

**UNIVERSITY OF NAIROBI, FACULTY OF ARTS
DEPARTMENT OF SOCIOLOGY AND SOCIAL WORK**

**SOCIO-ECONOMIC IMPACT OF FIRE DISASTERS IN NAIROBI
COUNTY: A CASE STUDY OF THE FIRE ACCIDENT IN SINAI SLUM,
VIWANDANI WARD, MAKADARA CONSTITUENCY IN NAIROBI
COUNTY**

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**A Research Project Submitted In Partial Fulfillment of the Requirements
for the Award of Master of Arts Degree in Sociology (Advanced Disaster
Management) of the University of Nairobi**

OCTOBER 2016

DECLARATION

I declare that this research project is my original work and has not been submitted to any other college, institution or university other than the University of Nairobi.

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SUPERVISOR

This research project has been submitted for examination with my approval as the University Supervisor.

Signature.....Date.....

Professor Edward Mburugu

DEDICATION

To my lovely wife Dorcas Wairimu and son Jeddy Mbugua, my parents Mr Josphat Kiruthi Mrs Mary Wanjiru , brothers Michael Kiruthi and Richard Gichia and sister Jane Wamaitha as well as my friends Charles Chacha and Edna Mbilunzu.

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ACRONYMS AND ABBREVIATION

NGO	-	Non Governmental Organization
HDI	-	Human Development Index
HIV	-	Human Immunodeficiency Virus
AIDS	-	Acquired Immune Deficiency Syndrome
WHO	-	World Health Organization
NPDMK	-	National Policy for Disaster Management In Kenya
KFSM	-	Kenya Food Security Meeting
KFSSG	-	Kenya Food Security Steering Group
ALRMP	-	Arid Lands Resource Management Project
NEMA	-	National Environment Management Agency
PTSD	-	Post Traumatic Stress Disorder
UNISDR	-	United Nations International Strategy for Disaster Reduction.
UN OCHA	-	United Nation Office for the Coordination of Humanitarian Affairs.
SPSS	-	Statistical Package for the Social Sciences
KPLC	-	Kenya Power & Lighting Company
NYS	-	National Youth Service

ABSTRACT

The study sought to examine the social and economic impact of fire disaster to residents of Sinai slum who were affected by 2011 inferno. The study will add knowledge on understanding how various risk factors contribute to the occurrence of fire disaster in Kenya. The study was conducted in Sinai slum Makadara constituency within Nairobi County.

The aim of the study was to establish the socio-economic situation of Sinai residents before the fire disaster, to identify the effects of Sinai fire on household cohesion, to find out the risk perceptions among Sinai residents following the fire accident, to examine the risk reduction strategies created following Sinai inferno, and to establish the effect of Sinai fire disaster on household incomes and poverty levels.

The study utilized purposive sampling where 320 respondents were selected. The quantitative data was collected from main respondents constituted both male and female residents of Sinai slum and analyzed by using a statistical package for social sciences (SPSS) while qualitative data was collected from key informants and analyzed using content analysis.

The results of the study revealed that poverty, housing, illegal electricity connections and lack of access roads were causes of fire disaster within Sinai slum. The study showed that impacts of the inferno on residents led to break up of families, divorce, orphan hood, and widowhood.

The study recommends that both County and National government should come up with a relocation programme in this area. They should be settled on permanent houses to alleviate another disaster since most resident are on top of pipeline and under high voltage electric cables. The study also found out that there is need to train people on effective response to fire disaster in term of preparedness, evacuation, mitigation, so that there could minimize loss of life and damage. Both national and county government should lender victims of Sinai fire some soft loans to start small business enterprises to uplift their living standards and also to have a source of living. In addition, there should be nationwide public awareness campaign on effects of siphoning oil and measures to be put in place to control fire.

CHAPTER ONE: INTRODUCTION OF THE STUDY

1.1 Background of the Study

Losses from human actions and economic factors have increased rapidly over a given time frame irrespective of the efforts that governments are taking and the international community to educate the masses on the importance of minimizing risk. For example, Kenya has been exposed to various risks and disasters which impact negatively on the economic growth including loss of life and suffering. Disasters can be termed as events which affect the existence of the community, or affecting property and the environment exposing organisations which operate in this environment to losses. In extreme cases, these calamities impact negatively on the community to perform as usual (Pelling & Holloway, 2006). Kachenje & Kihila (2010) disasters, natural or man-induced, depending on their cause might be slow or abrupt. Many reasons lead to an increase in costs associated with disasters such as increased population growth, density, failure to plan for rural-urban migration, environmental degradation and global warming. The economic implication of disasters has contributed to a shift in the political approach in dealing with risks that face the modern societies (Blaikie, Cannon, Davis & Wisner, 1994).

Disaster originated from a French word, *Desastre* which meant bad or evil star. For instance, the World Health Organisation (WHO) perceives a disaster as an abrupt economic phenomenon of a significant magnitude which requires external aid. PDMK (2009) posit that a disaster is an incident which happens all over sudden causing damage, disruption of the ecology and loss of life, decline of health hence requiring the affected community to seek for intervention. A disaster is either natural or manmade. Disasters keep on evolving and they need response to minimize their effect (Alexander, 2000).

Social and economic costs of disasters differ tremendously hence it's hard to quantify them in a global perspective. There is need for more accurate and systematic data concerning

disasters to assist in establishing their socio-economic effects on the short and long-term basis. Even if most communities in developing economies sustain several calamities such as wildfire, small floods and droughts, this is not reflected in the statistics for disasters (Mwanzia, Mugo & Ngamau, 2006).

The NPDMK 2009 observe that response in disaster costs Kenya's government including other stakeholders quite a lot as compared to the costs of putting in place protective measures to manage disasters. Experts indicate the need to minimize risk and to get prepared for Furthermore, experts increasingly acknowledge that there is a need not only to respond to disasters, but to also undertake risk reduction initiatives to prepare for any future disasters (Alexander, 2000).

Africa has had some nasty experiences from droughts and famines resulting to deaths in some cited cases between 1972 and 1973 which affected the Northern, Southern, Eastern and Sahelian Africa (Gommes and Petrassi, 1996). Locally, losses have increased from both human and economic losses creating an impediment in achieving sustainability in development leading to the establishing of National Policy for Disaster Management and the creation of the Kenya National Disaster Operation Centre.

Other initiatives which are part of the coordinated system involve the Kenya Food Security Meeting (KFSSM), Kenya Food Security Steering Group (KFSSG) and the Arid Lands Resource Management Project (ALRMP). Other stakeholders in managing disaster include the Police, Department of Defense, the National Youth Service and National Environment Management Agency (NEMA) among others (Kanyi, 2012).

1.1.1 Overview of Disaster Management in Kenya

Disasters are as a result of the manner in which the societies align themselves economically and their way of interactions as well as building relationships. Kenyans are exposed to various hazards which affect their lives and property adversely. These ranges of disasters are drought, soil erosion, desertification, landslides, and deforestation among others. These calamities cause injuries, deaths and shortages of food. In accordance to NPDMK (2009), Kenya is prone to disaster; the most common ones experienced are induced by hydro-meteorological, seismic and environmental procedures contributing to floods, earthquakes among others.

Majority of the incidents were severe injuries and deaths that happen from the impact while outbreaks of diseases and shortages of food arise depending on the magnitude and the nature of disaster. Previously, some sections of the country faced fires where property which was valued a lot of money were destroyed. Flooding is also a cause of anxiety, notably, *El Nino* flooding, Nairobi County being the most pronounced. Terrorism is an impediment, it cause fear and insecurity in the country, in particular major towns, leading to travel advisories, this impacts negatively on local tourism. Famine is a cyclic problem in Kenya ever since independence that has affected most parts of Turkana (Ngecu & Mathu, 1999).

In accordance to UN OCHA, 2008 for decades, climatic hazards had impacted negatively on several communities hence defining their traditional and basic socio-economic events. Many at times, livelihoods of populations are affected by famine in Northern and Western Kenya. This is part of the human suffering that requires to be minimized through food security. Poverty and population increase in the urban areas has led to vulnerability, putting communities at a high risk from disaster and lack of development (Strobl, 2008). It is worth to note that unless appropriate action is taken Kenya will continue losing property and lives from calamities since this keeps repeating in cycles.

For a such a long-time, disasters have kept increased overtime and the manner in which they manifest themselves keeps changing. Examples include the Mtongwe ferry accident that happened in Mombasa where 270 people died, El Nino floods that happened back in 1998, this affected 1.5 million people where 80 percent of their livestock perished among others.

In view of the fact that disasters interrupt people's lives by displacements, fatalities as well as injuries, they destruct occupation and consume years of economic gains and growth. Natural disasters for instance cause loss of lives and property, displacement of people from homes, destruction of infrastructure like roads, rails and telecommunication lines, infectivity of water sources causing diseases or depletion of the same altogether.

The following characteristics are used to determine the scale of a disaster; the likely hood and strength of the risk vulnerability of the showing elements to the current environmental conditions (Pelling & Holloway 2006).

The current disaster management system in Kenya does not have a disaster policy framework that is well coordinated neither a legal base for the same. Kenya has a partly impulsive system used by the government and relief agencies to take action in case of a disaster. Disaster response policy in Kenya has been inadequately perceived because it does not have a common criterion functioning procedures and disaster crisis operational plans. The above confusion has resulted to replication of efforts and wastage of capital / resources. All these challenges put disasters victims in a state where they are prone to more bigger risks and a lot time is taken to recover in case of a disaster . (Mwanzia, et al 2006) argues that lack of planned, synchronized action, prevention of disasters, preparedness and mitigation of loss in case it occurs will prove to be unattainable.

1.2 Statement of the Problem

In September 2011, around 120 people died and more than 100 were injured in Sinai slum settlement in Nairobi, when a pipeline burst into flames as local people were siphoning fuel from it. Sadly, calamities have been occurring in Kenya. Considering the costs associated with astrology in disasters and issues to do with humanity, it would be important to lay down mechanisms and policies to neutralize all manner of disasters for sustained development. This would also lessen the impact of such disasters, especially fire disasters, whose actual socio-economic impact has not been clearly delineated in a qualitative fashion that would enable the understanding of the “what” and the “why” of the disasters (Khatun, 2003).

Some studies on disaster management in Kenya have been undertaken. For instance, UN OCHA (2008) study carried out on the challenge of settlement in Budalangi and Yala swamp area in Western Kenya and indicated that there was a need to evolve an integrated watershed management plan for effective management of the area for the wellbeing of the surrounding ecosystem. Maingi (2009) assessed the economic effects to climatic change and revealed that risk management had the potential to minimize damages and losses, this necessitated huge economic savings. Ngecu and Mathu (2006) indicated that rainfall seasons in Kenya can be extremely wet and erratic resulting to both large and small river devastating floods like the El Niño floods of 1997/98 with major socio-economic impacts.

