

Analysis of Nature of Fire Hazards in Selected Locations of Kibera Slums of Nairobi County, Kenya

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Abstract: Slums are increasingly becoming a feature of urban crisis which is now a major concern to disaster managers and generally the humanitarian stakeholders globally. It's a human settlement pattern widespread in the urban areas of many developing countries where statistics show is a home to over 70% of urban settings. The livelihood levels and options of most slum dwellers make them more susceptible and vulnerable to many forms of disasters including fire. This study examined nature of fire hazards, a common element in urban disasters using selected locations of Kibera slum, one of the largest informal settlements in Africa. Mixed method design was used and the sample size was 225 with households being principal respondents. Questionnaires, FGDs, observation check-lists and in-depth interviews with key informants purposively selected from Government officials and land owners aided data collection. The study established that nature of fire hazards in Kibera slums was mainly as a result of physical and social dimensions of vulnerability and that the level of fire risk to communities in Kibera slum was high due to illegal electrical connections, material used for construction that were inflammable in nature, and high population density resulting in sharing a room as a cooking area as well as a living room. The study recommends up scaled efforts not only on public education on fire hazards but also to subsidize residents particularly with regard to social dimension of their vulnerability. This will improve their coping capacity and resilience to fire and secondary disasters thereof.

Keywords: slum, fire, hazard, vulnerability.

1. INTRODUCTION

Current statistics by UNFPA (2013) shows that more than half of the world's 6.6 billion people live in urban area and that if concerted efforts are not put in place to accommodate them, the urban crisis will soon go out of hand. In India, for instance, roughly 13.7 million households, or 17.4% of urban Indian households, are considered to live in slums. Statistics on slums and their trends indicate a human settlement pattern that span multiple continents: Neza-Chalco-Itza (Mexico), Orangi Town (Pakistan), Dharavi (India), Khayelitsha (South Africa), and Kibera (Kenya). The proliferation of slums and the growing number of slum dwellers have become an intricate global challenge for our society given their susceptibility to disasters (UNOCHA, 2011; UN-HABITAT, 2009).

Whereas several studies have been conducted on causal factors to proliferation of informal settlements and statistics on populations therein (Rosenberg, 2013; UN-Habitat, 2007; Boraine *et al.*, 2006), limited studies exist on specific factors that characterize disasters like fire in these habitats. Attempts on this empirical lacuna have concentrated on informal settlements within big economies like Brazil and South Africa (CCT, 2013). According to the United Nations (UN) reports quoted by CNN, June 2009 an estimated 200 million people died as a result of fires in informal settlements with

an estimate of one third being in sub-Saharan countries. This study focused on Kibera slum in Kenya which incidentally is one of the largest in Africa (UN-Habitat, 2011a; Patel *et al.*, 2012). Located in Nairobi County where there exist over 150 informal settlements, most of Kibera slum dwellers live on less than one dollar per day mark, a situation which heightens their vulnerability to disasters among them being fire outbreaks, disease outbreaks, structural failures and flash floods as major hazards or disaster risks. Most of the housing structures' building materials are temporary and highly inflammable increasing risks of fire hazards (GOK, 2004). As any other slum in developing world, Kibera has experienced a series of fire resulting to loss of life, property, bodily injuries, displacement and trauma. The susceptibility to fire disaster has partly been due to the socio-economic status of the communities found in the Kibera slums. Fire disasters remain a major threat to survival, dignity, livelihood and security of informal settlement communities globally. By examining nature of fire disasters in the study area, this study sought to narrow the empirical gap on this aspect in one of the biggest slums in the world.

2. METHODOLOGY

A sample size of 225 composed of households was utilized and their feedback reinforced through interviews of Government officials and landowners from four out of 12 locations, namely Gatwekera, Laini Saba, Makina and Silanga was used. These locations or villages as are commonly referred to are characterized by high susceptibility to fire and environmental hazards (Okombo 2010). A mixed methods design was used. The data for the study was obtained through questionnaire, interviews, document analysis and direct observations which allowed triangulation of feedback. Descriptive statistics: pie charts and frequency tables was used to analyze the data and was reinforced by chi-square test.

