

Analysis of the Recap of the Passive Fire Prevention and Protection Measures in Nigerian Markets: A Solution for Reducing Air Pollution

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ABSTRACT

A market is an authorized site and a public place where people meet for trade or where goods and services are exchanged to the terminal consumer for money. Markets in Africa are varied in terms of size, mode and quality of construction, facilities for market users and physical maintenance. Air pollution is the contamination of air in the environment and it occurs when the air contains fumes or gases, smoke, dust and odour in harmful amount. Fire is a special type of chemical reaction or an oxidation process that happens very fast, so that light, heat and sound are released. In Nigeria, markets are prone to fire outbreaks. Therefore, it is important that, fire is treated with care in markets in Nigeria. Unwanted fires have a monetary impact on communities because, fires remove businesses from the tax rolls while the damaged building is reconstructed. According to available statistics, over 40 percent of the businesses that experienced a fire outbreak, never re-open because they lose their customers base. Passive fire prevention measures in Nigerian markets were overviewed with the aim of being informed of the need for proper market designs against fire and thereby reducing the release of harmful smoke to the environment. Analyzing the significant of markets to people, and the negative effects of the harmful smoke that are being released to the environment are the objectives. The review of relevant literature on fire outbreaks in markets is the method adopted for this study. The passive fire prevention and protection measures in markets are also parts of the relevant literature that were reviewed. The findings showed that, there is no study on how to use building designs to reduce fire problems in markets in Nigeria and subsequently, there is need for evaluation of passive fire prevention and protection measures in Nigerian markets. It is expected that, this study shall reduce the release of harmful smoke to the environment and lay a foundation for further studying of passive fire prevention in markets in Nigeria. Thus, the study recommends that, passive fire prevention measures should be well considered in the design of markets in Nigeria, in order to reduce the incidences of fire outbreaks and their consequences.

Keywords: Fire Prevention, Harmful Smoke, Markets, Nigeria, Passive.

INTRODUCTION

A market is a public place and an authorized site where people meet for trade or where goods and services are exchanged to the terminal consumer for money (Lipsey, 1963; Chabbi-Chemrouk, 2007; Ngugi, 2015). African markets are quite diversified in terms of size, mode and quality of construction, facilities for market users and physical maintenance (Ikelegbe, 2005). The concept of market from agricultural perspective is described as a place where farmers buy and sell their products (Jikun and Scott, 2003). In this context, a market place is defined by infrastructural needs of producers for the distribution of food products to consumers in urban and rural areas within a country and also, for the purpose of export.

Air is the mixture of gases which surrounds the earth and which people breathe with it. Air is a precious resource and it supplies people with oxygen, which is essential for people. Pure air is a mixture of several gases that are invisible and odourless. Air pollution is the contamination of air in the environment and it occurs when the air contains fumes or gases, smoke, dust and odour in harmful amount [UNEP (United Nations Environment Programme) Collaborating Centre on Energy and Environment 2006; Union of Concerned Scientists, 2016]. The importance of air in the atmospheric environment cannot be over emphasised. For example, animals need the oxygen in the air to live and in the human body, the lungs give oxygen to the blood, and give back carbon dioxide to the air. Plants need the carbon dioxide in the air to live and they give off oxygen that humans can breathe again. Therefore, it is important that, the air in the environment is being protected against contamination by reducing fire outbreaks in Nigerian markets that release harmful smokes to the atmospheric environment.

Fire is the visible effect of the process of combustion (Science Learning Hub, 2009). Worldwide, fire is one of the destructive agents in the terrestrial ecosystems (Bond and Van, 1996; Sugita *et al.*, 1997; Willyet

al., 2000) and in Africa, particularly, Nigeria, markets are prone to fire outbreaks (Ogeah and Omofonmwan, 2013). Therefore, it is important that, fire is treated with care in markets in Africa. Fire is also a special type of chemical reaction or an oxidation process that happens very fast, so that light, heat and sound are released (Glossary of Wild land Fire Terminology, 2009). Unwanted fires have a monetary impact on communities because, fires remove businesses from the tax rolls while the damaged building is reconstructed. Statistics have confirmed that, over 40 percent of the businesses that experienced a fire outbreak, never re-open because they lose their customers' base (Stookey, 2010). A review of the 2014 United States Fire Loss Statistics showed that, the nation continues to suffer property loss, income loss, injury, and deaths at a significant rate (Hylton, 2015). Therefore, it is essential that, fire outbreaks in markets should be prevented as much as possible and not just only in the United States but also in Africa and particularly in Nigeria.