Thus, many researchers, policy makers and scholars studied various aspects of disaster management in Kenya, but this study intended to deepen this rich literature by demarcating the social and economic impacts of fire disasters, using the Sinai fire accident as a case study, in Nairobi county of Kenya. This then led to the main research question, what are the social and economic impacts of the Sinai fire accident?

1.3 Research Questions

The research endeavoured to answer the following research questions:

- i. How was the Social and Economic situation of Sinai residents before the fire disaster?
- ii. In what ways did the Sinai fire disaster affect household cohesion?
- iii. What were the risk perceptions among Sinai residents following the fire accident?
- iv. What was the risk reduction strategies created following the Sinai fire disaster?
- v. What was the effect of the Sinai fire disaster on household incomes and poverty levels for the victims?

1.4 Objectives of the Study

1.4.1 Overall Objective

The main objective of the study was to establish the impact of fire both socially and economically amongst residents of Sinai slum in Nairobi County. To achieve this goal, the study was guided by the following specific objectives:

1.4.2 Specific Objectives

The specific objectives of the study include;

- i. To establish the socio-economic situation of Sinai residents before the fire disaster.
- ii. To identify the effects of the Sinai fire disaster on household cohesion
- iii. To find out the risk perceptions among Sinai residents following the fire accident.
- iv. To examine the risk reduction strategies created following the Sinai fire disaster.
- v. To establish the effect of the Sinai fire disaster on household incomes and poverty levels

1.5 Significance of the Study

Disasters and emergencies are fundamental reflections of normal life. Thus, it was important to study socio-economic impact of fire disasters in any social context because the social environment is dynamic and always getting new socio-economic advancements. This study was not only timely, but also relevant and of importance as it came at a time when disasters have become many in Kenya, as witnessed in droughts, fires, floods, collapsing of buildings, HIV/AIDS, industrial accidents and terrorism (Ngecu & Mathu, 1999). This has become an impediment to sustainable development with various regions in Kenya having experienced fires in which property worth millions of shillings has been destroyed and regrettably, lives sometimes lost. To date, few studies have been undertaken to specifically study the socio-economic impacts of fire disasters in Nairobi County, underscoring the significance of this study.

Over and above the Nairobi County government using the results of this study to improve on fire disaster management practices, the study was to help stakeholders in the disaster management sub-sector to refine their disaster management initiatives for a more aversive society. It also served as an exposure to other county governments on how the devastating effects of fire disasters can cause anguish to the affected if not well managed. This should generate discussions among the Members of the respective County Assemblies and result in establishment of relevant policy framework and institutional competencies for superior fire disaster management initiatives.

The Government of Kenya finds this study an invaluable source of insights into the socio-economic impact of fire disasters in Kenya, especially in densely populated areas like the Sinai human settlement. Further, it provided insight to various disaster management initiatives which work in place of a coordinated system in order to enhance their joint effectiveness. Successful conclusion of this study was an important input to policy makers in

formulation of policies that focus on disaster management and how it can be leveraged for the general good of the entire Kenyan people.

Finally, other researchers would benefit from the study as it would add on to the growing body of knowledge on disaster management practices in Kenya. This acted as a source of reference for future longitudinal studies thereby contributing to the pool of knowledge.

1.6 Scope and Limitations of the Study

The study investigated the social and economic impact of fire disasters, using the Sinai fire accident as a case study. The study aimed to get a representation of Sinai fire accident victims and interrogate them on various issues as outlined in the study objectives. The primary data from the research was triangulated with secondary data on actual socio-economic impacts of fire disasters.

The study only focused on social economic impact of Sinai fire; it was not able to cover the psychological impact on the resident because covering these three kinds of impacts in the same study would take a lot of time and resources which the researcher does not currently have access to. In addition, the study does not cover the entire Nairobi county or other counties due to the limitations of time and finances. However, it is an important study that can be replicated in other parts of the country. Therefore, the findings of this study are only generalized to Makadara Division in Nairobi County but not to other counties in the country.

The issue of fire is a sensitive issue and hence persons with fire burns or who lost their loved ones in the inferno were not ready to divulge information with ease. Therefore, it took a lot of time and patience to access the information needed. In addition the study focused on people who suffered some burns and who were also bitter when sharing information; hence it took the researcher a lot of time in building trust.

Additionally, given the approach taken by NGO and media personalities in dealing with victims of the fire, the respondents expected to get monetary returns in exchange for information shared with researcher.

1.7 Definition of Terms

Fire – is a rapidly self-sustaining oxidation process accompanied by the evolution of heat and light in varying intensities.

Disaster – A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society using its own resources.

Risk-A probability or threat of damage, injury, liability, loss, or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through pre-emptive action.

Hazard- Threatening event, or probability of occurrence of a potentially damaging phenomenon within a given time period and area. A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

Literature review is one of the critical components of any research that is hinged upon scientific principles. It not only gives direction to the study but also gives credence to the research by incorporating input from other scholars in the subject of the study. It also helps establish the gaps that need to be addressed. To this effect, this chapter reviews literature on the socio economic impact of disasters with a bias on fire disasters such as the one that visited the Sinai community in Nairobi, Kenya's capital.

2.2 Concepts and Impact of Disaster

Disasters have been defined as the convergence of hazards with vulnerabilities. As such, an increase in physical, social, economic, or environmental vulnerability can mean an increase in the frequency of disasters. Literature on disasters posits that on a yearly basis, millions of people are affected by disasters, and the impact can be calamitous. Scholars postulate on many effects of disasters whenever they strike ranging from the destruction of buildings to the spread of diseases. Scholars in the field of disaster management posit that such disasters can devastate entire societies and/or countries overnight. Tsunamis, earthquakes and typhoons do not just wreak havoc on land; they also disrupt people's lives, especially for those living in remote regions (Child Fund International, 2014; World Bank, 2010).

One of the most immediate effects of natural disasters is population displacement. The rationale of this argument is that when countries are ravaged by disasters such as earthquakes and other powerful forces of nature, many people have to abandon their homes and seek shelter in other regions. A large influx of refugees can disrupt everything from accessibility of health care and education to food supplies and basic hygiene. Large-scale evacuations are common in light of the power of tsunamis and other natural disasters, and those fortunate

enough to survive face a range of challenges following widespread destruction (Child Fund International, 2014).

Furthermore, disasters may lead to other secondary socio economic effects which are usually carried for a longer time span than the others.

The inferior effects caused by natural disasters such floods after an earthquake can be as destructive as the present disaster. For instance, in states which are ravaged by tropical storm, tornado and tsunamis; they habitually root to brutal flooding in their wake. Consequences of these inferior effects range from malaria to waterborne spread diseases. The net effect of all this is the emergence of health complications which are usually established among survivors of natural or man-made disasters. According to (Child Fund International, 2014) if international relief organizations were not to assist to mitigate risks after the instant disaster the number of death can rise. The Child Fund International also posits on a number of other implications. The institution argues that whenever disaster strikes, food can become scarce. A critical examination of historical documents on disasters, the institution argues, reveals thousands of people around the world who have gone hungry from one time or another as a consequence of a loss of agricultural supplies and destroyed crops. Citing natural disasters, the institution posits that the impact of hunger following an earthquake, tropical storm or tornado can be tremendous. Furthermore, disasters can also cause shock among the affected people. The most common trauma results from seeing the extent of destruction and from bereavement of people known to us, family members and friends, post-traumatic stress disorder (PTSD) is usually common after such disasters. PTSD can be defined as a psychological condition caused by tremendous trauma. If the disorder is not attended it can result to emotional stress or psychological harm.(Child Fund International, 2014).

(Rodríguez, Fuente & Torre, 2008) states that there is a relationship between the increasing frequency of natural disaster to increasing rate of exposure to households and societies in the third world countries. These exposures aggravate the intensity felt after a natural disaster hindering the recovery process. As per the above, developing countries are prone to added rate of poverty and scarcity of resources due to natural disasters.

2.2.1 The Poverty - Disaster Nexus

Numerous patterns in research, policy and practice have come out while trying to uncover the vibrant link that exists between disaster and poverty since the 1990s. Studies show that there has long existed uneven intensity that disaster implicate on poor people. Literature also explains that being poor increases the chances of being prone to risk. There is no measures to show the definite force that exist between disasters and poverty as these finding keeps changing with change of conceptual frameworks and perspectives assumed in research, policy and practice

In the past thirty years or more, policy and practice has unenthusiastically been subjective by change in theoretical knowledge dissertations .since 1990s the intensity of effects between disaster and poverty has never been clearly communicated until recently but since the beginning of 1970s theoretical dissertations have for a long time showed the mutual relationship. The new world development is treating the risk poverty nexus with the respect it has been commanding for even though the policies and actions formulated has not been transformed to practicable format .The risk poverty relation is how able an individual or a family unit is to quickly react to the aftermath of a disaster . The response has been characteristically defined as the function of a household's asset endowment and access to insurance mechanisms (World Bank, 2002).

Physical Vulnerability

Disaster was first experienced in the 1960s when the issue of being exposed to risk was taken with more seriousness by the engineers and architects in an attempt to investigate the effect of hazards for instance earthquakes. Vulnerability was perceived as a measure of destruction of property attributed by a hazard (Hilhorst, Bankoff & Frerks, 2004). As this primarily physicality analysis did not assume from a communal perspective, such research often concluded that the space/ locations which poor people inhabited and the houses and built environment they lived in were particularly vulnerable to natural hazards. In late 1970s the concept of vulnerability was first used to explain disasters as the outcome of socio economic and political processes.

In 1970s researchers hypothesized that vulnerability concept be not just an attribute of physical structure but it is either socially influenced or socially formed and thus belong to social groups (Arnold & Kreimer, 2000). He further states that the process creating vulnerability directly rendered some social and economics groups' vulnerable .this caused the causality of disaster to move to social and political from pure physical

Social Vulnerability

In the early 1980s, another trend occurred involving which was more dominant involving an exploration of social production risk and vulnerability in which exclusion defined the discourse. This perspective assessed patterns of risk and vulnerability as socially produced as a result of developing activities. Poverty and related conditions of deprivation were seen as root causes of calamities. In the 1980s, people gain recognition concerning social processes that generated imbalanced exposure to risk by exposing some people to calamities; these inequalities were seen as a function of power relations to each society that was understood according to the level of vulnerability of an individual, a group of a community (Arnold & Kreimer, 2000). It is therefore important to invest in protective measures that mitigate risks

that emanate from disasters. This implies that when a disaster strikes it might be difficult to cause disruptions and risks. A survey by World banks depict the existence of numerous vulnerabilities that expose the poor to disaster and other risk factors that include lack of adequate financial housing for the less fortunate and failure to invest in disaster risk reduction. Other causes emanate from failure to engage professionals such as engineers, and architects and failure to plan for pre and post disaster in risk reduction and failure to improve in instruments such as planning guides, building codes, housing designs and lack of proactive measures to mitigate exposure to risks and failure to practice social protection measures that assist social groups to make the necessary preparations to recover from calamities (World Bank, 2010).

