
Evaluation of the Factors to Consider for the Development of Appropriate Guidelines for Designing Markets in the Federal Capital Territory of Nigeria with Less Fire Problems

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ABSTRACT

Nigeria does not have an original National Fire Safety Code; frequent fire outbreaks in market places is a serious challenge Nigeria is facing and they have led to loss of lives of many people and destruction of valuable properties. In order to reduce this problem, a study was carried out on markets in the Federal Capital Territory of Nigeria to determine the development of appropriate guidelines, in order to improve the designs of markets in Nigeria with less fire problems. The primary research data are from the discussions that were made with staff of the Federal Fire Service of Nigeria, National Association of Nigerian Traders, and managing company of the markets that were studied with regards to fire outbreaks in markets. They are also from the direct observations of the current conditions of the markets with regards to fire outbreaks. The secondary research data are from the reviews of the relevant literature. The results of the research showed that there is no provision for water reservoir(s); there is no proper market keeping in markets that were studied. The results also showed a wrong allocation of electric control fuses in shops; indicated absence of mini fire service stations in markets in the study area. Among other recommendations for this research are: in the development of guidelines for designing markets in Nigeria with less fire problems, there must be water reservoirs of a minimum capacity of 16,000 litres (4,000 gallons) at different intervals or a specified location for fighting fires, depending on the sizes of markets. The walls of the front verandahs or corridors should be where electrical power distribution boards will be mounted to allow open and quick access for the removal of electrical power fuses. All markets must have a mini fire service station for the immediate fighting of fire outbreaks before the arrival of major firefighting vehicles from the main fire service stations.

Keywords: *Designs, Fire, Guidelines, Markets, Nigeria.*

INTRODUCTION

In the informal sector of economies of Nigerian cities, trading is one of the most popular activities (Ogeah and Omofonmwan, 2013). One aspect of trading consists of sales people who operate in markets in urban areas. In the Federal Capital Territory (FCT) of Nigeria, just like in any other city of Nigeria, there are many markets and the large population of the FCT gave encouragement for the establishment of different markets in the Territory (Federal Capital Development Authority [FCDA], 2016). These markets are busy almost all the times with many people of different origins coming for business transactions. Vehicles that are loaded with goods of different kinds such as commercial fabrics, electronics; other portable properties, and agricultural products like, rice, beans, yam, tomatoes and fruits among others always come from the Northern parts of Nigeria to these markets where goods are sold. Similarly, different goods from the eastern, western and southern parts of the country are brought to these markets. From the surrounding villages to FCT, products of agriculture like plantains, vegetables and fruits, animals for meat, and different goods are also brought to these markets. Consequently, in addition to other economic activities taking place in these markets, there is high volume of trade.

A guideline is a procedure or information which is intended to direct a person on how something (building designs) should be carried out by giving advice and examples of information on the type of action that should be taken in a specific circumstance (Facilities and Operations, 2017; British Psychological Society, 2016; Council of Architecture, 2015; New Horizons Resources [NHR] Foundation, 2006). A frequent fire outbreak in market places is a serious challenge Nigeria is presently facing and they have led to loss of lives of many people and destruction of valuable properties (Federal Fire Service of Nigeria, 2016).

Nigeria does not have an original National Fire Safety Code. In 2002, Nigeria adopted 1995 National Fire Code of Canada that was issued by the National Research Council of Canada which is subject to amendment from time to time by Canada, as the main National Fire Safety Code of Nigeria; otherwise, an edition of any Fire Safety Code that is issued by a National or International Organisation is adopted as the National Fire Safety Code of Nigeria (Nigerian Fire Safety Act, 2002). This means that when Nigeria is not making use of the

National Fire Safety Code of Canada, another Fire Safety Code of any nation or International Organisation should be used as the National Fire Safety Code of Nigeria. This immediate statement implies that the National Fire Safety Codes of Egypt (Africa), China (Asia), Russia (Europe), Mexico (North America), Brazil (South America) and other nations or a combination of the National Fire Safety Codes of two or more nations in any part of the globe can be adopted as the National Fire Safety Code of Nigeria at any point in time. The above analysis of adoptions of National Fire Safety Codes of different nations by Nigeria revealed that Nigeria is presently in the state of confusion with respect to its Fire Safety Code. Therefore, it became important that guidelines for designing Nigerian markets with less fire problems are generated to improve the adopted National Fire Safety Codes for Nigeria; hence, it also became important that a good consideration is given to processes involved in the development of guidelines for designing Nigerian markets with less fire problems.

