RESEARCH ARTICLE

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Strengthening Resilience to Fire Disasters through Community Participation in Gikomba Market, Nairobi City County, Kenya

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ABSTRACT

Fire disasters accounts for 20% of the total disaster in Kenya, with direct property loss estimated at USD 595,715 From 2014 to 2022, a total of 248 fire incidences were reported in Nairobi, about 30 of which occurred in the Gikomba market. Contribution of community in disaster risk mangenet can never be overlooked in disaster resilience building. Even though the concept of multi-stakeholder has been adopted in Kenya, the community's involvement in disaster risk management has always been passive. Therefore, the objective of the study was to determine how the level of fire risk awareness by the Gikomba community affects their participation in disasters risk management. This study was guided by the model of Sense of Community Responsibility (SOCR), Rocha's community empowerment model, and the theory of margin. A mixed research design was adopted in the study. A stratified random sample was obtained by dividing the Gikomba market population into several homogenous and non-overlapping strata based on the nature of the business. Open-ended questionnaires were administered to collect quantitative data from 384 respondents. On the other hand, the no-probability sampling technique was used through purposive snowball sampling to collect qualitative data through interviews. Key informants were mainly disaster experts drawn from, national, county, and private stakeholders. Quantitative data was analyzed through SPSS (version 26) software, while qualitative data was organized into meaningful and reasonable units that were coded using words or short phrases. The study established that level of community understanding of their involvement in disaster risk management was low since 52% of the respondents believed that disaster risk reduction was the sole duty of the national government or county governments. Therefore, this study recommends that, both national and county governments enact and implement laws that will enhance community participation in disaster risk management programs as part of the stakeholder group in line with the existing multiagency concept of operation. Further disaster risk awareness should be integrated into school curricula to improve disaster awareness at the local level.

Keywords: Community Risk Awareness, Community Participation in Disaster Risk Management, Role of Community in Disaster Management.

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I. Introduction

The capacity of various countries to bear the effects of disasters has continued to be challenged by the increase in the frequency and magnitude of disasters. The impacts of disasters on development and human lives have negatively affected community disaster resilience, therefre, the local community suffers the most from the effects of a disasters. During such an emergency, there is a sense of shared purpose and solidarity throughout the community or nation as a whole (Hannigan, 2012). People put aside their personal goals, political, religious, and societal preferences in order to save a life. Community's resilience to disaster is a crucial capability that makes it easier to adapt and cope with its shocks. Community reaction is crucial to disaster management to the point that occasionally the lack of institutional resources causes the community to mobilize in order to deal with the disaster's impacts (Chan, 2019). It is importtant to note that disasters can have an adverse effect on years of development. This may cause disruption in the state, organizations, communities, and families. The level of community preparedness is essential when devising a disaster risk reduction strategy that builds resilience. The decision to implement the Hyogo Framework for Action (HFA) in 2005 and later the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030 has considerably benefited global leaders' ability to grasp disaster risk management strategies.

The 2030 Agenda for Sustainable Development by various countries reafirms the criticality of the disaster rsikmamnegemt in realizarion of development. The HFA's priority number one aims to promote community participation in DRR in order to address community needs. Further, Community level training is recommended as element of Priority 3, which includes fostering a disaster resilience culture, to boost local capabilities to prepare for and recover from disasters (UNDRR, UNDRR Annaul Report 2020, 2020). The participation of every member of society in the implementation of disaster risk reduction initiatives is one of the tenets of the Sendai Framework. Priority 1 aims to raise disaster risk awareness , whereas Priority 4 recommends the establishment of community centers for resource mobilization (UNDRR, Sendai Framework for Disaster Risk Reduction 2015-2030, 2015). It is therefore, worth noting that a pivotal pillar of disaster risk reduction is involving the community in disaster preparedness.

Kenya has continued to be vulnerable to disaster due to existing gaps in the level of preparedness coupled with increased frequency of occurrence, diversity, and intensity of impacts of disasters over time and space. The disaster profile in Kenya is dominated by road traffic accidents, domestic fire, building collapse, floods, droughts, terrorism, diseases, and epidemics that interfere with people's way of life beyond their coping mechanism (Menya, 2016). Many lives have been lost, property destroyed, and general economic development interfered with by diverting planned resources in order to address the immediate humanitarian needs resulting from the effects of disasters. Kenya has been reacting to disaster with much eforts being directed to response phase. Various disaster stakeholders have always been taking part in disaster response with no clear mandate (AfDB, 2019). The resolution Kenya made to follow the Sendai Framework for Disaster Risk Reduction for the years 2015 to 2030 as well as the Africa Risk Capacity demonstrate Kenya's continuous commitment to ensure that disaster risks are reduced. According to a Development Initiative evaluation of Kenya's preparedness for natural disasters, neither the national level nor the most Counties had any policies in place to deal with disasters. Lack of political good will, poor coordination and participation of stakeholders, competing objectives at the National Assembly, and a lack of an executive champion could all have played a role in this. (Initiative, 2017). Kenya has historically had a disjointed approach to disaster management, frequently acting reactively rather than proactively and engaging many different organizations and government departments. However, participation in the community has been very minimal. Disaster management is a shared responsibility of the National Government and County Government in Kenya, according the constitution. In the event of a disaster counties are supposed to act as first responders. This has not been the case since most Counties have not developed disaster management capacity. A report on program end-line evaluation of Kenya by Redcross conducted in 2019, it was established that there was the need for the clear link of the emergencies response to long-term planning and community resilience building actions in line with Sendai Framework 2015-2030. Therefore, much emphasis must be put on community level empowerment.

