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Thesis title: The Role of social capital in Advancing Community Resilience Towards Fire Disaster Risk Management in Informal Settlements. A case study of Makina Village, Kibera Slum Nairobi, Kenya.

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Summary

Informal settlements are characterized by lack of WASH facilities including water and access roads, lack of tenure security, low quality housing all these features cumulatively lower the quality of living for the inhabitants. One of the challenging issues faced by informal settlements are regular fire disasters which affects the well-being of the communities living in makina village, Kibera slum, nairobi kenya. It was for this reason that the research was conducted to understand the role of social capital in advancing community resilience towards fire disaster risk management. Previously the government of kenya has focused much on the physical aspect in building community resilience and less research on the social infrastructure has been emphasized which has the possibility of building long lasting community resilience. In this study the researcher investigated whether social capital contributes to fire disaster risk management or hindered. Through this study the researcher found the existing forms of social capital used to promote fire disaster management in the village of makina and investigated how fire disasters are currently managed and the actors involved in community recovery phase aftermath fire disasters in makina village Kibera slum Nairobi. The researcher used mixed methods of both Quantitative and Qualitative methods, to investigate the dynamics of social capital in a real-life context. The reason for choosing these both methods is to reach multiple sources of information from diverse participants who are more informed about the social phenomena under study. The findings reveal that majority of the households in Makina village had positive relationships with their neighbours. More than 70% of the households in Makina village had an intense sense of belonging to their community. there was a prominent level of perceived collaboration with the neighbourhood of Makina. A significant majority of the households in Makina are willing to support their neighbours during fire disasters. Forms of social capital used in fire disaster risk reduction management include Community-Based Disaster Response Teams, Religious Institutions, and Community Savings Groups as Structural Forms of Social Capital Involved Fire Disaster Management Community and Family-Driven Response through Volunteerism. Capacity Building and Using Schools to Create Fire Disaster Awareness and kenya Red Cross society, Nairobi County government and slum dwellers international are some of the organizations involved in fire disaster Risk management. On recommendations the government should set up more campaigns on fire safety and management, set up financial literacy and coaching to existing community groups, land use plan developed including supplying adequate green spaces for community interactions.

Keywords

Social capital, Fire Disaster Risk management, Informal Settlements, Community Resilience Disaster Management Cycle.

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Foreword

This thesis is Authored by the researcher as part of fulfilment of the requirement for: The master's degree in urban management and development specializing in urban housing and land justice at the institute of housing and urban development studies, Erasmus university Rotterdam. It is with uttermost gratitude introducing this thesis about the role of social capital in advancing community resilience towards Fire Disaster Risk Management in the informal settlements. A case study of makina village, Kibera slum, Nairobi, kenya. This thesis aimed to explore how different forms of social capital interact in different phases of fire disaster from Mitigation, Preparedness, Response and Recovery. Identifying how fire disasters are managed and which organizations are responsible in each phase of disaster management. Lastly to identify forms of social capital which can be utilized to ensure effective fire disaster risk management. Disaster management is a dynamic field, as disasters strike cities at different times leaving little time for urban and disaster managers to plan for them. Therefore, the need to anticipate for any kind of disasters should be on the planning realm of any city. Informal settlements on the other hand are vulnerable as there are unfunctional systems present to react to disasters, in the context of Kenyan informal settlements, community members have been part of the active agents in managing fire disasters on their own before the county governments arrive at the scene. However, there's a need to build resilience communities which are safe and liveable as a way of attaining sustainable development. Kenya has however invested in the physical capital in making informal settlements liveable and safe through provision of basic WASH facilities, access roads, and affordable housing programs. however, the social capital is having not been fully explored, invested on neither studied at this area which it was of this purpose that this research was done. The results of this research indicated that makina village has structural social capital as 43.7% of the respondents aware of 5-6 organizations operating in the area. As well the bonding social capital, bridging social capital and linking social capital are involved in all the phases of fire disaster management. The active organization in fire disaster management include kenya Red Cross society, Slum Dwellers international and Kibera community Emergency Response Team. With all these findings disaster managers should utilize these existing social structures in implementing the disaster management plan and engaging community members in the formulation of the Disaster management policy which is ongoing.

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Abbreviations

Abbreviation	Full form
HIS	Institute for Housing and Urban Development Studies
KRCS	Kenya red cross society
SDI	Slum dwellers international
CBDRT	Community Based Disaster response teams.
KCERT	Kibera community emergence response team.
WASH	Water sanitization and Hygiene

Introduction.

1.0 Background of the Study.

Research on fire disasters in slums highlights the significant risks and vulnerabilities these communities face. (Umana et al., 2018) and (Bankoff et al., 2024) emphasize the need for better fire safety measures. Umanah names common causes of fatal fires in homes and public buildings. (Chaturvedi, 2017) and (Cruz et al., 2022) discuss the challenges slum dwellers face, like poor living conditions and the threat of eviction, which increase their vulnerability to fire disasters. These studies call for a comprehensive approach to reducing fire risk, including physical safety measures and broader social and economic interventions. Several studies have focused on fire disasters in African slums (Walls et al., 2020) and (Quiroz et al., 2021) analyze fire dynamics and spread in these areas (Walls et al.,2020) stress the need for sustainable solutions (Mbiggo,2018) and (Quiroz et al., 2021) discuss challenges in Kampala, Uganda, such as using charcoal for cooking and electric faults (Mbiggo.,2018) suggests measures like space allowances and using motorized bikes for firefighting. These studies emphasize the urgent need for better fire safety in African slums. Studies have examined fire disasters in Kenyan slums (Mworoa,2012) and (Ngau and Boit.,2020) highlight the role of carelessness, electrical faults, and poor infrastructure in causing fires, stressing the need for comprehensive fire management policies. (Ngau and Boit ,2020) also highlight response challenges, such as delays, lack of central command, and physical barriers like inaccessibility and lack of hydrants, they found that there's paradigm shift concerning fire disaster management in informal settlements, communities are no longer reliant on local governments to assist in fire disasters, community members have gained sense of unity and work collectively in responding to fire disasters. With this finding it is relevant to understand the social capital dynamics in makina as well on how community members interact and exchange information for purposes of promoting fire disaster risks in the informal settlement (Young, 2009) notes the lack of disaster readiness at local and national levels (Odhiambo and Aiyabei, 2020) focus on mitigation efforts, advocating for location-specific strategies, like placing fire pumps, engines, water stations, and evacuation routes. These studies underscore the need for comprehensive, context-specific fire management and disaster readiness strategies in Kenyan slums.

The issue of fire disasters in Makina Village, part of the Kibera slum in Nairobi, Kenya, is closely linked with the area's social and structural conditions. Kibera, one of Africa's largest informal settlements, presents unique challenges affecting its vulnerability and resilience to disasters like fires (Ongoro, & Muiya, 2023). Makina Village is characterized by high-density living conditions, with makeshift housing primarily made from highly flammable materials such as wood and corrugated metal. The absence of adequate formal infrastructure, including roads, water, and sanitation services, complicates emergency responses to fires. Additionally, illegal electrical connections and the use of open flames for cooking and lighting heighten the risk of fire outbreaks (Mitra, et al., 2017). Social capital, which involves the networks of relationships among people living and working in a community, enabling that society to function effectively, plays a crucial role in enhancing community resilience to these disasters (Delilah Roque, et al., 2020). In informal settlements like Kibera, community-based initiatives and networks are key. They enable rapid dissemination of information, resource mobilization, and coordinated actions during and after fires. This includes forming community disaster response teams, local fire brigades, and neighbourhood watch groups running within the settlement (Mitra, et al., 2017). Moreover, the strong communal ties and informal governance structures among residents can enhance their

collective ability to manage risks and recover from fire disasters. However, the effectiveness of social capital in disaster resilience also relies on support from external factors, such as the government, non-governmental organizations, and international aid agencies. These entities must collaborate with local communities to enhance infrastructure, supply fire safety education, and strengthen overall disaster preparedness (Odhiambo & Aiyabei, 2020).

1.2 Statement of the Problem.

In Kenya fire disasters are rampant due to human errors, carelessness, environmental degradation. The vulnerable communities to fire disasters live in informal settlements characterized by high tenure insecurity, low-quality housing, lack of WASH facilities, access roads, overcrowding, unplanned growth with compact settlements, inadequate firefighting services and weak urban governance resulting to uncoordinated fire response. These among other factors increase the vulnerabilities of the informal settlements exposing inhabitants and properties to fire disasters (UN-habitat,2007: IFRC,2011). Furthermore, the mushrooming of informal settlements In Kenya's major cities is due to continuous population growth from rural to urban migration. According to (UN-Habitat, 2007) 34% of the Kenya's population live in urban areas and 70% of them live in informal settlements which causes unequal supply versus demand of urban services in informal settlements in Kenya. More consequences of urbanization will occur and there is a need to address this challenge before it reaches the irreversible state. As well addressing it will reduce poverty, inequality and spatial segregation which is the foundation of social injustices in Kenya's urban landscape. From 2014 to 2022, Nairobi reported 248 fire incidents, with Kibera accounting for the highest percentage (Ongoro & Muiya,2023). Fire disasters pose a significant threat to the survival, security, and dignity of Kibera's residents. The causes of fires vary, often including accidental knocking over of lanterns, stoves, and candles, gas explosions, and electrical faults. Given the proximity of houses, fires spread rapidly, and in most cases, residents are the first responders, working together to contain the fire spread (Odhiambo & Aiyabei,2020). Generally, the spatial features of informal settlements as earlier discussed contributes to frequent occurrence of fire disasters in these areas, rehabilitation/ upgrading of slums could be a way reducing the impacts of fire disasters in an informal settlement. One of the key projects for rehabilitating informal settlements implemented by Kenya's government includes Kenya slum upgrading programme KENSUP. which is a collaborative project between Kenyan government and UN habitat launched on 4 October was 2004. The main aim of this project is to improve the livelihood of people living and working in slums. The approach included the provision of basic infrastructure (e.g., water and sanitation, access roads) income generation activities, promoting good governance, housing improvements and provision of secure tenure (UN-habitat,2007). The KENSUP programme has helped slum dwellers, 822 units of houses were built as a result at Soweto east a village in Kibera through redevelopment of new housing units which is part of tenure regularization (Agayi & Serdaroğlu 2020). Currently the government has continued with housing projects such as affordable housing program which is government agenda to address the deficit of 2 million housing units. (Nzau, 2020). This is evident that the government has delved much in physical infrastructure-centred in advancing community resilience, without considering the social infrastructure which could work better in advancing community resilience as argued by (Aldrich & Meyer, 2015). It was in this regard that this study seeks to examine the role of social capital in advancing community resilience to fire disasters in Makina Village, Kibera slum in Nairobi Kenya. By understanding the social capital dynamics and furthering the roles of actors in aftermath of fire disasters which (Ngau and Boit,2020) highlighted roles of local responders during fire disasters.

While several studies highlight the importance of social capital in disaster resilience (Aldrich & Meyer, 2015; Sreelekha, 2022), there is a lack of detailed research focusing on its specific contributions within the unique context of Kibera's Makina Village. Moreover, the existing literature often emphasizes broader regional or national perspectives without delving into micro-level community dynamics. Research is needed to examine the precise mechanisms through which social capital runs in Makina Village, including how trust, networks, and community engagement aids in disaster preparedness and recovery effort. While the importance of social capital forms like networks, norms, and trust is recognized in general (Bernier, & Meinzen-Dick, 2014; Aldrich & Meyer, 2015), specific studies detailing these forms within Makina Village are missing. Detailed, localized studies are necessary to find and analyze the specific forms of social capital present in Makina Village and how these are actively employed or could be enhanced in fire disaster resilience initiatives. This study will aid Disaster managers, urban planners, and policy makers to understand the relevance of using social capital in design and implementation of disaster management plans which forms both physical and social infrastructure towards attaining resilient cities and communities which are safe and liveable.

1.3 Research Objectives.

The main aim of this study was to examine the role of social capital in advancing community resilience towards fire disaster risk management in Makina Village, Kibera slum in Nairobi Kenya. In this study the researcher investigated whether social capital contributes to fire disaster risk management or hinder. Through this study the researcher identified the existing forms of social capital utilized to promote fire disaster management in the village of makina and identify how fire disasters are currently managed and who are the actors involved in community recovery phase aftermath fire disasters in makina village Kibera slum Nairobi. This study additionally recommended forms of social capital to improve fire disaster management in Makina Village.

1.4 Main Research Question.

I. How does social capital contribute/hinder to fire disaster risk management in Makina village in Kibera slum, Nairobi kenya?

1.5 Sub Research Questions.

i. What are the existing forms of social capital utilized to promote fire disaster risk management in Makina Village, Kibera slum in Nairobi?
ii. How are fire disasters currently managed and who are the actors involved in community recovery phase of fire disasters Makina Village, Kibera slum in Nairobi?
iii. What forms of social capital could be recommended to improve fire disaster management in Makina Village?

1.6 Study Structure.

This thesis begins with chapter one, which generally introduces the study concepts to the potential audiences. Chapter one specifically captures background of the study on the role of social capital in advancing community resilience to fire disasters, statement of the problem, research purpose, and both main and sub research questions chapter two is based on the review of past studies on the study topic, it captured the theories to underpin the study findings and concepts, and finally conceptual framework. Chapter three addressed the method that was adopted by this study, this included: Operationalization of the study variables, method selected for this research**, s**ampling techniques, description of data, and possible limitations to data collection. Chapter four reported

on the response rate and characteristics of the research respondents to set up the quality of the collected information presentation of Descriptive and inferential statistics, along with deep analysis and interpretations of the results. Chapter five summarized the research results backing them with results from chapter four, additionally compared them with other relevant studies, and provided conclusions based on the study goals. The author additionally suggested recommendations based on the findings and proposed areas for further research.

Literature review

2.1 Introduction

This chapter entails a review of past studies on the study topic, it also captures the theories to underpin the study findings and concepts, and finally conceptual framework.

2.2 Empirical Review

2.2.0 The concept of social capital.

Social capital has gained popularity among community of development professionals, but it still is a fleeting construct. Different authors have descriptively and analytically defined the forms of social capital, the components which result in a stream of benefits. Social scientists and development agencies are continually trying to understand what social capital is. Their aim is to find ways in which it can be promoted reputably to achieve social and economic development. This study however utilized a definition by Norman uphoff which he defines it as "an accumulation of various types of social, psychological, cultural, cognitive, institutional, and related assets that increase the amount (or probability) of mutually beneficial cooperative behavior" (Uphoff, 2000: p216). The results of these behaviors are positive not just to individuals but to society, for instance if an individual does his/her role as expected chances are high that the wellbeing of a community will be high as well. We choose this definition of social capital as the literature about social capital gives elaborate examples on how social capital can be theorized and described but failed to give details of what components make up social capital which forms the basis of understanding what is social capital which later this work furthered the discussion of how this concept is utilized different phases of fire disaster risk management. Hillary Putnam defined social capital as "features of social organization such as networks, norms and social trust that can facilitate coordination and cooperation for mutual benefit" (Putnam, 1993: p 35). This definition is much better compared to other definitions provided by other authors however it misses important aspects of what contributes to social trust, which surrounds cultural background or values of an individual. The debate of whether social capital is classified as a form of capital is still ongoing among social scientists, for something to be considered a capital it should be a result of investment. and if it is considered as investments, we could further question if these investments are created or they occur organically withing the societal setup? And with these investments do they appreciate or depreciate, with all this stated is social capital formed for specific occasions or it is continuum? Having multiple questions surrounding social capital aids to better understand what social capital is and how it interacts with other factors to generate material benefits as asserted by (Uphoff,2000). Other scholars dispute that the benefits are not necessarily material as such. Forms of capital are considered as assets which yield streams of benefit that give a better future with innovative solutions due to knowledge gained from past experiences (Aldrich, 2012) distinguished social capital into three main types: Bonding, Bridging, and linking.

2.2.1 Bonding social capital.

Refers to the value derived from tight knit, emotionally close relationships, such as those found among family members or close friends. These networks are characterized by strong personal

connections and a high degree of supportiveness, often supplying emotional and substantive support during times of need (Aldrich, 2012).

