

ASSESSMENT OF THE IMPLEMENTATION OF FIRE PROTECTION REGULATION ACTS IN PUBLIC BUILDINGS IN KANO METROPOLIS

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Abstract: The study was designed to assess the implementation of fire protection regulation act in public buildings in Kao Metropolis. Two research question and two null hypotheses guided the study. Descriptive survey research design was used for the study. The target population for the study comprises of 378 subjects 150 Building Facility Officers, 139 Fire Service Staff and 89 Local Building Officers. A purposive sampling technique was used to choose public building with high records of fire outbreak and mass population density of people in carrying out their day to day activities. The instrument for data collection is a structured questionnaire titled "Questionnaire on Assessment of the Implementation of Fire Protection Regulation Act in Public buildings (QAIFPRAPB)". The questionnaire was validated by 3 experts. One (1) Lecturer in the Department of Industrial and Technology Education, Federal University of Technology, Minna and Two (2) Chief Fire Officer from Municipal Local Government, Kano State Fire Service Headquarters in Kano State. Crónbach Alpha statistic method was used to determine the internal consistency of the instrument to be 0.89. Data collected for this study was analyzed using mean, standard deviation and ANOVA. Mean will be used to answer the research questions while ANOVA will used to test the hypotheses at 0.05 level of significance. The findings of the study revealed that the fire protection regulation requirements on the issuance of fire certificate to put up public building in Kano Metropolis are moderately implemented while few aspects were not implemented and also revealed that the fire protection regulation on the provision of fire fighting equipment in public buildings in Kano Metropolis moderately implemented. Although the finding also showed few of fire protection regulation on the fire fighting equipment were not implemented. It was recommended that the fire service staff, local building inspectors and building facility manager should ensure that no construction of any public building without issuance of fire safety certificate in Kano Metropolis and government should ensure that no public building is put to use without adequate fire-fighting equipment as stipulated in the fire protection regulation act.

Keywords: Assessment, Implementation, Fire Protection Regulation Acts, Public Buildings

Introduction

Fire protection regulation act is an act which provides for public or residential building the regulations for fire safety, services and protections in buildings which is about to be or has been put up and is to be used as residential, office accommodation, factory or public place or any other place to which the public have access to. The requirement of the fire protection act as provided in the Kano State of Nigeria Gazette (1986) includes: all the buildings shall be built detached and apart from other building, all the walls of corridors, circulation areas and stairs cases shall be built with fire resistant materials such as concrete, cement block or burnt brick, all the doors of the building shall be made of fire resistant and smoke free resistant, all the building shall be equipped with reasonable number of fire equipment for fighting fire such as rising mains, carbon dioxide fire extinguisher of not below 2.5kg, 3 feet by 3 feet fire blanket provided in the kitchen, dry powder fire extinguisher of not below 9kg, hose reel tubing system and all building shall here fire alarm system in the building.

Despite the fire protection regulation act in Kano State, reported cases of fire incident with loses of individuals, group of individuals and properties are being recorded. This may be unconnected to the implementation of fire protection regulation act in public building in Kano State. Woon and Mohd (2015) opined that poor implementation of fire safety management lead to numerous injuries and fatalities in public building.

Public buildings are buildings use for day-to-day activities such as our post offices, courthouses, government agencies, markets, libraries, places of worship, and other civic institutions that are often impressive but uninviting. Public buildings can be so much more deserving to the communities it serves, places that support everyday public life, places that bridge cultural and economic differences and places for public celebration (Lin, 2005). Public building is often open to public during business hours, they includes building that provide facilities or shelter for public assembly, buildings used for educational office or institutional purposes, hotel, motel, sport arena, supermarket, transportation terminal, retail store, restaurant or other commercial establishment which provides services or retail merchandise and so many other. These types of public building that enclose human and their properties can be seen in Kano Metropolis with likelihood of either little or none consideration of fire protection regulations.

Fire kills people every year than any other force of nature (Wahab, 2015). Fire is the rapid oxidation that occurs if a material in the exothermic chemical process of combustion results in the emission of heat, light and various reactive products (Wahab, 2015). Fire starts in different ways and can serve as a potentially destructive force in peoples' lives (Supermedia, 2011; Wahab, 2015). Fire normally takes place without any warning. When this happens, building occupants are restricted in the amount of time they have to either extinguish the fire or to escape (Salleh and Ahmad, 2009). Lawal (2015) who reported that, the incident of fire outbreak in public facilities in Kano Metropolis is the increase in almost every year about 5 to 6 cases averagely and these affects human lives, health and safety, damage to or loss of property and severe interruption to normal business activities or opportunities.

