin used to fuel it and negligence.
- Response to fire depends on fire classification by the fire men and the location of the fire..
- To ensure efficiency, the fire brigade department has a regular check up on their machines to certify their capacities at the start of every shift.
- Every fireman attends the daily fire drills with the aim of refreshing on the existing techniques in fighting fire.
- Entry requirement into the profession is attainment of at least a mean grade of D plain in the secondary school education. The candidate must also be physically fit, highly disciplined, committed, and trainable and of sound mind.
- There is need for increase in number of staff at fire brigade from 154 to 700 to cater for the rapidly increasing population.
- Though buildings need to be inspected for compliance with fire security requirements, so many buildings already occupied do not comply to the

specifications.

- There is need for continued education on awareness concerning safety measures.
- Basically, water is used in almost all types of fire. For instance fire caused by wood, stoves, candles, arson, depending on what is burning there's direct use of water.
- Fire fighters complain of poor working conditions as well as no insurance cover even though they work in very risky environment.
- Despite poor planning within the city centre and its environs, the fire brigade have continually ensured emergency lanes in the city are void of structures and parked vehicles so as to ease movement and serve as escape routes in times of fire and other related incidences.
- Out of a total of 4500 water hydrants in Nairobi, less than 500 are serviceable. Even though they are serviceable, the low water pressure in pipes cannot allow discharge of water.

Challenges experienced in data collection

The following challenges were experienced

- Failed appointments-they do not honour
- Unavailability of reliable records;or not available or not updated
- No enough time to interview them,they were always in a hurry
- Suspicion-information may be used to fight the council or report them to for disciplinary measures
- Fear of higher authority that those in lower positions are always afraid to speak unless with authority from seniors.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS.

5.1 Introduction

This chapter allows for conclusions to be drawn from the findings of the study. It is from these conclusions that recommendations are reached at. This chapter also outlines areas for further research. The focus of this study was to assess preparedness and capacity of the Nairobi City fire service in responding to fire disasters in the city.

5.2.1 Factors that inform the level of response towards fire outbreak.

The response to fire outbreak was mentioned to be affected by several factors, some within their control and others not within their control. Fire outbreak has first of all to be classified by fire fighters according to information received from the informer. This is usually done in the office by the person charged with analysing the situation. After analysing the situation, personnel and equipment are assigned that is equal to the task.

The location also dictates the response. For long distances outside the city centre there's need to use high speed vehicles. The road network is also a main factor to consider. In case there's traffic jam (peak hour) there's need to use an alternative route other than the main road. Since Nairobi Fire Brigade does not have an elaborate functional structure, the centralization of functions is a major hindrance in their operations. Lack of enough fire stations especially near disaster prone areas is also a major blow to its functions.

The budgetary allocations also play a major role in disaster response as a lot is dictated by the finances. The continual underfunding of the unit affects its ability to execute its services with utmost efficiency. This is because personnel and equipment are all dependent on availability of funds.

5.2.2 Impact of unplanned development on Nairobi City Council fire services to the public.

Fire fighting in Kenya has not been an easy task because most of the issues that affect successful fire fighting have external influence. Some of the external influences include traffic jam, narrow roads, non supportive communities, mushrooming of illegal structures and so on. Despite the roads being narrow, some motorists do not give way even after being notified by the sirens.

Crowded structures like those in most slums and the unplanned construction of structures in the city make it very difficult to access some areas in Nairobi. Overhead electricity cables also pose another challenge. Some are too low making it difficult for the passage of Fire Brigade vehicles. Some fire hydrants are sometimes tampered with to a point that they are useless.

The stretch in public resources that could be attributed to rural urban migration has seen the city of Nairobi grow faster than the improvement on social facilities like roads and general infrastructure, drainage system, prudent planning and availability of land for development. As a result of all these, the public have taken advantage to construct illegal structures not only in residential estates but also within the city centre. Vehicles are packed anywhere anyhow adding problems to the already existing ones.

-All these activities coupled with inadequate government will contribute to the difficulties faced by fire fighters in Nairobi.

5.2.3 To investigate the working conditions of the city fire department personnel.

The basic requirements for entry into fire fighting department are rather low. This reduces the competitiveness of the department in all aspects including the financial one. On admission, one is trained on fire fighting skills to be able to do the job well. The department even hold in house trainings and daily fire drills to get employees ready any time there is need.

Despite the trainings given, fire fighting is a risky profession. The firemen normally risk their lives as they execute their duties. They complain of little monthly risk allowance and lack of insurance cover. Their salaries are not only low but also irregularly dispatched. The amount received is not commensurate with their responsibilities. The safety of firemen is therefore put at risk as safety devices in use are old fashioned, worn out and often limited thus increasing the risks of getting injured.