In Nairobi City County, the risks of fire are very high, this could be attributed to the high rural-urban migration which leads to high population density in most parts of informal settlement. (Huho *et al.*, 2016). Despite Kenya not having a disaster management Act, Nairobi County is a step ahead as one of the Counties that has had the County Disaster and Emergency Management Act since 2015. However, handling previous disasters has exposed crucial institutional weaknesses and deficiencies in various capacities, including key disaster policies. Disaster response has always been conducted haphazardly in coordination, for instance, firefighting preparedness by the Nairobi County fire and disaster department. A case in point during the Sinai fire incident, inadequate knowledge of fire management amongst community members, hampered their efforts to save the victims. The casualty rate could have been low if the community had some rescue skills. Disaster response Agencies within the county include the Nairobi fire brigade, Ambulance service providers, the military, Kenya Red Cross, St. John's Ambulance business communities and local communities. Coordination of fire disaster response efforts within Nairobi County is worsened by the lack of fire disaster management plans (Wangara, 2017).

II. Research Design

The researcher adopted a mixed research design whereby both qualitative and quantitative data was collected. This design was used since it provided deeper insights into the phenomenon under study and enabled the capture of information that might be missed by using only one research design. Quantitative data was gathered through a random sampling to pick respondents from the Gikomba population using structured questionnaires. In addition, the researcher collected qualitative data through purposive snow bowling sampling of key informants selected from various stakeholders drawn from National and County Government through interviews and focus group discussions. Further, the study focused on a descriptive approach that offered accurate data to provide insight into community involvement in disaster management. This explored research problem beyond the superficial level, thereby providing a detailed description of the research topic.

A. Study Site Selection and Description

The study was conducted in Nairobi City County which is the Capital City of Kenya purposively at Gikomba Market due to high rate of fire incidences that have been occurring yearly. According to the Sendai Framework for Disaster Risk Reduction country disaster profile, road traffic accidents have killed 4909 people in Kenya between 1997 and 2022, accounting for 49% of all recorded fatalities. Fire incidents have claimed 1939 lives, accounting for 20% of all recorded fatalities, with an estimated direct property loss of USD 595,715 during this time. In terms of housing damages, floods are the highest with 30298 houses damaged followed by fire with 5522 houses damaged. (Sendai, 2022). From the above data fire incidences are the second leading in terms of mortality damage to property after road traffic accidents and floods in Kenya. From 2002-2022 a total of 239 fire incidences were reported in Nairobi with 30 fire incidences having been reported in Gikomba market. According to Burns Awareness Statistical Data, the number of reported cases in 2020 exceeded the 200,000 annual average, with the ministry of health documenting 213,770 burn incidents. 20% of the burns patients that were admitted to the Kenyatta National Hospital in 2020 succumbed to various complications. It is worth noting that, Nairobi reported the highest number of incidents with 40% of all fires being reported in informal settlements. Starehe and Kamukunji, compared to other sub counties in Nairobi City County, had the highest number of deaths caused by fires (Waweru, 2021). Therefore, the study was purposively selected to be conducted in Gikomba market, Kamukunji Sub-County in Nairobi due to high number fire incidences reported yearly. While preside visit was conducted in Starehe sub county. Urban settlements have increasingly become vulnerable from the effects of fire disasters. This is because migration of population to urban areas increases human vulnerability due to increased population density. The Gikomba market is located in the Kamukunji Sub-County, on the southern edge of Nairobi's CBD. To the East and the Northern regions are a number of Nairobi residential estates with intermediate and low income levels. The Southern boundaries are the Nairobi industrial area. A significant physical feature is the Nairobi River Course Way. The market covers an estimated area of 2.5 km^2 with an estimated population of 65,000 people (KNBS, 2019). This population census was conducted at night when most of the businesses are closed therefore day population of Kamukunji is likely to be higher than the documented one by the 2019 census report. The Gikomba Market is the biggest open-air market in Kenya and the largest used clothing market. The most of the goods traded here are second-hand imports from the United Kingdom, the United States, and several European nations. Gikomba market was purposively selected since community has continued to suffer from the impacts of the disaster which has seen them lose lives, property and economic livelihood. The cruelty of these disasters and their effects on lives and livelihoods has necessitated this site selection.

B. Sample Size Determination

Gikomba community has a heterogeneous population estimated at 65,000 according to 2019 Census report (KNBS,2019). In reality, gathering data on such a big population would be challenging, time-consuming, expensive, and inconvenient. In order to accurately represent the complete population, a sample had to be carefully chosen. Therefore, the study used the Cochran formula shown in (1) to determine the sample size (Cochran, 1977).

$$n = \frac{z^2 pq}{e^2} \quad (1)$$

where;
n = the sample size required,
z = Z-score (Standard Score value) extracted from z-table,
p = p is the estimated proportion of the population that has the attribute in question,
q =1-p,
e = is the desired level of precision (acceptable margin of error).

Given the lack of information on the exact proportion of the various business identified, the study assumed that 50% = 0.5 of the Gikomba population operate wholesale businesses in clothing, hardware, cereals and jua-kali artisan. In this regard, the study sought to have a sample size at a confidence level of 95% with ±5% precision. Therefore, acceptable percentage error was $1 - 0.95 = 0.05$ since 50% of the population which was considered as proportion of population then percentage error was $0.05 \times 0.5 = 0.025$ this figure was added to confidence level $0.95 + 0.025 = 0.975$. From the z-score table, the value sits at the intersection of the row labeled 1.9 and the column labeled 0.06. Therefore, the sum of column and row value is the z-score which was 1.96.