The fire regulations set up standards for the issuance of fire safety certificate for purpose of fire protection measure before the construction of any public building. But how effective this section of the regulation act is being carried out still remain undetermined. This building permit serves as a green light in housing development schemes. Hence, without the requisite consent from the relevant local authorities, no housing development can legally take place (Hammah and Ibrahim, 2014). The provision of fire fighting appliances in public building as stipulated in the regulations serve as first measure in controlling the spread of fire outbreak. In the view of Ajao and Ijadunola (2015) fire fighting equipment prevents the fire from spreading further, brings down the temperature and reduces smoke levels and thereby allowing the occupants to escape easily. There is an increased possibility of high risk of fire in some public building due to the activities and number of users involved in the building such as factories, educational institutions, market premises, hotels, warehouses and departmental stores hence the fire prevention act of Kano State specified regulations governing fire management. High rise buildings (storey) often hosting reasonable numbers of dwellers have become increasingly more common in the metropolis during the last few years. The combination of the dwellers activities within the same building as well as an increased possibility to antagonistic fire attack creates problems for fire safety.

Della-Giustina (1999), stressed that developing and implementing fire safety management can bring a lot of benefits which include reducing property insurance premiums, preventing business interruptions, boosting customer service and public images, fostering an efficient work environment, realizing quality gains and impacting the profitability of the public facilities. From the foregoing, it is obvious that there is no conclusive argument on the implementation of fire protection regulation act in public building in Kano Metropolis. Therefore this study set out to evaluate the implementation of the of fire protection regulation act in Kano Metropolis.

Statement of the Research Problem

It is expected that occupant in the case of fire incident in a public building escape with less difficulties and some of their belongings. But that is not the case as reported by Fire Disaster Prevention and Safety Awareness Association of Nigeria (FDPSAAN, 2018) noted that, incessant fire outbreaks in public building in the country has cost the national economy about N6 trillion between 2012 and 2017, while on annual basis, Nigeria is said to be losing about N50 billion and many lives.

Supporting FDPSSAAN report is Kano State Fire Service annual report which indicated that they have received 108 distress calls on fire incident within 2011 to 2017 from tertiary institutions, hospitals, market/shopping malls, public offices premises and Hotels within Kano Metropolis. This has confirmed the high increase of fire outbreak in Kano Metropolis. For example the reported case of fire incident in May, 2014 which razed the entire last floor of a three-storey building at No. 1 Warri Road, Sabon Gari, Kano Metropolis. Also in September, 2016 separate infernos within different time engulfed Gwammaja market and a two storey building in Tarauni district area. In 2016, Kantin Kwari market. In 2017, Sabon gari market and recently in 2019 Kano State University of Science and Technology, Wudil. Even though fire protection regulation acts of Kano State Government has been in place since 1985, the high record of fire outbreaks in Kano Metropolis may not be unconnected to the implementation of fire protection regulation act in public building in Kano Metropolis. Hence, the need to evaluate the implementation of fire prevention regulation acts in public buildings in Kano Metropolis.

Purpose of the Study

The purposes of the study are to determine the extent of implementation of;

1. The fire protection regulation act requirements on the approval of public building plan for the issuance of fire certificate before the construction in Kano Metropolis
2. The fire protection regulation act on the provision of fire fighting equipment in public buildings in Kano Metropolis.

Research Question

This study will provide answers to the following research questions;

1. What is the extent of implementation of the fire protection regulation act requirements on the approval of public building plan for the issuance of fire certificate before the construction in Kano Metropolis?
2. What is the extent of implementation of fire protection regulation on the provision of fire fighting equipment in public buildings in Kano Metropolis?

Hypotheses

The following null hypotheses will be tested at 0.05 level of significance:

- H_{01} There is no significant difference between the mean ratings of fire service staff, local building inspectors and building facility manager on the extent of implementation of The fire protection regulation act requirements on the approval of public building plan for the issuance of fire certificate before the construction in Kano Metropolis.
- H_{02} There is no significant difference between the mean ratings of fire service staff, local building inspectors and building facility manager on the extent to which the provision of fire fighting appliances based on fire protection regulations act are being implemented in public buildings in Kano Metropolis.