2.2.2 Disaster Vulnerability

According to Benson and Clay (2003) countries in the sub-Saharan Africa are becoming more and more vulnerable to climatic hazards and hence here lies the countries with the highest concentration of risk. Benson and Clay recommend that risks derived from geographical hazards should be highly prioritized as their expenditure and cost in relation to economic development is increasing .this is feasible because all the natural disasters example famine/ draught constrains the national budget with a huge amount of funds set aside to respond to the unexpected event. This has long term as well as a short term challenge to economy's growth. Reallocation is the primary fiscal response to disaster. Disasters have minimal impact on trends in total aid flows (Benson & Clay, 2003).

Benson and Clay (2003), economy is not spared in case of a natural disaster and normal the effect is negative .according to Benson and Clay disaster affects economic growth, progress and poverty diminution in the long run. In Countries experiencing economic transformation, rapid development, urbanization and linked technological and social changes vulnerability is shifting tremendously for instance in countries prone to tropical storm such as Bangladesh,

where declining sensitivity to tropical storms and floods and increased resilience resulting from both economic transformation and public actions for disaster reduction (Benson & Clay, 2003).

According to county case it is not easy to clearly reveal the effect of a disaster. Bangladesh has poverty reduction as one of their main challenge to development, states Benson and Clay (2003) every successive government in Bangladesh tries to its capabilities by allocating more resources to poverty reduction, economic and human resource development as an approach of achieving this feasible goal. Disaster slows down the rate at which these actions are to be executed as infrastructure is ruined. it is difficult to measure the exact impact of the disaster to the level of capital expenditure in general Benson and Clay (2003) noted that disaster spending has correspondingly displaced planned investment by creating more vital needs.

2.2.3 Economic Impacts of Disasters

As Okuyama2008 argues, economic impacts of disasters are complex and difficult to assess and evaluate due to the features and uniqueness of assess and evaluate, due to the features and uniqueness of disasters. However, scholars do agree that at the macro level of analysis, natural disasters cause significant budgetary pressures, with both narrowly fiscal short term impacts and wider long term development implications. This is due to the fact that reallocation is the primary fiscal response to disaster (Benson & Clay, 2003; Okuyama, 2008).

At the micro level, namely the household, the industries and the individual, disasters result into disruption of normal production as well as the destruction of property resulting in untold economic suffering. Studies concludes that during the early stages of a disaster only the direct losses are visible which in turn may or may not lead to indirect losses causing inferior

effects that are felt continuously during the recovery period .these secondly effects outlines the requirements of the succeeding vulnerability.

Reduced output and employment opportunities from direct and indirect damage in impacted activities or economic sectors create knock-on indirect and secondary costs through reduction in consumption and investment, reduced productive capacity and increased social costs. Such social costs include the costs incurred on resettlement as well as the impacts arising from health issues and complications (Pelling & Wisner, 2009). Benson & Clay (2003) studies show a significant increase in the effect of natural disasters on development of human beings. This also increases the level of poverty. Rodriguez et al. (2008) observes that droughts are eminent natural calamities that impact negatively on social indicators.

2.2.4 Social Impacts of Disasters

Displacement of the population is an immediate effect from natural calamities. Disasters may also lead to other secondary socio economic effects which are usually carried for a longer time span than the others. These include the emergence of health complications which are usually prevalent among survivors of natural or man-made disasters (Khatun, 2003).

Furthermore, property destruction in the social sector impacts on the macroeconomic factors in an economy. These effects include loss of contribution to national economy that is caused by health or housing while impacting negatively on a country's balance of payment while giving room for increased inflationary pressures (Benson & Clay, 2003).

2.2.5 A Critical Analysis of Gaps in Literature

The literature however leaves a number of grey areas of which scanty information to counter the arguments is available. The first grey area surfaces in the contradictory nature of literature on social impacts of disasters. Benson and Clay (2003), contend that the sustainable effect of calamities on economic development has a negative bearing. That is, many displaced people

depend on government, Non-Governmental Organisation for support either for upkeep or finances to start business. This may lead to constrain in the economy as a whole. However, this is a sharp contrast to Toya and Skidmore (2002) who argued that disasters impact positively on growth which implies a reduction of returns on physical capital while increasing human capital resulting to a high level of growth. Strobl (2008) for the US coastal regions noted that hurricanes decrease impacts negatively on growth of an economy with a margin of 2 percent. This is attributed to people who seek employment to support themselves and also the large number of displaced population who consume donated products in large quantity.

Theories of development have put substantial weight on the task of capital and labor development and output. Studies also states that disasters bring relentless damage to major capital assets and resources. Output of safe capital and labor declines in relation to interruption caused by faulty infrastructure and market environments

A huge potential of unswerving capital losses exists where drought is considered an exception. Disasters such as drought might disrupt lasting investment including physical and human capital. Governments might divert resources away from set plans (Pelling & Holloway, 2006).

Another gap that surfaces is on the interplay of the various impacts. For example, the literature is scanty on the interplay between psycho-economic impacts among others. In addition, the study offers little information on the chain set up of the impacts of disasters on societies where they are experienced. For example, there's need to put into record the chain effect of economic impacts on the political set up of a given community whenever disaster strikes as well as the degree of this chain impact.

2.3 Theoretical Framework

This research is built on the assumption that disasters and hazards impact significantly on the adverse socio-economic effects in the societies where this happens. While macroeconomic theories can explain economic costs, it cannot measure the social impacts. To this effect therefore, in seeking to understand the socio-economic impact of the Sinai fire disaster; this study employed three theoretical frameworks upon which the assessment was hinged, namely; the systems theory, the social impact assessment theory and chaos theory.

2.3.1 The Systems Theory

On one hand, the systems theory of disaster management views the management cycle of disasters as one morphed into a system. The theory is hinged upon the basic premise that the disaster management cycle cannot be explained as independent since it involves several parts and processes. In understanding the impact of disasters, the systems theory holistically attends to all facets of the disaster thus bringing the whole picture of the disaster to the vogue.

The systems theory is hinged on the premise that the nature of environment affect how a system operates hence they system needs to cope with these changes. According to Von Bertalanffy, after a disturbance, a stimulus, the system re-establishes its steady state. Thus, this is viewed as the basic characteristics of self-regulation of an open system. In addition, Pareto developed a system consisting of interrelated parts. In such a system, might affect some parts of a system or the entire system (Peitgen, Jurgens & Saupel, 1992). This means that a high level of risk is expected whenever there lacks control of the system and if their implication to the environment is uncertain. It can be assumed that firms make decisions to manage risks and predict future outcome.

The systems theory insists that a disaster risk management should be tailored to the respective environment in order to cater for the expected needs of a given disaster. The probability of a

disaster occurring should be included when considering economic, social and political factors this helps the firm to align its strategies in a manner that it can incorporate all the factors which might be considered to influence calamities (Holden, 1996).

This theory describes the traits of the system theory that makes it relevant for disaster management cycle (Alexander, 2000). To have an understanding of the principles that are valid to systems in general enables the firm to understand the best approach to deal with unique calamities. This underlies the importance of the systems theory in understanding the socio-economic impacts of the Sinai fire disaster in 2011 as detailed out in the research's conceptual framework (McEntire, 2006).

2.3.2 The Social Impact Assessment Theory

Assessment of social effect can be defined as a process of measuring prior the social cost from human actions in a country or state. Social effects involve all the social and cultural impacts of a human population that alter the manner in which people stay, how they work and relate to one another in attempt to satisfy their needs and cope with other members of the society (Strobl, 2008).

This theory expound on the process of examining the social impact of actions that arise from a certain phenomenon. This theory puts more emphasis on the process of determining the impact of a calamity and making relevant preparations to mitigate a disaster (Blaikie et al., 1994). Therefore, this theory gives us an input on how both risk factors and impacts of Sinai fire could have been assessed. In addition, it is going also to highlight measures that could have been put in place to avoid or divert the inferno. Thus the theory encompasses all measures of assessment on the impact of a disaster upon society. This paper seeks to use the social impact assessment theory.

2.3.3 Chaos Theory

According to Arnold and Kreimer (2000) chaos as turmoil, turbulence, primordial, abyss and understanding randomness but scientists see chaos as something extremely sensitive to initial conditions. A chaos system acts in a way that happens very smoothly and orderly. According to Holden 1986, the theory was developed by Lorenz Edward 1960. Irrespective of the complexity of the system they rely on small events or systems that cause complexity of behaviour (Peitgen et al, 1992). Determination holds that the belief of an action is a consequence of actions that follow. It functions on the premise that causes all effects, and rules that define science. Isaac Newton was linked to the establishment of modern science. He maintains that natural science laws accurately predict systems. They meant that an individual performance as a business would be influenced by three main factors; His /her own attitude towards her occupation; the expectation held by the sanction group and the operation requirement of the job. In the study, the values held by the society are the determinants of the attitude towards ones occupation and the expectations of the sanctioned group in the society. Important to note is that changes over time are exogenous variables as population, and technology drift impeaches on the role of structures in determining whether the stakeholders' response would be determined by cultural values (Waldrop, 1992).

