

Fire Hazards Awareness and Preparedness Among the Residents of Bwari Area Council, Abuja, Federal Capital Territory, Nigeria

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Abstract- Fire disaster has become so alarming and has remained one of the major threats to man's survival, livelihood, security and have affected the environment on a global scale. Resident's awareness and effective community preparedness will reduce vulnerability from inevitable events of fire destruction. The aim of this study was to assess the level of awareness of responses of residents of Bwari area council in the event of fire hazards and to investigate resident's fire hazard preparedness and response in the council area. The study employed the administration of multistage random sampling and interviews using questionnaires among the residents to assess the level of awareness in the council area and that of personal observation through checklists to assess the area council's preparedness to handle fire outbreaks. The data collected were analysed using the SSPS and ANOVA statistical techniques and presented using tables. The study found that the majority of the respondents do not attach seriousness to the issue of fire safety in the area surveyed, hence, fire safety awareness is very low amongst most of the area council residents. The results further showed that the area council does not inspect compliance with any fire disaster preparedness bylaws. The study recommended that the area council should organize intermittent training for the residents and also ensure regular inspection on compliance with fire disaster preparedness. more sensitization among residents to be organized covering all areas under the study area.

Indexed Terms- Awareness, Bwari Area Council, Federal Capital Territory, Fire disaster, Fire hazards, Preparedness.

I. INTRODUCTION

The world at large has experienced fire disasters with devastating impact that has affected both lives and properties. The magnitude of the impacts has been very severe in places with low levels of fire safety awareness and among communities that were unprepared for it. Fire disaster has remained a major threat to the survival, livelihood, security of man and his environment. The combination of poverty, ignorance, overcrowding, inadequate infrastructures, poor urban planning cum management, and inaccessibility are but a few to mention, has aggravated and exposed man to a range of preventable fire hazards (Dynes & Russell, 2002). It has been observed that nearly half of the world's population is living in the urban areas (Pelling and Wisner, 2009). These prevailing fire risks eventually turn into fire disasters leading to loss of lives, properties and environmental degradation. More so, it has had a terrible toll on development especially in the developing and less developed countries. Such that the emergence of fire disaster diverts attention and resources from development needed desperately to escape poverty (AURAN, 2006; Boraine *et al.*, 1992, Victoria, 2003).

Fire has been identified as the greatest challenge to the safety of not only the industrial plants but in all workplaces, livelihoods and liveable places (Kelvin, 2003). A fire can result in extensive damage and destruction of properties as well as injuries to occupants of a given premises. Even when fire don't injure workers, they can disrupt activities quite significantly and bring most operations to a standstill. Fire can also lead to loss of important records and information hence the need for clear fire safety rules to minimize outbreaks and the loss that can result from such hazards (Schitiliti, 2003)

II. LITERATURE REVIEW

A disaster is a hazardous event that disrupts the functioning of a community and causes human, material, environmental, and economic losses. This event has four phases which include mitigation, preparedness, response and recovery (Behnam, 2017). Fire disaster awareness and preparedness are the twin important elements in fire disaster risk reduction strategy. Fire disaster awareness encompasses a community pre-knowing early when and what to do in the event of fire hazard occurrence in a place or community. The aim of this is principally to save human life. While, fire disaster preparedness encompasses all the mitigation and firefighting systems that are put in place both to prevent and fight the fire when it eventually occurs, from the level of the amateur occupants of the environment, through to the semi-professional and the professional fire fighter. The principal purpose of this is to save or minimize damage to the facility and its contents.

The level of urban risk is higher in developing countries. According to a research, it has been expected that by 2050, more than two-third of the world population will live in cities (Musabber et al, 2020). However, fire can cause extensive destruction within no time and it is one of the most feared causes of unplanned urbanization. Safety regulations in UK impose mandatory fire safety training to all employees working within a building, a construction area or any other busy area which helps provide employees with crucial information, develop skills such as those used in operating fire extinguishers and proper escape behaviours (Sime, 2001).

A research in Queensland investigated levels of awareness of and preparedness for fire disaster among community members and found that the level of fire safety awareness has direct relationship on the level of preparedness. He says being ignorant of dangers of fire makes people ignore the installation of firefighting devices which would have helped save life and property in the event of fire outbreak. He also found that poor awareness of fire caused a lot of fire outbreaks while good knowledge enabled people to know the possible fire risks in their premises. The study supported the more intensive and comprehensive capacity building in order to raise the

level of awareness and the need for fire hazard preparedness among residents (Wood, 1990).

