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Evaluation of Proactive Fire Disaster Measures by Property Managers in Low-Rise Residential Houses in Minna, Nigeria

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This study was carried out to evaluate proactive fire disaster measure in low - rise residential properties. The objectives amongst others include establishing the occurrence of fire disaster in low rise residential properties in Minna and examining the measures put in place to reduce the extent of loss and the level of preparedness and or awareness amongst managers and occupants of residential properties against fire disaster. Primary and secondary data were collected from the Niger state fire service, the property managers and the occupants of the residential apartments. A total of 200 questionnaires were administered using stratified random sampling among occupants of low-rise residential buildings. A focused group discussion was also conducted with Officers of fire service. It was found that although the awareness of fire and its devastating effect is known, no proactive measure is in place to mitigate fire disaster. It was recommended that there is need to put in place proactive measures like the use of fire alarm, smoke detectors and fire extinguishers in residential buildings. The capacity of the fire service must also be revamped for effective service delivery.

Key words: fire safety, fire alarm, management, occupants, surveyor.

Introduction

Fire is very important in the growth of human society, and it has become an important part of human civilization. Among different types of disasters, fire constitutes a momentous threat to life and property in urban and rural areas. In Nigeria, Segun (2015) reported that the country losses about 50 Billion Naira every year to fire disaster. Society has responded to the threat of fire in buildings in many ways, including fire department intervention, insurance, building regulations, education on fire hazards, controls on the use of materials and products in buildings, and the design of buildings to resist the effects of fire, but fire continues to burn. A growing concern is how to take appropriate fire risk management measures in buildings, to prevent and control potential fire accidents, reduce the casualties and losses of

accidents, and ensure building safety.

Fire disaster remains one of the major risk residential properties are prone to. A fire tragedy will not only involve damage to property but also to life. This is in spite of the transformation drive towards a safe and secured environment. This trend is unacceptable as a lot more can be done to reduce this fire disaster in our country in the face of dwindling oil revenues and housing deficit. The study therefore seeks to evaluate the measures put in place to curtail fire disaster and prevent loss to live and damage to properties in Minna. The study seeks to evaluate the proactive measure put in place by occupants and property managers of low rise residential buildings to reduce the risk and consequences of fire outbreak in Minna.

Concept of Fire Safety in Buildings

Fire safety is the lessening of the apparent harm to life as a result of fire in buildings. Rasbash *et al* (2004), defined fire safety as goals that are aimed at fire prevention, fire control occupant and protection, which normally can be in the introductory sections of building codes and other fire safety legislation. Although the potential for being killed or injured in a fire cannot be totally eliminated, fire safety in a building can be achieved through proven building design features intended to minimize the risk of harm to people from fire.

Designing a building to make certain minimal risk or to meet an approved level of safety from fire is more complex than just the simple thought of what building materials will be used in construction of the building (Grant, 2010). Canadian Wood Council (CWC, 2000) stated that fire safety is the reduction of potential for harm to life as a result of fire in buildings. The Council further said that the number of deaths in building fires will appreciably dropped due to increased use of smoke detectors, improvements in electrical and heating systems and changes in life-style habits of habitants.

Fire Risk Assessment in Buildings

Fire risk assessment in buildings comprises three steps of fire risk identification, fire risk analysis, and fire risk evaluation. Fire risk identification is the methodical process to identify how, when, and why fire could happen. Fire risk analysis is the process of estimating magnitudes of consequences and probabilities of the adverse effects resulting from fire in a building (Hasofer *et al* 2006). The end result of fire risk analysis is expressed either in qualitative, mixed or quantitative terms depending on the type of risk, the purpose of risk analysis, how detailed the analysis is to be and the information resources available. Fire risk evaluation then involves applying the developed risk criteria and making a decision about the level of fire risk. Fire risk treatment is the process of improving existing risk controlling measures, developing new risk controlling measures

and implementing these measures to reduce fire risk. (Bedford & Cooke, 2001). Therefore, fire risk analysis is only one part of fire risk management process, and it serves as the groundwork for regulatory decision-making on whether to take actions to reduce risk or choose appropriate risk treatment measures.