Therefore, we use (1) to get n = the sample size that was required:
z = 1.96
p = 0.5
q = 0.5
e = 0.05

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2}$$

$$n = \frac{3.8416 \times 0.25}{0.0025}$$

$$n = 384$$

The study therefore, desired to use sample size of 384 study participants selected through stratified random sampling technique as a representation of the study population. The 384 participants were divided equally into 4 strata to yield 96 study participants drawn from wholesalers dealing in hardware, clothing, cereals and major jua-kali artisan. Further, 10 key informants who were purposefully chosen made up the second type of respondents, while 20 focus groups participants made up the third type of respondents.

C. Sample Selection

The Gikomba population being a heterogeneous community with varying characteristics in terms of type of business operations, stratified random sampling was an ideal technique. This was done by dividing the Gikomba market population into four homogenous and non-overlapping strata based on the nature of the businesses. These included; wholesalers dealing in hardware, clothing, cereals and major jua-kali artisan. The study adopted this technique because it deliver higher precision data and also offers an equal chance to respondents (Tagawa, 2020). The researcher made a pre-study visit in order to familiarization and to identify potential locations for sample responders before choosing them. Access to accurate data of the wholesale business in Gikomba was not readily available from the Nairobi City County since from the records it was not easy to identify which business is operating at wholesale level. Therefore, during the pre-visit, the researcher developed a manual sample frame of 800 respondents with help of research assistants by listing 200 wholesalers from each businesses sector dealing in hardware, clothing, cereals and major jua-kali artisan. Thereafter, 96 respondents from each stratum of 200 respondents were therefore, randomly selected using an online random sample generator. Table I shows sample size distribution in each of the four wholesale business stratum.

TABLE I: SELECTION OF WHOLESALE BUSINESSES IN GIKOMBA MARKET

S/No	Sector (stratum)	Sample size	Percentage
1	Wholesale hardware	96	25%
2	Clothing wholesale stores	96	25%
3	Cereal wholesale stores	96	25%
4	Major jua-kali artisan	96	25%
	Total	**384**	**100%**

Source: Field data, 2022

In addition, the researcher selected key informants based on their participation in previous fire disaster in Gikomba. The researcher visited NDOC to establish key stakeholders who have been actively involved in fire disaster risk mangenet. Key informants were purposively drawn from National, county, and Non-Governmental Organizations disaster management stakeholders at management level. Those selected assisted the researcher in the identifying other respondents through snowball sampling. This included; two interviewees each from DRB from the Kenya Defence Forces, NDMU from National Police Service and Nairobi County Fire Brigade and one interviewee each from National Youth Service, NDOC, KRCS disaster response team, the Nairobi branch, and St John Ambulance. The snowball sampling technique for collecting qualitative data was an ideal for this study because it was less time consuming and also provided the opportunity to engage better with the respondent since they were referrals from the first respondent who was linked to the researcher (Naderifar *et al.*, 2017).

Finally, the researcher sought to conduct two focus group discussions consisting of at least ten respondents each from DRB from the Kenya Defence Forces and NDMU from the National Police Service. Twenty respondents were purposively selected based on their prior experience on fire disaster response at supervisory level. The researcher requested the two organization to consider those who have been actively involved in fire disasters response at the Gikomba Market as members of the focus group discussion.

D. Tools of Data Collection

Quantitative data was collected using questionnaires while qualitative was collected through interview schedules. The study used structured questionnaires designed in a mobile phone android Commcare application with Global Positioning System (GPS) capability whereby all questions within questionnaires were incorporated in the system was used to collect quantitative data that was administered face-to-face. This tool was appropriate since it allowed for the evaluation of respondents' levels of awareness and understanding about community participation in disaster risk reduction.

Further, an in-depth interview with disaster stakeholders at county and National levels through an open-ended interview schedule was conducted on the purposively selected key informants to collect qualitative data. In addition, focus group guide was used to guide the in the discussion.

E. Data Collection Process

Primary and secondary sources was used to gather information. Primary data was gathered using structured questionnaires, interview schedules and focus group discussion. Due to demographic characteristics and budget constraints, a mobile phone android application Commcare with Global Positioning System (GPS) capability was developed whereby all questions within questionnaires were incorporated in the system. The enumerators collected data at Gikomba market from 4 strata, that is Hardware store, Cereals store, Clothing store and Juakali store in seven days. Data was collected on a daily basis using the mobile phone android Commcare application with a target of 96 respondents from each stratum accumulating to a total of 384 respondents. The application involved coding and introduction of GPS which enabled the researcher to be sure that data collected was from intended location. The application recorded the exact location for each response, data and time. Four research assistants assisted the researcher collect data. Each assistant was provided with a smartphone that featured a useful app, thanks to the researcher. Each research assistant was assigned specific strata whereby they administrated online questionnaires to various study participants within the assigned strata in the Gikomba market. The application, saved time since time that could have been spent on data entry and management was basically allocated to data analysis.

In addition, qualitative data was collected from interviews and focus group discussions. This involved 10 key informants drawn from NDOC, DRB from the Kenya Defence Forces, NDMU from National Police Service, National Youth Service, Nairobi County Fire Brigade, KRCS disaster response team, the Nairobi branch, St John Ambulance were interviewed. Through note-taking and audio recording, the researcher captured their comments. The interview schedule provided the researcher with the chance to ask probing questions that allowed the respondents to express their understanding about the role of community in fire disaster risk management.

Further, two focus group discussions each consisting of 10 respondents were conducted at DRB from the Kenya Defence Forces and NDMU from National Police Service. This was ideal since most of the focus group members had actively participated in Gikomba fire disaster response and they had firsthand experience on level of community participation in fire disaster. The researcher did not manage to secure interview with G4S Fire Services representatives. The interview's main objective was to obtain a comprehensive and in-depth assessment of community involvement in fire disaster risk management from the perspective of disaster experts. The discussions were held at DRB and NDMU conference rooms at Embakasi and Vigilance house, Police Headquarters in Nairobi. The location of the discussion provided a conducive environment and natural situation for the participants to freely give their views on key areas of concern in the study. During the session, the researcher took notes and recorded the audio to gather the data.