Fire prevention management is the application of a disciplined plan to ensure that the risks of fire are minimized (Fire Safety and Emergency Guidelines, 2009; Sordelet, 2014). Fire prevention comprises activities intended to reduce sources of ignition and partially focused on programmes to educate people against starting fires. Passive fire prevention is a means whereby fire may be prevented as much as possible through design and use of appropriate materials. This includes provision of area/place of refuge, provision of fire escape doors and stairs, and fire drills to educate occupants on fire protection devices and means of escape. Lives and properties can be saved by being prepared before fire strikes (Seattle Government, 2016). Fire management is a dynamic process with the components of training, conduction of drills, acquisition and testing of equipment and coordinating of activities with the community to the level of empirical analysis and computer aided simulations for the unexpected [Nigerian Society of Engineers, 2016]. Safety from fire is a consideration which seems often taken for

granted when looking at new building developments or refurbishments, particularly where markets are concerned.

Fire outbreak in market places is a frequent occurrence in Nigeria (Federal Fire Service of Nigeria, 2016) and therefore, it is important that, efforts should be geared towards minimizing its occurrence in market places in Nigeria through best practices and good management. Thus, performing a fire risk analysis to determine how best to address the fire safety challenges, unique to a specific market is absolutely necessary in any design concept of a market. The risk analysis will identify which fires should be addressed by the design, where the fires may include accidental fires, fires following earthquakes or terrorist threats.

In the design of buildings, there is need for safety in case of fire outbreak (Joseph *et al.*, 1992; Adler 1999). The incorporation of fire safety from the design stage to the completion stage of a market enhances optimum fire prevention and protection which in turn, reduces risks from fire. The spread of fire from one building to another is prevented by the fire resistant qualities of external walls and roofs (Neufert and Neufert, 2000). They must provide a barrier to fire and resist the surface spread of flame. According to Neufert and Neufert (2000), the distance between buildings or between the building and the boundary is obviously an important factor, as it is the likely severity of the fire, which is determined by the fire load of a building (the amount of combustible materials contained within). Thus, it is important that, lessons should be learnt from fire safety in market design, construction and post-construction.

STATEMENT OF THE PROBLEM

The rate of fire outbreaks in market places in Nigeria is alarming. For example, according to Federal Fire Service of Nigeria (2003, 2014, 2015 and 2016), there were fire outbreaks in Wuse old market in FCT (17th January, 2003), Alaba international market in Lagos State (30th June,

2014), Onitsha Ose Okwuodu Food Stuff Market in Anambra State (13th April, 2014), Balogun Lagos Market in Lagos State (12th January, 2015), Ilesa major market in Osun State (9th August, 2015), Garki model market in FCT (30th December, 2015), Yola south main market in Adamawa State (4th January, 2016) and Singer market in Kano State (20th February, 2016); in all these fire outbreaks, valuable goods and properties were destroyed. Plates I, II and III show fire outbreaks in markets in Nigeria.



Plate I: Fire Outbreak at Ilesa Major Market, Ilesa, Osun State, Nigeria (Source: Official Facebook Website of the Federal Fire Service of Nigeria, 2015: https://web.facebook.com/FEDERALFIRESERVICEPRESS/photos?ref=page_internal).



Plate II: Fire Guts Popular Balogun Market in Lagos, Lagos State, Nigeria (Source: Nigerian Monitor, 2015: <http://www.nigerianmonitor.com/photos-fire-guts-popular-balogun-market-in-lagos/>).



Plate III: Fire Razes Popular Singer Market, Kano, Kano State, Nigeria (Source: The Street Journal, 2016: <http://thestreetjournal.org/2016/02/breaking-early-morning-fire-razes-popular-singa-mkt-kano/>).

Nigeria do not have original National Fire Safety Code that can effectively reduce fire outbreaks in Nigerian markets because, in the year 2002, Nigeria adopted the 1995 National Fire Safety Code of Canada,

issued by the National Research Council of Canada which is subject to amendment from time to time by Canada (Nigerian Fire Safety Act, 2002). Subsequently, in all these fire outbreaks in the Nigerian markets, harmful smoke have been released to the atmospheric environment which in turn, responsible for global warming and health challenges like eye diseases, skin and lung cancers [British Columbia Government, 2016; Union of Concerned Scientists, 2016; Department of Environmental Protection, 2016; Department of Health, 2016; Michael, 2016; Manitoba Health, Seniors and Active Living, 2016]. Therefore, it is important to overview the passive fire prevention and protection measures in markets in Nigeria, in order to reduce frequent fire outbreaks and their consequences.