In another study conducted in Oshogbo, Nigeria to assess the relationship between levels of awareness and disaster preparedness. It was found that 73.4% of houses studied had “burglary proofs” installed on windows, doors and sometimes the veranda. Unknown to them, this action in itself can get people trapped in the event of fire outbreak (Bukowski, 2006).

Ayabei (2016) explored level of fire disaster awareness in Buildings within the Nairobi Central business district and found out that 50.5% of the tenants which were never trained in fire safety are also unaware of how to respond in the event of fire outbreak as 26.8% would rather shout/scream, call fire brigade or take any available options. This shows that most residents are not aware of their obligation to as a matter of priority, ensure their own individual safety in the event of fire outbreak (Ayabei, 2011). The results further revealed that the level of preparedness and fire safety awareness accounted for 66.5% which means the more residents are aware of their fire hazard situation, the more they would prepare for an outbreak and take quality of responses that will surely save lives and minimize damage to the facility and their contents.

- Assessment of Fire Preparedness

An assessment of fire preparedness involves information gathering on the community’s level of preparedness and perceptions to risk. This can be done through group discussions, interviews, review of secondary data from the community office, and other related government offices. A research conducted on disaster preparedness in the United States found that preparing in advance for emergencies can save lives, reduce injuries and limit property damage. This actually enables communities to recover more quickly (Quarantelli, 1995). Though, preparedness is one of the most important elements of emergency management, many people still remain unprepared when a disaster strikes. For instance, in Canada, a survey of 576 households was conducted in Kingston, Ontario in 2001 to determine levels of preparedness for extended winter power-outages, fires and medical emergencies

The study indicated a generally low level of preparedness among respondents and highlighted a number of areas where improvement was necessary, but it did not investigate factors that determine levels of household preparedness. At the personal and household levels, ethnic and minority status, gender, language, socioeconomic status, social relationships, economic resources, age and physical capacity have all been identified as determinants of the tendency of people to take preparedness action (Mileti, 1999).

Similarly, statistics released by Ghana Electrical Contractors Association in 2011 showed that 50% of fire outbreaks that occurred in Accra between 2009 and 2010 were in the Central Business District, 30% of which were caused by improper electrical installation. All the above-mentioned points determine the level of preparedness of the people.

III. MATERIALS AND METHOD

- Sampling

The study adopted probability sampling techniques to help in the selection of elements in the population. In the probability sampling technique, the stratified

sampling was used to gain precision in the estimates of the characteristics of the whole population and also to ensure that subgroups which otherwise will have been omitted entirely by other sampling methods because of their small numbers in the population were included (Borg and Gall, 1989; Mugenda and Mugenda, 1999).

Therefore, 640 questionnaires was prepared and administered in the three different strata as shown in the Table 1 below. Data gotten from the focal group and personal discussions were also used to compare and add to the data gotten from the administering of questionnaires.

NOTE:

P_t = population projected

P_0 = initial population

r = growth rate

n = the number of time periods you are projecting forward.

Table 1: Sampling Frame of Bwari Area Council

Strata	Population 1991	Projected Population 2006	Projected population (P_s) 2014	Sample size	No. of questionnaires administered	No. of questionnaires filled	% of response
Low Density Area	8090	30708	62547	9335	93	89	95
Medium Density Area	11258	42733	87041	1291	130	128	97
High Density Areas	35892	136239	277500	4141	414	412	99
TOTAL (P_t)	55240	209680	427088	6374	637	621	97

Source: NPC (1991)

Table 1 shows the sampling frame of the study area with the percentage response of the questionnaires' administered.

- Methods and techniques of Data Presentation and Analysis

Data analysis was principally based on two statistical techniques. These techniques are:

- Frequency- Percentage Technique: This method is a conventional technique analysis questionnaire. Its suitability and relative ease of analysis and

interpretation were responsible for its choice. The entire questionnaires were painstakingly analyzed to make inferences and deduction from them. Tables consisting of the relevant responses were outlined to show at a glance the frequency and percentage of respondents who choose what options. Statistical calculations were done to determine the actual percentage in relation to the overall percentage. The results of the analysis were presented using frequency distribution table and pie charts.

b) ANOVA statistical technique to measure the difference of the means in the density areas.