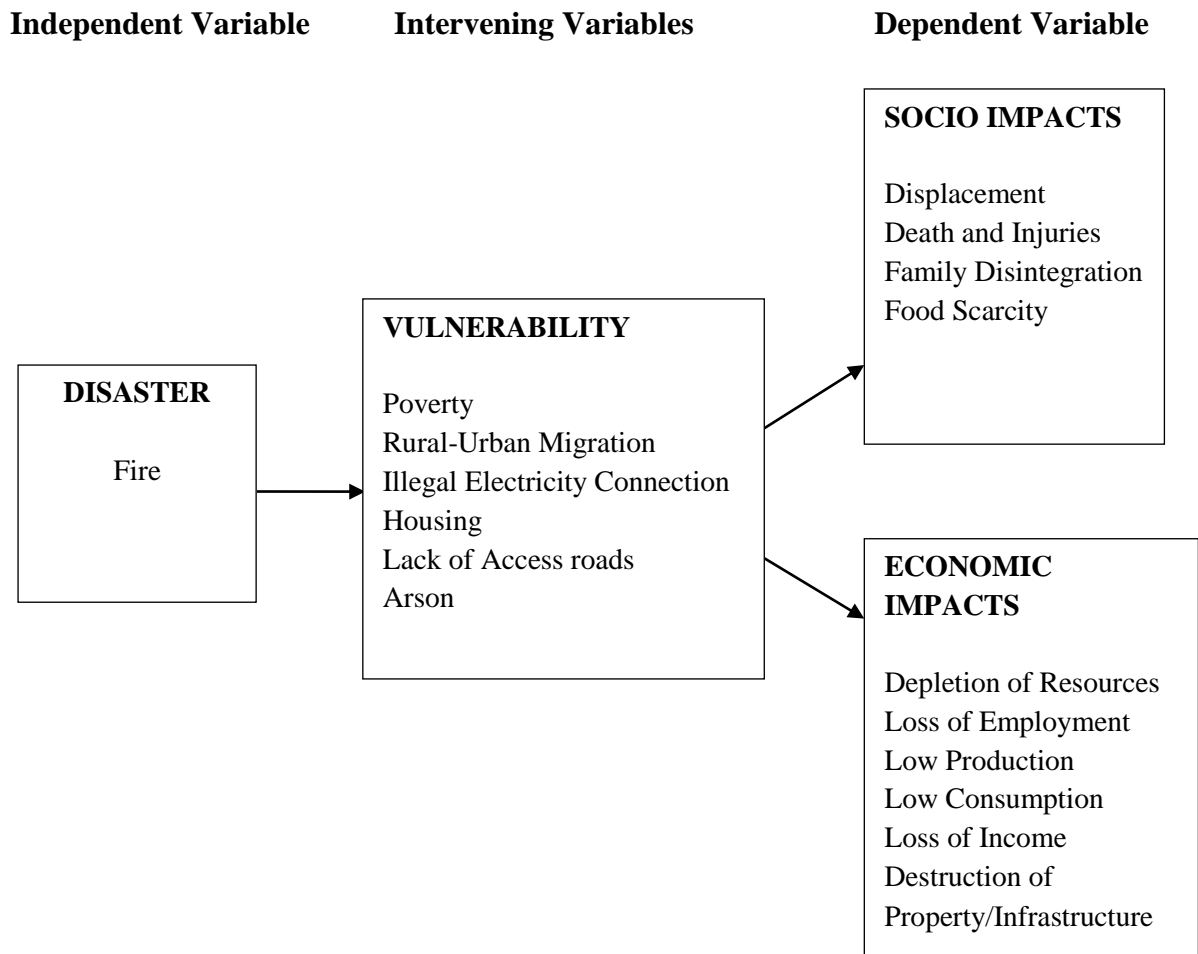
According to Waldrop 1992, chaos theory may provide useful management insight for organization which responds to large scale geographical area. Large scale disasters create chaos. Prepared plans should seek to anticipate the sources of chaos and plan to encounter them. Kautman and Goenor (1994) argue that chaos theory enhance the readers understanding of the process that causes firms to be disorderly. Pelling and Wisner (2009), posit that chaos theory is a framework that is worth exploring. The country has undergone myriad of disasters which have created chaos before normalcy prevailed. The examples are the Elnino floods of 1997/98 that lead to large sections of our country inaccessible to many

parts of the country .This lead to formation of an emergence operations centre that coordinates relief operations (draft on disaster policy in Kenya, 2009). Chaos theory can also help the researchers to unmask disaster preparedness in a country as it prepares and provides insights for government and other organizations that partner in responsibility of disaster response management for example Kenya Red cross and Africa medical Research Foundation (AMREF) (Kautman & Goenor, 1994).

2.4 Conceptual Framework

Fire disaster in the slums occurs as a result of presence of risk factors. On the other hand, impact of the fire can only be felt or observed after the fire has occurred. Therefore, the conceptual framework below represents the relationships among the three variables. In the presence of risk factors, fire is likely to occur where impacts are felt and observed in the lives of those affected. Fire disaster was conceptualised in this study as the independent variable while both social and economic impacts as dependent variables. The presence of risk factors / intervening variables was believed to directly influence the occurrence of fire disaster in the area. Figure 2.1 below represents the relationship between the three variables in a conceptual framework.

Figure 2.1: Conceptual Framework



Fire disaster in the slum was triggered by risk factors which include; poverty, rural-urban migration, illegal electricity connection, poor housing, lack of access roads and arson. According to the researcher, poverty levels in Kenya forces people to migrate to urban areas in search of better jobs. When jobs are not forthcoming, the population grow hence leading them to settle either on private or government land. This leads to construction of semi-permanent houses since they cannot afford better houses due to the fact that many people do casual jobs thus less financial remuneration.

There is coloration of causes of fire in the slum and electricity faults. This can be attributed to illegal power connection in the area which leads to fire when loose hanging wires come to contact. On the other hand, once the fire occurs the residents become exposed to certain

impacts which include: depletion of resources, family disintegration, death and injuries, scarcity of food, loss of employment which leads to loss of income, destruction of property / infrastructure. Therefore the conceptual framework above shows the relationship between all variables in question.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

Different research methodologies are compatible with different research situations. To this effect, it is of great importance to the researcher to know which methodology is best suitable for use with a particular hypothesis or question(s) he/she intends to address. Setting the terms of discourse in as far as the research method is concerned is thus of paramount importance. Therefore, the chapter gives a description of the site study, the design of the research, analysis units and observation, target population, techniques of sampling, procedures to collect data, analysis and ethical matters.

3.2 Site Description

The study was performed in Sinai, the site of one of the most disastrous infernos ever to occur in Nairobi County lies in Viwandani Ward, Makadara Constituency, Nairobi East Sub-County in Nairobi county; Kenya's administrative capital. The site lies in Nairobi's industrial area in an area adjacent to the pipeline system of the Kenya Pipeline Company. The slum is 3 miles from Kenya's international airport, which is one of dozens of informal settlements where majority of urban poor population are affected by inequalities. Most slum dwellers rush to scenes of spilt oils, diesel or petrol as an opportunity for business. Others live stay in risk areas adjacent to industrial zone.. In addition, some people also do small businesses like shops, cafes, money transfer services (*Mpesa*), selling of grocery and water vending to residents. The slum is home of 12000 residents who comprises of different ethnic background. At least 100 people died and 112 badly burned after a fire caused by an exploding oil leak swept through a teeming Kenyan slum.

3.3 Research Design

Research design has been defined by a number of scholars as the arrangement of conditions for collection and analysis of data in a manner that seeks to combine relevance to the research

purpose with economy in the procedure (Babbie, 1990).Kothari(2004) sees a research design as a blue print which facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible hence yielding maximum information with minimal expenditure of effort, time and money.

This study gathered quantitative and qualitative data describing the social, economic impact of 2011 Sinai fire disaster. The study adopted a descriptive research design; it portrays an accurate profile of events, persons or situation. Descriptive research allows the researcher to collect qualitative data which would be analysed quantitatively using inferential and descriptive statistics. Mugenda and Mugenda (2003), says that descriptive research is used to obtain information concerning the current status of the phenomena to describe "what exists" with respect to variables or conditions in a situation. Thus, the researcher felt that descriptive methods was best suited for this study since allowed for the description of Social, Economic impact of Sinai fire disaster in Nairobi county . Quantitative data was collected from individual residents of Sinai slum, while qualitative data was collected from key informants (Kothari, 2004).

3.4 Unit of Analysis and Units of Observation

A unit of analysis has been defined by Babbie 1990 as what or who is analyzed in the study. The unit of analysis in this study was the impact of fire on residents both socially and economically being a follow up of 2011 fire disaster in Nairobi County, a case on Sinai Slums in Nairobi. The unit of observation represents the objects that are observed and about which information is systematically collected.

The units of observation in this study were the residents of Sinai Slums who were affected by 2011 fire disaster as well as key informants who included area chief, Kenya Pipeline official, KK fire brigade, Nairobi County fire brigade, chairman of the victims, Kenya Power & Lighting Company official.

3.5 Target Population

According to Mugenda and Mugenda 2003, target population refers to the population about which information is wanted. The target population was on the residents of Sinai both who were affected and those who were not affected by the 2011 inferno, bearing in mind the number of years that he or she had lived in the slum, the education level, age, occupation, marital status, designation of the population and gender. The study collected data from 9 key informants who were mainly persons who have close interaction with resident of Sinai slum before, during and after the inferno.

3.6 Sampling Procedure

Babbie 1990 defined sampling as the process of examining a representative set of items. She further adds that sampling is done to gain an understanding of some features or attributes of the whole population based on characteristics of the sample.

According to the 2009 census, Sinai slums village had a population of 12,000 people that comprised of five clusters of villages that form Sinai slum: namely Sinai Original, Sinai Railway, and Paradise A, Paradise centre, and Paradise B. According to Kenya Red Cross Society (2011), the Sinai Original was the one affected by the inferno and it comprised 320 households. Therefore, Purposive sampling was employed to select the study area. By definition, purposive sampling allows a researcher to select a sample on the basis at his/her expense knowledge of the target population. It allows the researcher to use cases that have the required information with respect to the objectives of the study (Mugenda, 1999). The researcher is well informed on the distribution of Sinai fire in the slum, thus the researcher easily identify the area which was greatly affected by inferno. Based on the knowledge on the distribution of inferno in the slum, the researcher selected a sample of the village using 500 m radius on the area inferno spread.

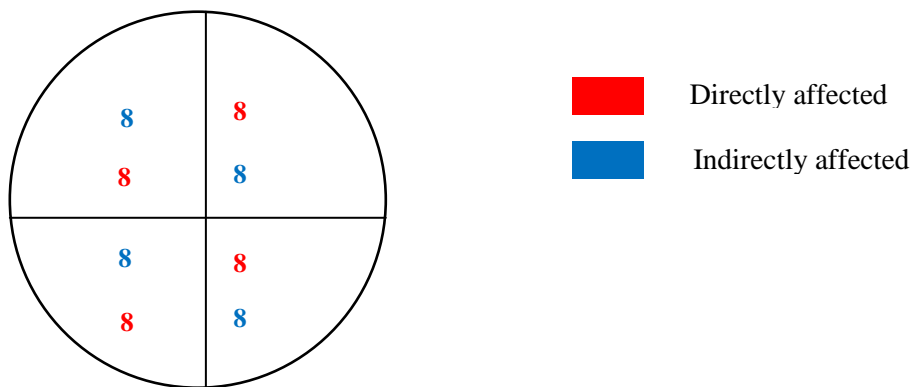
In addition, the researcher did sampling on those residents that were both directly and indirectly affected by the inferno within the radius of the inferno. The residents were selected randomly to capture diversity and control biases.

3.6.1 Sample Size Determination

Within the village simple random sampling was used to select a sample of 20% of total households so that the researcher got the sample size.

For the purpose of the study 64 respondents inclusive of male and women were randomly selected. Those selected are those who fell within 500 m radius.

Sample size: $\frac{20}{100} \times 320 = 64$



3.7 Methods of Data Collection

The study used both primary and secondary data. Primary data was collected using a structured questionnaire and key informant guide while secondary data was mainly constituted in the literature review and the researcher analysed all forms of data to come up with the findings. The questionnaire was specific to avoid any respondent generalization. The questionnaire approach was also preferred due to limitations of time and resources in the study since the drop and pick later method was found to be quite effective. Primary data was further sub-divided into; qualitative data and quantitative data.

3.7.1 Collection of Quantitative Data

Quantitative data collated from the main respondents constituted both male and female residents of Sinai slum. The instrument of data collection from these respondents was the structured questionnaire containing open ended and closed questions was used to gather requisite information. A questionnaire is a data gathering device that elicits from the respondents the answer or reaction to pre-arranged questions presented in a specific order.

