



Assessment of Fire Safety Preparedness in Muhammad Abubakar Rimi Market (Sabon Gari) Kano, Nigeria

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ABSTRACT: The frequent occurrence of fire disaster in industrial and commercial buildings, shopping malls, and markets in Nigeria has become a serious threat to the nation's fragile economy. This research is aimed to assess the fire safety preparedness among the marketers in Muhammad Abubakar Rimi market (Sabon Gari) Kano. Interview and questionnaire survey were conducted to collect data about the level of fire safety preparedness among the tenants within Muhammad Abubakar Rimi market (Sabon Gari). A total of 396 copies of a questionnaire were distributed. A purposive sampling was used to select the market, a stratified sampling was used to stratify the marketers based on the flammability nature of the commodity they sell and availability sampling was employed to collect data directly from the respondent. The data was analyzed using statistical package for social science (SPSS) and presented in pie chart, bar chart, percentages and tables. The result from the analysis revealed that: Majority of respondents (78%) are not well prepared against fire disaster in the market and this is due to their lack of knowledge on fire safety, lack of knowledge and training regarding the use of fire extinguisher. In conclusion, level fire safety preparedness among the tenants is very low. The study recommends for integrated fire disaster management system involving all stakeholders for sustainable commercial activities in Muhammad Abubakar Rimi market (Sabon Gari).

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The frequent occurrence of fire incidences in shopping malls, shops, markets and commercial buildings in Nigeria has become a serious threat to the nation's fragile economy (Oluwaseun and Ojoye, 2019; Agbola, and Falola, 2021). Many major markets and commercial buildings have experienced several fire incidences destroying lives and properties worth several billions of Naira (Oladokun, 2010; Aning-Agyei, 2018). The socio-economic impacts of these accidents are aggravated by the fact that victims of such fire disasters, mostly are without adequate insurance cover. Fire Disaster has continued to force many markets to close down, render many jobless, damage the environment and disrupt economic activities of a state. As described by Channing (2014) fire is one of the most disruptive, destructive and

costly causes of damage to any building and yet fire doesn't just occur, it is caused by a human based factor according to Risk Management Services (2004). Fire is seen as the leading cause of loss of lives and properties at commercial and industrial facilities worldwide (Blank, 2016). The records of losses from fire incidences in Nigeria are so numerous (Addaiet et al, 2016) and this indicates that more work needs to be done by researchers to find more prevention and preparedness techniques. The market is a commercial place where buying and selling take place. many markets both in and outside Nigeria have recorded significant losses from fire; The case of the Kumasi central market fire in Ghana, while in Nigeria, we have the mile one market fire in port Harcourt, the Ariaria market fire in Aba, farm center market fire outbreak in

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Kano and Muhammad Abubakar Rimi market fire outbreak 2015 and so on. Fire outbreaks are rampant across the globe and where there is no adequate preparedness in terms of facilities and equipment to combat the fire, the fire gets the better of the local people and their property. In 2008 alone, the fire department in the United States of America responded to more than 500,000 structure fires which resulted into 2,900 civilian fatalities, 14,900 injuries and property losses in excess of \$14,000,000,000. (Mardzry 2011). Nigeria records 1000 fire deaths and 7000 fire accidents annually. This was disclosed at a public lecture at Ahmadu Bello University (A.B.U) by a disaster management expert, Professor Edwin Iguisi on the 4th April 2012. The Market is an economic institution that plays a vital role in the economies of a hosting communities and the nation as a whole. It also serves as an index of measuring the performance of urban environmental quality (Ibrahim, 2014). Most of the economic activities in developing countries, either originate from markets or terminate at markets. One of the problems facing the markets in Nigeria is the occurrence of fire disasters, and this is attributed to lack of knowledge about fire safety preparedness plan among marketers and other stakeholders. Many major markets have been gutted by fire disaster destroying lives and properties worth several billions of naira (Oladokun, 2010; Oluwaseun and Ojoye 2019). Market fires have become a regular occurrence in Lagos State in recent times. Between the years 2012 and 2013, the frequency was phenomenal. One remarkable market fire during this period was the 2012 Boxing Day in Jankara market fire, Idumota, Lagos. Also, in urban Africa, where most of the urban populace partakes in small-scale retail trading and other forms of commercial activities. Numerous studies have been conducted on fire outbreak aimed at identifying and classifying the causes of market fire in different commercial land uses in Nigeria for example. Nnamdi Ilodiuba (2017) results showed that the most common cause of market fire in Nigeria is “general storing” and this category attained a commonality ratio of 0.09284. Other causes of fire in markets included electrical installation which ranked second, while the third to the sixth in that order are, disposal and knowledge of market locations, market exit points, regulations regarding markets and awareness and fire emergency plan. On average, over the 15 years’ period, about 6 markets got on fire annually in Kano markets (Ibrahim, 2014). This entails the amount of wealth being lost annually; which if otherwise would generate, based on the spectrum of trading activities, about one and a half (1.5) equivalent profit. Kano metropolis being the second largest commercial center in Nigeria after Lagos and the most dominant commercial area in Northern Nigeria is engulfed with