The study area is Wuse market, Garki model market and Kado market of the FCT of Nigeria. The whole buildings in the study domain is the scope of this study. FCT is located in the central Nigeria and it is also the capital city of Nigeria (Nnodim, 2011). The aim of this study is to determine the development of appropriate guidelines, in order to improve the designs of markets in Nigeria with less fire problems. Objectives of the study are: to find out the opinions of the Federal Fire Service (FFS) of Nigeria with regards to development of appropriate guidelines to improve market designs against fires in Nigeria; to ascertain the opinions of the National Association of Nigerian Traders (NANT) with regards to development of appropriate guidelines to improve market designs against fires in Nigeria; to investigate the opinions of the managing company of markets in the study area with regards to development of appropriate guidelines to improve market designs against fires in Nigeria. It is well assured that this study has led to information about the development of appropriate guidelines to improve the designs of markets in Nigeria with less fire problems. This information will educate architects with regards to development of appropriate guidelines to improve market designs against fires in Nigeria. It is also well assured that this study has laid a foundation for further studying of the development of appropriate guidelines to improve market designs against fires in Nigeria.

MATERIAL AND METHODS

All the buildings with their architectural style of design in the study area is the target population for this study. Abuja Markets Management Limited is the current managing company of the markets that were studied. The total number of sales points in Wuse market is 2,091 (Abuja Markets Management Limited, 2016). Systematic sampling method was adopted for this study and it was applied at every 5th interval of sales points, in order to get the sample size; as a result of this, 419 sales points were selected out of the total number of sales points in this market for the study. The total number of sales points in Garki model market is 1,430 (Abuja Markets Management Limited, 2016). Systematic sampling method was also adopted for the study and it was applied at every 5th interval of sales points, in order to get the sample size; as a result of this, 287 sales points were selected out of the total number of sales points in this market for the study. The total number of sales points in Kado market is 353 (Abuja Markets Management Limited, 2016). Similarly, systematic sampling method was adopted for this study and it was applied at every 5th interval of sales points, in order to get the sample size; as a result of this, 71 sales points were selected out of the total number of sales points in this market for the study.

The primary research data are from the discussions that were made with staff of the FFS of Nigeria, NANT and managing company of the markets that were studied with respect to fire outbreaks in Nigerian markets. They are also from the direct observations of the current conditions of each selected sales point of the markets that were studied with regards to their architectural designs against fires and the development of appropriate guidelines to improve the designs of subsequent markets against fires in Nigeria. The secondary research data are from the reviews of the literature on fire outbreaks in markets; other public buildings, and other fire related issues in and outside Nigeria.

RESULTS AND DISCUSSION

The result of the discussion with the Assistant Controller General of the Federal Fire Service (FFS) of Nigeria indicates that the FFS of Nigeria discharges its duties perfectly but many Nigerians have been complaining that the discharge of the services of the FFS of Nigeria is ineffective and inadequate with respect to many fire outbreaks in Nigerian markets. He said, the reason for these

complains from many Nigerians is because most times when there are fire outbreaks in many Nigerian markets, the FFS of Nigeria will normally go to extinguish fires with firefighting vehicles (trucks) but if fires are serious ones the extinguishing water normally finish in the process and before firefighters can get back to their office stations to fetch another water and return to markets to continue fighting fires because of the problem of unavailability of water in markets, serious damages must have been done to such markets. The observation results also showed that there is no water reservoir in all the markets that were studied to serve as a source of extinguishing agent when there are fire outbreaks.

The Assistant Controller General of the FFS of Nigeria suggested that in developing guidelines for designing markets in Nigeria with less fire problems, addressing this problem of water unavailability in Nigerian markets should be taken as one of the top priorities. Then, he concluded that there should be a provision for water reservoir(s) in all Nigerian markets in the development of guidelines for designing markets with less fire problems, so that when there are fire outbreaks in markets, there must be an availability of adequate water to extinguish fires, in order to minimise further loss of goods, properties and lives of people.

The results of the discussions with staff of the FFS of Nigeria and NANT revealed that there is a need for proper market keeping in Wuse market, Garki model market and Kado market. This means that the use of interior building materials that can easily burn in markets should be avoided or forbidden. For example, interior decorative materials of buildings that can easily burn like carpets should not be used in market places to avoid ease of transfer of fires from one building material to another building material because when there are fires due to sparks in the surge protectors, extension wires, stabilisers and other electrical equipment, the probability of the transfer of fires from the ignition points through carpets to other materials in market buildings is very high; this should be incorporated in the development of guidelines for designing markets in Nigeria with less fire problems. In the same vein, improper market keeping was observed in some buildings in the study area.