Secondary data was acquired from previously published textual materials, which were examined in order to reach conclusions. Reviewing pertinent reports, theses, dissertations, books, and periodicals was critical for secondary data collection. Additionally, to support the primary sources of information, relevant government reports and policy documents were examined.

F. Validity

The approach of a mixed research design was used to guarantee the validity of this study. Due to the population's diversity, data were gathered via stratified random sampling, semi-structured interview questions, interview schedules, and focus group discussions. Additionally, the researcher employed a number of quality control procedures to guarantee the accuracy of the data. These procedures included designing and developing a mobile data collection application with GPS functionality to guarantee that the data collected actually came from the intended audience. Research assistants were also given training to help with reliable data collecting. The data analysis method employed was a combination of qualitative and quantitative methods. Qualitative data assisted in the identification of recurring themes, thereby supplementing and clarifying the quantitative results. Therefore, the study's findings' validity was verified by the use of several data collection techniques.

G. Reliability

To enhance reliability, research instruments were subjected to pre-testing in Kariakor market, Starehe Sub-County. The training of the research assistants and the determination of whether the data gathered complied with the study's objectives were both very crucial. Connelly (2008) posits that a pilot sample should be 10% of the overall sample expected for the study (Connelly, 2008). Therefore, 39 participants from four business sectors clothing, hardware, cereals, and jua-kali artisan participated in the pre-test, which involved data collection since the sample size of this study was 384 study participants.

The pre-test site had a similar demographic characteristic to the study area. This helped in evaluating and validating research instruments before their final application. The pre-test data was analyzed to aid in the adjustment of unclear questions within the data collection tools. The final analysis of the primary research data did not use this data. Pre-testing was crucial in enhancing the quality of the data collection tools. Pre-testing was conducted by administering a digital questionnaire to selected respondents, asking for clarification of answers and clarifying questions along the way. This ensured the integrity and quality of the data collection instrument. The selected pre-test site was similar to the study area.

H. Data Management and Analysis

Research team collected data on a daily basis using the mobile phone Android application Commcare. The research questions were deployed in Commcare and data collection done using Commcare application. The enumerators collected data at Gikomba market in 4 strata by visiting each of the selected stratum of interest, that is hardware store, cereals store, clothing sore and juakali store in seven days. The total number of responses collected in each stratum were 96 accumulating to a total of 384 responses. The synchronized data in Commcare server was exported to an excel spreadsheet and then imported to SPSS for management and analysis. Inconsistencies, duplicates and missing values in the data were identified. The identified errors were corrected using commands in SPSS version 26. A quantitative analysis was performed on the cleaned quantitative dataset to produce descriptive statistics that summarized the data into specific patterns. Key variable distribution was organized, condensed, and communicated using descriptive statistics that is frequencies and percentages.

Qualitative data was collected via audio recording of interviews and focus group discussions. Enumerators booked appointment from purposively selected organizations through a written request. Data was audio recorded and backed up with note taking in the field notebooks. Audio recorded data was transcribed to text using Transcribe transcription tool into MS word. Data was further organized into meaningful and reasonable units that was coded using words or short phrases, based on the response to a question. Through narration classification of the respondents' verbatim quotations, analysis of the different responses from the key informant was done on a thematic level in order to uncover significant concepts that were shared in regard to the study objectives.

Data from focus groups was combined with information from key informant interviews to generate qualitative data. Fieldwork notebooks and audio recorders were used to record data. Using the Transcribe transcription function in Microsoft Word, data was converted to text. Short phrases were used to further classify data and indicate a category. In order to find recurring themes in the various responses in connection to the study objectives, analysis of the responses was done on a thematic level.

I. Ethical Considerations

On 15 June 2022 Kenyatta University Graduate School authorized the filed study by via reference S202/OL/CTY/27414/2019. Further an approval by The National Council for Science and Technology and Innovation (NACOSTI) was granted on 22 June 2022. The NACOSTI research permit number License No: NACOSTI/P/22/18489 was issued vide Ref No: 562978. The enumerators were given copies of the research authorizations and an introduction letter to use as proof of the study's approval throughout the full field study. Interviews were sought through a letter of introduction, and participants were informed that the study would only be used for academic purposes and that their names and portfolios would be preserved. Participants were not forced to take part; instead, they volunteered after being fully informed of the study's objectives and receiving their consent before taking part. This guaranteed the responders' anonymity and confidentiality. They were made aware that the final report and publications will not contain their names or any other information that could be used to identify them (such as their titles and organizations). Respondents were given the assurance that the results would solely focus on the discussion's topic and not the responses.

III. Results

A. Background and Demographic Characteristics of the Respondents

Demographic characteristics of the study participants focusing on the sex, business ownership and level of education are presented in this section. Demographic characteristics allowed the researchers to determine to whom research findings generalize and allows for comparison to be made across replication of studies. Demographic variables influence the degrees of community participation. The lowest level of participation is co-option where community passively participate but have no real input on key decisions. While the highest level is co-learning where community is actively involved in key decision making and have full ownership of the programs. A total of 384 respondents participated in the study and they were drawn from wholesale traders dealing in hardware, clothing, cereals and major jua-kali artisan outlets as indicated in Table II.