Methodology

Descriptive survey research design was used for this study. The study was conducted in Kano state, Nigeria. Kano State is situated in the North-West geo-political zone on Latitude of 2.25' east and longitude 7 and 13.4' north (Kano Master Plan, 2000). The target population for the study comprises of 378 subjects 150 Building Facility Officers, 139 Fire Service Staff and 89 Local Building Officers/ Purposive sampling techniques was used to choose public building with high records of fire outbreak and mass population density of people in carrying out their day to day activities. These include the whole tertiary institutions, hospitals, market/shopping mall, public offices premises and Hotels within Kano Metropolis. The instrument for data collection is a structured questionnaire titled "Questionnaire on Evaluation of the Implementation of Fire Protection Regulation Act in Public buildings (QEIFPRAPB)". The questionnaire was validated by 3 experts. One (1) Lecturer in the Department of Industrial and Technology Education, Federal

University of Technology, Minna and Two (2) Chief Fire Officer from Municipal Local Government, Kano State Fire Service Headquarters in Kano State. Cronbach Alpha statistic method was used to determine the internal consistency of the instrument to be 0.89. Data collected for this study was analyzed using mean, standard deviation and ANOVA. Mean was used to answer the research questions while ANOVA was used to test the hypotheses at 0.05 level of significance. Real Upper and lower limit of numbers were used in order to determine the level of agreement or disagreement of the respondents to the items. 4.50-5.49 - Highly Implemented (HI), 3.50-4.49 - Implemented (I), 2.50-3.49 - Moderately Implemented (MI), 1.50-2.49 - Not Implemented (NI) and 0.50-1.49 - Undecided (U).

Results

Table 1: Mean and Standard Deviation of Respondents on Extent of Implementation the Fire Protection Regulation Act Requirements on the Approval of Public Building Plan for the Issuance of Fire Certificate before the Construction in Kano Metropolis

S/N	Items	\bar{x}	SD	D
1	Use the regulation for the approval of residential, office accommodation, factory, public place or any other place to which the public have access	2.51	0.61	MI
2	Use the regulation specification requirements for fire escape routes before approval of public building plan	2.50	0.56	MI
3	Ensure that the minimum width of the escape routes conform as much as possible to the table in part 1 in the regulation	2.60	0.57	MI
4	Public building owners always present building plan including fire safety plan for approval before construction take place	2.37	0.52	NI
5	Ensure that the building plan have befitting access of each exit from any storey to a final exit from the building or a staircase protected from fire leading into a final exit	2.48	0.58	NI
6	Consideration of external route leading to a final exit, as the case may be	2.61	0.57	MI
7	satisfy with the design in conformity with the column 1 of Part II of the regulation	2.37	0.54	NI
8	Satisfy with design being signified in the colour red by the symbol appearing opposite it in column 2 of Part II of the regulation	2.35	0.50	NI
9	satisfy with arrangement of staircase within the central core of office building before approval of building plan	2.73	0.66	MI
10	Refusal to issue fire safety certificate upon completion in respect to any building unless all requirement is satisfied	2.27	0.50	MI
11	No completed building is given approval unless certificate is issued	2.73	0.65	MI
GRAND MEAN		2.50	0.57	MI

Key: D = Decision, SD= Standard deviation, MI= Moderately Implemented, NI= Not Implemented, \bar{x} = Mean

The data in Table 1 shows the views of fire service staff, local building inspectors and building facility managers on the extent of implementation of fire protection regulation requirements on the issuance of fire certificate to put up public building in Kano Metropolis. The fire protection regulation requirements on the issuance of fire certificate to put up public building in Kano Metropolis was moderately implemented with a mean range of 2.50 – 2.73. The respondents also did not implement some of the regulations with mean range of 2.35 – 2.48. The grand-mean of

2.50 showed that the respondents moderately implement the fire protection regulation requirements on the issuance of fire certificate to put up public building in Kano Metropolis. Table 4.1 also showed that the standard deviation of the items ranges from 0.50 - 0.66. The 11 items had their standard deviation less than 1.96 showing that the respondents were not too far from the mean and were close to one another in their responses

Table 2: Mean and Standard Deviation of Respondents on Extent of Implementation of Fire Protection Regulation on the Provision of Fire Fighting Equipment in Public Buildings in Kano Metropolis