2.2.2 Bridging social capital.

On the other hand, encompasses more distant connections that span different social groups. These are typically weaker than bonding ties but are invaluable for accessing diverse information and resources, easing the flow of ideas across different segments of society. Bridging networks can thus be powerful tools for innovation and broad-scale mobilization (Aldrich, 2012).

2.2.3 Linking social capital.

Extends upward, connecting individuals and groups with people or institutions across explicit, formal, or institutionalized power gradients. This form of social capital is crucial for accessing support or resources from government bodies, organizations, or authorities in power. It allows groups to use societal structures to gain benefits typically beyond reach, aiding in efforts for systemic change or resource allocation (Aldrich, 2012).

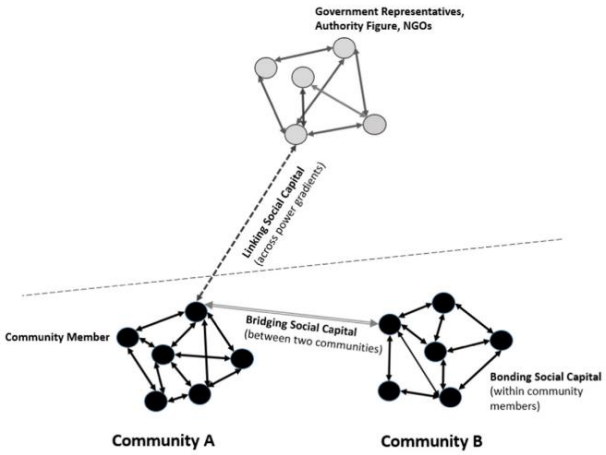


Figure 1: forms of social capital Adopted from: (Sanyal & Routray,2016).

(Uphoff, 2000) distinguishes what constitutes social capital specifically into two categories which are **structural** and **cognitive** as a way of understanding deeply about social capital.

2.2.4 Structural social capital.

consists of social organizations, their roles, the rules, precedents, procedures altogether with diverse networks that fuels cooperation which he termed as mutually beneficial collective action (MBCA) which is a product of social capital (Uphoff, 2000).

2.2.5 cognitive social capital.

comprises of mental processes backed up by culture and ideology mostly norms, beliefs, attitudes, and values which contribute to cooperative behaviors and collective efficacy (Uphoff, 2000). Both structural and cognitive dimensions are interconnected as networks, roles, rules precedents and procedures are tangible results from the cognitive process which distinguishes both domains. structural forms are observable while the cognitive aspect of social capital is intangible, but none can work without the other. Additionally, networks are patterns of social exchange and

interactions persistent over time which goes ahead of social capital be it formal or informal which are held together by the mutual benefits and sustained by norms of reciprocity or expectations of members (Uphoff, 2000) elaborated the dynamics of social networks into the shapes it takes throughout the interaction he categorized it into horizontal linkages and vertical linkages.

2.2.6 Social capital and community resilience.

The interplay between social capital and community resilience to fire disasters hinges on how social connections nurture collective action and resource sharing, vital for both disaster preparedness and recovery (Aldrich & Meyer, 2015). Social capital, encompassing networks, norms, and trust that underpin coordination and cooperation for mutual advantage, is central to a community's capacity to respond to and bounce back from fire disasters (Delilah Roque et al., 2020). Incorporating social capital into community resilience planning is vital because it boosts the community's capacity to marshal resources, plan effectively, and manage post-disaster recovery (Aldrich & Meyer, 2015). High levels of social capital correlate with increased community involvement in fire prevention measures, effective dissemination of risk information, and stronger community networks, all of which are crucial for swift response and recovery efforts (Meyer, 2018). Moreover, communities with robust social capital tend to achieve better outcomes in rebuilding and restoring normalcy after disasters. These communities are more inclined toward collective action, leading to more efficient recovery processes and infrastructure rebuilding. The trust embedded in social networks eases faster and more effective coordination among residents, local authorities, and relief organizations, which is critical during the recovery phase after a fire disaster (Lee & Kim, 2021).

2.3 The concept of Fire disaster risk management.

2.3.1 The fire disaster management cycle.

Disaster management are activities carried out by involved parties from the community level to top level to minimize damage from a disaster and is categorized into four phases which disaster scholars term it as disaster management cycle namely: ***Prevention/mitigation, Preparedness*** (occurs before a disaster) ***Response and Recovery*** (Occurs after a disaster). (Farahani et al.,2020). Each phase has different activities and disaster management being a multifaceted field more actors and coordination of experts from the private and public sectors, non the less non-governmental organizations as well plays a pivotal role in almost all the phases of disaster management. Secondly disasters strike unpredictably, with time limited to plan for and resource constraints worsen the situation. Understanding the activities of each phase supplies a deep understanding about the key roles to be done within that phase and ensuring that concerned organizations are aware about their roles to avoid confusion and chaotic scenes during disasters. (Farahani et al.,2020). Therefore, we supply extensive explanation about the activities in each phase as follows:

2.3.2 Mitigation /prevention phase.

This includes measures to cut the causes and possibility of socio-technical disasters resulting from human activities and getting rid of vulnerable components to risk for a natural disaster (Kim, 2016; Farahani et al.,2020). In context of fire disasters as pinpointed by (Ngau and Boit, 2020) that causes of fire disasters in informal settlements include improper disposal of wood ashes, improper

use of electrical appliances and faulty electricity connections. Additionally, the spatial features of an informal settlement characterized by high density structures supported with low quality building materials further ignites the spread of fires, the physical inaccessibility comprising of thin streets of informal settlements contributes to delay of fire firefighting Engines, which are also not provided adequately as one firefighting engine serves a big population overpassing the standards (Ngau & Boit, 2020). Therefore, having highlighted all the probable causes of fires in the informal settlement the mitigation phases the community members including family units (bonding social capital) faith-based organizations, home associations (bridging social capital) and top-level coordinating organizations (linking social capital) ought to work together in implementing mitigation measures. Communities should jointly take part in these activities by using the available resources such as social media to inform community members. For example, on the fire safety community organizations and leadership could share preventive measures to ensure that the entire community is safe, secure, and livable (Matous & Ozawa, 2010). Therefore, the possible activities which residents could do is ensuring that they use electrical appliances properly, reporting faulty electric connections to responsible personnel, while the government on the other hand need to address the issue of timely response and faith-based organizations should champion for functional family units to ensure responsible fire handling safety. (Farahani et al.,2020) highlighted strengthening infrastructures, supplying insurance plans, using technological plan are among the activities done in this phase.

2.3.3 Preparedness phase.

This phase includes the measures and activities for mobilizing and supplying workforce, funds, firefighting equipment relief supplies and ensuring that they are in safe position and can be accessed in incidences of fire disasters (Kim, 2016). On context of fires disasters in informal settlements public education ought to be conducted, this is done to ensure that the informal settlement residents are familiarized with what they are expected to do or behave during fire disasters, as (Ngau and Boit, 2020) found that local responders are the first to rescue during fire disasters there is need to train community responders to have sufficient knowledge on how handle fires. (Farahani et al., 2020; Restás et al.,2015) highlighted that one of the challenges in casualty management is death of practitioners on site during rescue missions such personnel are exposed to much risk and they need to be aware not to limit the human resources needed to rescue victims and secure their lives as well. Secondly prepositioning is done by ensuring that all the personnel and equipment are placed at the right position for example constructing a firefighting station next to informal settlement to ensure adequate provision of firefighting services, provision of communication channels such as hotline contact for firefighting services and effective logistical planning by creating relief routes to neighborhoods and ensuring that rescue teams are trained adequately (Kim, 2016). Lastly preplanning emergency services like for example mapping vulnerable areas to fires within the community, conducting trainings and drills for community responders, collaborating with other stakeholders for example holding regular meetings to discuss about rescue services (Farahani et al.,2020). (Bihari & Ryan, 2012) asserts that communities with high level of social capital are much prepared compared communities with low level of social capital, trust, frequent communication, collective efficacy preposition communities to be in a better position to handle disasters collectively.

2.3.4 Response phase.

Response phase consists of emergency support activities for responding to disasters. It is basically operations to rescue human lives and offer security to victims of disasters. (Farahani et al.,2020; Kim,2016) highlights that casualty management is critical part of the response phase by maximally using the limited resources to manage casualties and transfer them to further medication which is done by multiple organizations to reduce the number of deaths and increasing the number of survivors. Response phase requires effective planning and humanitarian operations as there is limited time to rescue victims. Relief preparation includes provision of basic services to victims of disasters such as food, blankets, and shelter. In the context of fire disasters faith-based organizations offers aid for example in 2018 during fire disasters in Kijijini an informal settlement in Lang'ata Nairobi County, the church leader opened doors to accommodate victims during that night while other residents sought refuge at Ngei primary school (Owenga,2018; Otieno,2018). The government plays a pivotal role in disaster management in Kenya and the function is decentralized to the county governments who are responsible in offering support to fire disaster victims. The department of disaster management handles distributing relief to required areas (Mpanje et al.,2022). During this phase different actors work together including international organizations, donors and well-wishers work collectively to ensure that relief preparation is successful. Casualty management is another critical activity at this phase as it involves saving lives, hours after disasters massive victims cause constrains in the healthcare systems and there is need to develop onsite medical camp to attend critical victims who requires immediate attention before getting transferred to hospitals to receive extensive treatment and care (Farahani et al.,2020). Victims at this point might be wounded from burns, suffocated due to lack of oxygen, others are buried in case of a building collapse and require immediate attention to survive. During this phase different experts arrive at the scene in context of fire disasters ambulances and firefighting engines are needed. The ambulances transport severely injured victims to receive immediate treatment while less injured receive treatments on-site medical camp it could be dressing wounds and first aid (Farahani et al.,2020). On the other hand, firefighters who are trained work together to have the spread of fires. However, fire disaster management in informal settlements Response team delays because of poor accessibility of informal settlements forcing community members to work together to have fires. One key factor which enables a successful response is a sense of unity, from the neighborhood level to community level which requires a solid social cohesion to achieve the goal, together with supplying resources such as water. Lastly, provision of security to victims and their property is another activity within this phase for example, community members ensure that salvaged properties, for example home appliances, are safe (Ngau and Boit, 2020).

2.3.5 Recovery phase.

This is the last stage in disaster management which is critical and supplies a solid foundation for communities to get back to their normal setting but not necessarily as the first form it might take new shape depending on the size of the disaster. It includes resuming day to day

operations guided by policies and measures carried out to recover fundamental living environment damaged after occurrence of a disaster (Aldrich, 2010). The key activities conducted in this phase is mostly rehabilitating activities aiming at restoring the social functions and reconstruction activities to bring back life after the disasters up to implementation of mitigation measures after environmental rehabilitation. (Farahani et al.,2020) pinpointed the key activities carried to include debris clearing which in most cases the government coordinates the process in some cases private contractors are involved to assist communities to rebuild homes as they work with community stakeholders, but it varies depending on the magnitude of the disaster and the disaster management policies per country. To some extent governments enable economic recovery by offering grants and loans to business which were disrupted by disasters for examples After the Aceh tsunami at the coast of Sumatra in Indonesia, the government introduced economic programs which favored small enterprises entities to bounce back through offering subsidized loans, tax exemptions as a way of restoring livelihoods disrupted by disasters. (Hidayati,2018). Similarly, a functional government supplies economic facilities for their citizens to rebuild as they guide how it is done using a comprehensive mitigation plan to reduce the vulnerability to disasters in the future (Aldrich, 2008). More importantly addressing mental health to disaster victims is necessary at this point, during disasters residents experience trauma, shock and undergo severe depression which might hinder their mental state. During this time residents with few friends or new to the neighborhoods are the worst affected as they have nobody to listen to them and express the trauma they undergo during such tough situation, from the existing literature individuals with rich social capital are more likely to recover quick compared to individuals with less social connections. As well as highlighted by earlier studies, communities with strong social organizations are more likely to get back to normal as compared to communities which are segregated with weak social networks (Aldrich, 2010).

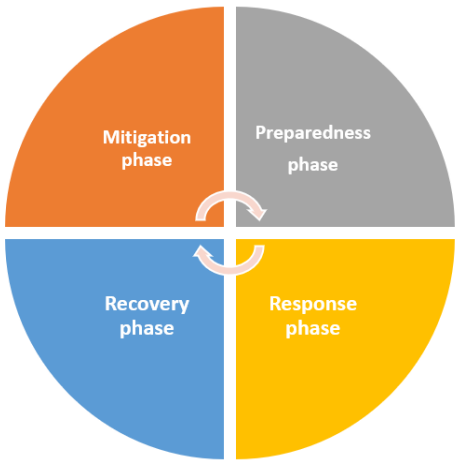


Figure 2:Source Author: (2024). The disaster management cycle.

2.4 conceptual Framework.

Conceptual framework is an analytical tool that uses concepts and ideas to organize and structure the understanding of a particular study. It serves as a map or a schematic blueprint that guides the research by outlining the key variables, their expected relationships, and the context within which the research questions are formed (Fuertes, et al., 2020). This study aims examine How does social capital contribute/hinder to fire disaster risk management in Makina village in Kibera slum. Therefore, Social capital is an independent variable which in our study we make assumptions that social capital is relevant in fire disaster risk management. The dependant variable in this study will be fire disaster risk management. On basis of having a definite method of measuring the concepts of the study the researcher classified the variables based on past authors classifications and definitions of terms under study. We unbundled social capital according to perceptions of different authors, on forms of social capital (bonding, bridging and linking) we used a study of (Aldrich and Meyer, 2015; Aldrich, 2012) to elaborate how vertical and horizontal social networks interact, (Uphoff, 2000) describes categorization of social capital into structural and cognitive aspect and how they all interconnected to form streams of benefit which this study utilized in exploring the factors guiding the social organizations at makina village and what benefits is it attained through this forms of social capital. **Bonding social capital** is found in close relationships, like those with family members or close friends. **Bridging social capital,** on the other hand, encompasses more distant connections that span different social groups. These are typically weaker than bonding ties but are invaluable for accessing diverse information and resources, easing the flow of ideas across different segments of society. **Linking social capital** extends upward, connecting individuals and groups with people or institutions across explicit, formal, or institutionalized power gradients (Aldrich and Meyer,2015). **Structural social capital** consists of social organizations, their roles, the rules, precedents, procedures altogether with diverse networks that fuels cooperation which he termed it as mutually beneficial collective action (MBCA) which is a product of social capital. On the other hand. **Cognitive social capital** forms of mental processes backed up by culture and ideology mostly norms, beliefs, attitudes, and values, which contribute to cooperative behavior and collective efficacy (Uphoff, 2000).

On the dependant variable this study utilized the disaster management cycle to aid analytical breakdown of disaster risk management and rely on the Sendai disaster risk management framework to guide the general study in contexts of fire disasters in informal settlements.

mitigation /prevention *phase.* -measures to cut the causes and possibility of socio-technical disasters resulting from human activities. ***Preparedness phase-*** It includes the measures and activities for mobilizing and supplying manpower, funds, and firefighting equipment and relief supplies and ensuring that they are in safe position and can be accessed in the event of fire disasters. ***Response phase.*** -This is the phase consisting of emergency support activities for responding to disasters. It is basically operations to rescue human lives and offer security to victims of disasters. ***Recovery phase***-It includes resuming day to day operations guided by policies and measures carried out to recover fundamental living environments damaged after the occurrence of a disaster (Farahani et al.,2020; Aldrich, 2010; Kim, 2016).