In the context of this study, data was collected using close ended questions and very few open ended questions regarding impact of Sinai fire on residents. The researcher went to the field with two research assistants and administered the questionnaires to the respondents

3.7.2 Collection of Qualitative Data

On the other hand, qualitative data was collected from key informants using a key informant guide. Key informants, for the purpose of this research were composed of area chief, Kenya Pipeline officials, KK fire brigade, and Nairobi county fire brigade, chairman of victims, and Kenya power and lighting company.

3.8 Ethical Considerations

Research best practices dictate that it is the responsibility of the researcher to consider whether any type of harm could occur as part of his/her research and whether he/she needs to ensure that mechanisms are instituted to remove this potential harm. It is, therefore, essential that the researcher carefully evaluates the potential for harm to arise and ensure that he/she behaves according to appropriate ethical standards; and, he/she considers how his/her research might negatively affect participants.

In the case of the Sinai fire disaster, it is important to understand that disasters that are of catastrophic proportions the size of the 2011 Sinai fire inferno have been known to cause long term psychological impacts unto those affected either directly or indirectly. To this

effect, the main ethical consideration for this research was psychological impact of the disaster especially the trauma that can be triggered by revisiting the disaster during the process of data collection.

3.9 Data Analysis

This involves the interpretation of information collected from the study's respondents. Once the questionnaires have been completed and collected from each respondent, the researcher compiled them by using data editing, data coding and data tabulation. The data was then analysed quantitatively using the SPSS software so as to enable the researcher to meaningfully describe distribution of score or measures.

In addition, qualitative data was analysed in a systematic way in order to come up with some useful conclusions and recommendation. The researcher was therefore able to obtain detailed information on the study and tried to establish patterns, trends and relationships from the information that was gathered. The results were presented by employing descriptive statistics including frequency tables, pie charts and graphs.

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.0 Introduction

The study on disaster management was conducted in Sinai informal settlement in Makadara constituency in Nairobi. The focus of the study took into cognizance the aspect of fire disasters in the area. A total of 62 respondents were interviewed in a period of one week with care being taken to ensure gender balance in the exercise.

4.1 Social and Demographic Characteristics

4.1.1 Years of Residence

Table 4.1: Distribution according to gender and members of years of residence

Years of Residence	Gender				TOTAL	
	Male		Female			
	N	%	N	%	N	%
6 - 10	8	26.7	19	59.4	27	43.6
11 - 15	14	46.7	4	12.5	18	29.0
16 - 20	3	10.0	5	15.6	8	12.9
21 - 25	2	6.6	1	3.1	3	4.8
26 - 30	3	10.0	3	9.4	6	9.7
Total	30	100	32	100	62	100

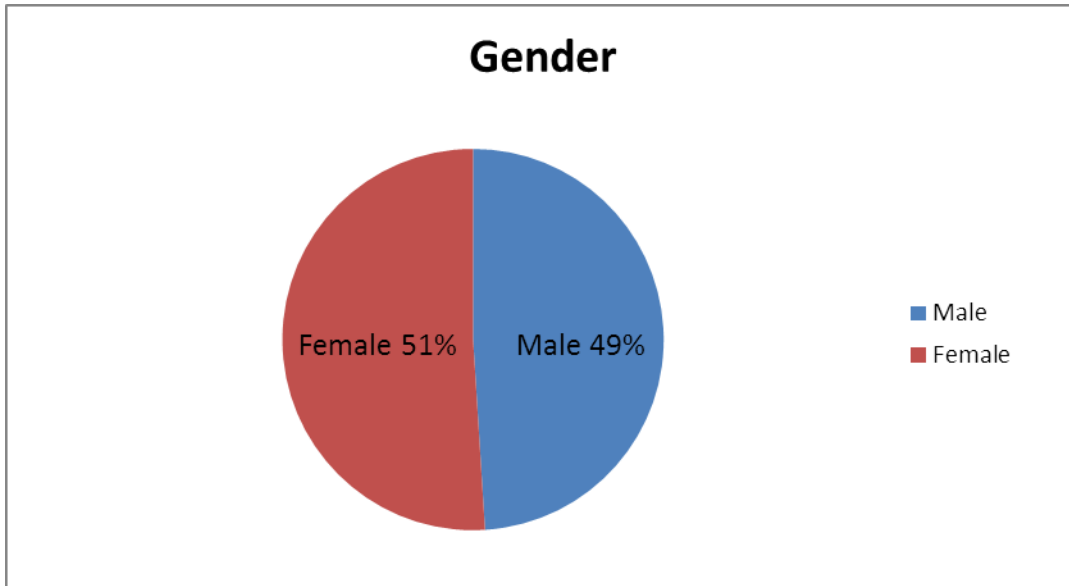
As table 1 indicates, the majority of the respondents have lived in the area for more than 5 years. This gives credence to the responses that were contributed towards the study as the community members had lived in the area for a reasonable amount of time and can provide reliable information.

4.1.2 Gender Distribution

A total of 62 respondents were interviewed in a period of one week with care being taken to ensure gender balance in the exercise. Therefore 49% were males and 51% were females were reached in the study. The number of those affected seems much higher among women than men. Therefore, this explained why there were higher response rates from women. The

findings further indicate that majority of males have lived in this area more than eleven years compared to women who have stayed for ten years. The findings are illustrated in figure 4.1 below.

Figure 4.1: Distribution by Gender



4.1.3 Age Group Distribution

The study targeted respondents who seemed to be fairly distributed across age groups. 19.4% of the respondents were aged between 18-24 years, 29% were aged between 28-29 years, 32.2% were aged between 30-34 years and 19.4% of the respondents were above 35 years.

The distribution of the respondents across the groups is illustrated in the table 4.2 below:-

Table 4.2: Distribution of respondents by Age

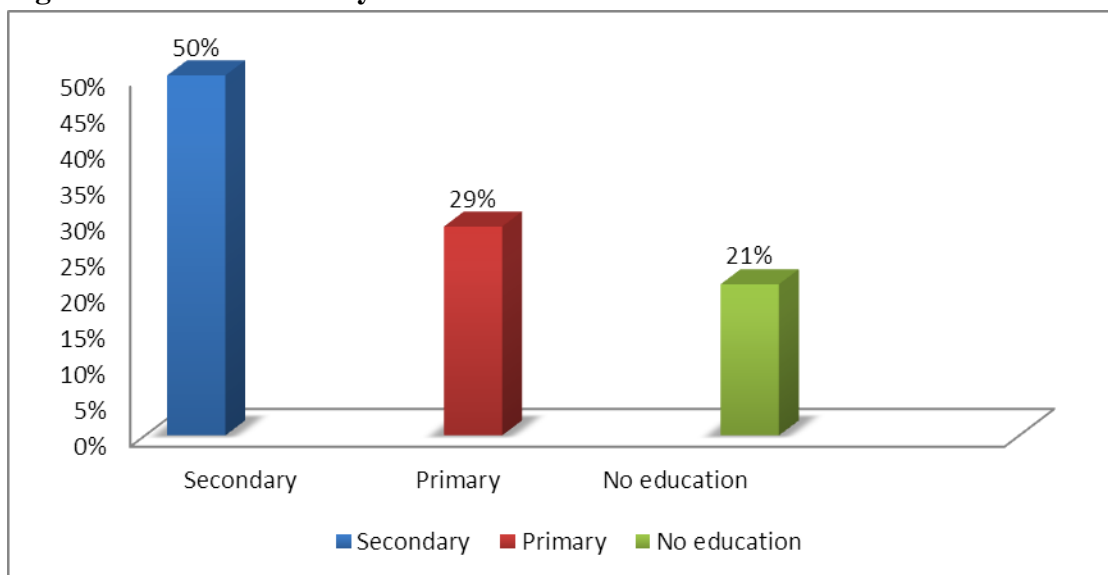
Age Bracket	Frequency	Percentage
18-23	12	19.4%
24-29	18	29%
30-35	20	32.2%
36 & Above	12	19.4%
Total	62	100

This therefore, means that three quarter of the respondents were below the age of 35, thus belonging to the youth bracket. This has helped researcher to identify that most of the residents who were affected by inferno were young persons who had gone to scoop fuel from the drainage. As one parent puts it “my daughter left me in the house with my grandson, went with a five litre jelly can, only to be called that she had been taken to the hospital unconscious due to inferno”. The chairman of the victims affirms this by saying that those who suffered severe burns and hospitalized were youth.

4.1.4 Level of Education

Asked about the highest level of education attained, findings show that 29% have at least attained secondary education, 50% of the respondents have primary education while a further 21% had not completed formal education as indicated in graph 1 below.

Figure 4.2: Distribution by Level of Education

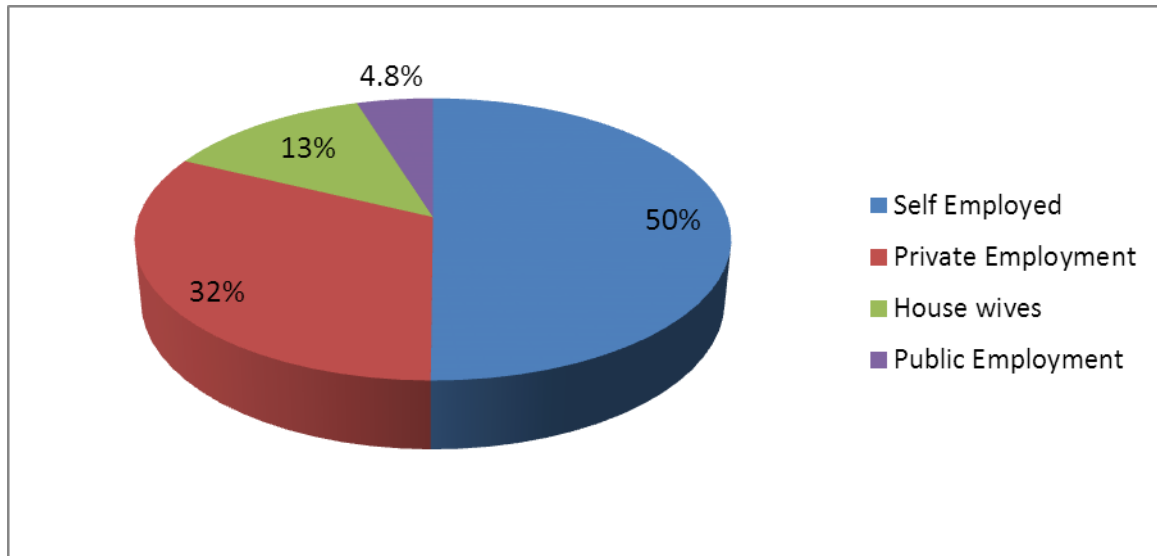


This clearly shows that 50 % in Sinai had secondary level of education, 29% had primary while 21% had no level of education. According to the finding many of residents have no vocational training hence the reasons why most of the residents were either casual labourers or self-employed. However this also shows that residents were in a position to not only comprehend but also assess what they would need should a fire outbreak occur.