5.3 Recommendations

The recommendations based on the findings and discussions are as follows;

- There is need for the fire Brigade to be partly financed by the Central government in order to increase their ability to respond.
- Access areas and other designated areas within the city should be left void of structures so as to ease movements at times of fire and other related disasters and this be rigorously enforced.
- There should be routine inspection of water hydrants in existing buildings..
- There is need for scrutiny of building plans and materials to ensure compliance with set standards.
- The number of fire stations should be increased to 15 with at least 50 staff members in each in order to comply with the international standards where within a population of 200,000 persons there should be a fire station.
- An elaborate public education system be established and enhanced so as to equip the public with better knowledge on fire incidents.
- The City Council to undertake a disaster mapping exercise to identify areas which are more prone to fires.

Areas for further research.

1. There is need to understand underlying conditions for continual poor performance of the Nairobi Fire Brigade apart from those mentioned in this study and explore the possibility of changing tact in handling fires even if it means borrowing from developed countries.
2. A detailed study on infrastructure development is needed to get the city back to good performance levels. This is because most of the problems are associated to poor city planning.

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5. Comment on the budget allocation, its adequacy and how its utilized.

6. What is the average annual budgetary allocation by NCC with regard to fire disaster management?_

7. What was the budget allocation for the last five years?

2007	2006	2005	2004	2003

8. How much of this goes to:-

Fields	2007	2006	2005	2004	2003
Salaries					
Tools and equipments					
Training					
Repair and maintenance					
Any other					

9. In your own view is the budgetary' allocation enough?

10. If not what budgetary allocation would you propose? Kshs.

11. What budgetary allocation would you propose in the following fields?

Training	
Salaries	
Tools and equipments	
Repair and maintenance	
Any other	

12. Fire fighting is a profession that requires informed individuals. What is the minimum education level required for one to join this profession?

13. What is the training frequency to update the personnel's with the most relevant and technologically updated fire fighting knowledge and skills?

14. What is the average number of staff in fire brigade institution?

15. In your own opinion do you think that this number of staff is enough to cater for the current fire situation in the city of Nairobi?

16. If no what do you think is the right number of staff?

! 7. How has planning and construction in the city undermined fire fighting services?

18. What areas in the city are supposed to be left void of structures to ensure movements during times of fire and other related disasters?

19. It has been alleged that such avenues and water hydrants have often been blocked by new buildings and parked motor vehicles and NCC has ignored. What do you say?

20. How do you ensure existing and new buildings are equipped with appropriate fire fighting equipments?_

21. What are the authorities doing to ensure unfettered access to these areas in times of need?

Appendix II

QUESTIONNAIRE FOR THE JUNIOR STAFF

1. **What are the common causes of fire disasters that you deal with?**

2. **What agent(s) do you use to extinguish fire caused by the above causes?**

3. **How effective are these agent(s)?**

4. **What other agents of putting off fire exist in the market?**

5. **Are different agents used to extinguish fire caused by different objects?**

6. **How many levels of training in fire fighting profession are you aware of?**

7. **What is the highest level of the training that you have achieved?**

8. **How do you rate the effectiveness of the training you have undergone in regard to preparedness in fire disaster management?__**

9. What makes you think so in (8) above?

10. What new techniques/methods of fire fighting are in the market?

11. Are you using them in your daily work?

If yes which one?

Which is the most preferred method/technique?

12. If no why?

13. How often do you undertake fire fighting drills?_

14. In 2007 how many times did you practice fire drills?

15. Which new skills and equipment did you encounter in this training?

16. How relevant was this training in terms of new skills acquired?

17. According to the institute of fire fighting (2002) the examination subjects are grouped and then subdivided into four general disciplines which discipline have you undertaken?_

18. Comment on the terms and conditions of service.

19. Describe exactly what you mean in (18) above

20. What would you have preferred?

21. Do NCC have city planning systems that ensure safety and efficiency during fire crises

(1) Yes (2) No (3) Not Sure

22. If yes what are these safety measures?

23. What areas in the city are supposed to be left void of structure to ease movements during times of fire and other related disasters?__

24. Are they clearly marked?

25. Do all fire fighting staff know where they are located?_

26. It has been said that such avenues and hydrants have often been blocked by new buildings and parked motor vehicles and the NCC has ignored. What do you say?

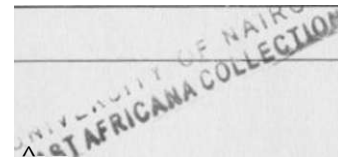
27. What is the NCC doing to ensure safety and efficiency during fire disasters in area where there is no city planning in place as slums and private plots'

28. What are some of the difficulties/challenges/problems that you come across as you execute your duties?__

29. How do you ensure that existing and new buildings are equipped with fire fighting equipment?_

30. What are the requirements?

31. Do you conduct inspections of buildings to ascertain there fire safety devices?



32. When did you do it last and why?_____ ^ _____

3 . Are you legally empowered to enforce/compel building owners to fit fire safety devices in buildings?___

34. Can you remember an incident you did in last two years?_

35. How often are inspections carried out in a year?___

36. What are the specific problems that you face in enforcing fire safety regulations?___