S/N	Items	\bar{x}	SD	D
1	Installation of hose reel tubing system	2.54	0.61	MI
2	Provision of gas pressure extinguishers	2.51	0.55	MI
3	Provision of dry powder and carbon dioxide extinguishers	2.62	0.57	MI
4	Availability of sprinkler fire fighting system	2.37	0.52	NI
5	Installation of risers in the building	2.45	0.53	NI
6	Fire drill use to be organized for building user	2.61	0.57	MI
7	Warning devices are adequately installed	2.37	0.52	NI
8	Means of escape in the case of fire is adequate	2.35	0.48	NI
9	Sign and notices for fire safety is available in the building	2.74	0.65	MI
10	Fire lighting system is installed in the building	2.24	0.46	NI
11	Fire alarms are installed in the building	2.72	0.65	MI
GRAND MEAN		2.50	0.56	MI

Key: D = Decision, SD= Standard deviation, MI= Moderately Implemented, NI= Not Implemented, \bar{x} = Mean

The data in Table 2 shows the views of fire service staff, local building inspectors and building facility managers on the extent of implementation of fire protection regulation on the provision of fire fighting equipment in public buildings in Kano Metropolis. The implementation of fire protection regulation on the provision of fire fighting equipment in public buildings in Kano Metropolis was moderately implemented with a mean range of 2.50 – 2.74. The respondents also did not implement some of the regulations with mean range of 2.24 – 2.45. The grand mean of 2.50 showed that the respondents moderately implement the fire protection regulation on the provision of fire fighting equipment in public buildings in Kano Metropolis. Table 4.2 also showed that the standard deviation of the items ranges from 0.48 - 0.65. The 11 items had their standard deviation less than 1.96 showing that the respondents were not too far from the mean and were close to one another in their responses.

Table 3: One-way ANOVA of mean scores of respondents on the extent to which the approval of building plan based on fire protection regulations act are being implemented in public building

Source	Sum of Square	Df	Mean Square	F	Sig. (p-value)
Between Groups	0.269	2	0.134	1.727	0.179
Within Groups	28.860	372	0.078		
Total	29.128	374			

The result of analysis as presented in Table 3 showed that there was no significant difference ($p > 0.05$) in the mean scores of the respondents. The hypothesis one was therefore upheld (accepted). The data supported the hypothesis one, $F(2, 372) = 1.729$, p (sig.) = 0.179. The mean and standard deviation for fire service staff were 2.48 and 0.34 respectively. The mean and standard deviation for local building inspectors were 2.54 and 0.2 respectively. The mean and standard deviation for building facility managers were 2.54 and 0.35 respectively. The total mean of 2.50 is an indication that the approved building plan based on fire protection regulations act are being implemented moderately in public building. From the results, there is no significant difference between the mean ratings of fire service staff, local building inspectors and building facility managers on the extent to which the approval of building plan based on fire protection regulations act are being implemented in public building in Kano Metropolis. This result implies that the approved building plan based on fire protection regulations act are being implemented moderately in public building in Kano metropolis.

Table 4: One-way ANOVA of mean scores of respondents on the extent to which the provision of fire fighting appliances based on fire protection regulations act are being implemented in public buildings.

Source	Sum of Square	Df	Mean Square	F	Sig. (p-value)
Between Groups	0.251	2	0.125	1.681	0.188
Within Groups	27.692	372	0.075		
Total	27.943	374			

The result of analysis as presented in Table 4.6 showed that there was no significant difference ($p > 0.05$) in the mean scores of the respondents. The hypothesis one was therefore upheld (accepted). The data supported the hypothesis two, $F(2, 372) = 1.681$, p (sig.) = 0.188. The mean and standard deviation for fire service staff were 2.50 and 0.21 respectively. The mean and standard deviation for local building inspectors were 2.47 and 0.22 respectively. The mean and standard deviation for building facility managers were 2.54 and 0.34 respectively. The total mean of 2.51 is an indication that the provision of fire fighting appliances based on fire protection regulations act are being moderately implemented in public buildings. From the results, there is no significant difference between the mean ratings of fire service staff, local building inspectors and building facility managers on the extent to which the provision of fire fighting appliances based on fire protection regulations act are being implemented in public buildings in Kano Metropolis.