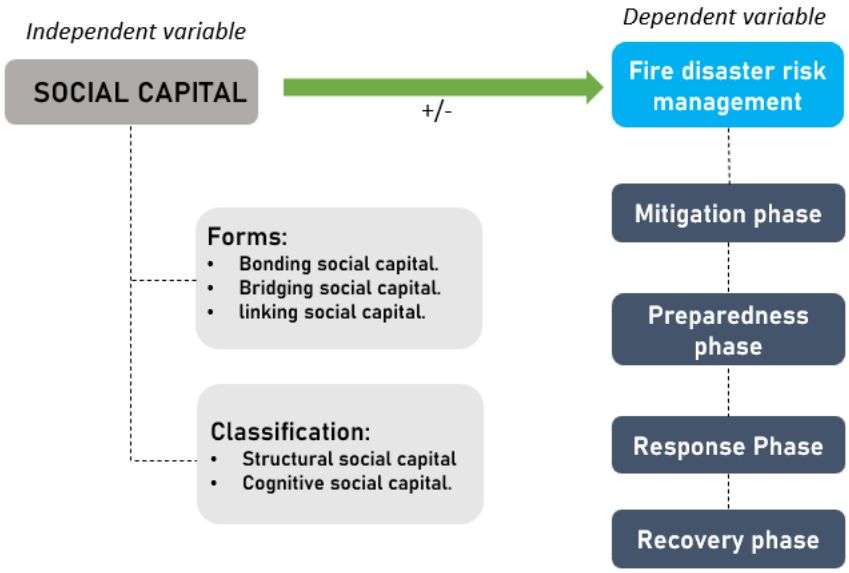


Figure 3: conceptual framework, source. Author (2024)

2.5 Theoretical Review.

To underpin the study concepts and variables, this study will rely on the following theories and frameworks.

2.5.1 Social Capital Theory.

Social capital theory, introduced by Bourdieu (1985), highlights how relationships and networks function as potential sources of benefits. This theory considers connections between individuals—whether through family ties, friendships, professional networks, or broader societal relationships—as a form of capital that can be used to achieve personal and collective goals (Caïs et al., 2021). The theory emphasizes the importance of trust, reciprocity, and exchange, which hold people together. Trust is a key part, as it allows individuals to believe that their investments in social relationships will eventually yield returns. Trust also enables individuals to share resources, exchange information, and collaborate with the expectation of mutual benefit (Swanson et al., 2020; uphoff, 2000). Social capital comes in three forms: bonding, bridging, and linking. In relation to this study, social capital theory offers a robust framework to understand the dynamics of social networks, social norms, and social trust, proving how these elements interlock to form the basis of societal interaction and individual well-being. The theory not only illustrates the mechanisms by which social networks, norms, and trust can be used for individual and collective advantage but also highlights the interdependence of these elements in shaping social capital.

2.5.2 Sendai Framework for Disaster Risk Reduction.

The Sendai Framework for Disaster Risk Reduction, set up in 2015, marks a big step in global efforts to boost resilience against natural disasters. Starting from the 3rd UN World Conference on Disaster Risk Reduction in Sendai, Japan, this framework builds on the Hyogo Framework for Action, expanding its focus to better tackle disaster risks from 2015 to 2030 (Busayo et al., 2020). At its core, the Sendai Framework shifts away from reacting to disasters to taking an initiative-taking, preventive stance focused on managing risks. This new view includes not just frequent, smaller disasters but also rare, large-scale events with big impacts. A thorough approach means understanding all sorts of risks, like environmental, social, and economic ones (Mizutori, 2020). The framework has four main priorities, aiming to embed disaster risk reduction across different areas of society and governance. The priority highlights the importance of understanding disaster risk in all its aspects—knowing about vulnerability, capacity, exposure of people and assets, hazard characteristics, and the environmental settings where they happen is key for good policymaking and planning (Djalante & Lassa, 2019). In terms of governance, the framework pushes for strong disaster risk governance structures that enable clear, competent, and coordinated risk management across sectors and levels. It suggests creating policies and institutions that are well-prepared to manage disaster risk and work with various stakeholders (Mizutori, 2020).

Research design and methodology.

3.1 Introduction.

This chapter entails the methodologies and approaches that were used to answer the research questions. The chapter specifically entails research methods, research design, operationalization of the study variables, sample size and sampling techniques, data sources, target populations, data collection instruments, validity, and reliability of research findings and finally data analysis and processing.

3.2 Operational of Study Variables.

A questionnaire instrument was developed to gather information about how community members working together in handling fire disasters within makina Kibera village. The indicators provided were measurable, aiding the researcher to find trends, patterns from the descriptive statistics of this research together with backing up with the existing literature. To ensure the content validity of the scale used, it is advised to largely adopt the items for each construct from prior research as adopted from (Amundsen, 2014); (Bernier, and Meinzen-Dick, 2014); Genkin et al. (2022); (Bizer, et al. 2014); (Wamsler, 2023); and (United Nations, 2015). Structured interviews were used to bring out the detailed understanding of the study concepts and address issues which were uncaptured in the questionnaire survey.

3.3 Operationalization Table.

Research questions	Variable	Sub Variables	Explanation	Indicators	Method
What are the existing forms of social capital used to promote fire disaster management in Makina Village, Kibera slum in Nairobi?	Social capital "An accumulation of various types of social, psychological, cultural, cognitive, institutional, and related assets that increase the amount (or probability) of mutually beneficial cooperative behavior." uphoff (2000: p216)	• Bonding • Bridging • Linking • Cognitive • Structural	**Bonding social capital** is found in close relationships, like those with family members or close friends. **Bridging social capital**, on the other hand, encompasses more distant connections that span different social groups. These are typically weaker than bonding ties but are invaluable for accessing diverse information and resources, easing the flow of ideas across different segments of society. **Linking social capital** extends upward, connecting individuals and groups with people or institutions across explicit, formal, or institutionalized power gradients (Aldrich & Meyer, 2015). **Structural social capital** consists of social organizations, their roles, the rules, precedents, procedures altogether with diverse networks that fuels cooperation which he termed it as mutually beneficial collective action (MBCA) which is a product of social capital. On the other hand, **cognitive social capital** forms of mental processes backed up by culture and ideology mostly norms, beliefs, attitudes, and values, which contribute to cooperative behavior and collective efficacy uphoff (2000).	**Bonding social capital** • Number of friends/relatives that stay together. • Number of neighbours names known. • Number of years stayed in the area. • Frequency of visiting neighbours • Streams of benefits attained from bonding social capital during and after disasters. **Bridging social capital.** • Frequency of community meetings • The rating of neighbourhood in terms of collaboration during fire disasters. • Number of residents who are members of social organizations. **Linking social capital** • Frequency of information shared within the community about fire safety. • Organizations linking fire disaster victims with • Experiences of residents about support from the outside community aftermath disasters. **Structural social capital** • Number and types of social organizations in the area focus on fire disasters. • Methods of organizations alliances and cooperation on fire disaster management • Methods of communication used within the community about fire safety. **cognitive social capital** • Resident's perceptions about trust in families, Community members, and government aid during fire disasters • Residents' ratings about government roles in fire firefighting services.	Surveys Thematic analysis
How are fire disasters currently managed and who are the actors	**Fire disaster risk management** This involves a mix of technical, organizational, and community-based approaches that together	• Mitigation • Preparedness	***mitigation /prevention*** *phase.* -measures to cut the causes and possibility of socio-technical disasters resulting from human activities.	**Mitigation phase** • organizations involved in mitigation phase of fire disaster management and what are their roles.	Semi-structured interviews

involved in community recovery phase of fire disasters Makina Village, Kibera slum in Nairobi? ***What forms of social capital could be recommended to improve fire disaster management in Makina Village?***	reduce risk and enhance the ability to manage and recover from fire-related incidents. Djalante & Lassa, 2019	• Response • Recovery	***Preparedness phase***- It includes the measures and activities for mobilizing and supplying manpower, funds, and firefighting equipment and relief supplies and ensuring that they are in safe position and can be accessed in the event of fire disasters. ***Response phase.*** -This is the phase consisting of emergency support activities for responding to disasters. It is basically operations to rescue human lives and offer security to victims of disasters. ***Recovery phase***-It includes resuming day to day operations guided by policies and measures carried out to recover fundamental living environments damaged after the occurrence of a disaster. (Farahani et al.,2020; Aldrich, 2010: Kim, 2016)	• programs in place to mitigate fire disasters. • actions/community initiatives implemented by organizations to mitigate fire disasters. • community initiatives championed in the area to ensure fire safety awareness. • Policies and instruments are in place and how are they used to reduce/ mitigate fire disasters in informal settlements? • forms of social capital aid in mitigation phase of fire disaster management. **Preparedness phase.** • organizations involved in preparedness phase of fire disaster management and what are their roles. • What forms of social capital aid in preparedness phase of fire disaster management. **Response phase** • organizations involved in Response phase of fire disaster management and what are their roles. • Role of community members in response disaster management. • rules (formal/informal) within these organizations to ensure effective coordination and collaboration during fire disasters? • What forms of social capital aid in response phase of fire disaster management. **Recovery phase** • organizations involved in preparedness phase of fire disaster management and what are their roles. • Opinions about social organizations of makina residents' relationship and with formal organizations in fire disasters. • ways in which formal organizations aid fire victims reach full recovery. • What forms of social capital aid in Recovery phase of fire disaster management.	Thematic analysis

3.4 Research Design.

The researcher adopted a case study research design as the study looks to explain some present circumstance i.e., how a social phenomenon works. This research design is relevant as it seeks to answer the research questions extensively and "in-depth" description of a particular social phenomena within the study area (Yin, 2009). Therefore, it combined descriptive and explanatory research in describing the social phenomena occurring together with explaining the reasons why it occurs. The researcher chose Makina village as their study area which is part of large extension of Kibera slum. The researcher opted for this village because most of the fire disasters have been occurring at this village and it is a suitable area to study and find out how local communities have been dealing with fire disasters as showed by past research studies about. The case selection is justified for this research since it supplies deeper insights into the phenomenon under study and offers an opportunity to capture a variety of information that might have not been pinpointed by earlier studies importantly supplying evidence to support the findings of this research. This design aligns well with the research aims and the complex, real-world nature of the problem under investigation as justified by (Sale, 2022).

3.5 Research Methods.

The researcher utilized mixed methods of both Quantitative and Qualitative methods, to investigate the dynamics of social capital in a real-life context. The reason for choosing these both methods is to reach multiple sources of information from diverse participants who are more informed about the social phenomena under study. It comprehensively supplies relevant information to answer the research questions of this study as both methods complement each other (Clark, et al.,2021). Quantitative methodologies were used to express the frequency of how a phenomenon occurs, this will be expressed through systematic analysis of activities within the study area to capture the forms of social capital and reinforce it with numerical data including descriptive statistics such as mean, median and percentages. Qualitative methods were used to gain the in-depth of non-numerical data by engaging participants in an intense interview with the aim of exploring their feelings, experiences, and opinions of varied participants about fire disasters in makina village. The expert participants aided in supplying in-depth understanding of how different organizations work together in fire disaster management.

3.6 Data sources.

The researcher used both primary and secondary sources in seeking answers for the research questions of this study. The primary data was collected on site with direct engagement of participants. This was through answering questions which the researcher looked to understand more about the phenomena under study. The secondary data was relevant in triangulating the information from participants about the topic under study as well used to confirm the accuracy of information provided by participants. The researcher ensured that secondary sources of information utilized under this study are from reputable sources including government publications such as gazettes, policy documents, government websites which were obtained via different organizations' websites, additionally past academic papers and grey literature will be utilized to back up the primary data sources of this study.

3.7 Target population.

The targeted population in this study included the residents of makina village and fire disaster management experts from the county government of Nairobi, Kenya Red Cross society employees, community leaders and faith-based organizations heads. The residents of makina included people working at makina area for example traders at Toi market who don't reside at makina but own shops and stalls around the area and experts who were not be part of makina residents were included in the study as part of the targeted population. To ensure that only residents of makina participated in this study the researcher surveyed households within makina village to reach correct data. Only participants who reached the age of consent were recruited to take part in this study.

3.8 Sample Size and Sampling Technique

This study targeted less than 2,500 households and various institutions and experts who are involved in combatting fire disasters in Makina Village, in Kibera slum. In the quantitative survey, households will be used as the unit of analysis, while heads of the households were used as the units of observation. A priori power analysis was conducted as showed in figure 4.

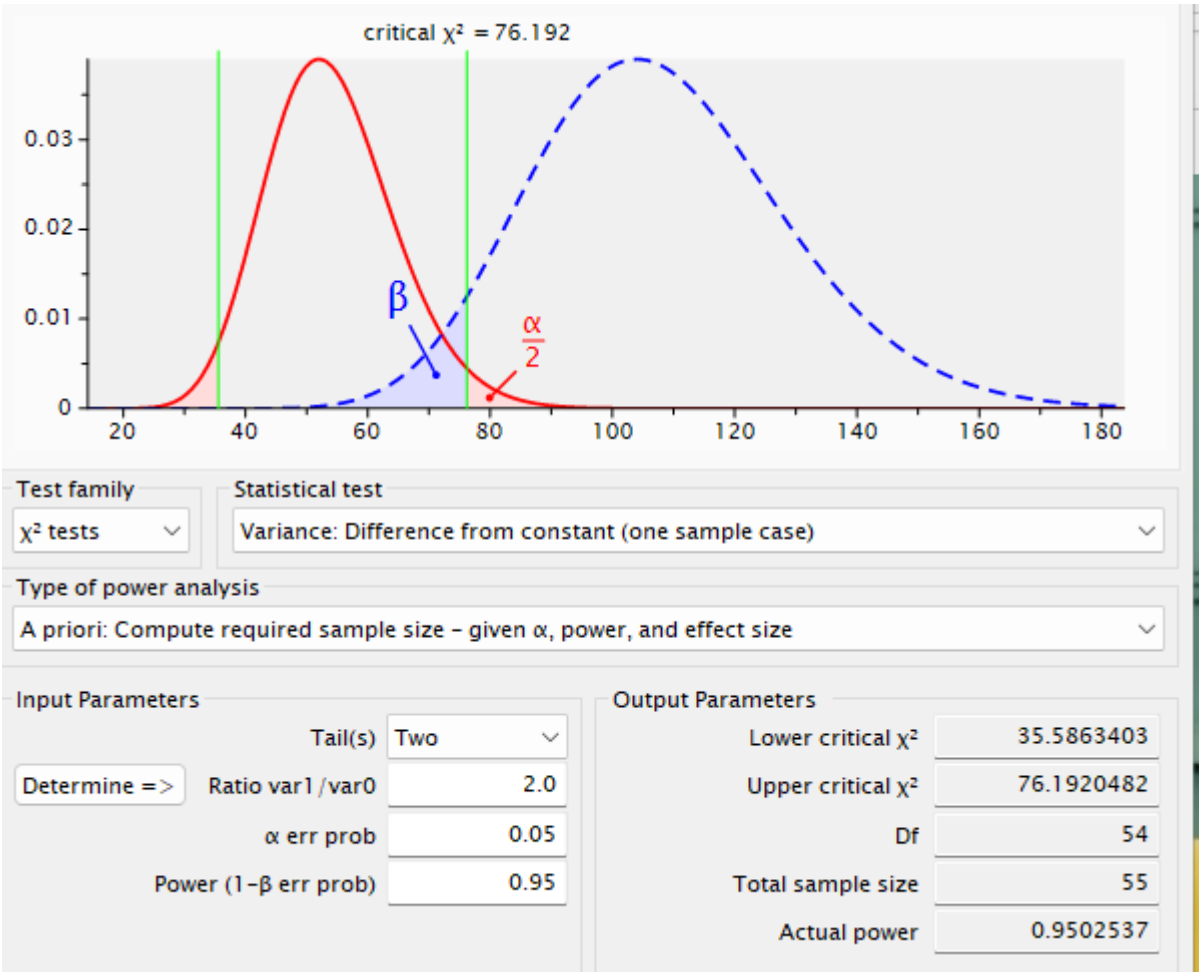


Figure 4:G-power sample calculator.

G-power was essential to decide the sample size needed to achieve the desired statistical power based on predefined alpha and effect size levels before data collection begins for the

study. The two-tailed test setup suggests that the alternative hypothesis could claim the actual variance to be either more or less than the hypothesized value. The ratio of var1/var0 set at 2.0 implies that the observed variance is expected to be twice that of the hypothesized variance, which shows a substantial deviation and justifies the need for a robust testing approach. The alpha error probability is kept at 0.05, aligning with standard scientific practices, which allows a 5% risk of incorrectly rejecting the null hypothesis (Type I error).