IV. RESULT

TO EXAMINE THE FREQUENCIES OF FIRE INCIDENTS IN THE STUDY AREA BETWEEN 2004-2011

In the study area, there had been cases of fire outbreaks that led to loss of lives and property in increasing frequency in exception of one or two cases. According to the available data collected from the FCT Fire Service, Asokoro, for the period 2004 – 2011, it is certain that there are some basic factors responsible for the rate of fire outbreaks in the study area.

Table 2: Frequency of fire occurrence in the study area (2004-2011)

YEAR	NO OF FIRE OUTBREAKS	PROPERTY LOSS (N)	NO OF LIVES LOST
2004	18	10M	5
2005	9	6M	2
2006	11	10M	3
2007	23	100M	1
2008	17	72M	0
2009	37	90M	6
2010	49	102.7M	2
2011	53	155.5M	8
TOTAL	217	546.2M	27

Source: FCT FS, 2014

In examining the frequency of fire disaster in the study area, secondary data acquired from FCT Fire Service were analyzed based on the availability of data from the source. From Table 4.7, the study revealed that a total of 217 cases of fire outbreaks, 27 fatally injured and a property loss of 546.2M were recorded for the period 2004-2011. The year 2011 had the highest number of fire outbreaks in the study area with 53 cases of fire outbreak followed by 2010 with 49 cases while the year 2009 had the 37 cases. The year 2005 had the least number of fire cases which was 9, followed by 2006 with 11 cases and 2008 with 17 fire cases. It is a clear attestation of the fact that fire disaster is associated with loss of lives and properties of worrying proportion. In relation to those fatally injured, the year 2011 recorded the highest number of

8, the year 2009 had 6 cases while the year 2010 and 2005 had the lowest number of 2. The year 2011 had the highest property loss of 155.5M followed by year 2010 with a loss worth, 102.7M while the year 2005 had the lowest of 6M. Critically, looking at the increase in the number of lives and property lost as the year went by, this is only an indication that as the years passed, the population density increased which in turn influenced on the rate of fire outbreaks in the study area. In addition, as development occurred in the area, different types of activities such as commercial and industrial activities were introduced. The lack of urban management system only influenced the increased rate of fire outbreaks.

ASSESSING THE LEVEL OF FIRE HAZARDS AWARENESS AND PREPAREDNESS IN THE STUDY AREA

The Table below shows the corresponding questions asked to determine the level of the fire hazards awareness of the respondents in relation to their preparedness.

Table 3: Level of awareness and preparedness of respondents to fire hazards

S/N	ITEMS	Agree (%)	Disagree (%)
1.	Do you know fire can occur in your home	94.6	5.4
2.	It is right to put off electrical appliances when not in use	97.1	2.9
3.	It is advisable to cook inside the living room	5.0	95.0
4.	It is advisable to keep inflammable items inside the house	1.2	98.8
5.	It is necessary to know the appropriate body to contact when fire disaster occurs	95.4	4.6
6.	Where professional involved in construction of your building	25.3	74.7
7.	Do you have escape route in your house	17.3	82.7
8.	Do you have fire-fighting extinguishers	23.7	76.3

Source: Field Survey, 2014

Table 3 shows the response of the people on their level of awareness of fire disaster in the study area. The table revealed that a greater percentage of the people agreed on some of the items raised. Some of these items included their level of awareness on whether to put off electrical appliances when not in use in which it was recorded that 97.1% of them agreed that it is a good habit, others in this category are, contacting fire services authority in the time of fire disaster (95.4%), 25.3% sought the services of professional involved in construction of their building. However, all the respondents still agree that professionals should be engaged in the design and construction of their houses but for their income which is a hindrance. 17.3% of the respondents actually had escape routes in their house though majority of the respondents know the importance of having escape routes in their houses. 23.7% had fire-fighting extinguishers in the home to use in case of fire outbreak and others know the importance but for some reasons do not have them.