Findings of the Study

With respect to the research questions and hypotheses of this study the summary of the findings of this study among others are given below:

1. The fire protection regulation requirements on the issuance of fire certificate to put up public building in Kano Metropolis are moderately implemented. Though few of fire protection regulation requirements were not implemented.
2. The fire protection regulation on the provision of fire fighting equipment in public buildings in Kano Metropolis moderately implemented. Though few of fire protection regulation requirements were not implemented.
3. There is no significant difference between the mean ratings of fire service staff, local building inspectors and building facility managers on the extent to which the approved of building plan based on fire protection regulations act are being implemented in public building in Kano Metropolis.
4. There is no significant difference between the mean ratings of fire service staff, local building inspectors and building facility manager on the extent to which the provision of fire fighting appliances based on fire protection regulations act are being implemented in public buildings in Kano Metropolis.

Discussion of Findings

On the extent of implementation of fire protection regulation requirements on the issuance of fire certificate to put up public building in Kano Metropolis, the study revealed that majority of the fire protection regulation requirements on the issuance of fire certificate to put up public building in Kano Metropolis are moderately implemented. Though, few of fire protection regulation requirements were not implemented. The 11 items had their standard deviation less than 1.96 showing that the respondents were not too far from the mean and were close to one another in their responses.

The findings are in consonance with the findings of Salleh and Ahmad (2009) who in a study on fire safety management in heritage buildings found out that several fire protection regulation stipulate for public buildings are partially implemented. According to Salleh and Ahmad (2009), the partial implementation is the possible reason for sudden fire disaster in public buildings in Nigeria. This was buttressed by Nuruddeen and Sanni-Anibire (2018) who in a study on integrated fire safety assessment a public building for student housing facility lamented on the absence of regulation specification requirements for fire escape routes before approval of public building plan.

The findings on hypothesis one revealed that, there is no significant difference between the mean ratings of fire service staff, local building inspectors and building facility managers on the extent to which the approved of building plan based on fire protection regulations act are being implemented in public building in Kano Metropolis. The data supported the hypothesis one, $F(2, 372) = 1.729$, $p(\text{sig.}) = 0.179$. The hypothesis one was therefore upheld (accepted). This result implies that the approved building plan based on fire protection regulations act are being implemented moderately in public building in Kano metropolis.

On the extent of implementation of fire protection regulation on the provision of fire fighting equipment in public buildings in Kano Metropolis, it was revealed that the fire protection regulation on the provision of fire fighting equipment in public buildings in Kano Metropolis moderately implemented. Though, few of fire protection regulation requirements were not implemented. The 11 items had their standard deviation less than 1.96 showing that the respondents were not too far from the mean and were close to one another in their responses.

The findings is in agreement with the findings of Woon and Suleiman (2015) who in a study on problems of in implementation of fire safety management practices found out that the scarcity of fire fighting equipment and materials for fighting fire is mostly experienced in several public buildings. This according to Woon and Suleiman (2015) is because several of the public buildings are not having adequate fire fighting equipment and materials lie dry powder and carbon dioxide extinguishers.

From the results of hypothesis two, there is no significant difference between the mean ratings of fire service staff, local building inspectors and building facility managers on the extent to which the provision of fire fighting appliances based on fire protection regulations act are being implemented in public buildings in Kano Metropolis. The data supported the hypothesis two, $F(2, 372) = 1.681$, $p(\text{sig.}) = 0.188$. The hypothesis two was therefore upheld (accepted).

Conclusion

From the findings of this study, it was concluded that the fire protection regulation requirements on the issuance of fire certificate to put up public buildings in Kano Metropolis are moderately implemented. However, few sections of the fire protection regulation requirements on the approval of public building for issuance of fire certificate before construction were not implemented. The fire protection regulations on the provision of fire fighting equipment in public buildings in Kano Metropolis are moderately implemented. Though, few parts of fire protection regulation requirements the provision of fire fighting equipment in public buildings in Kano Metropolis were not implemented. There is no significant difference between the mean ratings of fire service staff, local building inspectors and building facility managers on the implementation of fire protection regulations in public buildings in Kano Metropolis.

Recommendations

Based on the findings from this study, the following recommendations are made:

1. The fire service staff, local building inspectors and building facility manager should ensure that no construction of any public building without issuance of fire safety certificate in Kano Metropolis
2. Government should ensure that no public building is put to use without adequate fire-fighting equipment as stipulated in the fire protection regulation act.
3. Reinforcing strict adherence to all safety and fire protection regulations on public buildings.
4. Periodically organizing safety awareness and orientation programmes for users of public buildings, fire service staff, local building inspectors and building facility manager to improve professional practice.

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