3. RESULTS AND DISCUSSIONS

Gender mainstreaming in disaster risk reduction initiatives has been encouraged since the Beijing world women conference in 1995 (UN, 2003). This study therefore considered gender during sampling and respondents based on gender is as captured in Figure1. As shown, Males were 95(50.5%) while females were 93(49.5%). Chi-square test conducted on association between gender and perception of fire hazards' trigger factors yielded no significant variation between Male and Female respondents in this study ($\chi^2 1, 0.884^{021}$). This indicates that perception of trigger factors to fire hazards was not unique across gender.

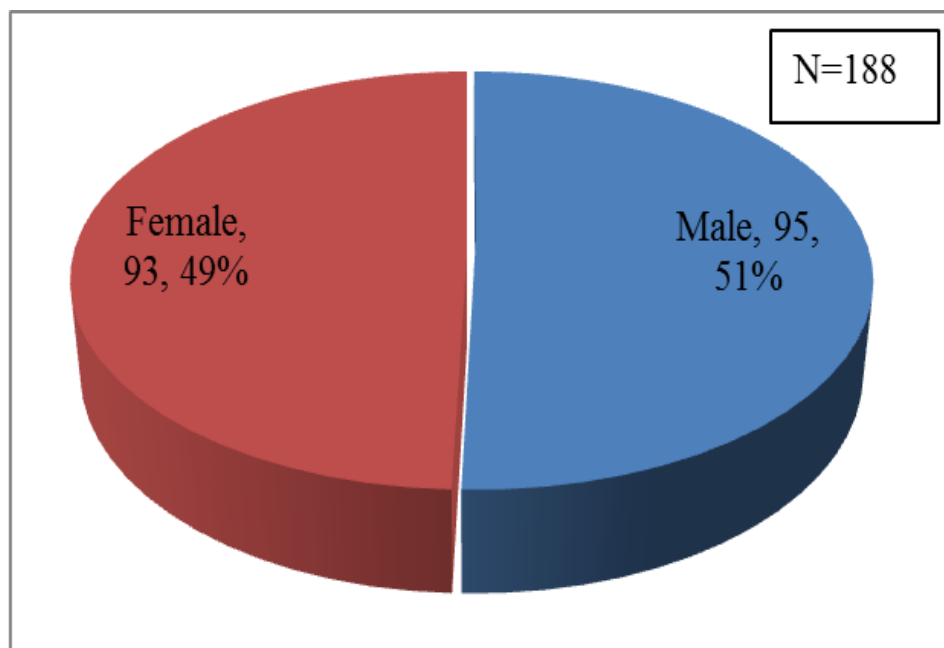


Figure 1: Gender of respondents in Kibera slums, Source: Field Data (2016)

According to UN Habitat (2007), there has been increase in gender based domestic violence in informal settlements. Some of the violence has resulted to torching of houses when the other spouse is inside the house by using paraffin or

polythene as form of punishment. A study by Nyakundi, *et al.*, (2010) echoed this finding in spite of the fact that men are mostly engaged in outdoor work, unlike women who normally engage in Home-Based Economic (HBE) activities. When asked on how frequent respondents had witnessed fire outbreaks in their stay at Kibera informal settlement, majority of them 138 (73.4%) said they had witnessed fire outbreaks more than five times. Only 5 (2.7%) had never witnessed fire outbreaks while 15 (8.0%) had witnessed fire outbreaks once. This response is captured in Figure 2. Since period of stay was important on judging fire hazards frequency, a chi-square test was done to gauge the association. It was found that there was significant association between duration of stay (in years) of respondents in Kibera and the number of times they have witnessed fire outbreaks in Kibera slums as shown by Pearson Chi-square of ($\chi^2_{9,0.01} = 42.955$).