4.1.5 Occupation Distribution

Asked what their main occupation was, most of the respondents were self-employed at 50% as indicated in figure 4.3, closely followed by private employment at 32% and housewives at 13% while those in public employment were 4.8%.

Figure 4.3: Distribution by Occupation



Most of the self-employed operated their businesses at home therefore the enumerators were able to reach the respondents and have time for the interview. As one of the key informants argued ‘most of the residents were self-employed with a majority of them rearing pigs as their main source of income. Others were landlords with a number of houses to rent out given that most of those employed in the neighbourhood which is an industrial area live there due to proximity to their work place and also the affordability of the houses.

4.1.6 Marital Status Distribution

Asked about their marital status a majority 61.3% of the respondents were married, 14.5% were single followed closely by those who were separated at 12.9%, those who were divorced were 8.1% while the widowed were 3.2%.As the village chairman argued, most of the residents had lost their partners in the inferno and had to remarry while others separated due to various challenges that befell them. The pain of losing a loved one could have led to the

turn of events like widowhood and divorce in the area. As the area chief explained that a family had lost two children in the fire and that was the beginning of domestic violence in one of the households and eventually they had to separate. The findings are illustrated in table 4.3 below.

Table 4.3: Distribution by marital status

Status	Frequency	Percent
Married	38	61.3
Single	9	14.5
Divorced	5	8.1
Separated	8	12.9
Widowed	2	3.2
Total	62	100.0

4.1.7 Family Size Distribution

According to the table below a majority of the respondents 41.9% had three to four children followed closely by those with one to two children at 35.5% and a further 17.7% with five to six children while a 4.8% had no children. Therefore, majority had three children and above.

Table 4.4: Distribution by number of children

No. of children	Frequency	Percent
1 to 2	22	35.5
3 to 4	26	41.9
5 to 6	11	17.7
None	3	4.8
Total	62	100.0

This study reveals that 69% of the populations were married therefore had families.77% showed that most had children who were being taken care of by both parents before inferno.

The family size decreased as a result the inferno as most of those who lost their lives were young persons.

As the chief put it, one family separated as they had lost two children in the inferno. The woman chose to remarry somewhere else because the husband had lost everything in the inferno that is cattle, pigs and rental houses. The husband was the last to leave the hospital with burns.

4.2 Economic Status of Sinai residents before the Fire Disaster

Asked about their economic situation before the 2011 fire disaster, a majority at 61.3% as indicated in the study findings were stable, 32.3% were moderate and a further 4.8% were very stable while 1.6% were unstable. According to the area chairman a stable economic status meant that they went on their businesses well without any loss or interference since a majority were self-employed that is rearing of pigs, zero grazing and running of small businesses, while others were landlords. Those on private employment opted to stay at Sinai due to its proximity to the industries.

Table 4.5: Distribution by Economic situation in Sinai before fire disaster

Status	Frequency	Percent
Unstable	1	1.6
Moderate	20	32.3
Stable	38	61.3
Very stable	3	4.8
Total	62	100.0

4.3 Social Situation of Sinai residents before the fire Disaster

As shown in the table below a majority 35.5% suffered at a great extent, 29% at a very great extent, and 19.4% at a moderate extent while 16.1% suffered a small extent.

Table 4.6: Distribution by Extent to which the Sinai community suffered socially from the 2011 Sinai fire disaster

Extent of cause	Frequency	Percent
Small extent	10	16.1
Moderate extent	12	19.4
Great extent	22	35.5
Very great extent	18	29.0
Total	62	100.0

Family destabilization was high since most of family members were misplaced and were to stay apart until they found shelter. As a majority cited they had to move to the streets since they had no other place to go .This was as a result of local administration denying them to rebuild houses on the area that houses were burnt by inferno. According to chairman of the victims, local chief was given orders not to allow anybody to build any structure in the area. Those who disobeyed were arrested and fined. Others gathered at Makadara social hall where people of good supported them in terms of food and other basics needs especially to those who had children and elderly persons. Some opted to rent houses in other place of slum to start afresh while others went back in rural areas altogether. There are some people from Sinai who are still displaced.

The victims of Sinai fire normally find it hard to visit friends, relatives freely as they used especially those who were burnt to some degree. Their self-esteem seemed to be very low due to disfiguring of the body. Some friends, partners left them when they leant of their ordeal. According to area chief, marriages and friendships ended abruptly leading to victims of Sinai being affected more psychologically. Merry go round groups they had collapsed abruptly due to the fact that some can't be able to sustain them. Most had no source of income anymore.

4.3.1 Lifestyle Change Distribution

Asked to what extent the community suffered in terms of customs and beliefs 19.9% of those interviewed said it was moderate, 29% were of the opinion that it was to a great extent, a further 33.4% said it was to a great extent while 17.7% were of the opinion that was to a small extent. The findings are illustrated in table below:

Table 4.7: Distribution according to lifestyle change

Extent of cause	Frequency	Percent
Small extent	11	17.7
Moderate extent	11	19.9
Great extent	22	33.4
Very great extent	18	29.0
Total	62	100.0

Therefore, 62.4% of population have felt that their way of life was disrupted. Some communities are used to giving respect to the dead in a special way but this never happened. Dead bodies stayed at the morgue longer than expected due to identification process. Some were unable to identify their deceased without DNA tests. As one village elder puts it, “there was cleansing ceremony following inferno; the dead were not accorded burial ceremony according to the African culture. In addition, families who used to meet within the slum to worship, conduct ceremonies ceased to do so .Some of their members relocated, died, or were afraid to come out in public. Members who used to attend same church were affected while those who used to meet every evening were disorganised. There was social disintegration.”

4.3.2 Family Set up and Impact of Fire Disaster

The study sought to find out whether the family set-up was interfered with by the 2011 fire disaster and as indicated on table 10,53.2% said that it was at great extent ,40.3% at a very

great extent,3.2% at a moderate extent while another 3. 2% were at a small extent. The findings are illustrated in table below:-

Table 4.8: Distribution according to interference of family set up by fire disaster

Extent of Interference	Frequency	Percent
Small extent	2	3.2
Moderate extent	2	3.2
Great extent	33	53.2
Very great extent	25	40.3
Total	62	100.0

According to a key informant children were orphaned, parents lost their children in the inferno while spouses lost their partners. This therefore brought about widowhood while separation was at a high rate .This was a result of challenges that befell the family after the inferno.” people lost their livelihoods for example most of the residents reared pigs which were burnt during inferno while others derived their income from renting houses which they also lost “Area chief said that two families ended up separating because they lost their children in inferno and never got the chance to bury them since they were burnt to ashes. This case was as a result of blame game. Cases of divorce were also reported arising from differences among spouses. As one of the residents narrated the ordeal how he came from hospital where he was admitted, only to find his wife has left him. His wife married again in another county. He attributes this to his disfigured body that had 20% burns.

4.4 Predisposing Factors Distribution

Asked about the factors that increase exposure and vulnerability to fire risks in the area 35.5% of those interviewed attributed this to poor housing, 27.4% cited lack of access roads, 17.7% cited illegal electricity connections, and 9.7% cited high population density that leads to poor housing while another 9.7% cited poverty.

Table 4.9: Distribution by predisposing factors

Factors	Frequency	Percent
Poverty	6	9.7
Housing	22	35.5
High population density	6	9.7
Illegal electricity connections	11	17.7
Lack of access roads	17	27.4
Total	62	100.0

This is well explained by the fact that Sinai is a slum that is situated next to an industrial region given the many industries located there .Therefore most of the residents work in these industries on casual basis. Due to this the residents have to put their living costs at a minimum given the low income that most of them get from the temporary employment. This has led to most of people opting to rent semi-permanent houses constructed with old iron sheets and wood. They are fitted with illegal electricity that poses high risk in case of power surge or fault. Kenya power officials said that illegal connections are done by quakes thus exposing residents to more danger. Lacks of accessible roads in the area contribute a lot to severity of fire. This is attributed to the fact that fire fighters and their fire engines cannot be able to put out fire.” We are forced to demolish structures that are on the way to be able to access to the site of inferno.

4.4.1 Causes of Fires Distribution

As shown in the table below a majority 58.1% of those interviewed cited electric faults as a cause of fire in Sinai settlement, 29% cited domestic violence, 8.1% cited others while 4.8% cited fuels.

Table 4.10: Distribution of Causes of fires in Sinai area

Causes	Frequency	Percent
Domestic violence	18	29.0
Electric faults	36	58.1
Fuels	3	4.8
Others	5	8.1
Total	62	100.0

According to residents others included arson and candles since most of them cannot afford expensive sources of energy. This explains why illegal electricity connection is rampant in the area and the increase of incidences of fire outbreaks.

According to a KPLC official, cases of illegal electricity connections are very rampant in Sinai and every effort is being made to curb the vice. As the area chief argues” the residents are sitting on a time bomb against the law which prescribes that the safety of every person starts with individual responsibility”.

According to him having proper electrical wiring, avoiding siphoning fuel and keeping our environment free from combustible material are some of the ways of avoiding fires in the area. It is therefore safe to conclude that the available information on disaster management is very helpful in minimizing fire incidences but how to apply the information could be a hindrance. However, having an elaborate and effective fire policy could be of great importance.

4.4.2 Shelter Distribution

Asked where they would seek refuge in case of fire outbreak, 56.5% of the respondents said in the streets, 25.8% said in the Makadara social hall, 8.1% said they would stay with friends, 4.8% with relatives and a further 3.2% with unaffected neighbors while 1.6% would go to rural areas.

Table 4.11: Distribution by places the respondents would seek shelter

Places	Frequency	Percent
In the streets	35	56.5
With an unaffected neighbors	2	3.2
With friends	5	8.1
With relatives	3	4.8
Go to rural areas	1	1.6
Others	16	25.8
Total	62	100.0

Most of the respondents who were interviewed said they would seek shelter in the streets since they had been born here and had nowhere else to go to. They put up shanties to house before they were taken to Makadara social hall. Only a small fraction stayed with friends or neighbours. In addition, they were forced to streets because they cannot afford to rent houses and yet their source of livelihood was cut short by inferno. As local administration continued to restrict them from going back to their burnt houses, many opted to camp along Dunga road with temporary shanties.

4.4.3 Frequency of Fire Distribution

Asked about fire frequencies over the past few years 2% of the respondents cited an increase, 3.2% said that it stayed the same while 90.3% cited a decrease. Therefore, majority of residents feel that fire incidences have decreased since the one in 2011.