the proliferation of numerous daily marketplaces that are distinct from one another in terms of mercantile commodities; scale of operation; planning attributes. Ahmad (2014) revealed that, frequent conflagratory fire outbreak is one of the leading factors affecting the growth and development of markets as well as the sustainability index of the entire Kano business landscape. An analysis of the records of fire outbreak from the year 2000 to 2014 showed that marketplaces in Kano metropolis have sustained a total of 88 incidences of fire outbreaks. Ahmad (2014) revealed that ‘the past incidences of fire outbreak in Kano markets have made over 200 traders in Rimi market alone out of businesses’. Based on the detailed records Rimi market almost every year sustained fire outbreak (13 incidences from 2000 to 2014). Similarly, the 18th January 2014 fire outbreak in Kwari market has destroyed over 1,000 stalls and hundreds of makeshift stands in 6 blocks of shops, resulting in the loss of billions of naira in goods and property. The intensity of the effect of disaster (such as fire) on any organization largely depends on the organizations prevention measures, mitigation measures, preparedness as well as recovery measures (Ngulube, 2005; Popoola, et., al. 2016). Therefore, protecting markets from fire disasters has been critical and important because fire disasters pose risk in terms of safety to marketers, building integrity, business interruption and the health of the community (Oladokun, 2010). The reduction in the risk of fire disaster in markets and other commercial buildings has been a significant goal for society that ought to be achieved through a better understanding of all the factors that contribute to fire disaster. Adequate knowledge of fire causes, prevention and preparedness is very important to all marketers. Thus, this study wishes to assess the level of fire safety preparedness among the tenants within Muhammad Abubakar Rimi market (sabon gari) with a view to influencing the formation and enforcement of fire safety preparedness policies and practices for sustainable commercial activities in the market.

MATERIALS AND METHODS

Study Area: Muhammad Abubakar Rimi Market is a large open air market located within Kano metropolis Sabon gari area of Kano state, Nigeria. It is one of the largest markets not only in Kano but also in sub-Saharan Africa, covering the area of about 36 hectares and hosting thousands of traders. Kano metropolitan area lies between latitude 11° 55'N to 12° 3'N and longitude 8° 27'E to 8° 36'E, with land area about 499kilometre square (Dankani 2010). Kano is 481 meters (1,578 feet) above sea level. The Kano metropolitan population projection by the UN Habitat (2008) was put at 4,489 million by 2020 and by 2025 it will grow

to 5,056 million inhabitants while the population density was put as 856 per km square in the pre urban areas to 8000 per km square in the metropolis with an expansion rate of 2 km square per annum between 1996 to 1981 (Falola 2002, Nabegu 2010, Maiwada 2014, Maigari 2014).

Research Design and Participants: Descriptive research design was adopted for this study. The population of the study comprised of all marketers in Abubakar Rimi (Sabon Gari) Market Kano metropolis Nigeria. The marketers were stratified into various stratum based on the commodity they sell and the population of the stratum were obtained and presented in table 1. Multiple stage sampling method was used in this research. Purposive sampling method was used to select Muhammad Abubakar Rimi (sabon gari)

market. Because the commodities sold comprises all other goods sold in other markets within Kano metropolis and its international importance. And stratify sampling was used in stratifying the market commodity based on the flammability nature of the goods as showing in table 1. However, availability sampling method was employed in selecting the available respondent (marketer) who wills to give the needed information for the research at the time of data collection. The number of questionnaire distributed at each stratum was determined according to the proportion of the stratum in the total population of the research as showing in table 1. The confidentiality of the respondents was protected so that, no names or personal information was required in the questionnaire and measures were taken to ensure no undue influence was exercised.