Causes of Fires in Residential Houses

Research has indicated that older houses are often linked with fire injuries (Shai & Lupinacci, 2003). They opined that older houses were built when there was less demand for electricity, and therefore have fewer original electrical outlets. Occupants sometimes compensate by overloading an outlet or by using extension cords. If extension cords become frayed or overloaded, they can constitute a fire hazard. This may not be true on a general basis but rather for fire whose source is electrical. However, there is a consensus among researchers about the major causes of fire in residential buildings to include failure of occupant to follow necessary safety precaution against fire outbreaks in a building, simply termed carelessness. The fire from this source starts from a point and continue to spread around the building if not quickly controlled. Makanjuola *et al* (2009) enumerated causes of this source to include, careless handling of combustible materials like matches and lighters, indiscriminate disposal of cigarette stump by smokers and children playing with matches and other glowing splint who may throw it in a corner and when it comes in contact with other element of fire it consequently result in fire outbreak. Also, careless handling of ignitable substances is a common source of domestic and industrial fire. The storage of liquids like petrol which is a common place in our society causes a lot of fire in residential buildings.

Makanjuola *et al* (2009) opined that accident is an unplanned event, which has the capacity to cause injury or damage, and is attributed to either unsafe act or an unsafe condition such as faulty electrical equipment and wiring system on fans, air-

conditioner, lighting fittings and power fittings often cause fire in buildings. Accidents could also include fire spreads from adjacent buildings which can affect another building if not properly checked, indiscriminate burning of bushes or debris especially where there is wooden electric pole.

Another source of common of fire outbreak is willful act or arson which is a deliberate act of people to cause fire outbreak. This type of fire is very difficult to control (Aqua group, 1985).

Fire Safety Awareness and Management

Fire safety awareness can be achieved by employing basic training of building occupants about the possible causes of fire, use of fire fighting equipment in the building, the evacuation procedure, and possible fire attack procedure. Makanjuola *et al* (2009) mentioned the scope of fire safety management to include regular maintenance of the warning system, regular maintenance of the direction and escape signs, regular maintenance of fire appliances, maintenance of unimpeded escape routes, training of staff and occupant in evacuation on procedures and training of staff and occupants in first aid fire fighting. Some common fire safety appliances are portable fire extinguisher, fire alarm emergency lighting system, fire exit, fire safety signs, flame dictator, fire bucket, smoke detector, and heat detector.

Study Methodology

Niger state is one of the federating states in Nigeria. The state has a population of about 3,959,249 (NPC, 2006). Minna the state capital and the town in which the study is carried out. Structured questionnaires were used to gather information from the professional Estate Surveyors and Valuers practising in Minna, the occupants of the houses under the care of professional management of Estate Surveyors and the fire service personnel who are in charge of fire management and control. Nine (9) questionnaires were also administered on registered property firms operating in Minna out of which seven (7) or 78% were returned. A sum total of 2005

properties were under the portfolios of the seven firms that returned their questionnaires. 10% of these properties numbering two hundred (200) were sampled and questionnaires were administered on the residents of houses using stratified random sampling technique. One hundred and eighty (180) or 90% questionnaires were returned. The researcher also had a focused group discussion with the officers of Nigeria fire service Minna. Simple descriptive statistics are used to present the results.

Presentation of Data and Discussion of Result

This result was obtained from a focused group discussion with the Chief Superintendent Niger State Fire Service and some firemen indicated that the Niger State Fire Service was established in 1977, with the responsibilities of fighting and controlling fire in Minna and its environs. The State Fire Service confirmed that there was an average of twenty (20) fire incidences on monthly basis in Minna. The chief course of fire was electrical faults and carelessness from the use of candle and other fire promoting materials.

It was discovered that there were inadequate fire engines and few that were available were in very bad state of disrepair. There was also the problem of inadequate manpower. The fire engine which is supposed to be manned by at least fifteen (15) personnel broken into teams of fighters, rescuers and salvagers had only four personnel to man it.

There was also the problem of training and demonstrations. The routine demonstration that is supposed to be carried out by men of the fire service with the fire engines was not possible because of lack of water. In the case of any distress call, the fire engine had to travel a distance of almost eight kilometres from the office most times to the water board to get water.

The fire service lacked basic fire support equipment like fire ambulance which is supposed to convey victims of fire disaster that sustains injuries or bums to the

hospital.

Table 1 above table shows the level of responses to the questionnaire administered. 180 out of the 200 questionnaires administered to the respondents were returned representing 90% success. Also out of the 9 questionnaires distributed among the practicing surveyors, 7, representing 78% were returned and analysed.

awareness on both the part of residents and Property Managers in Minna. 180 respondents indicated that they are aware of fire incidence in Minna. A total of 7 surveyors who responded to this question equally agreed to be aware of the incident of fire disaster in Minna. This shows that there is no ignorance in the issue of fire incidence.