The Table also revealed the respondents in disagreement with some of the items raised on the list. Some of these items included having the experience of fire occurrence in their homes, if advisable to keep inflammable items inside the house and having fire-fighting extinguishers. The result on the table reveals that the respondents were still aware of some fire dangers in their immediate environment and the underlying consequences. This is an indication that the level of education of the respondents attained is good enough for them to be aware of the happenings in their immediate environment and prepare better since there is a direct link between fire hazards awareness and preparedness.

Table 4: ANOVA table depicting awareness and preparedness of respondents to fire hazards based on their education

	Sum of Squares	df	Mean Square	F	Significant
Between Groups	159.731	3	53.244	11.106	.000
Within Groups	1131.452	236	4.794		
Total	1291.183	239			

Source: Field Survey, 2014

Table 4 shows the ANOVA table which depicts the level of preparedness of the respondents to their fire hazards awareness based on the level of education of the respondents. The F calculated value of 11.106 at 3 degree of freedom between the groups and 236 within the groups when compared with the F table value of 4.61 shows an increase on the side of the F calculated, the result shows that there is no significant difference in the level of awareness of the respondents based on their level of education. The result indicated that fire hazard awareness in Bwari Area Council should be dependent on their level of education. Despite the fact that a higher percentage of the respondents are aware of fire hazards, it is expected their educational status makes a difference on their level of preparedness but otherwise is the case. Since the level of awareness of the study area is on the average, it is expected that their preparedness level should be on the average but reverse is the case. The study has revealed that their preparedness level is very low due to some other factors present in the study area.

Table 5: ANOVA table depicting preparedness of respondents to hazards based on income

	Sum of Squares	df	Mean Square	F	Significant
Between Groups	68.810	3	22.937	4.428	.005
Within Groups	1222.373	236	5.180		

Total	1291.	2
	183	3
		9

Source: Field Survey, 2014

Table 5 shows the ANOVA table which depicts the level of preparedness of the respondents to their fire hazards awareness based on the level of income of respondents. The F calculated value of 4.428 at 3 degree of freedom between the groups and 236 within the groups when compared with the table value of 4.61 shows a decrease on the side of the F calculated. This result implies that there is no significant difference in the preparedness level of the respondents due to their income. The study showed that majority of the respondent earn from 40,000 naira below monthly, this is an indication that their level of low income is a hindrance to their level of preparedness. However, it was expected that those who were average and high income earners ought to show a difference in their preparedness level but reverse was the case. This is to say that the low preparedness level of the study area is not a function of their income level.

TO ASSESS THE LEVEL OF FIRE HAZARDS AWARENESS AND PREPAREDNESS AMONG THE VARIOUS DENSITY AREAS

Table 6: Fire hazards awareness and preparedness among various density areas

S/N	ITEMS	Agree (%)	Disagree (%)
1	All hazards are man-made	23.3	76.7
2	It is possible to reduce the rate of fire occurrence	90.0	10.0
3	Living in this environment makes one vulnerable	86.2	13.8
4	Fire disasters should not be prepared for because they are not common in our community	10.1	89.9
5	Governments do not have to carry out	33.3	66.7

sensitization on fire hazard awareness

6	Fire disaster is an act of God what would be would be.	59.6	40.4
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Source: Field Survey, 2014

Table 6 revealed the perception of preparedness in the various density of the study area to fire hazards. The table revealed that there are lots of items that were positively perceived by the respondents based on the percentages of agreed to disagree. Some of the items that have positive perception are; reduction rate of fire hazard occurrence, living in a hazardous area makes one to be more vulnerable. It was also observed from the responses presented in the table that majority perceived preparation for fire hazard in the area as an important issue.

Table 7: ANOVA Table depicting level of awareness of respondents to fire hazards

	Sum of Squares	df	Mean Square	F	Significant
Between Groups	224.812	3	26.704	15.907	.000
Within Groups	396.183	236	1.679		
Total	620.296	239			

Source: Field Survey, 2014

Table 7 revealed the result of the Analysis of variance performed on the data collected on the awareness level of the respondents to fire hazards in the study area. The areas identified were High Density, Medium density and Low Density areas. The F calculated value of 15.907 when compared with the F table value at 3 degree of freedom between the groups and 236 within groups give a value of 4.61, this shows that the F calculated is greater than the F table, it implies that there is no significant difference in the awareness of the respondents based on where they lived. The implication of this is that where they lived played a greater role in their level of awareness. To find out which of these areas of density has the highest awareness level, a Post hoc test using the Scheffe verification was carried out. The result of the post hoc revealed that the respondents from the high density

area had the highest level of awareness. Respondents within the medium density still had an edge over Low density areas. In spite their differences in the level of awareness, their level of preparedness still remained the same. The three density areas still had a low level of preparedness. This study only showed that where they lived played no role in their level of preparedness. Therefore, there are other factors influencing the preparedness level in the study area.