In overall, the findings revealed that fire outbreaks in Kibera informal settlement increased relative to the duration of respondents' living in area. During FGD, one of the discussant who was twice a victim of fire outbreaks stated that:

We were six of us, we lost everything this was the second time I was being a victim of fire, I lost all my documents including the hospital card, I am afraid what I will tell them because the last time I told them it was fire and it was replaced. How will they trust me this time? I have not taken my ARVs for two weeks now

During the interview with various key informants, village elders in this study revealed that fire outbreaks are among the main disasters that threaten the livelihood of the residents in Kibera informal settlement. The occurrence of fire disaster has left the majority of the residents poor as most of them loss their property as well as sustain burns be it minor or serious burns. The official from KPLC revealed that even though fire disaster is rampant in the republic, it is acute in informal settlements of Nairobi especially Kibera as a result of illegal power connection. The same sentiments were corroborated by SHOFECO official. In their observation, the occurrence of fire in Kibera informal settlements is wanting. The official asserted:

During the numbers of years I have been in Kibera Informal settlement I have witnessed many fire disasters. In fact some of them have been serious leading to loss of life as the victims are helpless.

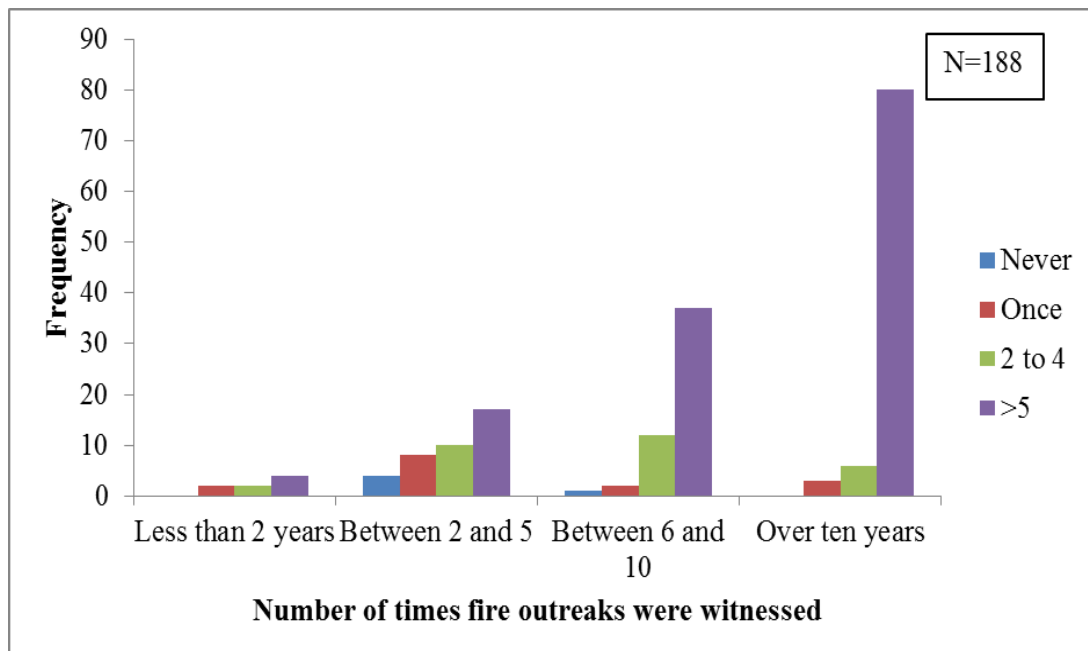
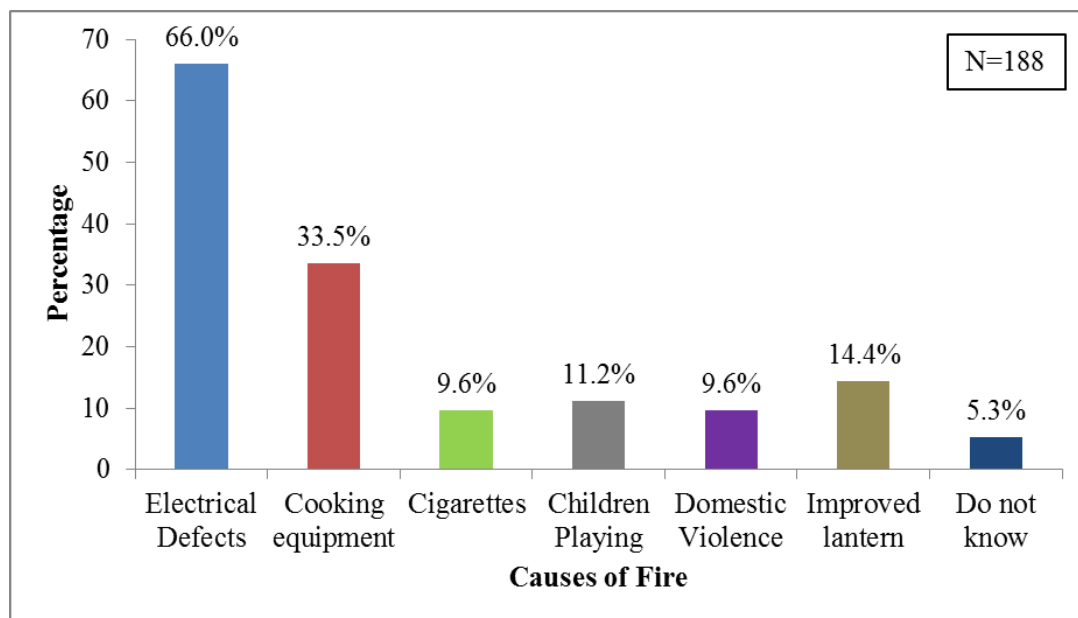