Table 4.12: Distribution by Fire frequencies in the area

Response on frequencies	Frequency	Percent
Increased	2	6.5
stayed the same	4	3.2
Decreased	56	90.3
Total	62	100.0

This was attributed by arson, electrical faults or explosion from cooking stove. A large proportion of respondents admitted to have witnessed fires occurring however, they are not of big magnitude as importance to that origin of 2011 Sinai fire. Electrical faults were accorded highest percentage of causes of fire in Sinai slum. The cases of illegal electricity connection have been in increase. People tap wires from the main power lines hence putting residents of Sinai at high risk of fire.

4.4.4 Origin of the 2011 Sinai Fire Distribution

The study sought to find out the origin of the 2011 Sinai fire and as indicated in table 15,a majority of the respondents 46.8% said that it originated from the neighbourhood,19.4% shows did not know ,19.4% cited other while 14.5% said it originated from within the house.

Table 4.13: Distribution by what Respondents Thought was the Origin of the 2011 Sinai Fire

Origin	Frequency	Percent
Cigarette Smoking	53	85.5
From the neighborhoods	4	6.5
From within the house	3	4.8
Do not know	2	3.2
Total	62	100.0

85.5% of respondents attributed the inferno as being ignited from cigarette smoking.

Fuel had leaked into a storm drain from the pipeline. Residents said the spill had prompted many people to rush and collect leaking fuel. There was a loud bang, and a big explosion, followed by fire .The blast was sparked by a cigarette butt thrown into an open sewer that was filling with fuel.

4.5 Fire Disaster Preparedness Distribution

The purpose of being prepared is to enable effective response whenever fire a disaster occurs. It involves planning, equipping, training and exercising in order to create or sustain

capabilities in order to prevent, protect against, mitigate, and respond to any fire emergency. Researcher sought to find out from residents whether there was measures put up by county government together with national government to prevent, mitigate such tragedy again.

Asked whether the county government has done enough, a majority 87.1% responded the county had not done enough no while 12.1% said they have done enough.

In addition, respondents feel that the high rising number of inferno in Sinai can also be as a result Nairobi County government not doing enough to deal with fire outbreak. Majority of 87% said that there has been little response from fire department. As much they respond, they do it when it is too late.

Table 4.14: Distribution by Fire Disaster Preparedness

Response	Frequency	Percent
Yes	8	12.9
No	54	87.1
Total	62	100.0

4.5.1 Level of Fire Safety Awareness Distribution

In order to establish if the level of fire safety awareness in disaster preparedness, the respondents were asked whether they have been trained on safety, or whether they know what to do in case of fire outbreak

Out of the respondents interviewed 87.1% have no idea on any training done for them to be in a position to stop a fire while 12.9% are only aware on what to do. There was clear indication that majority have not received any training in the fire safety awareness, they have not therefore taken the necessary precautions against fire disasters.

Table 4.15: Distribution by whether trained on fire safety measures

Whether Trained	Frequency	Percent
Trained	8	12.9
Not Trained	54	87.1
Total	62	100.0

4.5.2 Response of Firefighters Distribution

The study sought to find out whether the county firefighters did respond on time to the Sinai inferno, as shown in table 17 below, 85.5% said they fire engines from county came late to the scene after even being called through mobile phone while 14.5% said the response was good. This was attributed by the fact that G4S fire engine is some kilometers away. They were joined by other fire engines much later.

Table 4.16: Distribution by whether fire-fighters responded on time

Response	Frequency	Percent
Responded on time	9	14.5
Responded late	53	85.5
Total	62	100.0

4.5.3 Communication Ways Distribution

Asked on how they would reach the fire brigade a majority of those interviewed 75.8% said that they would call the police to inform them while 24.2% would call them directly via cell phone.

Table 4.17: Distribution by Ways of communication

Ways of communication	Frequency	Percent
Call them directly via cell phone	15	24.2
Call the police to inform them	47	75.8
Total	62	100.0

75% of the respondents believe that they would notify police in case of fire outbreak then in return the police to call fire brigade. This was the case even after the KK fire engine being some meters away from the slum; none of the respondents had their emergence numbers.

4.6 Effects of Sinai Fire Disaster on Households Income and Poverty Distribution

Asked about the impact of the Sinai fire disaster on the economic wellbeing of the Sinai community, 53.2% of those interviewed cited great extent while 46.8 said that the impact was very great.

Table 4.18: Distribution by Extent to which the Sinai Fire Disaster adversely affected the economic well-being of the Community

Extent of adverse effect	Frequency	Percent
Suffered Great extent	33	53.2
Suffered Very great extent	29	46.8
Total	62	100.0

The residents became much poorer than before since they lost the little they had .Most of them lost their houses and had to rebuild while others relocated which a cost that was not planned for. Others were subjected to medication hence the families had to foot a high hospital bill. People who were rearing pigs, zero grazing and had houses to rent, they lost all of it to the inferno. They were left to depend on well-wishers for support. Depletion of financial resources was noted as major impact of Sinai fire. 98.3% feel that they have spent a lot in terms of monetary, either in seeking medical treatment to those who sustained burnt injuries, others renting out houses to stay, while others bought material to build houses afresh. Sinai victims have to buy new piglets/cows to start their business. In addition, poverty level was seen as a cause of the disposing factor of fire as well as an impact.

4.6.1 Social Cost Distribution

Out of the respondents interviewed, 54.8% said that the social cost of the economic impact of the Sinai fire disaster was to a great extent, 43.5% to a very great extent while 1.6% was of the opinion that it was to a small extent.

Table 4.19: Distribution by Social Cost

Extent of cause	Frequency	Percent
Small extent	1	1.6
Great extent	34	54.8
Very great extent	27	43.5
Total	62	100.0

Therefore, the depletion of financial resources was noted as major impact of Sinai fire. 98.3% feel that they have spent a lot in terms of monetary, either in seeking medical treatment to those who sustained burnt injuries, others renting out houses to stay, while others bought material to build houses afresh. Sinai victims have to buy new piglets/cows to start their business

4.6.2 Poverty Level Distribution

Asked whether poverty was a cause of the 2011 fire disaster, 29% of those interviewed agreed, 25.8% were neutral, 22.6% strongly disagreed, and a further 11.3% disagreed while another 11.3% strongly agreed.

Table 4.20: Distribution by Poverty Level

	Frequency	Percent
Strongly disagree	14	22.6
Disagree	7	11.3
Neutral	16	25.8
Agree	18	29.0
Strongly agree	7	11.3
Total	62	100.0

29% of respondents agree that scarcity or lack of material possessions or money has led them to settle on reserve area of Kenya pipeline drainage system or railway lines. They have low source of income which cannot sustain them in renting houses in other areas. 50% of respondent having been in self-employment feels that Sinai fire rendered them last blow in becoming poor. They used their saving to medical purposes, rebuilding houses thus results in an endless circle of poverty.

Persons who were on private employment and had suffered severe burns were retrenched thus becoming jobless. Sinai fire was also found to increase dependence on others. This was mostly so for those who suffered physical disability. These group of people reported that they highly depended on others to help them move from one place to another.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter contains a summary of the very finding from the study based on a careful examination and analysis of the same. In this chapter the researcher draws conclusions from study findings and leaves recommendations for future studies based on the knowledge gap identified in the course of this study.

5.1 Summary of Key Findings

The summary sought to establish the social, economic impact of fire disasters in Sinai slum fire. The researcher was guided by fire research questions which were also in line with study objectives. The research questions sought to establish social, economic situation of Sinai residents before the disaster, ways that Sinai fire disaster affected household cohesion, raised perceptions among Sinai residents, raised reduction strategies created following Sinai fire disaster, effect of Sinai fire on household income to poverty levels for victims

It was noted that 98.4% of residents of Sinai had a source of income before the inferno. What makes this apparent is the revelation that 61% of Sinai residents interviewed were stable in their source of income. Additionally, 32% were moderate and 4.8% very stable that is they get their daily bread either during casual jobs in the factory or around the slum. Only 1.6% of the population had no source of income before inferno.

The study revealed that most of Sinai residents are married or remarried after the inferno. This is attributed by 61% of those interviewed said they had families. Those who lost their partners in the inferno remarried, while only 23% of respondents divorced, separated or widowed. The reason for this was because of stigma associated by couples where one of the partners suffered some burns, thus being deformed. In addition those widowed remained

single after their husbands died in the inferno. This finding was in correlation with family size which decreased as a result of children from most families died in the inferno.

Some who had four children were left with two after the other two perished in the fire. Those with two or one were left with no child due to the fact that those who perished were young persons. When fuel started to spill from the pipeline drainage system, most young and energetic persons of age between 18-35 rushed to scoop the fuel mostly petrol. This form of oil is highly flammable and circulates faster in the air than diesel. The gaseous fuel when ignited spread at wider area thus the severe effect. Those who were on the hole of the drainage were drunk of the fuel fumes hence when fire started, they could not escape, and they burnt beyond recognition.

It was established that those who lost their loved ones in the inferno had to undergo DNA test to identify their kin which was against their cultural practices. The deceased bodies had to be kept longer in the morgue awaiting DNA and identification which made kin to mourn and suffer more. Literally they normally keep the deceased for a week then bury them.

It was also established that residents of Sinai had higher risk of fire than normal estates in Nairobi County. 53.2% of the respondents quoted that poor housing and illegal electricity connection posed higher risk. This means that half the number of residents in Sinai live in semi-permanent houses which are fitted with illegal electricity. This was evident on houses built with timber/wood and old iron sheets, Electricity that is used in Sinai is usually connected from KPLC posts illegally without meter to measure or socket breaker to regulate power surge. These illegal connections usually bring sparks that create fire in the area. Lack of access roads and poverty were also mentioned as risk factor in Sinai slum. 27.4% of respondents feel that lack of roads in the area contribute a lot to the severity of the fire because fire engines cannot access the place of inferno. The roads that lead to the slum are

narrow and impassable. The roads are usually used as waste drainage that empty at sewage and then into Ngong river.

Residents of slums justify that they usually settle in Sinai due to the fact that they cannot afford to pay high rent fee in other estates in Nairobi/Makadara area. This is well supported by their livelihood/income they get from selling milk, pigs or doing casual jobs in nearby factories.

There is a coloration of causes of fire and electric faults. 58% of fires in Sinai come about due to illegal power connections which are connected hazardously on roof top of houses or buried underneath. When there is fault the sparks create fire. Other cause of fire in the area was through domestic violence that leads to arson. Asked about the place they seek shelter after the inferno, 56% respondents went into the streets for shelter. They put up shanties to house before they were taken to Makadara social hall. Only a small fraction stayed with friends or neighbours.

51.6% of respondents feel that fire incidences have increased since the one in 2011. This was attributed by arson, electrical faults or explosion from cooking stove. A large proportion of respondents admitted to have witnessed fires occurring as much they are not of big magnitude as importance to that origin of 2011 Sinai fire. 46.8% of respondents attributed this as having come from neighbourhood.