V. SUMMARY OF RESULTS

From reviewed works, it was observed that the catastrophic nature of fire has been a global phenomenon. Physical observations and focal group discussions helped to confirm the results of the analysis of the data gotten from the field survey carried out in the study area. The study showed that majority of the respondents were educated adults striving hard for survival thereby engaging in different activities which makes them create fire hazards unknowingly or cause fire outbreaks. With majority of these respondents having a minimum of SSCE, it showed that their level of fire hazards awareness was average though their preparedness level is very low compared to their awareness level.

The study also showed that the density areas varied in their level of vulnerability to fire hazards/disaster. Fire hazards such as illegal wiring, sales of fuel wood/black market close to residential areas, use of sub-standard electric poles, erection of electric poles and transformers within residential buildings were found present in the areas especially the high and medium density areas as stated by Evans (2002). Interestingly, factors such as poverty, low level of awareness to the dangers of fire, presence of clustered buildings with continuous roofing and lack of professionalism in the design/construction of buildings triggered the occurrence or increase of fire outbreaks in the study area. Others include poor accessibility, close proximity of buildings and high population density. The above-mentioned factors were found to be so common in the high-density areas like Kubwa, Dutsen Alhaji and Bwari while in the medium density areas such as Kuduru and Ushafa, it was better off. Considering the low-density area such as Shere and Lower Usman Dam had a low level of vulnerability to fire hazards/disaster due to the absence of most of the

factors earlier discussed which could enhance the rate of fire outbreaks. However, the vulnerability rate of the study area varied in the three-area densities due to the population size, level of development and urban management.

Considering the general perspective of the respondents on fire, majority of the respondents from the three density areas agree that fire can occur in any place, anytime and to anyone. In both the high and medium density areas, the major causes of fire outbreaks were as a result of electrical surge, gas explosion, generator and careless handling of fuel. For the low-density areas, bush fires, careless use of candles, matches and cooking with fuel wood were the major causes of fire outbreaks in the absence of electricity. This difference was due to the fact that most parts of the low-density areas were not developed thereby reducing the chances of fire outbreaks. The study also found out that as the number of years increased, the number of fire outbreaks also increased as a result of the influx of people into the study area thereby introducing more commercial activities and the use of more electrical appliances becoming the order of the day.

The researchers found out that on a general perspective, the level of education and income had little or no influence on their preparedness level. This is due to the fact that other factors such as their negligence, nonchalant attitude or carelessness play a more delicate role in their preparedness level (Onuoha, 2009, Kristantio 2006).

CONCLUSION

The study revealed that the susceptibility of the study area to fire can still be reduced if absolute commitment can be shown by both the community and the government. From the study, it is obvious that majority of the residents of the study area had never been trained on fire safety but only had the opportunity of knowing the basics by chance. This in turn added to their susceptibility to the disastrous nature of fire. Factors such as the income and educational level of the people which could have been an added advantage added little or no impact. Therefore, their level of preparedness is not a function of their income and educational level. That is to say that the two factors had no direct link on their level of awareness and

preparedness. It was seen that attitudes such as negligence, ignorance, apathy, and poverty were the bedrock of most fire outbreaks. Thus, the lack of preparedness can be tackled only if the people are ready to learn and act. It was found that their age, occupation and marital status were not the major determinants on the level of preparedness of the residents of Bwari Area Council.

RECOMMENDATION

To achieve a well prepared community that is well aware of fire hazards in their communities, the following recommendations have been suggested:

- i. There is the need of fire hazards awareness program and drills to be organized in the study area with the community members carried along at least twice a year. Representatives from the different districts should be trained so as to work hand in hand with the Fire Service or NGOs. The program should cover schools, marketers, religious places and residential areas.
- ii. There should be enforcement of building codes, fire codes and proper supervision or inspection by the Fire Service.

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