AIM OF THE STUDY

The aim of this study is to over view the passive fire prevention measures in markets in Nigeria, in order to be informed of the need for proper market designs against fire and thereby reduce the release of harmful smoke to the environment.

OBJECTIVES OF THE STUDY

The objectives of this study are:

- i. To evaluate the importance of markets to people.
- ii. To analyse the negative effects of the harmful smoke that have been released to the environment.

SCOPE OF THE STUDY

The scope of this study is the regional built-up markets in Nigeria. Regional built-up market is a market in a particular defined location or region, which is made up of different commercial buildings that contain lock-up shops, open stalls, restaurants, and other features of a market (Amiteye,2015; Ngugi, 2015).

JUSTIFICATION OF THE STUDY

Several scholars have carried out researches on fire outbreaks in markets in Nigeria and different issues associated with these fire outbreaks have been pointed out. For example, whenever there is fire outbreak in markets in Nigeria, the Fire Service Department in most cases arrives late to the scene and also come with inadequate materials for fighting the fire (Ogeah and Omofonmwan, 2013). This means that, there is always a problem of how to fight fire whenever it breaks out in markets in Nigeria. In all the studies carried out on fire outbreaks in markets in Nigeria, there is a gap in knowledge, which is the evaluation of passive fire prevention and protection measures in markets. Therefore, it is important that, this gap in knowledge is filled, in order to reduce the frequent fire outbreaks in markets in Nigeria.

METHODOLOGY

The review of relevant literature on fire outbreaks in markets is the method adopted for this study. The passive fire prevention and protection measures in markets are also parts of the relevant literature that were reviewed. Data were obtained from textbooks, journals, theses, reports, papers, archive and data base of institutions and the internet was also used to download information from various websites on the past fire outbreaks in markets and other commercial buildings in and outside Nigeria, in order to know about fire prevention and protection measures in markets and other related issues.

FINDINGS

There is no study on how to use building designs to reduce fire problems in markets in Nigeria. Subsequently, there is need for evaluation of passive fire prevention and protection measures in Nigerian markets.

SIGNIFICANCE OF THE STUDY

It is expected that, this study shall make architects to be aware of the need for proper market designs against fire. This awareness will help in

reducing fire outbreaks in markets in Nigeria and thereby reduce the release of harmful smoke to the environment. It is also expected that, this study shall lay a foundation for further studying of passive fire prevention measures in markets in Nigeria.

CONCLUSION AND RECOMMENDATIONS

A market is a public place and an approved site where people meet for trade or where goods and services are exchanged to the terminal consumer for money. African markets are varied in terms of size, mode and quality of construction, facilities for market users and physical maintenance. Air pollution is the contamination of air in the environment and it occurs when the air contains fumes or gases, smoke, dust and odour in harmful amount. Fire is the visible effect of the process of combustion. Globally, fire is one of the destructive agents in the terrestrial ecosystems. In Nigeria, markets are prone to fire outbreaks. Thus, it is important that, fire is treated with care in Nigerian markets. Unwanted fires have a monetary impact on communities because, fires remove businesses from the tax rolls while the damaged building is reconstructed. Statistics have confirmed that, over 40 percent of the businesses that experienced a fire outbreak never re-open because they lose their customers base.

The aim of this study is to overview the passive fire prevention and protection measures in markets in Nigeria, in order to be informed of the need for proper market designs against fire and thereby reduce the release of harmful smoke to the environment. Analyzing the significant of markets to people, and the negative effects of the harmful smoke that are being released to the environment are the objectives. The review of relevant literature on fire outbreaks in markets is the method adopted for this study. The passive fire prevention and protection measures in markets are also parts of the relevant literature that were reviewed. The findings showed that, there is no study on how to use building designs to reduce fire problems in markets in Nigeria and subsequently, there is

need for evaluation of passive fire prevention and protection measures in Nigerian markets. It is expected that, this study shall make architects to be aware of the need for proper market designs against fire. This awareness will help in reducing fire outbreaks in markets in Nigeria and thereby reduce the release of harmful smoke to the environment. It is also expected that, this study shall lay a foundation for further studying of passive fire prevention measures in markets in Nigeria. Thus, it is recommended that, passive fire prevention measures should be taken as the top paramount consideration in the design of markets in Nigeria in order to reduce the incidences of fire outbreaks and their consequences.

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