One side of the area is *Mukuru kwa Reuben* and the other *Mukuru Sinai*. *Mukuru kwa Reuben* is a dumpsite where garbage is disposed. They are burnt to give room for more refuse. When people started siphoning fuel which was petrol, the wind changed direction thus fire from dumpsite ignited the fumes that had spread in *Mukuru Sinai* hence the magnitude if inferno.

In addition, respondents feel that the high rising number of inferno in Sinai can also be as a result Nairobi County government not doing enough to deal with fire outbreak. Majority of 87% said that there was little response from fire department. As much they responded, they did it when it was too late. However the County government says there are no roads to access these areas.

It was established that Sinai residents were at a higher risk of fire due to the fact that 87% of them had no idea of what measures they can put in place to stop fire. This was attributed to the fact that most of them have primary or no education levels. However officials attributed this to ignorance thus increase in fire occurrences in the area.

85% of respondents said they have never seen any fire fighters or fire engines in the area. They confirmed that they fight fires with the help of neighbours. 14% of respondents said they have seen fire engines in the area. They confirmed to me that to have seen KK fire engines along Lunga lunga road but the fire engine was found out to be on standby for the companies in the area. However ,they said they would attend to any fire outbreak in the area.75% of the respondents believe that they would notify police in case of fire outbreak then in return the police to call fire brigade. This was the case even after the KK fire engine being some metres away from the slum; none of the respondents had their emergence numbers.

Sinai fire was found to have great impacts on the lives of Sinai slum. 53% of respondent believe they were greatly affected while 46.8% believe it was very greatly affected economically. People who were rearing pigs, zero grazing and had houses to rent, they lost all of it to the inferno. They were left to depend on well-wishers for support. Depletion of financial resources was noted as major impact of Sinai fire. 98.3% feel that they have spent a lot in terms of monetary, either in seeking medical treatment to those who sustained burnt

injuries, others renting out houses to stay, while others bought material to build houses afresh. Sinai victims have to buy new piglets/cows to start their business. In addition, poverty level was seen as a cause of the disposing factor of fire as well as an impact.

29% of respondents agree that scarcity or lack of material possessions or money has led them to settle on reserve area of Kenya pipeline drainage system or railway lines. They have low source of income which cannot sustain them in renting houses in other areas. 50% of respondent having been in self-employment feels that Sinai fire rendered them last blow in becoming poor. They used their saving to medical purposes, rebuilding houses thus results in an endless circle of poverty.

Persons who were on private employment and had suffered severe burns were retrenched thus becoming jobless. Sinai fire was also found to increase dependence on others. This was mostly so for those who suffered physical disability. These group of people reported that they highly depended on others to help them move from one place to another.

5.2 Conclusion

From the findings, the researcher concluded that residents of Sinai slum in Nairobi County suffered greatly both socially and economically and therefore, suitable measures need to be adopted by the National government, county government, civil society, NGOs, other stakeholders and residents of Sinai slum to alleviate situation. The study also concludes that people of Sinai slum had their source of income and lived a normal life hence were stable. The residents were greatly affected by inferno; lost their loved ones, marriages broke (separation, divorce), orphans which led to people being subjected to more suffering. From the findings, it can be concluded that victims of fire felt left out both by county and national government both in financial assistant in building their houses, treatment of physical burns and psychological counselling, In addition, the level of awareness on measures to prevent fire

seems to be minimal. This is as a result of both county and National government failure to spearhead efforts to reach out to victims of fire in Sinai. For this reason, residents/victims of Sinai have no idea where to seek help who to contact in case of another inferno.

The study also concludes that risk factors for fire in Sinai slum in Nairobi County are poor housing, illegal electricity connection, and poverty, level of education and lack of information. Furthermore, the researcher concludes that the impacts of fire on lives of Sinai residents in Nairobi include depletion of financial/economic resources, inability to secure source of livelihood resulting in a vicious cycles of poverty, increase of incidences of family break-ups; divorce/separation, increase in dependence on other people(relatives, friends) for economic and other support, and health complication or physical disabilities which result in stigma thus low self-esteem among the victims.

5.3 Recommendations

The study identified various recommendations, the researcher identified several strategies that government, civil society and county government could adopt in order to mitigate against risk factors and negative impact of time as a disaster among residents of Sinai slum. The researcher recommends the following:-

- Both National and County government should lender victims of Sinai fire some soft loans to start small business enterprises to uplift their living standard and also to have a source of living.
- There is need of government to come up with slum relocation programmes in this area. They should construct permanent modern houses somewhere else so that the slum dwellers could relocate or compensate them to vacate the area.
- The study found out that there was need to train people on measures of putting out fire or how to evacuate incase of fire and also effective response to disasters that is

preparedness – measures to be taken in view of disasters, consisting of plans and action programmes designed to minimize loss of life and damage.

- Public awareness campaign on effects of siphoning oil and measures to be put in place to control fire.
- There is need for community based counselors that should offer counseling to affected people.
- There should be coordination among the responding agencies. As evidenced by the range of responding organizations / institutions such as military, police, NYS, RED Cross, St. Johns Ambulance, KK fire, County Fire brigade.

5.4 Suggestions for Further Study

Based on the knowledge gaps identified in the course of study, further studies are recommended in the following areas:-

- (i) An extension of the current study into other regions of Kenya that have experienced fire incidents such as Rift valley.
- (ii) An assessment of inter – relationship between siphoning of fuel and cycle of poverty.
- (iii) Psychological impact of fire and stigma, low esteem and loneliness among victims of fire.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE FOR SINAI RESIDENTS

THE SOCIO-ECONOMIC IMPACT OF THE 2011 SINAI FIRE DISASTER

SECTION A: GENERAL INFORMATION

1. Name of your Sub – Estate -----

2. Number of years you have been a resident -----

3. Please indicate your gender

Male [] Female []

4a. Actual Age _____

b. Age group:

18 – 24 []

25 - 29 []

30 – 34 []

35 and above []

5. What is your level of education? Please tick where appropriate

Tertiary []

Secondary []

Primary []

No Education []

Other (Specify) -----

6. What is your main occupation? Please tick where appropriate

Public Employment []

Private Employment []

Self-Employment []

House Wife []

Other (Specify) -----

7. Marital Status

Married []

Single []

Divorced []

Separated []

Widowed []

Other (Specify)-----

8. Number of children

- 7 or more []
- 5- 6 []
- 3- 4 []
- 2 []
- 1 []
- None []

SECTION B: SOCIAL ECONOMIC SITUATION OF SINAI RESIDENTS BEFORE THE FIRE DISASTER

9a. How was the social economic status of Sinai residents before the fire disaster?

- Very stable []
- Stable []
- Moderate []
- Unstable []

Other (Specify)-----

b. Why do you think the situation has been so?-----

SECTION C: THE EFFECTS OF THE SINAI FIRE DISASTER ON HOUSEHOLD COHESION

10. Did the Sinai community way of life affected from the 2011 Sinai fire disaster? Please select one

- Very great extent []
- Great Extent []
- Moderate Extent []
- Small Extent []

11. a) To what extent did the Sinai community beliefs/customs were affected ? Please select one

- Very great extent []
- Great Extent []
- Moderate Extent []
- Small Extent []
- No Effect []

b) Explain the nature of socio cultural suffering-----

12. a) To what extent was the family interfered with by the 2011 Sinai fire disaster? Please

Select one.

- Very great extent []
- Great Extent []
- Moderate Extent []
- Small Extent []
- No Effect []

b) Please explain how the family was interfered with

SECTION D: RISK PERCEPTIONS AND RISK REDUCTION STRATEGIES OF THE PEOPLE FOLLOWING THE SINAI FIRE ACCIDENT

13. What are the factors that increase exposure and vulnerability to fire risk in this area?

(Multiple responses allowed)

- Poverty []
- Housing []
- High population density []
- Illegal electricity connections` []
- Lack of access roads []
- Solid waste accumulation []
- Others (specify) -----

14. What do you think are the cause's fires in this area?

- Domestic violence []
- Electric faults []
- Cooking fuels []
- Arson []
- Others (Specify)-----

15. If affected by a fire, where would you stay?

In the streets []

With unaffected neighbours []

With friends []

With relatives []

Go to the rural area []

Others (specify)-----

16 a) Have the frequencies of fires increased, stayed the same or decreased over the past few years?

Increased []

Stayed the same []

Decreased []

b) Why do you think the situation has been so?

17. Where did the Sinai fire originate from?

Cigarette smoking []

From within the house []

From the neighbourhood []

Do not know []

Other (specify)-----

18. Do you feel that the municipal council is doing enough to help you in coping with fire outbreaks?

Yes []

No []

19. Are you aware of any measures that you can put in place to stop a fire?

a) Yes []

No []

b) If yes, what measures are you aware of?-----

20. Do you know of any trained fire-fighters within the community?

Yes []

No []

21. How do you communicate with the fire brigade in the event of a fire outbreak?

Call them directly via cell phone []

Call them directly via landline []

Call the police to inform them []

Other (specify) -----

SECTION D: EFFECT OF THE SINAI FIRE DISASTER ON HOUSEHOLD INCOMES AND POVERTY LEVELS

22. To what extent did the Sinai fire disaster impact the economy of the Sinai community?

Please select one

Very great extent []

Great Extent []

Moderate Extent []

Small Extent []

No Effect []

23. To what extent was the impact of social cost on the economy due to 2011 Sinai fire disaster?

Please select one.

Very great extent []

Great Extent []

Moderate Extent []

Small Extent []

No Effect []

24. Any further explanation or comments on any of the questions above?

25. Below is a list of some of the causes of the 2011 Sinai fire disaster? Using the scale 5= strongly agree, 4= agree, 3= neutral, 2= disagree and 1= strongly disagree)

Cause	1	2	3	4	5
14. Poverty					
15. Unemployment					
16. Others (please specify)					
a)-----					
b)-----					
c)-----					
d)-----					

26. Please explain your answer in question 16 above.

THANK YOU FOR YOUR VALUABLE TIME AND CO-OPERATION

APPENDIX 2: KEY INFORMANT INTERVIEW GUIDE

THE SOCIO-ECONOMIC IMPACT OF THE 2011 SINAI FIRE DISASTER

1. Did the Sinai community suffer socially from the 2011 Sinai fire disaster?
2. To what extent did the Sinai community suffer socio-culturally?
3. To what extent was the family set-up interfered with by the 2011 Sinai fire disaster?
4. To what extent did the Sinai fire disaster impact on the mental well-being of Sinai residents?
5. To what extent did you or family members incur economic cost of the psychological problems resulting from the Sinai fire disaster?
6. To what extent did the Sinai fire disaster impact economically on the Sinai community?
7. To what extent was the social cost of the economic impact of the 2011 Sinai fire disaster?
8. What do you know about fire outbreaks?
9. What have you heard about ways of controlling/avoiding fires?
10. What do you think are the causes of fires in this area?
11. What do you think would make the community fail to put in measures to protect themselves from losses arising from fires?

THANK YOU FOR YOUR VALUABLE TIME AND CO-OPERATION