Figure 1 above figure shows the level of

Table 1 Response Rate to the Research Instrument

Target Questionnaire	Number administered	Number and % received	Number and % unreturned
Resident	200	180(90%)	20(10%)
Surveyor	9	7(78%)	2(22%)
Total	209	187(89%)	22(11%)

Source: Field Survey, 2014.

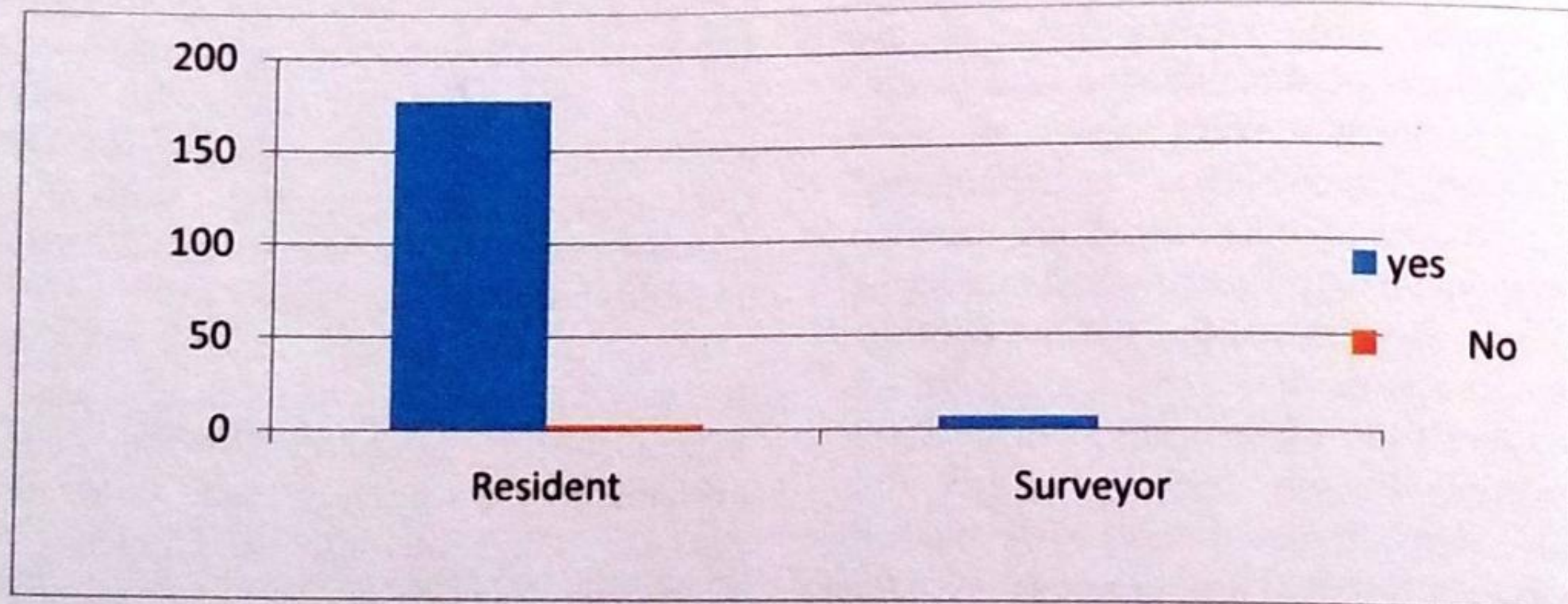


Figure 1: Awareness of Fire Disaster Occurrence

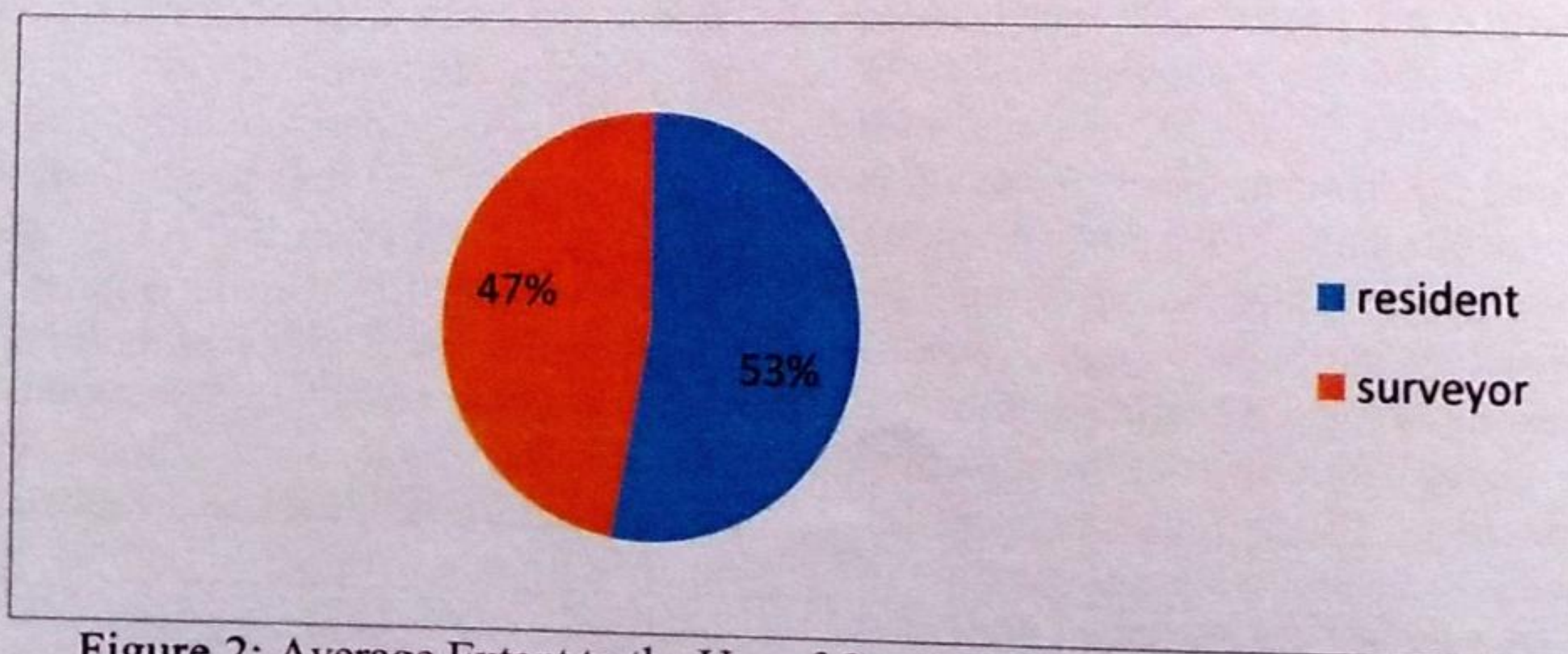


Figure 2: Average Extent to the Use of Combustible Materials in Building

Figure 2 shows the level to which combustible materials are used in the

building construction. While the mean estimate from residents is put at 45%, the mean estimate from surveyors is put at 40%. This shows that there are combustible materials used in the construction of the building. The mean of the two shows that to very large extent, combustible materials are used in building construction.

Table 2 above shows that four of the commonest fire preventive measures to be put in place as measures against fire disaster have not been put in place.

Table 3 above shows the opinion of both the

management surveyors and the residents of the houses. 100% of the surveyors said there was need for proactive measures and 100% of residents equally said there was need for proactive measures also.

Figure 3 above shows that 71% of the surveyors advised their principal on the need to put in place measure that can prevent fire occurrences or help mitigate same while 29% of surveyors did not tell their principal anything about measure to prevent fire.

Table 2 Assessment of Measures Put In Place In Case of Fire Disaster

Target Questionnaire	Material For Fire Prevention	Resident Responses		Target Questionnaire	Surveyor Responses	
		Yes	No		Yes	No
Residents	fire extinguisher	0(0%)	180(100%)	Surveyors	0(0%)	180(100%)
	Fire alarm	0(0%)	180(100%)		0(0%)	180(100%)
	Smoke Detector	0(0%)	180(100%)		0(0%)	180(100%)
	Fire Bucket	0(0%)	180(100%)		0(0%)	180(100%)

Source: Field Survey, 2014.

Table 3 : Necessity for Proactive Measure in Fire Disaster

target questionnaire	Yes	No
residents	180(100%)	0(0%)
surveyors	7 (100%)	0(0%)

Source: Field Survey, 2014.