Moreover, the power of the test, defined as 1 - β error probability, is set at 0.95. This level of power ensures a 95% chance of correctly rejecting the null hypothesis if it is indeed false, thereby substantially reducing the likelihood of a Type II error. The outputs of the analysis are notably rigorous: the chi-square values needed to reject the null hypothesis fall between 35.56 and 76.19. With 54 degrees of freedom, these critical points delineate the threshold beyond which the observed variance is considered significantly different from the hypothesized value. A total sample size of 55 is determined to be necessary to achieve this level of statistical rigor. The actual power achieved, calculated as approximately 95%, closely matches the intended power, confirming the efficacy of the sample size and test parameters. The study had 71 respondents which surpassed.

This study utilized convenience and purposive sampling. Convenience sampling was used to survey the number of households who were involved in this study using structured questionnaires. While purposive sampling was used to select the 13 study participants through the structured interviews from various institutions and experts who are involved in combatting fire disasters in the informal settlements. This range allowed for data saturation through formation of themes as justified by (Adeoye-Olatunde, and Olenik, 2021).

Data Collection Method	Sampling Method	Data Source	Number of respondents	Data gathered
Questionnaires	**Convenience Sampling**	**Primary sources**	**72-** **Makina community members.**	• Experiences of residents concerning the existing forms of social capital and how they interact in to ensure effective fire disaster risk management within makina village. This by measuring the aspects of social capital numerically to verify its existence and the strength/weakness of the form of social capital applied in fire disaster risk management.
Semi-structured interviews	**Purposive sampling**	**Primary sources**	**13** **5**-community representatives. **3** -Kenya Redcross society representatives. **2** -Nairobi County Government-Disaster management department representatives. **1** -Kibera community emergency response representative. **1**-slum dwellers international-*Muungano wa Wanavijiji*-representative. **1**-Nubian community youth council representative.	• Obtained information on how fire incidences in the past have been addressed and identifying who are the active agents involved in all the phases of fire disaster management. To reinforce the data collection the researcher interviewed heads of various institutions which are auxiliary to the national government, county government and the non-governmental organizations responsible for fire disaster management in the informal settlement of kenya. • Additionally, the researcher gathered opinions from disaster experts about possible forms of social capital that can be put in place to improve fire disaster management in makina village.

Table 1:list of respondents

3.9 Data Collection Instruments.

This study used both structured questionnaires and interviews. Combining these techniques in this research study offered a robust methodological approach that enhanced the validity and depth of the findings. Structured questionnaires were used to assess variables numerically and answer the first research sub questions. These structured questionnaires on the study variables were structured in the form of five-point Likert scale to answer questions dealing with opinions of makina residents while other questions offered multiple choices for participants to select proper choices. The reason for having a varied question structure is to aid in capturing more responses and hence giving more data about the activities happening in makina village concerning fire disaster risk management. Structured interviews were used to find themes that answered research questions purposefully to capture roles of institutions in different phases of fire disaster management phases and experts' opinions about the social organization of makina village and its relevance. Interviews were administered to various institutions heads and experts who are involved in combatting disasters in the Slum.

3.10 Data Analysis Methods.

This study used both qualitative and quantitative techniques to analyse data collected through interviews and questionnaires respectively. Quantitative data analysis was conducted using R version 4.2 to reach descriptive statistics that gives the extent in which disaster management initiatives have been implemented on makina village among the social units and groups. The data was collected using structured questionnaires and administered through kobo collect digital tool to capture all the observations from the field. Descriptive statistics such as frequency, percentages, mean, and standard deviation were used to describe the data and supply evidence about existence of social capital in makina village. For qualitative techniques thematic analysis using NVIVO 14, was used where codes were be formed which led to the formation of themes to answer research questions.

3.11 Validity and Reliability of Research findings.

Validity and reliability are considered essential tools for researchers using a positivist epistemology approach. This research is similarly founded on tenets of the same approach including the use of scientific facts, empirical evidence and seeking objective truth. At the earlier chapters of this research the social phenomenon under study is described and supported by existing scientific theories, the empirical evidence is gathered using the chosen data collection methods which are guided by scientific norms (Clark, et al.,2021). Reliability is defined as the extent to which results are consistent over time and a correct representation of the total population under study. On the other hand, validity decides if the research measures what is intended to measure and how truthful are the research findings. Mostly both definitions are aligned to quantitative paradigm while triangulation was used to confirm the non-numeric data which was collected through the qualitative paradigm. Triangulation reinforces a study by mixing methods or data and using both qualitative and quantitative approaches which was adopted by this study (Patton, 1999). This research arrived at a population sample using a scientific calculator which is scientifically tested and approved by previous researchers hence replicable. The sampling techniques used in the study offers an equal chance for all participants to take part in the study reducing bias and intending to answer the specific research questions. The data collection instruments used have structured questions which seeks relevant information which are useful in answering the research questions, hence boosting its internal validity (Clark, et al.,2021).

3.12 Challenges and Limitations.

Financially, this study faced constraints due to a limited budget, which restricted extensive fieldwork, the breadth of data collection methods like large-scale surveys, and the employment of advanced data analysis tools. Additionally, resource allocation issues affected the ability to implement interventions or pilot studies that might have provided more substantive insights into the community dynamics and resilience strategies. Logistically, accessing informal settlements for data collection posed its own set of challenges, including safety concerns due to the dense and potentially hazardous environment of such settlements. Moreover, the informal nature of employment among residents hindered scheduling for interviews and surveys, as availability was unpredictable.

From a methodological perspective, relying primarily on self-reported data through questionnaires and interviews is likely to introduce biases or inaccuracies. Financial and logistical constraints limited the sample size, potentially affecting the generalizability of the study findings to other informal settlements beyond Makina Village. Objectivity is another critical concern, especially if the researcher has previously been involved with community projects within Makina Village. Such prior involvement influences the study's neutrality and the interpretation of data. Additionally, community perceptions of the researcher's role or intentions might influence their responses and the level of their engagement in the study.

To mitigate these challenges, several strategies were employed. Forming partnerships with local research assists who will helped alleviate financial and logistical constraints. Employing a triangulation of data sources and methods enhanced the validation of findings and reduce the impact of potential biases. Maintaining transparency about any researcher biases and seeking regular feedback from peers or mentors helped safeguard objectivity. Furthermore, employing adaptive sampling techniques addressed the challenges posed by the dynamic and complex environment of informal settlements.

Results, analysis, and discussion.

4.1 Introduction.

This chapter addressed results and qualitative and quantitative analysis on the role of social capital in advancing community resilience to fire disasters in Makina Village, Kibera slum in Nairobi Kenya. The chapter also presents a discussion of the study findings by comparing them with extant studies in the literature review chapter.

4.2 Background Information on the Households.

This analysis intended to figure out the age of the households in Makina Village and their gender.

4.2.1 Age of the Households Heads in Makina.

Table 4.2 showed that most of the respondents (44) were aged between 18 and 30 years, followed by 32.4% (*n*= 23), who shown that they were aged between 30 and 45 and finally only 5.6% (*n*=4) wrote down that they were aged above 45 years. Cumulatively, the analysis shown that less than 95% of the households in Makina Village were aged below 45 years, implying that most of them are young.

Table 2: Age of the households.

		Frequency	Valid Percent	Cumulative Percent
Valid	18-30 yrs.	44	62.0	62.0
	30-45 yrs.	23	32.4	94.4
	Above 45 yrs.		5.6	100.0

Total	71	100.0

4.2.2 Gender of the Respondents

On the gender of the household heads in Makina, the survey revealed that 70.4% (*n*=50) of the participants were male compared to 29.6% (*n*=21) who were females. From the sampling methods employed all the participants were provided with equal chances to participate therefore no biases introduced in participants selection. It was clear that majority of the household heads in Makina were males as illustrated in Figure 4.1.

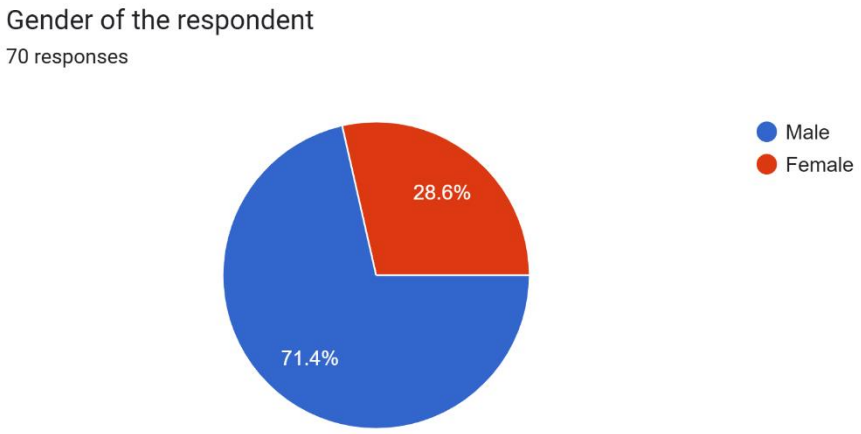


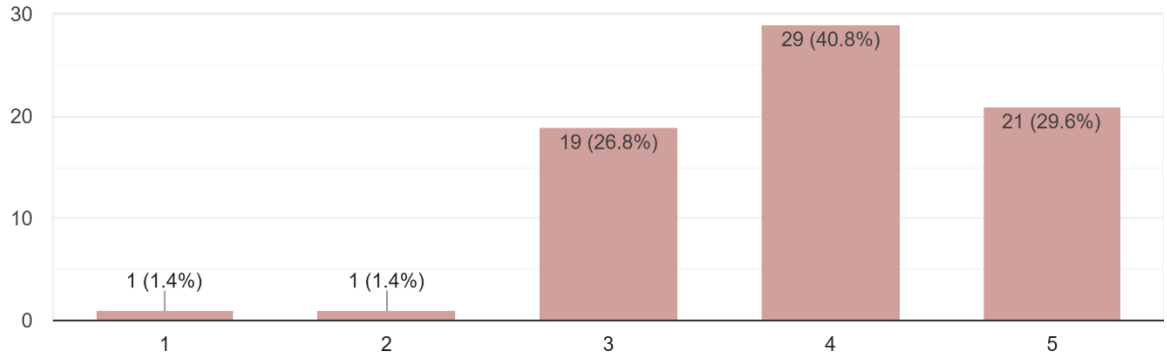
Figure 4. 1:Gender of Respondents.

4.3 Forms of Social Capital.

In this section, the researcher sought to determine Existing forms of social capital such as bonding, bridging linking, cognitive, and structural social capital, involved in fire disaster risk management in Makina Village.

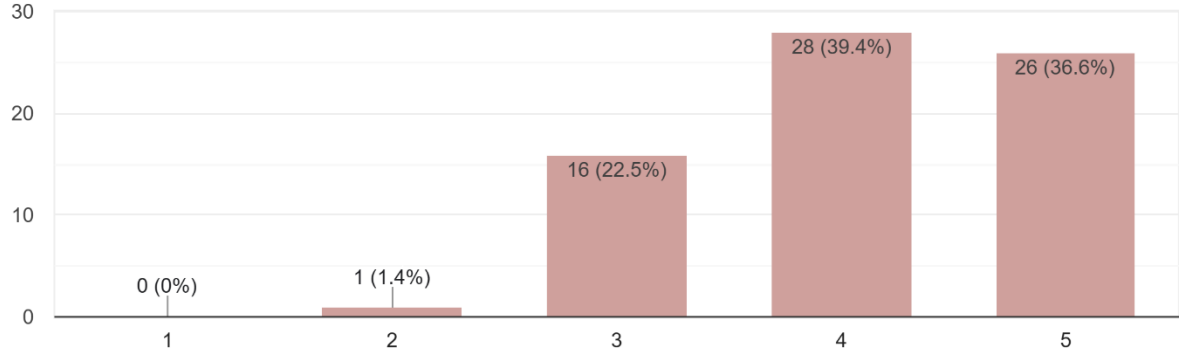
4.3.1 Bonding Social Capital

The researcher sought to determine number of friends/relatives that stay together, neighbours' names known, years stayed in the area, and frequency of visiting neighbours as indicators of bonding social capital which determined not only its existence, but the strength of the horizontal linkage as asserted by (Aldrich,2012).



Graph 1:Rating of Relationship with neighbours.

The respondents rated their relationship with their neighbours as follows: 1 (1.4%, *n*= 1), 2 (1.4%, *n* = 1), 3 (26.8%, *n*= 19), 4 (40.8%, *n*= 29), and 5 (29.6%, *n*=21). The average rating was 3.96 (*SD* = 0.896), which was statistically significant at 0.05, t(*df*=70) = 38.371, p = 0.000. This implied that 70.4% households in Makina village had positive relationships with their neighbours.



Graph 2:Rating on sense of belonging to the community.

While the sense of belonging to the community was rated as follows: 1 (0.0%, *n*= 0), 2 (1.4%, *n*= 1), 3 (22.5%, *n*= 16), 4 (39.4%, *n*= 28), and 5 (36.6%, *n*= 26). The mean rating was 4.11 (*SD* = 0.803), with a statistically significant result at 0.05 significance level, t(*df*=70) = 43.174, p=0.000. This result meant that more than 70% of the households in Makina village had an intense sense of belonging to their community.

Households reported their duration of residence in Kibera as follows: below 1 year (21.1%), 1-3 years (19.7%), 4-8 years (14.1%), and above 8 years (45.1%). The mean duration was 2.68 years (*SD* = 1.025), t (*df* =70) = 21.998, p < .001. This shows a varied but predominantly long-term residence among the respondents with an established bonding social capital.

Participants' living arrangements were categorized as follows: alone (43.7%) and with family members/relatives (49.3%). The mean response was 2.42 (*SD* = 0.625), t (*df* =65) = 32.672, p < .001. This suggests that nearly half of the respondents live with family or relatives. Study

participants reported that knowing the names of their neighbors is as follows: 1-2 neighbors (15.5%), 3-4 neighbors (40.8%), 6-7 neighbors (29.6%), 7-8 neighbors (8.5%), and 9+ neighbors (5.6%). The mean number of known neighbors was 2.48 (*SD* = 1.040), t (*df*= 70) = 20.083, p < .001. This shows moderate acquaintance with neighbors.

Participants reported talking to the following number of neighbors in the past week: 0 neighbors (7.0%), 1 neighbor (1.4%), 1-2 neighbors (29.6%), 3-4 neighbors (39.4%), 5-6 neighbors (15.5%), 7-8 neighbors (5.6%), and 9+ neighbors (1.4%). The mean frequency was 3.83 (*SD* = 1.095), t (*df* = 70) = 29.473, p < .001. This shows active communication among neighbors.

The frequency of visits to neighbors' homes was reported as follows: 0 visits (42.3%), 1-2 visits (49.3%), and 3-4 visits (8.5%). The mean number of visits was 1.66 (*SD* = 0.631), t (*df* =70) = 22.187, p < .001. This suggests limited but notable social interactions.

Question	**Responses**	**Frequency (Percentage)**	**Mean (Std Dev.)**	**t (df) p value**
How long have you lived in Kibera?	Below1 year	15 (21.1%)	2.68 (1.025)	21.998 (df =70), p=0.000
	1-3 yrs.	14 (19.7%)		
	4 – 8 yrs.	10 (14.1%)		
	Above 8 yrs.	32 (45.1%)		
Who do you stay with?	Alone	31 (43.7%)	2.42 (0.625)	32.672 (df=65), p=0.000
	With family members/relatives	35 (49.3%)		
How many neighbours' names do you know?	1-2	11 (15.5%)	2.48 (1.040)	20.083 (df=70), p =0.000
	3-4	29 (40.8%)		
	6-7	21 (29.6%)		
	7-8	6 (8.5%)		
	9+	4 (5.6%)		
How many neighbours have you talked to last week	0	5 (7.0%)	3.83 (1.095)	29.473 (df=70), 0.000
	1	1 (1.4%)		
	1-2	21 (29.6%)		
	3-4	28 (39.4%)		
	5-6	11 (15.5%)		
	7-8	4 (5.6%)		
	9+	1 (1.4%)		
How many neighbours' homes have you visited last week	0	30 (42.3%)	1.66 (0.631)	22.187 (df=70), p=0.000
	1-2	35 (49.3%)		
	3-4	6 (8.5%)		

Table 3: bonding issues

Stronger bonding social capital has been experienced among the villagers during fire disaster as indicated by P5.