Table 1 Sampling Groups

Stratum	Population	Percentage	No of Questionnaire
Cosmetics	2700	8.3	33
Agro-chemicals	1200	3.7	15
Kitchen wires	500	1.5	06
Shoes/Bags/jewelries	2000	6.1	24
Electronics/Touch light/padlocks	2100	6.4	25
Furniture/metals	2000	3.7	24
Perishables	1400	4.3	17
Textile/Gwanjo /Zare	3500	10.7	42
TextBooks/ stationaries	1200	3.7	15
Provisions	3200	9.8	39
Food stuffs	900	2.8	11
Others	12000	36.7	145
Total	32700	100%	395

Data Collection Instrument and Procedure: The study employed questionnaire and structured participatory observations using a prepared checklist in the collection of information as well as interview. Authorization was sought from the directorate of Muhammad Abubakar Rimi (Sabon Gari) Market Kano. The questionnaire was designed in three main parts. Part A relate to the general information about the respondents socio-demographic characteristics. Part B aimed to measure the knowledge of marketers (respondents) regarding essential fire safety preparedness and part C also captured their awareness and preparedness on fire safety within the market. The questionnaire was used to obtain both qualitative and quantitative data from the targeted respondents. A pilot study was conducted at Rimi Market Kano metropolis Kano state to measure the validity and reliability of the research instrument as this has some of the highest incidences of fire incidences in Kano markets. The pilot study targeted a sample size of 25 respondents in which all of them filled the questionnaire making a response rate of 100%. Primary data collection was conducted by the researcher over a period of eight weeks. The data collected for this study were subjected to various

statistical analyses using the computer based software Statistical Package of Social Sciences (SPSS). The results of the analyses are presented in the form of tables and graph for the purpose of easy comparison and clear expression of the findings.

RESULTS AND DISCUSSION

A total of 396 copies of a questionnaire were administered randomly by availability sampling technique to the various respondents proportionately within each stratum in Muhammad Abubakar Rimi market. But, a total of three hundred and eighty-eight copies were retrieved adequately filled by the respondents (marketers) giving a percentage response of 97%.

Socio-Demographic Characteristics of Respondents: In order to establish the various issues in fire safety preparedness at Muhammad Abubakar Rimi market, socio-demographic variables such as education, age, and gender were collected and analyzed as shown in the table 2. In total, there are more male respondents (80.2%) than female (19.8%). According to OSH (2007) more men than women work in jobs that expose them to high risks.

Table 2. Respondents Socio-Demographic Characteristic

	Frequency	Percentage (%)
Sex		
Male	311	80.2
Female	77	19.8
Total	388	100
Age group		
18 – 27	107	27.6
28 -37	107	27.6
38 – 47	84	21.6
48 – 57	53	13.7
Above 57	37	9.5
Total	388	100
Educational Status		
Never	32	8.2
Adult	45	11.6
Primary school	36	9.3
Secondary	96	24.7
College/Polytechnic	97	25.0
University	82	21.1
Total	388	100

Source: Field work 2019

Likewise, in this case when it comes to fire safety preparedness, men will play a vital role compared to women. Most of the respondents were within the age group of (18-27 and 28-37) years which constituted more than 50% of the total respondents. According to Owen (2011), age of the respondents has a significant influence in responses given in descriptive studies. It

is expected that, those with average age of 18-40 years should have adequate knowledge on fire safety and preparedness as well as effective response in case of emergency to fire outbreak. It is also seen that, less than 20% of the respondents did not attend school. This variation in education level ensured varied responses which richly contributed to getting very valuable information for the study. Ideally the level of education should determine the level of fire safety preparedness and vice versa.

Knowledge on Fire Safety Preparedness: The objective of this study is to assess the level of fire safety preparedness among markers (tenants) in Muhammad Abubakar Rimi market. In order to achieve that, several yes/no questions were presented to the respondents.