The results of the discussions with staff of the managing company of markets that were studied showed that in most cases when there are fire outbreaks in the lock-up shops in markets (especially at nights) when the shop owners are not available, the outcomes are always serious damages to the affected lock-up shops before the arrival of shop owners to open doors of lock-up shops for the removal of electric control fuses from the electric power distribution boards to reduce negative effects or increase of fires from electricity, and also to put out fires. It was suggested that electric power distribution boards must be accessible from outside the shops in markets, so that when there are fire outbreaks from electric power distribution boards, electrical equipment or any part of the lock-up shops, then, the electric control fuses can be removed by the management staff or other people in the absence of shop owners, in order to reduce damages to goods and properties, and to also reduce the spread of fires in markets; this should be incorporated in the generation of these guidelines for designing markets in Nigeria with less fire problems. Similarly, the results of the observations revealed that electric power distribution boards are located inside some buildings in markets.

It was observed that all the markets that were studied have no mini fire service station. Similarly, absence of mini fire service stations in markets in the study area were pointed out by staff of the FFS of Nigeria, NANT and managing company of markets that were studied, and it was suggested that mini fire service stations should be part of the development of the guidelines for designing markets in Nigeria with less fire problems. It was later pointed out that the availability of mini fire service stations in Nigerian markets will help in prompt fighting of fire outbreaks in markets in Nigeria, in case the main fire service stations will be far from markets that may be affected by fires, in order to stop fires from reaching the levels that will be difficult to control. Then, with this, there shall be reduction of serious damages to goods, market buildings and other market properties. Also, there shall be reduction of loss of lives of people and injuries to people in markets in Nigeria.

CONCLUSION AND RECOMMENDATIONS

In the informal sector of economies of Nigerian cities, trading is one of the most popular activities. One aspect of trading consists of sales people who operate in markets in urban areas. These markets are busy almost all the times with many

people of different origins coming for business transactions. Considering the significances of business transactions in markets, it therefore became important that the determination of the development of appropriate guidelines to improve the designs of markets against fires cannot be over emphasised. The aim of the study was to determine the development of appropriate guidelines, in order to improve the designs of markets in Nigeria with less fire problems.

The results showed that there is no provision for water reservoir(s) in all the markets in the study area. It was also revealed that there is no proper market keeping in markets that were studied. This means that the use of interior materials of buildings like floor carpets was found in markets and they can easily burn and transfer fires when there fire outbreaks. The results also showed that in most cases when there are fire outbreaks in the lock-up shops in markets (especially at nights) when the shop owners are not available, the outcomes are always serious damages to the affected lock-up shops before the arrival of shop owners to open doors of lock-up shops for the removal of electric control fuses from the electric power distribution boards to reduce negative effects or increase of fires from electricity, and also to put out fires. The results also indicated absence of mini fire service stations in markets in the study area.

It is recommended that in the development of guidelines for designing markets in Nigeria with less fire problems, there must be water reservoirs of a minimum capacity of 16,000 litres (4,000 gallons) at different intervals or a specified location for fighting fires, depending on the sizes of markets. This will enable fire fighters to fill one biggest truck (tender) at a point from a reservoir, in order to continuing fighting fires without going back to their office stations to fetch more water in case of shortage of water. According to Loone (2014), smallest and biggest sizes of water tanks of firefighting vehicles (trucks) are 4,000 litres (1,000 gallons) and 16,000 litres (4,000 gallons) respectively. However, there are still other sizes of water tanks of firefighting vehicles (trucks) that are in-between 4,000 litres (1,000 gallons) and 16,000 litres (4,000 gallons). Applied floor tiles (for example, concrete floor tiles, non-combustible metal floor tiles) must be at least two hours resistant to fires and must be very beautiful and eye catching or attracting to discourage the use of floor carpets in markets, since

floor carpets have no fire resistance and can transfer flames of fires from materials or properties to other ones in market buildings.

It is also recommended that in the development of guidelines for designing markets in Nigeria with less fire problems, all the floors of the lock-up shops in markets should be designed to have front verandahs or corridors. The walls of the front verandahs or corridors should be where electrical power distribution boards will be mounted to allow open and quick access for the removal of electrical power fuses by the staff of the managing companies of markets or other people, in case the shop owners will not be available during fire outbreaks, in order to reduce negative effects of fires in the lock-up shops. All markets must have a mini fire service station for the immediate fighting of fire outbreaks before the arrival of major firefighting vehicles from the main fire service stations to continue extinguishing fires in case such fire outbreaks are major ones that may not be able to be controlled by a mini fire service station. This study addressed the development of guidelines for designing Nigerian markets with less fire problems but it did not cover the complete guidelines for designing markets in Nigeria with less fire problems. Therefore, in subsequent study of this nature, this limitation should be addressed.

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