"*They are always united when it comes to disaster. Because you know, they are one community, and they are always united. Like Nubian community, they are the majority in Makina Village. So, for them, they always come together*."

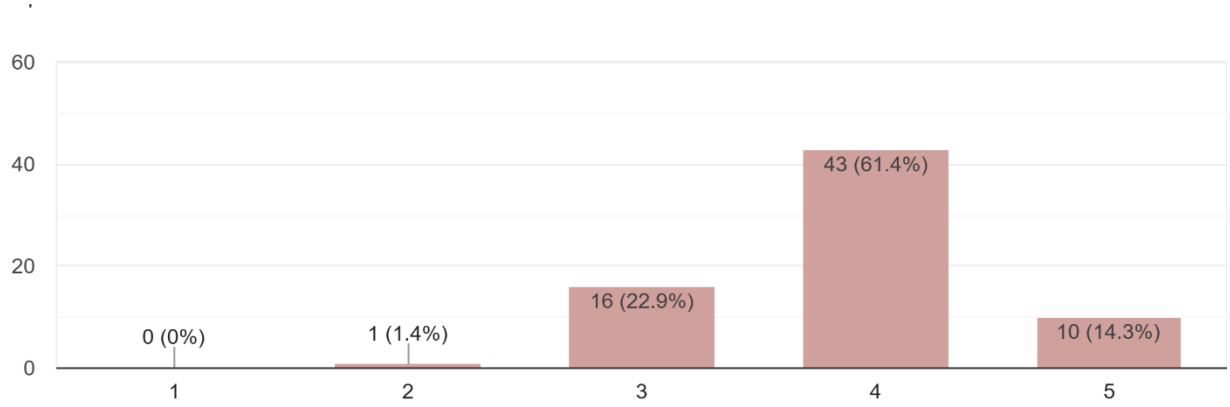
Stronger bonding social capital has also been witnessed during disaster recovery where families host the affected victims as illustrated by P1. "*I've seen some families being hosted by other families, who are probably not even relatives, but they've been able to take them in for some time as they find themselves out."*

Family and relatives' support has also been reported during fire disaster response phase (P1 & P4). P1 opines that some families in Makina have been hosted by other families who are not even their relatives until they find themselves out of the disaster which is a form of bridging social capital which is aligned to the findings of (Stone & Hughes 2001) that strong family ties contribute to community cohesion which leads to community wellbeing. P4 added that the affected family might integrate with relatives, who does not live in the area as they wait for the support from disaster management agencies.

The above quantitative results indicated that there was a moderate bonding social capital, despite positive communication, strong sense of belonging and long-term residency among residents of Makina. This was illustrated in their moderate acquaintance with neighbours and limited but notable social interactions. This to some extent contradicts the assertion of (Aldrich 2012), that bonding social capital is characterized by strong personal connections and a high degree of supportiveness, often supplying emotional and substantive support during times of need. Qualitative results indicated there was a stronger social bond during the fire disaster. This was supported by the findings of (Obaitor et al., 2021). who indicated that bonding can be valuable in low-income communities such as slums since they must depend on their social relationships to survive.

4.3.2. Bridging Social Capital

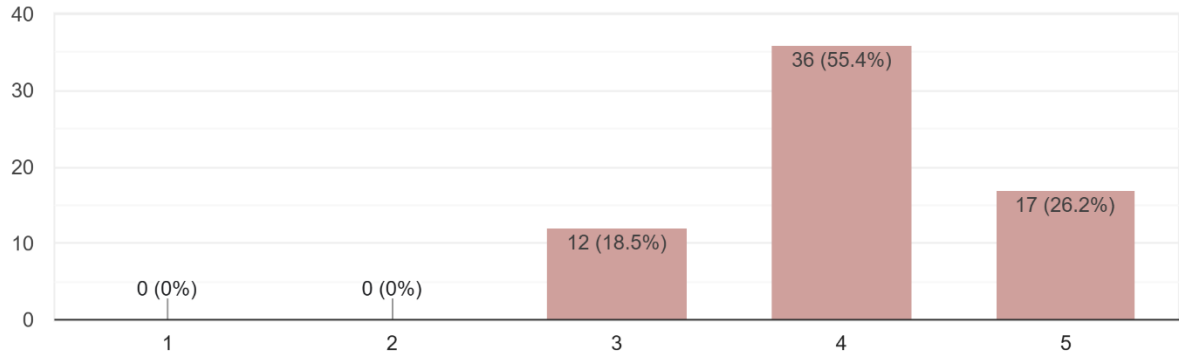
In this section, the researcher sought to determine frequency of community meetings, the rating of neighbourhood in terms of collaboration during fire disasters, and number of residents who are members of social organizations.



Graph 3:Rating on neighbourhood collaboration during fire disasters.

On the neighbourhood collaboration during fire disaster the results the rating was as follows: 1 (0.0%, *n*=0), 2 (1.4%, n=1), 3 (22.5%, n=16), 4 (61.4% n=43), and 5 (14.3%). The mean rating on neighbourhood collaboration was 3.89 (SD = 0.649), and was statistically significant

at significance level of 0.05, t (*df* = 70) = 43.174, p =0.000. This showed that there was a prominent level of perceived collaboration with the neighbourhood of Makina.



Graph 4:rating on the willingness to aid community members during fire disasters.

On the willingness to aid community members during fire disaster, the rating was as follows: 1 (0.0%, *n*=0), 2 (0.0%, *n*=0), 3 (18.5%, *n*=12), 4 (55.4%, *n*=36), and 5 (26.2%, *n*=17). The average rating 4.08 (*SD* = 0.669), which was statistically significant result at significant level of 0.05, t (*df* = 64) = 49.156, p =0.000. the study results revealed that a significant majority of the households in Makina are willing to support their neighbours during fire disaster.

Respondents were aware of the following number of social organizations: 0 (1.4%), 1-2 (7.0%), 3-4 (28.2%), 5-6 (43.7%), 7-8 (12.7%), and 9+ (7.0%). The mean awareness was 3.80 (*SD* = 1.037), t (*df* = 70) = 30.907, p < .001. This shows high awareness of social organizations within the area. Respondents' membership in social organizations was reported in Table as follows: no (14.1%) and yes (84.5%). The mean response was 2.83 (*SD* = 0.414), t (*df*= 69) = 57.681, p < .001. This shows an elevated level of engagement in social organizations.

Question	**Responses**	**Frequency (Percentage)**	**Mean (Std Dev.)**	**t (df) p value**
How many social organizations (churches, neighbourhood association) are you aware of that run within this area	0	1 (1.4%)	3.80 (1.037)	30.907 (df =70), p= 0.000
	1-2	5 (7%)		
	3-4	20 (28.2%)		
	5-6	31 (43.7%)		
	7-8	9 (12.7%)		
	9+	5 (7.0%)		
Are you a member of any of these social organisation/group/chama	No	10 (14.1%)	2.83 (0.414)	57.681 (df=69), p=0.000
	Yes	60 (84.5%)		

Table 4:Bridging Social capital

On the qualitative analysis it was determined that frequent meetings were organised by the government during fire disaster as indicated by P6.

"*There have not been frequent meetings or maybe organizing how to mitigate fires, but after the disaster is over, they come here. Yeah, and they come to solve and leave, not to even know*."

These social capital initiatives such as connections with church or family, have been revealed to have a positive influence on fire disaster management as indicated in by P8.

It was revealed that majority of the household owners in Makina village are affiliated to social organisations such as *chamas*, churches, and groups. This implied that there is high level of bridging social capital which brings collaboration during fire disaster as illustrated by the qualitative and quantitative results. This supported by the findings of (Aldrich, 2012), who indicated that bridging network as a powerful tool for broad-scale mobilization. The findings also indicated that bridging extends beyond the family and friends' connections in the village as corroborated by the findings of (Mpanje et al. 2022) who indicated that bridging as a form of social capital involves relationships beyond shared identities and associates in heterogenous communities.

4.3.3 Linking Social Capital

In this section, the researcher sought to determine frequency of information shared within the community about fire safety, and experiences of residents about support from the outside community aftermath disaster.

Information about fire disasters was accessed through community meetings (1.4%), social media (12.7%), word-of-mouth from neighbors/church members (84.5%), and others (1.4%). The mean response was 3.80 (SD = 0.524), t (df= 70) = 61.121, p < .001, as indicated in table 4.3. This suggests that word-of-mouth is the primary source of information. Community meetings were reported to occur occasionally (95.8%), after two weeks (1.4%), and weekly (2.8%). The mean frequency was 1.07 (SD = 0.351), t (df= 70) = 25.661, p < .001. This shows infrequent community meetings. Attendance at community meetings was reported as follows: 1 (95.8%), occasionally (1.4%), and regularly (2.8%). The mean attendance was 1.07 (SD = 0.351), t (df = 70) = 25.661, p < .001. This shows that most respondents rarely attend community meetings.

Question	Responses	Frequency (Percentage)	Mean (Std Dev.)	t (df) p value
How do you access information about fire disasters/Aid within this area	Through community meetings	1 (1.4%)	3.80 (0.524)	61.121 (df=70), p= 0.000
	Through social media i.e., Facebook	9 (12.7%)		
	Through word-of-mouth Neighbours/church members	60 (84.5%)		
	Others	1 (1.4%)		
If it is through community meetings how frequent are the meetings?	Occasionally	68 (95.8%)	1.07 (0.351)	25.661 (df=70), p=0.000
	After two weeks	1 (1.4%)		
	Weekly	2 (2.8%)		

How often do you attend these community meetings?	1	68 (95.8%)	1.07 (0.351)	25.661 (df=70), p= 0.000
	Occasionally	1 (1.4%)		
	Regularly	2 (2.8%)		

Table 5:linking social capital.

On the qualitative analysis, it was revealed that community organisation plays a significant role in linking the community to fire firefighters and these organisations use social media to communicate these fire incidences, based on the assertion by P1. "*And our role mostly is regarding linking community with the fire, firefighters. We are the first callers, you know, or rather we are the first people to be informed, you know, whenever there are fire incidences. And this, they use my mobile and, they use the social media platform*."

Qualitative analysis also corroborated quantitative findings by illustrating that Nairobi County government does organise frequent meetings on fire mitigation as indicated by P6. This was supported by P4, who indicated that dissemination of information during emergencies was not a challenge, but it was a challenge during assessments specifically on Nubian community as they do not share data which is relevant for disaster management planning and resource allocation.

Both qualitative and quantitative results have revealed that there are various ways in which information about fire disasters are shared and disseminated. Community leaders as well link fire disaster victims with those in power who then mobilize resources require for fire disaster response and recovery (Sheu et al. 2014). appreciated the role of relational capital in promoting information sharing. The results have also revealed that community organisations play a significant role in linking the community fire fighters and government administrators, during fire disasters. This was in tandem with the findings of (Aldrich, 2012), who indicated that linking as a form of social capital is crucial for accessing support or resources from government bodies, organizations, or authorities in power (Stone and Hughes, 2001) added that linking is a type of social capital, which can be used to garner resources from those in authority.

4.3.4 Structural Social Capital.

In this section the researcher sought to determine the number and types of social organizations in the area focus on fire disasters, methods of organizations alliances and cooperation on fire disaster management, and methods of communication used within the community about fire safety.

Respondents perceived relevance of friends, neighbors, or government in fire disaster recovery was reported as: maybe (2.8%), no (1.4%), and yes (95.8%). The mean response was 2.93 (*SD* = 0.351), t (*df* = 70) = 70.231, p < .001. This shows a strong belief in the relevance of social networks and government support in disaster recovery.

Aid during and after fire disasters was perceived to come from family/friends (90.1%) and government (9.9%). The mean response was 1.93 (*SD* = 0.308), t (*df* = 70) = 52.759, p < .001. This highlights the crucial role of family and friends in supplying support during fire disasters.

Question	**Responses**	**Frequency (Percentage)**	**Mean (Std Dev.)**	**t (df) p value**
Do you think friends/neighbours/government are relevant in fire disaster recovery?	Maybe	2 (2.8%)	2.93 (0.351)	70.231 (df=70), 0.000
	No	1 (1.4%)		

	Yes	68 (95.8%)

Table 6:structural social capital

Community savings groups such as *chamas* and merry-go round, mostly associated with women were being involved in a fire disaster emergencies women pool money together which can be used to assist their members in case they are involved in fire disasters or would like to take loans for business (P3, & P5). P3 reported that fire victims are supported by various merry-go rounds and table banking. This initiative was mostly done by women in Makina Village who trust each other to enable social capital function as asserted by St John (2017) that trust and reciprocal relationships within community units fosters cooperation and support among individuals which further enhances community resilience. P5 reported that some residents in Makina Village were involved in savings circle where they do fund raises during emergencies. P5 further mentioned examples of association in Toi Market and slum- going Green and women are at the forefront of these groups.

> *"Like example, we have Slum going Green. They always have a saving for when they have the emergencies. We have Toi Market. Toi Market also, they have an association. It's a circle where everyone in the market, they always contribute almost every day 50 shillings for the emergency and maybe cleaning the market. There are several within the community, especially for women. Women are the forefront in doing so. Yes, yes. In savings, women are doing it very well".*

Community-based teams who are volunteers were identified as another form of structural social capital (P2, P3, & P4). P2 stated that for the sustainability of fire disaster interventions, there is a need for community involvement as the "golden rule."

> "*That is the golden rule. And for me, the community say nothing is for us without us. And if you do your things without involving the communities, then you would not have sustainability of these interventions that you are doing. So, one, it promotes sustainability of your interventions*".

Hence, P4 recommends formation of the community-based volunteers who have an agenda of helping the community for the sustainability of the above interventions.

"*So, the future hope response team was initiated through key volunteers from the community, youths that have an agenda in terms of helping the community*."

P5 postulated that Red Cross have been involved in ability building of community members through working with community-based disaster response teams, (CBDRTs) where they are trained on the aspect of firefighting and prevention. This has significantly led to reduction of fire incidents in Makina. Finally, religious institutions in Makina such as mosques and churches as forms of structural social capital take part in fire disaster response and preparedness to build resilience in the village (P1, P2, & P4). P1 indicated that mosques in Makina usually enables affected families to access relief food and sometimes churches offer spaces for the affected families.

"I know that the mosque, you know, has also been able to enable families to access relief among other organizations within Makina. Yeah, I think the churches, sometimes they offer space for families."

P4 stated that mosques and churches in the area usually supports fire victims to build back their lives by supplying resources to them. P2 recommended the need for faith-based organizations, to support these communities to enhance preparedness and build community resilience to fire disasters.

it was revealed that the community and social organisations has communication challenges during fire disasters (P1, P2, P3, P8, & P6), but this was contradicted by P4. P1 indicated that there was no central command during fire disasters. P2 added that the community members are unaware of tollfree lines of the fire departments to communicate whenever there is a fire disaster. P3 added that social organisations have not invested much in information sharing as majority of the residents are not active social media users hence hindering fire disaster mitigation efforts.

The study revealed that friends, family, government, and social organisations such as *chamas*, mosques and churches play a significant role in the management of fire disaster. This was supported by the findings of (Bihari and Ryan, 2012) who indicated that social capital in a community through cohesion may be significant in the preparedness of wildfires. Thus, the need for cooperation during fire disaster. The study revealed that the challenge of communication has impeded the development of social capital during fire disaster in Makina Village. This contradicts the recommendations of Uphoff (2000) who indicated that structural social capital fuels cooperation which he termed it as mutually beneficial collective action which is a product of social capital.