Fig. 2, No of times fire outbreaks were witnessed against number of years; Source, Field data, 2016

The researcher sought to establish from respondents the nature of fire disasters. Their responses have been captured in Figure 3, where more than half of the respondents 124 (66.0%) indicated that electricity is the common cause of fire, 62 (33.5%) cooking equipment, 27 (14.4%) improvised lantern, 21 (11.2%) children playing, 18 (9.6%) cigarettes, 18 (9.6%) domestic violence and 10 (5.3%) did not know what caused fire outbreaks in Kibera informal settlement.



Source: Field Data (2016)

Fig.3. Trigger factors of fire hazards in Kibera Informal Settlement,

Electrical defects have been identified as the main cause of fire outbreaks in Kibera informal settlement. Unlike formal settlements where electricity connection are done with professionalism, informal settlements have witnessed a lot of illegal connection and overloading of the supply. The result from FGD revealed that the residents are beneficiaries of illegal connection since it was cheap. However, this comes at a cost as one of the discussants stated that:

Majority of us are poor. We cannot afford to have our own meter from Kenya power due to high cost associated with it. We are forced to use sambaza electricity for lighting but some houses have been found to use it even for cooking thus overloading the power lines leading to bursting or melting resulting to fire outbreaks (FGD I, 2016)

This revealed that illegal connections had been misused by the residents as they are meant for lighting only. Further, the researcher observed that some electricity connections are poorly done further exposing the community to risk of fire outbreaks. Other connections have been done underground which increase the risk of fire outbreaks during rainy season as naked wires once in contact with running water has resulted to electrical shock. Interview with the Kenya power officials confirmed that electricity has been the cause of fire outbreaks in Kibera Informal settlements. They attributed this to notoriety of Kibera residents. The researcher noted that, the residents of Kibera have a tendency to cover for each other in cases where there are illegal connections. In some houses, they cannot have access as the occupants are hostile. This has made the Kenya Power Company not to access the areas for electricity regulation further exposing their level of fire risk. When the researcher wanted to find out why they cannot source the security to access the houses, the official stated that, the County Government considers the settlement as informal and therefore they are no laws governing their tenure. COHRE (2008) revealed that perhaps the most immediate dangerous situation arises from the inadequate energy service. Since cables and electricity towers are installed informally and illegally, there are many power shortcuts which often result in fire outbreaks