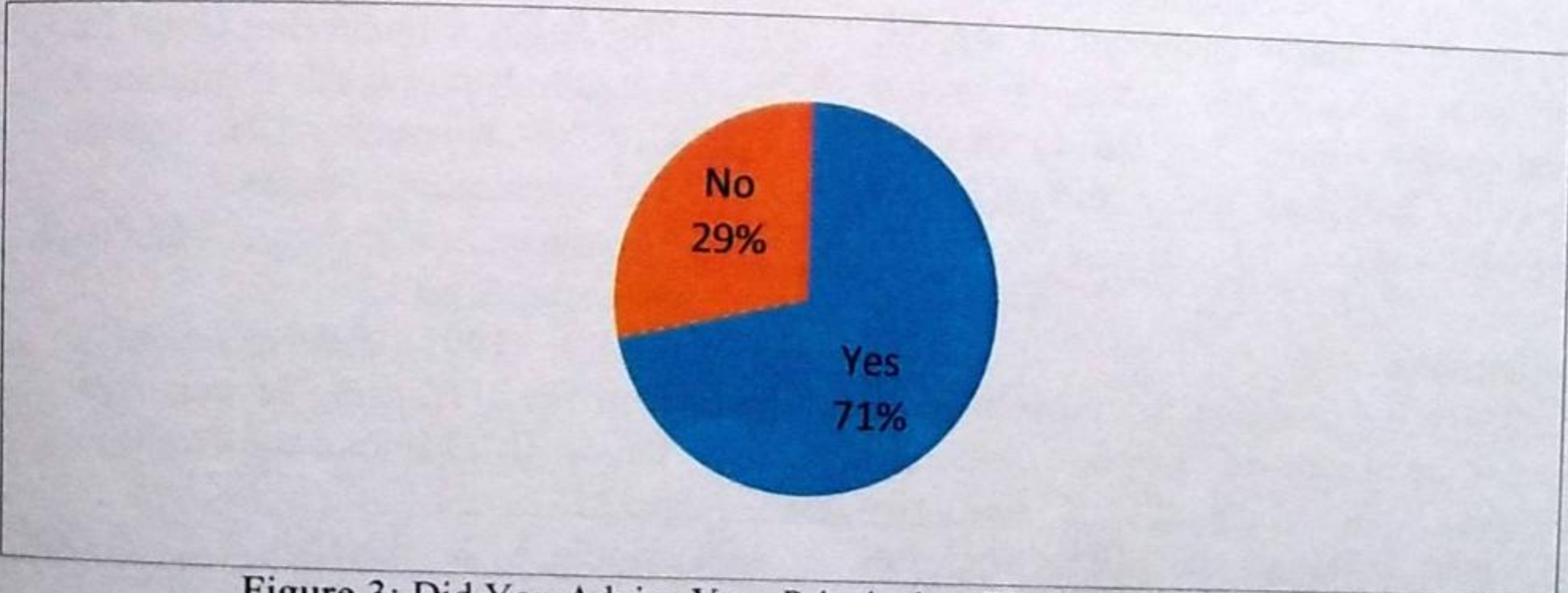


Figure 3: Did You Advice Your Principal on Fire Issues Yes or No?

Discussion of Results

The result of the questionnaire distributed

showed that both the management surveyors and the occupants of low-rise residential buildings are fully aware of fire incidences and their prevalence with such buildings. It was gathered from the Niger state fire service that there is an average of twenty fire incidences occurred on a monthly basis in Minna involving residential buildings and offices.

It was also established that there are fire supporting materials both in the construction of the buildings and among the loads of the residents thereby increasing the vulnerability to fire of these sets of buildings, as such preventive measures should be put in place. The research showed that there are no efforts put in place by either the management surveyors of these properties or the occupants of these properties to help fight or mitigate a fire disaster if it occurred. All the buildings under survey showed that they had no fire extinguishers, no smoke detector, no fire alarm or fire buckets that are handy in case of fire incidence. The research showed a gross non preparedness on the part of managers or residents of the residential buildings in the case of any fire incidence. A fire engine which is supposed to be manned by at least fifteen (15) personnel comprising of fighters, rescuers and salvagers is manned by only three to four personnel if it ever succeeds to go out on operation. The fire station equally lacked fire ambulances which are to convey victims of fire disaster with burns and injuries to the hospital. One major challenge of the fire service is accessibility. Lack of proper development control has led to blocked access to buildings under fire in many neighborhoods.

Conclusion

The study has assessed the proactive fire disaster management measure amongst managers and occupants of low rise residential buildings in Minna and has discovered that all the properties studied have no fire prevention plans in place. Installations like fire alarms, smoke detectors, smoke alarms, fire extinguishers are not available. It was discovered that the

professional property managers have not equally done much to educate their principals on the need to have these equipment in their buildings. The occupants of the buildings who are aware of the possibility of fire outbreak are not prepared to prevent or fight fire.

Recommendations

In view of the findings of this research on the proactive measure put in place against fire incidences, there is need to enforce the use of fire preventive measures in residential houses since the consciousness is there. The use of fire extinguishers, fire alarms, smoke detectors and sand in buckets should be made a mandatory in all residential buildings in Minna. Fire preventive measures should be placed at strategic intervals around the bedrooms on the ceiling or high on the walls but not in the kitchen.

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