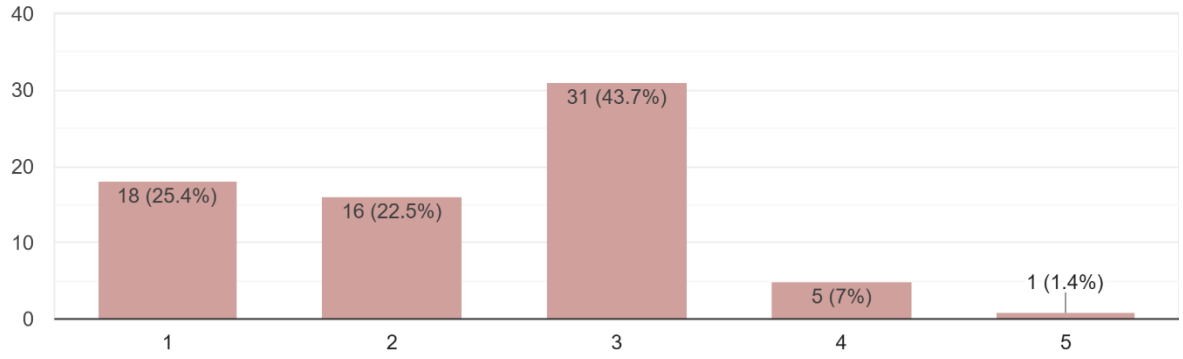
4.3.5 Cognitive Social Capital

In this section, the researcher sought to determine the perception and residents' ratings about government roles in fire firefighting services and trust among neighbours. Table 4.5 indicated that 90.1% (*n*=64) of the respondents indicated that family and friends were the most helpful and willing to help during and after a fire disaster. Compared with 9.9% (*n*= 6) who indicated that the government is most helpful and willing to help during and after a fire disaster. The mean response for the two groups is 1.93 (*SD*=0.308). The t-value of (*df*=70) 52.759and a p-value of 0.000 indicates that there is a statistically significant difference in the perceived helpfulness and willingness to help between family/friends and the government

Question	Responses	Frequency (Percentage)	Mean (Std Dev.)	t (df) p value
Which of the following is most helpful and willing to help during and after fire disaster?	Family/friends	64 (90.1%)	1.93 (0.308)	52.759 (df=70), 000
	Government	7 (9.9%)		

Table 7:cognitive social capital

On satisfaction with government firefighting services, the respondents showed as follows: 1 (25.4%, *n*= 18), 2 (22.5%, *n*= 16), 3 (43.7%, *n*= 31), 4 (7.0%, *n*=5), and 5 (1.4%, *n*=1). Further, the mean rating on the satisfaction level was 2.37 (*SD* = 0.989), with a statistically significant result, t(*df*=71) = 20.158, p=0.000. This shows a relatively low level of satisfaction with the firefighting services provided by the county government of Nairobi. Ngau and Boit (2020) highlighted that delay of response services during fire disasters are results of physical inaccessibility, lack of central command and coordination which was confirmed by P1.



Graph 5:rating on the satisfaction with government firefighting services.

Respondents reported leaving their doors open as follows: no (47.9%), yes (2.8%), and sometimes (40.8%). The mean response was 2.38 (*SD* = 0.684), t (*df* = 70) = 29.330, p < .001. This shows that most respondents do not leave their doors open when not home as they do not fully trust their neighbors.

Study participants showed that both national and county governments were involved fire disaster management (P1, P2, P4, P6, & P8). P1 recommended the need for the Kenya Fire Service to play a significant role in putting in place a fire facility in the community.

"We also have the Kenya Fire Service. You know, Kenya Fire Service play a bigger role, you know, can they just do one favour, put in place facility, a facility that I say it has a person, has an equipment, and has a space, you know, in the community. So, to me, that's basically what I can share."

P2 added that the government can strengthen the ability of the communities by regularizing disaster management bills and policies. Kenya Red Cross is the major organisation involved in fire disaster management as an auxiliary organisation to the government (P1, P2, P3, P4, & P7). P1 indicated that Red Cross has a clear mandate when it comes to disaster management and humanity.

"We have Red Cross that has a mandate, okay, it has a clear mandate, and they need to enable people like us, you know, they need to enable people like us to be relevant without necessarily focusing on brands. You know, organizations also focus so much on their brands until we miss the humanity part of it when it comes to a disaster."

Analysis from qualitative and quantitative data revealed contradictory results on the extent of involvement of various social organizations such as the government, with quantitative analysis revealing higher involvement of family and friends compared to lower involvement by the government and low level of satisfaction on government involvement. This is an indication of mixed opinions on the trust in government to provide resources for fire disaster management as illustrated by the findings of (St John, 2017) who indicated cognitive social capital as a measure of perceived trust. Qualitative analysis indicated government involvement in various stages of fire disaster management. (Obaitor et al., 2021) indicated that residents in slums have different perceptions of cognitive social capital through government-registered associations, thus leading to differences in trust and social cohesion in slums.

4.4 Fire Disaster Risk Management.

In this section, the researcher sought to qualitatively determine how fire disaster risk was managed through the various stages of disaster risk management based on Sendai Framework for Disaster Risk Reduction, (2015).

4.4.1 Fire Disaster Mitigation.

Organisations involved fire mitigation, their roles, and the programs they have implemented were assessed in this section. Community initiatives and actions were also determined, finally the researcher determined policies and instruments in place and the role of social capital in fire disaster mitigation.

Qualitative analysis revealed that various organisations are involved fire disaster mitigation. **Kenya Red Cross society** majorly involved in disaster management as an auxiliary institution to the government, other organisations included **Kibera Community Emergency Response Team (KCERT),** and **Kenya Fire Service.** Organisations such as **Slum dwellers international** through ***Mungano Wa Wanavijiji*** and **Danish Red Cross** do work in partnership with Kenya Red Cross. This theme was informed by three categories. Community organisations and County and National government in fire disaster mitigation.

Community organisations such as KCERT have been involved in fire disaster prevention, mitigation, and response and private security firms have been involved in fire disaster response on subscription (P1, & P5). P1 indicated that KCERT was started with the aim of disaster prevention, mitigation, and response to emergencies. The organisation has also been involved in emergency sensitization.

> *"Kibera Community Emergency Response Team, which is KCERT in short, was established to be able to prevent, mitigate and respond to issues around emergencies and disaster within Kibera. Another thing is also our approach around emergencies also involves around sensitization, which we use heavily through the social media."*

P1 added that the role of KCERT is to link the community with firefighters whenever there is a fire incidence. P7 adds that the community are always cooperative and receptive when it comes to disaster mitigation, when disaster managers in the area calls for meeting.

> *"I'm talking about the cooperation, the reception they give us, I can say they're cooperating with whatever we are doing in matters to do with disaster mitigation. Whenever we call for a meeting, they usually come up and we usually engage them".*

Study participants also indicated that investing in mitigation and preparedness as a policy, can reduce the overall cost and impact of disaster response as indicated by P4. Disaster managers from Nairobi County government usually engages the community mostly in community meetings by sharing information about fire disaster mitigation and conducting fire drills and trainings of firefighters with the collaboration of Africa fire mission. They help the communities to be better prepared ahead of fire disasters by sharing information about fire safety. (P7). Community members in Makina are usually cooperative when it comes to disaster mitigation (P2). Kenya Red Cross society takes the approach of schools, where students are trained through Red Cross clubs on emergencies, and they help in disseminating information to target households (P3).

Qualitative analysis revealed that various organizations with Kenya Red Cross being the main organisation involved in fire disaster prevention and mitigation in the village. The community in general has also been cooperative in fire disaster mitigation and prevention to create resilience in fire disaster. Farahani et al. (2020) pinpointed that disaster mitigation requires collaboration of various stakeholders, this has supported the study finding on the community and various organization collaboration in fire disaster mitigation initiatives. Kim, (2016)

emphasized the importance of mapping out disaster prone areas to ensure effective focus and relocation of resources required within these areas.

4.4.2 Fire Disaster Preparedness

The researcher sought to determine the role of organizations involved in fire disaster management and forms of social capital which are important in fire disaster preparedness. Qualitative results revealed that **Kenya Red Cross society** plays a role in creating urban resilience to fire disasters. In terms of preparedness, Red Cross have been involved in capacity building and training on preparedness phase (P1, P2, P3, & P6). P1 indicated that Red Cross have five approaches on capacity building to strengthen individuals on the issues of first aid and fire response.

"We (Red Cross) have five approaches that we use. We have capacity building where we strengthen capacities of individuals around issues to do with first aid and fire response."

P2 postulated that on disaster preparedness, Red Cross engages the communities in understanding the causes fire to reduce the risk, Red Cross is also involved in the training on structures such as community-based disaster risk reduction committees. (CBDRTs).

P3 further added that Red Cross has community-based disaster responders who they have equipped with skills on first aid, hence they are capable to support the community before emergency services arrive. It was also clear that other NGOs such as SDI Slum Dwellers international through *Muungano wa wanakijiji* are involved in capacity building and training of the members of the community on fire disaster preparedness and how fire safety can be enhanced amid fire disasters by P6.

Nairobi County Disaster Management and Fire Rescue Department and Kenya Red Cross society have used schools to create awareness on the management of fire disaster (P4 & P8). P4 indicated that Kenya Red Cross Society has taken the approach of schools, where they use high school students as agents who spread information about fire safety in the community particularly in their homes. P8 adds that schools in the informal settlements create awareness on fire disaster preparedness such as on how to control gas leakage.

"*In schools, they create awareness more on fire, like preparedness, disaster risk, like the simple ones, like at home, how you can control gas leakage, fire, cooking gas".*

The qualitative analysis has revealed that Kenya Red Cross is also the main organization involved in fire disaster preparedness. Kenya Red Cross was mainly involved through its urban resilience program in major towns through capacity building of the community responders. Nairobi County Disaster Management and Fire Rescue Department and Kenya Red Cross were also involved in creating awareness on the fire disaster preparedness among schools. This was supported by the findings of Ngau and Boit (2020) who indicated that local responders are the first to rescue during fire disasters there is need to train community responders to have sufficient knowledge on how to handle fires.

4.4.3 Fire Disaster Response.

The researcher sought to determine the role of organisations and community members involved in fire disaster response. The researcher also sought to determine the forms of social capital aid in response phase of fire disaster management. Based on the thematic analysis, it was revealed that community-based disaster response teams, religious institutions, and community savings groups are forms of structural social capital involved in fire disaster management response (P2, P4, P3, P1, & P5). Secondly, community-based disaster response teams, trained by the Red

Cross were also identified as a form of social capital. P5 reported that the community in Makina Village is always united, and they respond effectively during fire disasters, no matter their tribal affiliation. Which aligns with the findings of Ngau and Boit (2020) on the unity of local responders during fire disasters.

> *"They are always united when it comes to disaster. Because you know, they are one community, and they are always united. Like Nubian community. So, for them, they always come together. Okay. When fire comes, no one knows who Nubian is, who is not Nubian. With the fire, everyone supports because it affects everyone."*

P2 reported that social capital has an enormous impact on the goodwill of volunteers, although there is no compensation and no free medical attention for those affected. The community in Makina is also responsive and cooperative during capacity-building towards fire disaster as showed by P4 indicating the existence of a strong bridging social capital. P3 stated that Red Cross as an auxiliary organisation to the government also work with other NGOs. Through these collaborations, Red Cross organizes food and non-food items for the affected victims after conducting an assessment.

> *"But now, within their household, they don't have anything to start with. So as Kenya Red Cross, we always have a plan where we organize the non-food and the food items. To do this, we always conduct assessment*."

P7 added that Makina Village have quite a few active Red Cross societies, who comes in the case of disaster management response. P4 indicated that government has not been taking any actions or policy to address the impassable roads which has been a challenge for firefighting.

This study determined that kenya Red Cross society is an auxiliary organization to the government and collaborates with other organizations such as NGOs to respond to fire disasters by providing food and non-food materials to the affected victims. This finding was in tandem with the study by Owenga (2018), who indicated that relief preparation includes provision of basic services to victims of disasters such as food, blankets, and shelter. Farahani et al. (2020) added that during response different actors work together including international organizations, donors and well-wishers work collectively to ensure that relief preparation is successful. The study also revealed that ethnic communities such as the Nubians were highly united with their close-knit social structures as they responded to fire disasters in makina village. Ngau and Boit (2020) supported this finding by indicating that the success of the fire disaster response phase depends on community cohesion. The kenya Red Cross society was also involved in building the social capital of the community through training community responders.

4.4.4 Fire Disaster Recovery.

Religious institutions, Families, county, and national government were identified as forms of structural social capital involved in fire disaster recovery. However, results indicate that bonding social capital and linking social capital are relevant at this phase. The respondents who were traders at Toi market were supported by their own families and some received items from the government to restart their businesses aftermath fire disasters. As asserted by P 13

> *"Now going back to business was just me myself, the little money I had kept for myself and also just friends, they are just good Samaritan people, if someone gives you a little something, they send you five thousand, the other sends you two thousand, that's it, start going back to business."*

Community saving groups such as *chamas* and merry-go round make up the bridging social capital being involved in a fire disaster.

P2 added that community and Red Cross volunteers do offer psychological aid to the affected communities after capacity building by the kenya Red Cross society. These volunteers are also involved in targeting beneficiary registration as part of the recovery phase, where Red Cross seeks to determine and register persons who are mostly affected by the fire disaster and report it to responsible governmental organizations such as Ministry of Labour and social protection who will then process funds for affected families which is a form of linking social capital.

> *"For recovery, what we normally do is, with the support of our volunteers and our systems in place, what we do is do targeting beneficiary registration. And targeting beneficiary registration is a community-based targeting whereby we go to the community, have interviews with the affected populations, and then register them based on their, of course, effects."*

Religious institutions and community savings organisations such as *chamas* and merry-go rounds were the main social structural institutions identified to be involved in fire disaster recovery. The government through the Ministry of Labor and Social Protection is also involved in the fire disaster recovery phase. This corroborated the finding of Hidayati (2018), who recommended that during the recovery phase, the government can introduce economic programs that favor small enterprises entities to bounce back by offering subsidized loans, tax exemptions as a way of restoring livelihoods disrupted by disasters. Community-based disaster response teams were also identified as a form of social capital. The kenya Red Cross society is involved in this phase of fire disaster recovery by offering psychological assistance to the affected individuals through its volunteers. Aldrich (2010) indicated that during recovery stage worst affected individuals do undergo trauma.

4.5 Summary of the Findings and Discussion

The results indicated that there was a moderate bonding social capital with 40.8% of participants having good relationship with their neighbours. There is positive communication as neighbours as 39.8% of the residents talking to neighbours 3-4 times weekly. 70% of the residents feel to have strong sense of belonging and 45.1% of the participants had long-term residency among residents indicating intense sense of belonging. This was illustrated in their moderate acquaintance with neighbours and limited but notable social interactions where 49.8% visit their neighbours 1-2 times weekly.

61% of the participants perceived neighbourhood collaboration as active during fire disasters aligning with the qualitative results indicating that makina village residents are cooperative and collaborative during fire disasters. the study results revealed that 55.4% of the households in Makina are willing to support their neighbours during fire disaster indicating a moderate bridging social capital. 43.7% of the participants are aware of 7-8 organizations This shows high awareness of social organizations within the area and 84.1% of the participants are affiliated to these organizations indicating a rich structural social capital within makina village.

90.1% the respondents indicated that family and friends were the most helpful and willing to help during and after fire disaster indicating a high trust on close relatives and friends on satisfaction with government firefighting services, 7% of the respondents were satisfied with government firefighting services, this shows a relatively low level of satisfaction with the firefighting services provided by the county government of Nairobi. Lowering the trust levels of on the government services in response but instead local responders are reliable in salvaging properties during fire disasters.

On the phases of fire disaster risk management different forms of social capital are involved and with qualitative results indicating that bonding social capital is utilized in the recovery phase. Bridging social capital and linking social capital is utilized in response which

information sharing is important in mobilization of resources from disaster management agencies including kenya red cross society and the nairobi county government. Social structures including schools and community-based organizations including Kibera community emergency response team (KCERT), slum dwellers international through *Muungano wa Wanavijiji*, Shining hope for communities (SHOFCO) forms the structural social capital and they are relevant in community sensitization and sharing information about fire safety which are important in disaster mitigation phase. Kenya red cross society prepares the urban communities through training community-based disaster response teams (CBDRTs) and conducting public awareness through fire drills to create community resilience to fire disasters in makina village. Finally, the study revealed that Kenya Red Cross as the auxiliary organization to the government was the main institution involved in fire disaster management.