Fire safety preparedness started from the market building which must be approved from relevant departments such as fire service, shop registered with the market fire service, knowing the regulations and legislation regarding fire safety in Nigerian markets (Alabi et al., 2022), fire safety policy in the market and so on as presented in table 3.

Table 3: Respondents Safety Knowledge

Variable	Response	Frequency	Percentage (%)
Building plan approval	Yes	71	18.3
	No	317	81.7
	Total	388	100.0
Shop registered	Yes	62	16.0
	No	326	84.0
	Total	388	100.0
Safety regulations	Yes	108	27.8
	No	280	72.2
	Total	388	100.0

Source: Field work 2019

When respondents were asked whether they are aware that it is mandatory for the market building to get approval from relevant departments such as fire service and LGA before its construction, it was only 18% of the respondents are aware while 82% of the respondents were not at all. The shops within the market should be registered with the close fire station available, but when asking about registration of the shop to the fire station, 84% of the respondents did not register with the fire station.

It is revealed that, most of the marketers or respondents did not know the advantage or importance of the registration with the fire station only 16% were aware of the advantage. When the shop is registered some information about the shop is recorded such as the products either stored or sell in the shop. This would enable the fire service personnel to quickly

identify the class of the fire which may likely or accidentally occur in that shop and come up with the appropriate equipment to quench that fire (Oluwaseun and Ojoye 2019).

In every working environment commercial buildings like markets included must have legislations or regulations guiding fire safety. When the respondents were asked whether they are aware of such legislation guiding fire safety in Nigerian markets 72% of the response was no. meaning the respondents were not aware of such regulations while 28% of the respondents were aware of the legislation.

Knowledge on Fire Extinguisher: Some questions were asked to test the knowledge of marketers (tenants) whether they have knowledge on how and

when to use fire extinguisher. The result is presented in the table 4.

Table 4. Knowledge on Fire Extinguisher

Variables	Response	Frequency	Percentage (%)
Fire extinguishers provided	Yes	18	4.6
	No	370	95.4
	Total	388	100.0
Confidence in Using fire extinguisher	Yes	98	25.3
	No	290	74.7
	Total	388	100.0
Properly charged and pressurized	Yes	34	8.8
	No	354	91.2
	Total	388	100.0
Regularly serviced	Yes	43	11.1
	No	345	88.9
	Total	388	100.0
Practical training	Yes	66	17.0
	No	322	83.0
	Total	388	100.0
Fire Safety Policy Awareness	Yes	43	11
	No	345	89
	Total	388	100.0
Familiarity to the policy	Yes	16	4
	No	372	96
	Total	388	100.0

Source: Field work 2019

This result showed that, there is lack of knowledge on fire extinguisher and how to use it when there is fire at its incipient stage by the marketers. It is detected that 95.4% of the marketers have no fire extinguisher in their shops. However, 25.3% of the respondents knew how to use the fire extinguisher but they do not have it

in their shops while a great percentage (74.7%) has no knowledge on how to use it.

Fire Safety Policy Awareness: With respect to knowledge on market fire safety policy, only a few of the respondents (10.8%) reported that Muhammad Abubakar Rimi market had fire safety policy while 88.9% had no idea about the existence of such policy. A spot check conducted by the researcher however revealed that, there are no fire policies in place but only fire safety procedures which are not strategically placed. Several research recommended that any disaster preparedness plan (fire incidence) must have adequate resources that have been communicated and readily available and all vulnerable persons should be aware of workplace safety policy (markets included) (Oluwaseun and Ojoye 2019; Salvano, 2002; Oteng-Ababio et. al. 2015). It is clearly seen that only 11% of the respondents know about fire safety policy in Sabon Gari market while 89% of the marketers are unaware of the safety policy of the market. When furthered the investigation to find out if those who are already aware of the safety guidelines of the market are familiar with the policy, the result showed that 96% of the respondents are not familiar with the Muhammad Abubakar Rimi market fire safety (policy) /guidelines. *Awareness to fire safety symbols and Designated Place for Certain Activities:* A question was set to determine if the markers (tenants) are familiar with the market fire safety symbols and some designated places for some activities which may cause fire in the market such as smoking, restaurant, welding etc. the responses is presented in figure 1 below.