TABLE II: BACKGROUND AND DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

	Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Sex	Female	207	53.9	53.9	53.9
	Male	177	46.1	46.1	100.0
	Total	**384**	**100.0**	**100.0**	-
Business Status	Employee	222	57.8	57.8	57.8
	Other	8	2.1	2.1	59.9
	Owner	154	40.1	40.1	100.0
	Total	**384**	**100.0**	**100.0**	-
Duration in business	<6	161	41.9	41.9	41.9
	>5<11	69	18.0	18.0	59.9
	>10<16	104	27.1	27.1	87.0
	>15<21	50	13.0	13.0	100.0
	Total	**384**	**100.0**	**100.0**	-
Fire incidences witnessed from 2017-2022	1-5 incidents	145	37.8	37.8	37.8
	6-10 incidents	125	32.6	32.6	70.4
	11-15 incidents	54	14	14	84.4
	>15	60	15.6	15.6	100.0
	Total	**384**	**100**	**100**	
Education	College	10	2.6	2.6	2.6
	No education	1	.3	.3	2.9
	Primary	50	13.0	13.0	15.9
	Secondary	245	63.8	63.8	79.7
	University	78	20.3	20.3	100.0
	Total	**384**	**100.0**	**100.0**	-

Source: Field Data, 2022

Out of 384 respondents, 53.9% were female and 46.1% were male. Based on this finding, gender stereotypes and biases may have had an impact on gender participation in disaster risk management. Women are most likely to be engaged in fewer physical activities while pregnant or while breastfeeding their children. They can, however, be involved in risk mitigation planning or provide ideas. A survey on the informal economy in Kenya commissioned by the Federation of Kenyan Employers (FKE) in partnership with the International Labour Organization (ILO) found out that 58.5% of informal microenterprises are run by females (FKE, 2021). These findings reaffirm a similar trend in gender distribution on business ownership in the informal sector in Kenya whereby female were the majority in business. Gender dynamics resulting from the socially prescribed roles for men and women are believed to have an impact on socioeconomic status, the degree of agency, and how people prepare for, respond to, and recover from disasters. In a study conducted to assess the impact of tsunami in 12 countries spanning South-East Asia, South Asia, and East Africa in 2005 it was established that wherever disaster strike, pre-existing social structures and circumstances, men will less be affected while women pay a higher price. The gender gap is one of the distinctions that affects how individuals are impacted by such catastrophes. The capacity of women and girls to withstand the effects of a disaster may be strongly impacted by social norms and gendered roles. Learnt skills play a role in explaining disparities in self-rescue capacity. Further, dress code may also prevent women from acquiring survival skills or limit their capacity to react rapidly in emergency situations. Women may be unable to make critical decisions concerning their participation in disaster without the approval of a male family member (Oxfam, 2005). Therefore, with over a half of the traders being women this coupled with gender dynamics could have influence on the participation of community in disaster risk management due to the inherent or perceived gender roles.

The outcomes that 57.8% were employees, the level of responsibility to disaster risk management is likely to be low. Consequently, this is likely to affect the necessity of making the right investments in resilience to anticipate and plan for hazards and risks. Therefore, this is likely to affect their level of participation in disaster risk management since they might be limited in making certain key decisions. This could be an indicator that owners of business who are not actively involved in daily operations of their businesses are unaware of the need for them to be part of the disaster risk solution providers. This study result is consistent with the 2016 Micro Small and Medium Enterprise (MSME) Survey report of 2016 which established that, 55.1 % of the workers in informal enterprises were regular employees (Mwangi, 2016). However, this is not the case for the unpaid family workers, the MSME report indicated that 21% were operating family business while this study established that 2.1% of the workers were family members. Therefore, majority of the business operators are employees who may not be in position to make a significant decision to participate in disaster risk mangenet. There is need to hasten community sensitization on their role in disaster risk management.

Level of education is a factor in risk perceptions, including cognitive biases, in decision-making. The study therefore revealed that secondary education being the greatest level of education at 63.8% of the respondents. This was followed by University education at 20.3%, primary education at 13%, College education at 2.6% while 0.3% of the respondents had nil education.

Level of education may influence the degree of community participation in that low level of education will most likely lead to passive participation while higher level of education will accelerate active participation. Individuals are thought to gain knowledge, skills, and competences that can affect their capacity for adaptation primarily through formal education. Notably; First, there is proof that learning experiences connected to formal schooling have a long-lasting effect on the synoptic brain structure and improve cognitive abilities (Reynolds, 2014). Second, there is a correlation between education and problem-solving abilities. Thus, educated people may be better able to respond to disaster (Schnell-Anzola, 2005). Third, education improves the capacity to plan for the future and better resource allocation, as well as the acquisition of information, values, and priorities. Further education can help improve people's understanding of disaster hazards and how to deal with them. Fourth, education can affect how one perceives risk. People are more inclined to take action to manage these risks if they believe their dangers from disaster are serious. According to research by Paul and Bhuiyan, highly educated people are more aware of the earthquake danger and are more inclined to implement disaster preparedness measures (Paul, 2010). Thus, high risk awareness linked to education may support behaviors that reduce vulnerability. With only 22.9% having attained College and University education the degree of participation is expected to be low. This finding corresponds with a study conducted in Kamukunji in Nairobi Kenya to assess factors influencing the performance of metallic artisans whereby 56% of artisans had attained secondary education. However, this was not the case with Kamukunji artisans whereby 28% college education, 11% were primary graduate and 8% were university graduates (Wamalwa, 2021). These findings indicate that most people in the informal sector opt to venture in business than to further their education beyond secondary level. With 63.8% of respondents having high school education, this can provide a good foundation on which fire risk awareness can be built on to enhance community participation if DRR is mainstreamed in the education curriculum. A study conducted to evaluates the effect of socioeconomic characteristics of rural youths on their attitude towards participation in community development projects in Rivers State, Nigeria, revealed that there is a relationship between socio-demographic characteristics with community participation. Level of educational and the attitude of youths towards community projects are highly significant in the intensity and pattern of participation (Angba, 2009). He further stated that participation increases with education. This finding in relation to the 63.8% of the study participants of this study having had secondary education indicates that they can be participate in disaster risk management only if proper structures are put in place.