Conclusions

5.1 Introduction

This chapter presented a conclusion based on the main research question: how does social capital contribute/hinder fire disaster risk management in Makina Village in Kibera slum? and sub research questions: what are the existing forms of social capital used to promote fire disaster management in Makina Village, Kibera slum in Nairobi? How are fire disasters currently managed and who are the actors involved in community recovery phase of fire disasters Makina Village, Kibera slum in Nairobi? and What forms of social capital could be recommended to improve fire disaster management in Makina Village? The chapter also presents a list of recommendations based on the empirical evidence and scientific facts from the previous chapters and existing literature review on the study topic at the tail end the research provided areas for furthers studies.

SRQ: What are the existing forms of social capital used to promote fire disaster management in Makina Village, Kibera slum in Nairobi?

This study has confirmed the existence of different forms of social capital namely bonding, bridging, linking, structural, and cognitive and these forms play an important role in fire disaster risk management. From the primary data 40.8% of the respondents knows their neighbours by name indicating the close relationship with neighbours, 39.4% of the respondents spoke to 3-4 neighbours in the last week before the study indicating active communication and information sharing and 49.3% of the respondents visited neighbours' homes in 1-2 times, and 45.1% of the respondents have lived in makina village above eight years making indicating a solid social cohesion. All these indicators of bonding social capital shows that makina village has moderate relationships among the neighbours. The results contradict results on the role of bonding social capital in disaster management as supported by (Aldrich,2012) and (Matous, 2010), who indicated that strong personal connections and bonding can be valuable in low-income communities. 61% of the participants perceived neighbourhood collaboration as active during fire disasters aligning with the qualitative results indicating that makina village residents are cooperative and collaborative during fire disasters. the study results revealed that 55.4% of the households in Makina are willing to support their neighbours during fire disaster indicating a moderate bridging social capital. 43.7% of the participants are aware of 7-8 organizations This shows active presences of social organizations within the area and 84.1% of the participants are affiliated to these organizations indicating a rich structural social capital within makina village which is utilized in fire disaster risk management.

The study also revealed that social organisations such as community groups *chamas*, churches, and which provide a bridging network for broad-scale mobilization during fire disasters as corroborated by (Aldrich, 2012) and (Mpanje et al.,2022). The study also confirmed that there were various ways in which information on fire disasters are shared among various players of fire disaster management. Knowledge and information sharing plays a significant role in providing a linkage between various stakeholders as (Sheu et al.,2014), (Aldrich, 2012), and (Stone and Hughes, 2001) as asserted by P1.

"*And our role mostly is regarding linking community with the fire, firefighters. We are the first callers, you know, or rather we are the first people to be informed, you know, whenever there are fire incidences. And this, they use my mobile and, they use the social media platform*."

Additionally, the cognitive social capital enables cooperation of group members *chamas* to contribute to group savings for emergencies, from the primary data 90.1% the respondents indicated that family and friends were the most helpful and willing to help during and after a

fire disaster indicating a high trust on close relatives and friends which is aligned to the existing literature indicated that cognitive and structural social capital promotes trust, cooperation, and cohesion which is important for fire disaster risk management (Obaitor et al., 2021; St John, 2017; Bihari & Ryan, 2012; & Uphoff, 2000).

SRQ: How are fire disasters currently managed and who are the actors involved in the community recovery phase of fire disasters in Makina Village, Kibera slum in Nairobi?

This study has revealed that the fire disaster in Makina is managed in four phases (mitigation and prevention, preparedness, response, and recovery) of disaster management as supported by the study by (Farahani et al.,2020), (Kim, 2016), (Ngau and Boit, 2020), (Owenga, 2018), (Hidayati, 2018), and (Aldrich, 2010). The crucial phase which community members participate is the response phase whereby community members mobilize resources to contain fires including supplying water, salvaging properties and thereafter they host affected families. This study revealed that the fire disaster mitigation and prevention phase was the most important phase since it was cheaper compared to other phases. However, disaster mitigation activities have not been fully emphasized in makina village, disaster management planning is reactive rather than proactive planning occurs after fire disasters as P6 indicates that.

"*There have not been frequent meetings or maybe organizing how to mitigate fires, but after the disaster is over, they come here. Yeah, and they come to solve and leave, not to even know".*

In addition, religious institutions (churches and Mosques), Families and friends, community-based disaster response teams, schools, both county and national government, NGOs, community saving groups are involved in different phases fire disaster management as forms of structural social capital in Makina Village.

Religious institutions offer spaces for victims during fire disasters and Kenya Red Cross society supplies them with food and non-food items. Fire disaster victims solicit funds from immediate family members and friend's aftermath fire disasters to restore their livelihoods which is a form of the bonding social capital. As asserted by P13.

"Now going back to business was just me myself, the little money I had kept for myself and also just friends, they are just good Samaritan people, if someone gives you a little something, they send you five thousand, the other sends you two thousand, that's it, start going back to business."

In makina village there are several institutions who work together in fire disaster risk management, these organizations are affiliated with the government while others are not. The county government of Nairobi is responsible for offering firefighting local responders assist in fire disaster response. The kenya Red Cross society on the other hand works with the community in training community-based disaster response teams (CBRDTs) who are community volunteers, conducting post disaster assessments i.e., collecting data for resource sharing and aiding the government in distributing goods and offering medical services including Mental health and psychological support post disasters. Other relevant organizations involved in disaster recovery are the shining hope for communities (SHOFCO) Kibera community emergency response teams, KCERT, Slum Dwellers international Nubian youth council assists communities during and post disasters.

SRQ: What forms of social capital could be recommended to improve fire disaster management in Makina Village?

Since this study has revealed that social capital has a positive impact on fire disaster management through coordination and cooperation among community structures, as supported by (Aldrich, 2012), (Matous, 2010), (Mpanje et al.,2022), (Sheu et al.,2014), (Aldrich, 2012),

and (Uphoff, 2000). This study recommended the improving the bond and linkage of community-based volunteers as a form of social capital as part of improving the intervention initiatives on fire management. This can be done by improving their capacity and volunteerism in firefighting and prevention. Religious institutions such as mosques and churches should also be supported by government and NGOs since they take part in fire disaster response, since they offer relief food, and spaces for the affected families. Community saving groups such *chamas*, should find ways to incorporate more women into their groupings as this can improve funding of the affected victims during emergencies and the recovery process.

MRQ: How does social capital contribute/hinder fire disaster risk management in Makina Village in Kibera slum.

Based on the three sub-research questions, this study concludes that social capital as underpinned by the social capital theory by (Bourdieu,1985), has a positive contribution to fire disaster risk management, based on Sendai Framework for Disaster Risk Reduction, (2015). Specifically, this study revealed that the traditional forms of social capital such as bonding, bridging, linking, structural, and cognitive plays an important role in fire disaster risk management.

Bonding social capital enables fire disaster victims to access resources from their immediate circles, this study reveals that bonding social capital is vital for timely recover after fire disasters. Individuals with more connections and friends are likely to bounce back within a short time while those who have less friends or not affiliated to social organizations will take more time to recover from fire disasters in some cases livelihoods are totally shuttered by fire disasters as denoted by (Aldrich,2012).

Bridging social capital assists in building connections with other heterogeneous groups regardless of socioeconomic status or the number of years stayed in the neighbourhood. This strengthens the social fabric of community members and trust which is vital in response phase of fire disasters, this form of social capital aids in collaboration among different institutions and community members creating collective efficacy in fire disaster risk management as denoted by (Li, Ye, & Sheu, 2014).

The linking social capital ensures that fire disaster victims are linked to disaster management agencies which is the role of community based organizations and community leadership, this has ensured resource mobilization during emergencies such as deployment of fire engines to disaster scenes, proper coordination of rescue services by responsible agencies, the information sharing which is done by various methods is key in ensuring that the institutions involved in disaster management works together in ensuring that disaster risks are reduced and creating safety among community members. Trust which is cognitive social capital among community members and different institutions fuels cooperations and multidisciplinary collaboration which is key in ensuring that fire disasters are contained in the informal settlements. In addition, religious institutions, families, community-based disaster response teams, schools, both county and national government, NGOs, community-saving groups were involved in fire disaster management as forms of structural social capital in Makina Village. Various organisations played significant roles in the four stages (mitigation and prevention, preparedness, response, and recovery) of fire disaster risk management, with predominant role being played by Kenya Red Cross. Mitigation and prevention stage was identified as the most important phase of risk reduction, in terms of cost and expenditure asserted by (Kim, 2016).

From the conceptual framework the forms of social capital which is the independent variable positively affects fire disaster risk management which is the dependent variable. The social

capital utilized in fire disaster management at makina village are Bonding social capital, bridging social capital, linking social capital, structural social capital, and cognitive social capital. Through thematic analysis this study identified families and close friends are part of bonding social capital, religious institutions and community members forms the bridging social capital. Community based disaster response teams and community leadership forms the linking capital. County government, non-governmental organizations, community-based organizations, and schools forms the structural social capital. Cognitive social capital which is pinned on trust fuels cooperation and collective efficacy among different actors who are involved in fire disaster risk management. The interaction of different social capital provides an environment for information sharing and resource mobilizations which is utilized in different phases of fire disaster risk management.

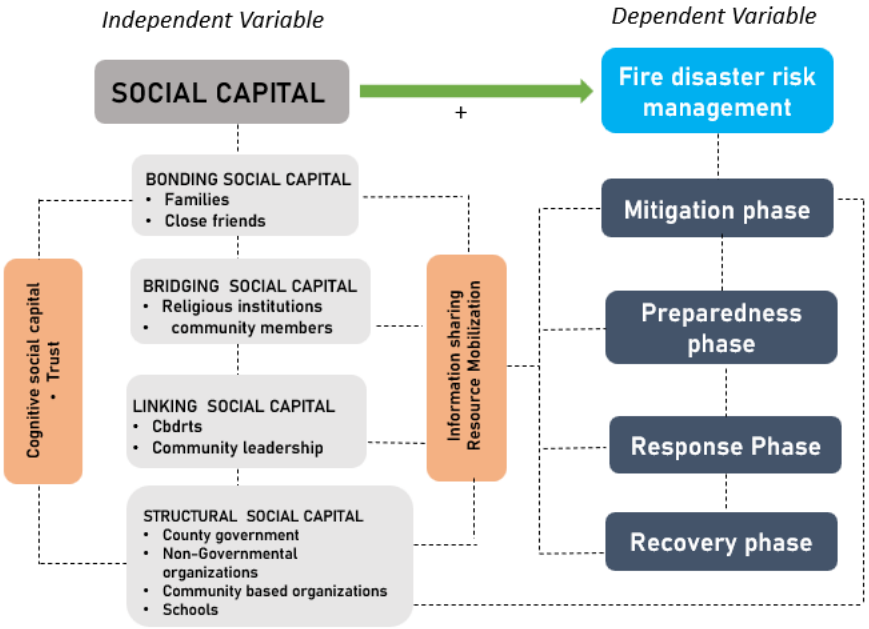


Figure 5:conceptual Framework.

5.2 Recommendations.

i. Leverage on the rich social capital among the residents of makina village-based on data collected makina village is a close-knit village where residents are working together. The government should establish more campaigns on fire safety and management.

ii. Establish a clear fire disaster management policy, The disaster management role is devolved to county governments. However, there are no clear policies on how to handle fire disasters in informal settlements.

iii. Establish Financial literacy and coaching to existing community groups, to ensure that small businesses within the informal settlements bounce back after fire disasters community members should be trained about savings on money markets to spread risks.

iv. Land Tenure regularization, the spatial features of the informal settlements make it hard to access the inner parts of the settlement in case of fire disasters, therefore all

the stakeholders should be brought together, and a new land use plan developed including providing adequate green spaces for community interactions.

5.3 Further research.

After identifying how fires are currently managed in makina village Kibera and how different actors work together throughout the different phases from mitigation, preparedness, response, and recovery, altogether with understanding the role of social capital in advancing community resilience towards fire disaster management. Through this study it was revealed that some community members fail to bounce back after fire disasters life takes a new shift and there's a need to study the pathways of urban residents' aftermath the disasters to understand the extent in which urban disasters impact the livelihoods of the urban poor and how they manage to handle the tough situation

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APPENDICES

Appendix 1:list of interviewees

List of interviewees			
No.	**Institution**	**Entity**	**Information Acquired**
1.	Three Representatives from Kenya Red cross Society	Non-Governmental Organization	Roles of auxiliary organizations in different phases of disaster management.
2.	Two Representatives from Nairobi County Disaster Management and Fire Rescue	Governmental organization	Roles of county government organizations in different phases of disaster management, including coordination.
3.	Three Representatives from Nairobi Community-Based organization	Community Based organizations	Roles of community-based organizations in different phases of disaster management, including the resource mobilization.
4.	Five Representatives Community	Makina Residents	To understand the existing forms of social capital and how they manage and bounce back after fire disasters.

Appendix 2:structured Questionnaire.

STRUCTURED QUESTIONNAIRE

Background questions

Hi my name is..... a student at institute of housing and urban development studies, Erasmus university Rotterdam, I'm conducting a research survey among a selected groups of households within makina village. The purpose of this survey is to understand the social fabric of residents and their relevance in combating fire disasters. Your individual responses and identity are confidential, and the questionnaire will take about 15 minutes.

Background information.
Name of the respondent ..... Address.....

1. **What is your age?**
   □ 18-25 yrs. □ 26-33yrs □ 34-41 yrs. □ above 42 years
2. **What is your Gender?**

   Male □ Female □

   Main information

3. **How long have you lived in makina village?**

   Below 1 year □ 1-2yrs □ 2yrs-4yrs □ 4 yrs-6yrs □ above 6 yrs.

4. **Who do you stay with?**

   Alone □ Family/relatives? □

If you stay with relatives how many relatives in total are staying in your house?

1-2 □ 2-3 □ 3-4 □ 5+ □

5. **How many neighbours' names do you know 0 □ 1-2 □ 3-4 □ 5-6 □ 7-8 □ 9_+**
6. **How many have you spoken to in the last week 0 □ 1-2 □ 3-4 □ 5-6 □ 7-8 □ 9_+**
7. **How many Neighbours homes have you visited last week 0 □ 1-2 □ 3-4 □ 5-6 □ 7-8 □ 9+**
8. **In the recent past how often has there been a fire that ruined a building in this village.**

   Never □ once □ 2-3 times □ 4-5 times □ more than 5 times □

9. **If yes, there has been fire How serious was the fire?**

   Minor (burnt a small section) □ Moderate (caused damage to a unit) □ Major (caused damage to whole building) □

10. **During that fire emergency in the village who came the most reliable to help. (Choose all that apply)**

    Family members living nearby □ close friends/neighbours □ county fire brigade □ others.

11. **After that fire disaster could you tell who assisted fire victims to get back to normal life?**

    Family members □ community □ county government □ social organization i.e., church/ charity

12. **In what way were they supported?**

    Offered money □ assisted to rebuild home □ Emotional support □ bought household goods □ other.

13. How do you stay informed about news events happening in this village concerning fire disasters?

Through community meetings □ social media i.e., *Facebook* □ Through word-of-mouth neighbours/church members.

If it is through community meetings how frequent are the meetings?

0 □ 1-2 □ 3-4 □ 5-6 □ 7-8 □ 9+ Every week, every day, every two weeks, every month, others please specify……

14. How often do you attend these meetings?

Regularly □ occasionally □ you haven't attended □ others please specify……

15. Rate your sense of belonging to this community opinions statements?

Yes □ No □

If yes how many times? 0 □ 1-2 □ 3-4 □ 5-6 □ 7-8 □ 9+

16. Are you a member of any social organization/group/chama?

Yes □ No □

If yes, what type of organization is it?

Faith-based organization (church) □ Charity organization □ business group □ neighbourhood associations □

17. Do the same organizations offer support in time of need i.e., during fire disasters.

Yes □ No

18. How would you rate your neighbourhood in collaborating in fire disaster management?

Very good □ good □ fair □ poor □

19. How do you rate firefighting services provided by the government?

Very good □ good □ fair □ poor □

20. In a scale of 1-5

How do you trust the government in dealing with fire disasters?

1 □ 2 □ 3□ 4 □ 5

How do you trust that the community members in dealing with fire disasters?