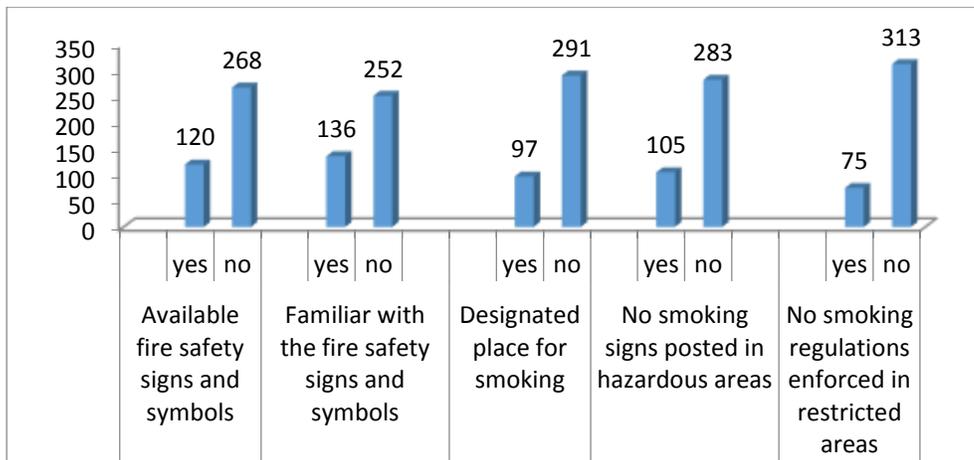


Fig 1: Symbols and Designated Place for Certain Activities

From figure 1, it is understood that more than half of the respondents (69.1%) are not aware of the fire safety symbols but about 30.9% of the respondents confirmed the availability of the fire safety symbols

around Muhammad Abubakar Rimi (sabon gari) market. However, those who confirmed the availability of the fire safety symbols around the market only 35.1% of them are well aware and familiar

with the symbols but 64.9% of them are not familiar with it because they did not know what some symbols are all about. Smoking everywhere in Sabon Gari market can be very dangerous which can easily cause fire outbreak especially in hazardous areas like cosmetics and agrochemicals due to the high flammability nature of the products (Mtani and Mbuya, 2018; Okon, and Njoku, 2018). For this reason the study respondents were examined to know whether they have designated area for smoking, no smoking symbols in hazardous areas as well as no smoking regulations enforcement in the market. 25% of the respondents argued that yes there is some designated place for smoking and some of them suggested the public convenience in the market is where the smokers use for their smoking purposes while 75% of the respondents said no there is no any place designated for smoking in the market at all. Some hazardous places in the market has no smoking signs clearly posted so as to prevent fire as a result of smoking. Here about 27.1% argued that the no smoking symbols are posted while 72.9% of the marketers said no symbols of that nature are posted even at hazardous areas. 80.7% of the respondents also argued that the no smoking regulations are not enforced in the market and even at the hazardous areas only 19.3% of the respondents have different view. The research was limited to Muhammad Abubakar Rimi market (sabon gari). Therefore, a research that will involve other markets within Kano metropolis and other states will be recommended. Also, there is need for further research to assess the response to the market fire outbreak from the tenants, market management and government.

Conclusion: The above finding shows that, in Muhammad Abubakar Rimi market (sabon gari) the level of knowledge of fire disaster preparedness by the respondents is very low. The respondent's awareness to fire safety guidelines of the market, their knowledge to fire extinguisher both maintenance and use is also very low. It was also concluded that carelessness of the marketers (tenants) and religious beliefs as well as little knowledge about fire safety are the main factors affecting fire safety preparedness in the Muhammad Abubakar Rimi market (sabon gari) because it happened in 2016 where huge amount of money and properties were lost in Muhammad Abubakar Rimi market (sabon gari) Kano. Therefore, the study recommends for integrated fire disaster management system involving all the marketers, market association as well as the market fire service station. The market management should have clear policy guidelines on fire safety preparedness in the market and strict supervision of the market place on adherence to the

rules and regulation should be developed and implemented. The market fire service station in collaboration with the state fire service should develop a standard fire safety training program in order to harmonize the information that is disseminated to the marketers not only in Sabon Gari market but also to other markets within Kano metropolis.

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