The researcher also sought to establish the duration the study participants have been in business operation in the Gikomba market. The study, revealed that 41.9% have been in business for less than 6 years followed by 27.1% having been in business operation between 10-16 years. From a psychological standpoint, when people participate more in activities that affect their environment, they start to develop a sense of control, dominion, and belonging over what happens there. In other words, they feel directly involved in the actions and consequences of each situation that arises in their environment (Ohmer, 2007). However, this is not the case with the Gikomba community since regardless of how long the study participants have operated business in the study location, they have witnessed incidences of fire. The effects of fire disasters have had an impact on the community, either directly or indirectly. Even though the community over time has become more vulnerable to fire disaster, its reluctant to institute mitigating measures. This could be due to economic, social, and political barriers.

B. Awareness Level of the Community's Role in Fire Disaster Risk Management

The study's objective was to determine the variables influencing community involvement in disaster risk reduction in the Gikomba market, Nairobi City County, Kenya. Therefore, the researcher sought to determine how the level of awareness of the community's role in fire disaster risk management by the Gikomba community affects their participation in disasters. To achieve this, the researcher sought the opinion of the study participants on their role in disaster risk mangenet. Further, the researcher also wanted to establish whether respondents have witnessed fire incident during the period they have been in business operation focusing on the last 5 years a period from 2017-2022 and find out how over the years this has impacted their perception on their role in disaster risk management. To understand the study participants' risk awareness level, the researcher went out to establish whether the respondents were aware of the probable causes of fire that they might have witnessed. The researcher also wanted to know if respondents knew what to do in the event of a fire disaster in order to determine the level of readiness.

1) Fire incidences experienced in relation to duration

Exposure to various fire incidences enhances coping mechanism and also inform future ways of dealing with similar incidences. Since the study participants had been operating their businesses in the Gikomba market for a variety of years, the researcher wanted to determine the number of fire incidents in relation to this period. As seen in Table III, are the outcomes.

TABLE III: FIRE INCIDENCES EXPERIENCED IN RELATION TO DURATION

	Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Duration in business	<6	161	41.9	41.9	41.9
	>5<11	69	18.0	18.0	59.9
	>10<16	104	27.1	27.1	87.0
	>15<21	50	13.0	13.0	100.0
	Total	**384**	**100.0**	**100.0**	-
Fire incidences witnessed from 2017-2022	1-5 incidents	145	37.8	37.8	37.8
	6-10 incidents	125	32.6	32.6	70.4
	11-15 incidents	54	14	14	84.4
	>15	60	15.6	15.6	100.0
	Total	**384**	**100**	**100**	-

Source: Field Data, 2022

The findings in Table III, the researcher established that 41.9% of the respondents have been operating business in Gikomba for the last 1-5 years (2017-2022) followed by those who have operated their businesses for 10-15 years (2007-2022) at 27.1%. While those who have been operating business for the last 5-10 years (2012-2022) at 18% came in third and finally those have been in businesses operation for 15-20 years (2002-2022) were only 13%. According to a similar survey carried out by the Kenya Bankers Association (KBA) Centre for Research on Financial Markets and Policy in 2021 in partnership with the Japan International Cooperation Agency (JICA), the most businesses are young start-ups, with 53% of them having been in operation for less than five years. The remaining businesses ranged in age from 6 to 10 years, making up 22.6% of all businesses, and those that had been in business for more than 10 years made up 24.4% of all businesses (KNBS, 2021). This could be a pointer that most businesses do not survive beyond five years. Based on this, it is likely that most traders are more concerned with making business breakeven. According to the third Priority area for Sendai Framework on disaster risk reduction 2015-2030 which is to invest in DRR for resilience. Since most of the respondents have been in operation for less than 5 years, it's an indication that their resilience to disaster is low. Therefore, investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of traders, communities and their assets. According to the theory of margin, this could be an indication that respondents are facing heavy load and little power to allow them to participate in disaster risk mangenet.

The researcher also wanted to determine how many fire incidents had happened in the previous five years, which covered the years 2017 through 2022. The study established that, 37.8% of the respondents had witnessed between 1-5 fire incidents followed by 32.6% who had witnessed 6-10 fire incidents, 14% witnessed 11-15 fire incidences while 15.6% witnessed more than 15 fire incidences. It is evident that study population had experienced fire incidences irrespective of the number years they have been in the study location. This has continued to affect the lives of many respondents thereby negatively impacting on their economic development efforts. Further, this presents a significant challenge to the community in managing disaster risks. It is clear that this high frequency is a threat to human security that interfere with the way of lives of the Gikomba population through interruption of the physical, social and economic systems. Based on this finding it is evident that the respondents have faced the impacts of fire disasters thereby compounding to them the economic load that impact on their freedom to participate in disaster risk management.

2) Awareness of community responsibility in disaster risk management

The respondent's perspective on who should be in charge of managing a fire disaster was what the researcher was interested in learning. The major goal was to see whether the locals believed they could help to mitigate the disaster. The results are shown in Table IV.