1 □ 2 □ 3□ 4 □ 5

Appendix 3:Structured interview guide.

STRUCTURED INTERVIEW GUIDE

Hi, my name is **Kiplangat Elisha** a student at the institute of housing and urban development studies, Erasmus university Rotterdam, I'm conducting this interview among a selected Experts who are Familiar with fire disasters in informal settlements. The purpose of this interview is to understand the social fabric of residents and their relevance in combating fire disasters. Your individual opinions and perceptions will be kept confidential, and the interview will take about 15 minutes.

Interview guide for experts.

Background questions.

1. Which organization do you work for and which position do you hold
2. For how long you have been working with this organization.....

Main questions.

1. In a rough estimate how many organizations are involved in different phases of fire disaster management and what are their roles?
2. If you can recall how many fire disasters handled successfully within the community or how many residents have benefited from your programmes such as Research/Fire drills/Donations?
3. What are the Experiences/challenges faced by disaster teams during fire disasters?
4. Which policies and instruments are in place and how are they utilized to reduce/ mitigate fire disasters in informal settlements?
5. What are the rules/culture in your organization which facilitates effective coordination and collaboration during fire disasters?
6. What is your opinion about involving community members in preparing disaster mitigation plans?
7. How many community initiatives championed in the area to ensure fire safety awareness?
8. What is your opinion about social organizations of makina residents' during fire disasters compared to other villages?
9. how can you describe the relationship between makina residents with formal organizations in the area?
10. In ways do formal organizations assist fire victims attain full recovery?
11. In your opinion do you think social capital has any influence on fire disaster management?
12. Anything you would like to add? have I missed anything regarding fire disasters as an expert in this field?

Interview guide for community members (fire victims).

Background Questions.

1. For how long have you been living in Makina village?
2. Where do you currently work?

Main Questions

1. How often have you encountered/heard incidences of fires occurring in this village?
2. Personally, when it happened to you how did it impact you, could you describe it? At what time of the day did this fire occur? Who did you contact for help?
3. How did you handle the situation after the incident who supported you to be back to your feet?
4. Did you receive any support outside the community, maybe from the government/any social organization, in what way did they help you? i.e Cash, emotional support, rebuilding home or other specify?
5. We there are any challenges you faced in accessing the resources from these organizations.
6. How did you learn about this outside support?
7. How do you perceive the importance of social connections and networks in times of crisis like the fire disaster before and after?
8. At what time did you feel that social capital played a significant role in the recovery and rebuilding process after the fire disaster?
9. With the frequency of fire disasters within this village what have you learned about the social organization of this village?
10. What is your opinion about the response coordination by different organizations such as the Kenya Red Cross society and firefighting department of Nairobi?
11. What should be done to improve these services?
12. What else do you think I miss out on in this interview that you wish to add?

Appendix 4: Codebook one.

Elisha Project

Codes

Name	Files	References
1 Theme Challenges in Communication, Coordination and Resource Allocation During Fire Disaster	6	12
10 Communication Challenges in Disaster Management	6	6
Communication and dissemination of information during emergencies is not a challenge during fire incidences	1	1
Communication challenges during fire disaster	1	1
Communities need to know the toll-free lines to communicate to the fire departments and rescue department of the government	1	1
Does not communicate much on social media	1	1
No central command for those who respond to disaster thus creating confusion as a challenge	1	1
Residents failing to call fire brigade and instead looking for smaller ways to mitigate the problem as the challenge of managing fire disaster in the area	1	1
10 Infrastructure Issues	2	4
Government not taking any actions or policy to address the impassable roads which has been a challenge for fire fighting	1	1
Need for planning for the informal settlements by the government to improve accessibilility	1	1
Roads are impassable for the fire engines in the informal settlments	1	2
10 Resource Limitations	1	2
limited resources lowering the level for communities to respond to fire disaster,	1	1
social organisations are willing to support fire disaster victims but they have dwindling resources	1	1
1 Theme Community and Family Driven Response through Volunteerism	5	12
10 Community Solidarity and Cooperation	3	6
Community have been responsive and cooperative in capacity building	1	2

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Appendix 5: codebook two.

Name	Files	References
Community members are always united when it comes to disaster	1	1
Community members in Makina are usually cooperative when it comes to disaster mitigation	1	1
Social capital having an impact in disaster management through coordination and cooperation within organisations	1	1
When it comes to fire everyone supports and they always respond	1	1
10 Family and Relatives Support	2	2
Families hosting other families who have been involved fire disasters, who are not their relatives	1	1
Most times fire victims integrate with relatives who lives in nearby setup	1	1
10 Volunteer Networks	2	4
No compensation, no free medical attention for those kinds of people who volunteered to respond to those things	1	1
Red cross having the capacity through community volunteers to build capacity of the fire victims	1	1
Social capital having an impact during fire disaster management as people come as volunteers	1	1
Targeting beneficiary registration through red cross volunteers as part of the recovery process to fire	1	1
1 Theme Roles of Various Organisations in Fire Disaster Management	8	35
10 Community Organisations and Private Security Firms Being Involved Fire Disaster Management	2	14
Community organisation agrees that Red Cross normally does community response	1	1
Community organisation assists individuals to access food and start small income genrating activities during disaster	1	1
Community organisation championing for reduction of fire disasters in the informal settlements	1	1
Community organisation having clear numbers on the people affected by the disaster	1	1
Community organisation involved in preventing, mitigating and responding to	1	1

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Appendix 6: Codebook Three.

Name	Files	References
issues around emergencies and disaster		
Community organisation offering roadside training to people, since they are the first responders	1	1
Community organisation offering sensitization on social media as an approach around emergencies	1	3
Community organisation playing the role of linking the community to firefighters	1	1
Community organisation usually partners with Red Cross for food and non-food items	1	1
Community organisations are also involved in the recovery phase but they need data on the affected people	1	1
Community organisations mobilizes the community and trains them on fire	1	1
Private entities such as security firms offering fire services but they are subject to subscription	1	1
10 County and National Government Involvement	5	6
County government does organise frequent meetings and organises how to mitigate fire disaster	1	1
County government has a disaster recovery team which is always to check on the victims and give them food and non-food items	1	1
County government regularizing disastermanagement bills and policies to strengthen capcities of communities	1	1
Households do reach out to emergency operations at county and national level in the cases of fire incidents	1	1
Kenya Fire Service having the mandate to play a bigger role in fire disaster	1	1
sector-specific contingency plans provided by the government to support communities affected disaster	1	1
10 Red Cross Involvement in Fire Disaster	5	15
Initially Kenya Red Cross focused on the innovative ways to prevent fire before adopting urban disaster risk reduction programs	1	1
Kenya Red Cross always receives support from various organisation to enhance capacity	1	1
Kenya Red Cross always receives support from various organisation to enhance	1	1

Appendix 7:codebook four.

Name	Files	References
capacity and to support communities (Codes)		
Kenya Red Cross conducts assessments of on the affected people, so that they can plan organize non-food and food items for the affected people	1	1
Kenya Red Cross have posterity, disaster management bills and policies which guides them in times of disaster	1	1
Kenya Red Cross leading in shelter and provision of non-food items	1	1
Kenya Red Cross playing a role in urban resilience to disaster such as fire in terms of preparedness	1	1
Red Cross being the most active organisation in responding to disaster	1	1
Red cross does come up with programs that support cash transfers, food distribution so that fire victims can build back their lives	1	1
Red cross having community facilitators to respond to fire disasters as part of its strategic plan	1	1
Red cross having the capacity through community volunteers to build capacity and offering psychological aid to the fire victims	1	1
Red cross having the capacity to build on the psychological first aid of the fire disaster victims	1	1
Red cross having the clear mandate in disaster	1	1
Red cross working with the fire departments during fire disaster	1	1
Red cross working with the government as the auxiliary in disaster management	1	1
1 THEME_ Community_Based Disaster Response Teams, Community Organisations, Religious Institutions, and Community Savings Groups as Forms of Social Capital Involved Fire Disaster Management	5	10
10 Community Saving Groups being Involved in Fire Disaster Recovery	2	3
Community members being in a circle where they do savings and they do come together during disaster recovery	1	1
Examples of community organisations which have savings for emergencies	1	1
residents of Makina support each other through merry go-rounds and table banking when disaster happens	1	1
10 Community-based Disaster Response Teams	3	3
Capacity building of community members through community-based disaster	1	1

Appendix 8:Codebook five.

Name	Files	References
response teams which are trained by Red Cross and has significantly lead to reduction of fire incidents		
Community creating volunteers team to respond to disaster	1	1
Involving communities in disaster preparation promotes sustainability of interventions	1	1
10 Religious Institutions being Involved Disaster Response	3	4
Churches offering spaces during fire disaster	1	1
Churches, mosques and well-wishers from the community do come through when victims want to build back	1	1
Leaders, churches, faith-based organisation need to support communities to enhance their resilience	1	1
mosque enabling families to access relief	1	1
1 Theme_Capacity Building and Using Schools to Create Awareness on Fire Disaster	7	12
10 Awareness Campaigns on Fire Disasters	4	5
Creaating days for fire awareness and sensitization, where multi-agency approach	1	1
Departments, fire investigators, fire inspectors and disaster management officers who create awareness as the instrument in place to reduce and mitigate fires	1	1
Disaster manager in Kibera usually conducts community engagement to raise awareness	1	1
Red Cross usually conducts Burns and Fire Safety Awareness Campaigns	1	1
Uses community barazas to conduct fire disaster campaigns	1	1
10 Training and Capacity Building Initiatives for Disaster Response	4	5
capacity building as one of the approaches to strengthen individuals around issues to do with first aid and fire response	1	1
Kenya Red Cross working closely with community-based disaster responders and training them on First AID	1	1
Preparedness phase involved communities understanding the causes of fire and how to reduce the risks through training	1	1
Training community on fire precautions as the initiatives to ensure fire safety awareness	1	1

Appendix 9:codebook six

Name	Files	References
Training community-based disaster responders as a mitigation strategy	1	1
10 Using Schools to Create Fire Awareness Programs	2	2
Red Cross takes the approach of schools, where they trained Red Cross clubs on emergencies, focusing on fire prevention	1	1
schools in the informal settlements creating awareness like preparedness on fire	1	1
Availing equipments such as ambulances and stretchers during disaster as some of the approahes to fire response	1	1
Bouncing back to normalcy depends vulnerability levels and varies from household to household after fire emergencies	1	1
Calling the emergncy numbers, either ambulance or fire department as response to fire disaster	1	1
Carelessness in handling fire as the cause of fire incidents i	1	1
Community being in the forefront in responding to emergency	1	1
Community members support each other when there is fire in removing things from the house	1	1
Community need to know the early warnings of fire if they are not well prepared	1	1
Disaster management is a multi-sector and multi-agency responsibility	1	1
Disaster management officers conducting risk management to determine the extent of the effect	1	1
Disaster managers engage the community mostly in community resilience through preventing disasters, mitigation and also help the community to prepare	1	1
Disaster managers in Kibera does monitoring on the early warning systems and helps the community to the recovery process and builds back	1	1
Disaster managers take advantage of the Chiefs Barazas and they take public participation	1	1
Disaster managers usually conducts post need assessment and they make sure relief reaches every person affected by the fire disaster	1	1
Disaster managers usually conducts post-disaster needs assessment and support victims through foods	1	1
Disaster managers usually engages the community in various activies on how to prevent and mitigate fire disaster	1	1
Disaster officer agrees thta there are so many organisations who are involved in fire disaster	1	1

Appendix 10:Codebook seven

Name	Files	References
missions		
Fire caused by assault attacks from students during secondary schools' strike	1	1
Fire disaster being a big menace in Kibera	1	1
Fire disaster management is a responsibility of the government and Red cross plays a role in responding to it	1	1
Fire reported as a result of high temperatures, forest, and may be wildfires during drought	1	1
Fire victims normally builds almost immediately, after fire disaster	1	1
Food distribution, non-food items and shelter materials are some of the items distributed by red cross to the affected households	1	1
Government and Kenya Red Cross come in handy to support during recovery and response	1	1
Government has budgeted for the disaster management	1	2
Government provides directorate of disaster management policy, which is utilized by Red cross	1	1
Government should be responsible to fire disaster by putting machinery, policies and personnell to respond to disaster	1	1
Having a space where people's capacity can be strengthened and exercise Ubuntu	1	1
Having communities that are better prepared cuts accross all the disasters and builds synergies within ministries or departments	1	1
Having friends who are close influences when they have disaster	1	1
Having the community to have some community fire extinguisher as some of the urban resilince progmming	1	1
Illegal electricity connections as the cause of fire in the informal settlement	1	1
Informal communities need to understand, where they can evacuate themselves in the case of fire, just like in the formal settlements	1	1
involving and preparing in the community in mitigation plans	1	1
involving communities in diaster preparation supports ownership of plans formulated	1	1
involving communities in diaster preparation supports Red Cross to have informed plans for those affected	1	1
It is hard to collect data and people in Makina dont like sharing information	1	1

Appendix 11:codebook eight.

Name	Files	References
Kibera having a lot of fire incidences, resulting in alot of damages	1	1
Landlords assist them to rebuild the houses after the fire disaster	1	1
Lay responders having no technical know-how and proper equipments for responding to disaster	1	1
Major target being of the community organisation being first-hand person to avoid the problem of relief reaching the wrong person	1	1
Most fire disaster in the informal settlement caused by negligence	1	1
No policies are there in Makina that can be utilized to mitigate fire disasters	1	1
No policy which can push the government to have space to offer capacity to the residents of the informal settlment during emergency and disaster such as fire	1	1
Organisations dont respond to fire incidences and they are always in the forefront during fire	1	1
People come up with reliefs when fire disaster happens	1	1
People come with free medical care post disaster but they are very rare	1	1
People easily bouncing back after fire incidences because of the temporary structures used to build houses	1	1
People in Makina dont need any support from the government	1	1
Poor planning in the informal settlement as the major issue faced by fire disaster management team	1	1
Post disaster no one cares whether you have cooking materials such as stove, hence there is need for policy	1	1
Poverty as the issue within communities in informal settlement as one of the challenges facing disaster teams	1	1
Public health supporting individuals affected by emergencies	1	1
Recommends investing more on the mitigation and preparedness phase of disaster than responding, since it is more expensive to respond	1	2
Recommends need for spaces between houses where people can run through and place their items during fire	1	1
Recommends organisations and government to enable people of Makina to have a substation	1	1
Red Cross uses social media and local media stations to comminicate	1	1
Relief services offered by community organisation and post emergency disaster	1	1

Appendix 12:codebook nine.

Name	Files	References
Social capital positively contributing to fire disaster management	1	1
Social initiatives and linear structure of the community has helped the Makina residents on the reoccuring incidences	1	1
Social organisations in Makina are self-centered and there is big challenge on the organisations focuses on the community	1	1
Teaching the communities on the construction of resilience houses for them to have fireproof houses and working together with KPLC to ensure they regularize connectivity since the major cause of fire in the area is local connectivity	1	1
the communities have innovative ways of bouncing back since they have their houses are semi-permanent and as a result they have built some resillience	1	1
The landlords also do come through to rebuild	1	2
The more you are connected the more resilient and the more likely to bounce back during emergencies	1	1
Their communities also needs to understand how to provide psychological fast with these communities because in any case, there are faster respondents	1	1
There is a problem in the recovery phase, compared to other phases such as mitigation, preparedness during fire disaster	1	1
there is lack of community structure to adequately respond to fire incidences	1	1
There is no fire engine in Kibera and other informal settlements and vulnerable communities	1	1
They dont have clear policy for responding to disaster and they are still lobbying for the establishment of fire substation	1	1
Time taken for the response team to reach fire disaster scene as one of the challenges	1	1
Use of local administration such as chiefs, sub-chiefs, and village elders as the community entry structures	1	1
Use of toll free number to report fire incidences	1	1
Uses Community barazas to communcate to people and uses them as ambassadors	1	1

Appendix 13: IHS copyright form

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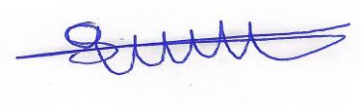

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