Domestic violence was widespread and commonplace. In all the settlements infidelity was commonly referred to as “mpango wa kando”, drug abuse and irresponsibility in terms of performance of household duties. From the FGDs, it was clear that domestic violence, including gender-based violence prevailed in everyday life of Kawangware, Kibera, and Mukuru. The findings are in agreement with Omenya and Lubaale (2012) who found out that in the Fuata Nyayo area, a woman who returned from visiting her relatives in rural upcountry found her husband with another woman in their home. Feeling so betrayed by her husband, she hurled the burning stove in their house at the couple. While the man and his liaison escaped, the house burnt down. Unfortunately, the fire spread to vast areas of Fuata Nyayo destroying several homes and properties in its wake. Results from FGD revealed that domestic violence coupled with the use of improvised lantern have resulted to fire outbreaks in Kibera Informal settlement. The researcher noted that, when fight erupts among partners especially at night the female partner have been found to use lanterns as shield and scaring of their husbands

towards attacking them. The findings by Macgregor *et al.*, 2005) that domestic violence, social circumstances and the use of candles and paraffin were also cited as triggers since many of the fire incidents are recorded or were recollected by the authorities and the community as starting on weekends. The problem in these cases is attributed to fighting between partners or drunken men, knocking over candles or other sources of flame, thus causing a fire.

Cooking equipment was also identified as cause of fire outbreaks in Kibera informal settlement. The researcher noted that most of the residents in Kibera informal settlement used open flames such as firewood to prepare their food. Others used paraffin stove or charcoal *jiko* for cooking which beside electricity have been identified to trigger fire outbreaks in households. The situation has become worse in instances where minors have been tasked to cook for the family or for themselves. During FGD, one of the discussant revealed that, alcohol and drug abuse have worsened the situation in the informal settlements. He observed that:

One of my neighbours who is a habitual drunkard triggered a fire outbreak in his room, since after drinking, he lit a stove; put some food on the fire and then slept. The food burnt beyond recognition and we were forced to break the door to enter his house as the guy was dead asleep. His legs were burnt (FGD II, 2016)

Numerous reasons why paraffin stoves could lead to fires were identified: Cooking while under the influence of alcohol was one of the main reasons. People reportedly fall asleep after becoming inebriated, leaving paraffin stoves unattended. When asked why people drank, members explained that this was due to lack of alternative recreational activities or depression resulting from unemployment and poverty. Others revealed that cheap fuel (paraffin) which is contaminated with impurities had found its way to slums. This fuel had exploded cooking stoves leading to trigger of fires in Kibera. According to NDOC, (2008) a particularly bizarre feature of the statistics relating to the incidence of stove explosions is that of the ten such occurrences recorded between 1995 and 2004, eight were in 1996 and the other two in 1998. This shows that, cooking stove alone accounts more to cooking equipment causing fire in the informal settlements

Further, cigarette smoking is rampant in majority of informal settlements. The cause may be due to moral lapse as parents are busy making ends meet for their families. As such, youth as young as 12 years found themselves introduced to smoking of cigar and bhang from their peers. The way cigarette remains are dispose has been found to be a cause of fire outbreaks in Kibera informal settlements. During the interview with a Chief from Silanga, explained;

You find young people throwing cigarette filters anyhow. They do not care where they land as long as the filter is out of their hands. This has triggered fire outbreaks especially during dry and rainy seasons (Interview, Silanga Chief).

Similarly, during FGD, it was revealed that youth whose parents are against them smoking have been found to hide cigarettes in places where inflammable materials are located. One of the discussants stated:

When I was introduced to smoking, my parents were against it. One day they bumped into the house while I was smoking. I was forced to hide the cigar in the basket full of clothes. Unfortunately I forgot to put it off. It burnt the clothes and when the smoke was unbearable, I was forced to run away from the house due to the punishment that was to follow (FGD II, 2016)

Surprisingly, some of the respondents as shown by 5.3% were unable to pin point the cause of fire. During the FGD, three discussants revealed that it is difficult to specify the cause of fire. When victims are burnt to death when there are no people at the houses, there are a lot of speculations of the cause of fire and the same is replicated in the media where the public are misinformed. One of the discussants stated that:

Some of these fires occur at odd hours either when majority of the residents are out of their houses or when we are asleep. It is difficult to know what the main causes are and in some incidences, the occupants of the house give false information for fear of accounting for damages caused to the neighbouring houses (FGD II, 2016)

4. CONCLUSION

The study concluded that fire hazards in Kibera slums was mainly as a result of the residents physical and social dimensions of vulnerability that catalyzed their unconventional methods like illegal electricity connection, improvised lanterns (*Koroboi*) which predisposed them to fire disasters.

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