TABLE IV: DISASTER RISK MANAGEMENT RESPONSIBILITY

Responsibility	Frequency	Percent
National Government	125	32.5
County Government	75	19.5
National Government and County Government	95	24.7
Gikomba Community	50	13.1
Not sure	20	5.3
No response	19	4.9
Total	**384**	**100**

Source: Field Data, 2022

Only 13.1% of the respondents believe they have a responsibility to play in mitigating fire disasters, according to the research, which shows there is very little understanding of their involvement in disaster risk management. Even though most traders have basic education level with 63.8% having attained secondary education 76.7% of the respondents think it is the responsibility of the government to manage disasters.

Similar sentiments were registered by the one of the key informants who emphasized on the need to create general disaster risk awareness to all in order to change the perception on the responsibility to manage disaster risks.

> *Community awareness on their role in disaster risk management is still low. One of the challenges is lack of knowledge on the general disaster risk management. There is the perception by the majority of the traders that management of disaster is the sole responsibility of County fire department and the National Government. These, among other challenges, has made it difficult for Gikomba community to accept that they have a role to play in fire disaster risk management* (Key Informant, NDMU headquarters Vigilance House).

The degree of understanding of the Gikomba market community in Nairobi City County on their responsibility in disaster risk management raises concerns about the idea of an all-inclusive approach to disaster risk management in Kenya. The community hasn't done much to lower the risk despite the fact that Gikomba market traders continue to endure fires every year. Despite the high risk of fire, the community has remained uncommitted to the DRR efforts because of a lack of knowledge, which may be a result of this low impression of the role of the community in DRR. Therefore, there is no question that a higher level of community responsibility for disaster risk management is a result of improved understanding of the role of the community in disaster risk mitigation. The Gikomba community can build knowledge of the role of the community in disaster risk management on a solid foundation by incorporating disaster risk management into the educational curriculum.

C. Risk, Hazard and Vulnerability Awareness

The 1st priority area of concern for the Sendai Framework on DRR 2015–2030 is risk awareness. The risk increases with continued exposure to dangers since risk is a function of the chance of exposure to hazards and the seriousness of any potential harm that could come from such exposure. Thorough awareness of the underlying dangers can be used to assess risk before to a disaster occurs thereby mitigating it, and designing and putting into practice suitable preparedness for resilience building. As a result, inadequate knowledge of dangers in relation to exposure levels increases risk. Therefore, the researcher sought to find out whether study participants were aware of factors that contribute to fire hazards within their area of operation and the possible causes of fire. Table V shows response from the study participants on the fire hazards and the causes of fire in the Gikomba Market.

TABLE V: FIRE RISK AWARENESS

	Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Hazards drivers	Infrastructural factors	150	39.1	39.1	39.1
	Social economic factors	123	32.0	32.0	71.1
	Environmental factors	111	28.9	28.9	100
	Total	**384**	**100**	**100**	
Causes of fire	Land conflict	152	39.6	39.6	39.6
	Electricity	97	25.3	25.3	64.9
	Politics	53	13.8	13.8	78.7
	None	23	6	6	84.7
	Others	59	15.3	15.3	100
	Total	**384**	**100**	**100**	

Source: Field Data, 2022

According to the aforementioned data, 39.1% of the study's participants think that physical elements like inadequate building design and construction and unrestricted land use planning are the main causes of a high fire risk factor. Furthermore, 32% of those surveyed think that social and economic factors like vulnerability, such as poverty, marginalization, social exclusion, and discrimination based on gender, social position, handicap, and age. While 28.9% of the respondents believe that environmental factors contribute to the high vulnerability. This finding is supported by one of the key informant stated that the materials used for constructing the sheds and stalls are made of flammable materials:

> *Most of the materials used to construct stores are made of flammable materials. When fire breaks out it spreads very first before fire engines could arrive. This coupled with congestions and inaccessibility makes it difficult to effectively contain fire. The traders end up blaming County fire department for not doing much to put off fire* (Key informant Nairobi City County Fire Department).

The use of substandard construction materials and congestions could be attributed to economic factors compounded by increased rural urban migration thereby creating much pressure on the limited resources within the market. This amplifies the necessity of including disaster risk management in the process of urban development in order to lessen vulnerability.

From the study, it is evident that most fires were caused by an act of commission or omission by human being with 39.6% of the respondents indicating that land conflict as the major cause of fire due to population pressure on the limited space available for business. From focus group discussion, it was further established that fires suspected to be a result of arson, response efforts are always interrupted by arsonists who ensure that fire access roads are blocked thereby hampering response efforts by firefighters' vehicles.

Further, the congestion in the Gikomba market and the materials used for constructing the sheds and stalls are made of flammable materials thus contributing to fire spreading. This could be attributed to economic factors compounded by increased rural urban migration thereby creating much pressure on the limited resources within the market this increase the risk of fire. This is an indication of underlying factors that creates conflicts amongst traders. 25.3% of the respondents believed that the main course of fire is electricity due to illegal connections thereby causing electric overloads, hot charcoal originating from iron boxes, and charcoal stoves used by food kiosks owners. Although the results of this study differ from those of a related study conducted in Nairobi's Sinai settlement to evaluate the socioeconomic impact of fire disasters, which found that 58.1% are caused by electric faults, human error or commission still rank among the leading causes of fire (Mbugua, 2016). This is because most of residents in Sinai settlement cannot afford electricity that is why probably there are illegal electric power connection.

1) Response to fire disaster

Knowing how to respond to fire disasters offers the community the confidence to take part in fire rescue operations successfully. The purpose of the study was to gauge the respondents' degree of knowledge regarding what to do in the event of a fire. Table VI displays the findings.

TABLE VI: ACTION DURING EMERGENCY

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Run as fast as possible	46	12.0	12.0	12.0
Rescue some property	166	43.2	43.2	55.2
Shout for help	64	16.7	16.7	71.9
Put out the fire with whatever is available	75	19.5	19.5	91.4
Call the fire brigade	33	8.6	8.6	100.0
Total	**384**	**100.0**	**100.0**	

Source: Field Data, 2022

It was established that only 19.5% would attempt to put off fire. When asked whether they have any emergency contact number only 8.6% would call Nairobi fire brigade. Further research revealed that 43.2% of respondents preferred to save their belongings in the case of a fire. In a study conducted in Sinai, Nairobi City County to assess socio-economic impact of fire disasters it was established that only 12.9% were aware on what to do while 87.1% of the residents had no idea on what to do to stop fire (Mbugua, 2016). In a similar study conducted in Kibera informal settlements in Nairobi to assess fire hazards reduction capabilities, only 4% would dial for help from the fire brigade, 53.6% would rush to the scene to assist while 10.1% would not take a specific response action in the event of fire (Kamengere, 2014). From this findings and findings of other related studies the community is willing to participate in fire response, however, their capability to effectively participate in fire response is limited. Relating to a study conducted in Kiandutu slums in Thika Municipality to investigate risks of fire, established that, 62.5% of the residents have low mitigating skills while the remaining 37.5% had high mitigating skills (Gachago, 2013). There is a consistent trend of low level of fire risk management awareness across the board among the affected communities. Focus group discussion brought out the need to enhance disaster risk awareness among the communities. The group recommended community sensitization on their role in disaster risk management, training of community based groups through barazas and mainstreaming of disaster risk mangenet in school curriculum.

Additionally, it was discovered in a similar study carried out in Korogocho to evaluate the susceptibility of urban informal settlements to environmental risks that people' understanding of how to control fire outbreaks was limited, indicating a general lack of preparation on their part (Omedo, 2010). These results were consistent with a study that evaluated the county administration's role in fire disaster mitigation and management in the Mukuru Kwa Njenga slum in Nairobi County, Kenya; it was found that 43% of the study participants believed that there had never been any training on disaster response plans. While 23% of respondents are unsure whether the county public has informed the community about fire disaster response preparations (Muiruri, 2013). These results support the study's conclusions, which indicate that awareness levels are quite low.

From the study findings, in the event of fire outbreak 43.2% of the study participants will prefer to rescue their property than to call the fire brigade. This shows that there is low opinion on the capacity of the county fire resources based on the previous accounts of dissatisfaction in terms of efficiency. One of the key informant reaffirmed this by stating that the community has a negative perception about the Nairobi fire department.

> *At times we are even stoned when we respond simply because maybe previously we had challenge of accessing the scene or maybe due to Nairobi traffic we don't make it in time as expected. This coupled with our internal challenges has really affected our credibility to the traders* (Key informant, Nairobi City County Fire department).

It is clear that the owners of the impacted businesses want to save their assets, but they are unable to fully participate in disaster risk management. Initiatives that strengthen existing networks between actors involved in disaster management or that center on fostering community self-efficacy should therefore be supported. Such initiatives are likely to substantially improve community resilience to disasters. Recognizing that unpredictability, complexity, ambiguity, and uncertainty are key aspects of disasters is vital; hence, community-level preparedness is essential. CBDRM is still a preferred technique for fostering local community resilience in the face of disaster. This involves the ability of the affected population to plan and select activities to lower the danger of a disaster using their own resources. Priority should be given to helping the community comprehend the risk scenario, raising local awareness, using the lessons learned from past errors, and looking for solutions to lessen their vulnerabilities. By managing risks, it will be possible to lessen the impact on people's lives and property. The level of understanding of the Gikomba market community in Nairobi City County about their responsibility in disaster risk management raises concerns about the idea of an all-inclusive approach to disaster risk management in Kenya. Therefore, there is no doubt that the greater understanding of the community's involvement in disaster risk mitigation increases the level of community responsibility in disaster risk management. As a result, leveraging the academic level of the Gikomba business community, the most of them have secondary and university education at 63.8% and 20.3% respectively, can create awareness of the role of community in disaster risk management among the Gikomba community.

IV. Conclusion

In conclusion, the study established that there is inadequate awareness on the role of community in disaster risk management which could justify their passiveness participation in disaster risk managment. Further, the roles of other stakeholders in disaster both at national, county and private organizations are clear this affects efficient corporation among stakeholders. The study also found out that information sharing systems are inadequate since majority of the traders do not have emergency numbers for other stakeholders thereby affecting coordination among early warning actors. This could be due to the perception that it’s the sole responsibility of the National and County Government to manage disaster risks. Therefore, the current level of the community’s understanding on their responsibility in disaster risk management raises concerns about the realization of the SFDRR in Kenya by 2030 alongside the vision 2030, the East Africa Community (EAC) Vision 2050, the 2030 Agenda for Sustainable Development and Africa Union (AU) Agenda 2063. In that regard, it is imperative for community education and sensitization on the roles and responsibilities of different stakeholders in disaster risk management in order to nurture sense of community responsibility. This can be achieved through mainstreaming of disaster risk mangenet in school curriculum to increase risk awareness as stated in the priority 1 of the SFDRR. Despite the fact that 43.2% of the respondents expressed willingness to take part in response operation with sole purpose of rescuing their property, it is evident that the community lacks capacity to effectively contribute as one of the stakeholder. Therefore, empowerment strategies should be developed by both levels of government and non-governmental organization. Development of comprehensive National and County Disaster Risk Financing Strategy through devolution in accordance with public finance Act in order to establish a contingency fund at both level of government will be critical. Further, development and dissemination of DRM mainstreaming guidelines for all sectors in the devolution structure will be critical in enhancing multi-agency cooperation in disaster risk management. This will empower the community to actively and effectively contribute towards disaster risk management hence increasing resilience to disasters.

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