A REVIEW OF THE CAUSES, EFFECTS AND MANAGEMENT OF FIRE DISASTER IN NIGERIA

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Abstract
The study assessed the causes and control measure of fire disaster in Nigeria. fire outbreak is one of the world's most rampant and devastating disasters in Nigeria. This disastrous impact of fire to the environment and economy has attracted attention to strategies to prevent, control or eliminate it when it occurs. There are two-edged of disasters. One edge is the natural and man-induced mishap or the trigger mechanism which could be earthquake, tremor, thunder / windstorm, technological disasters among others while on the other edge, are the damages done to the built environment, the injuries and loss of human life and property. The contributing factors to fire disasters are; cooking and heating equipment, smoking material, child playing with fire, electrical, open flame or ember and so on. Fire outbreak causes emotional distress as well as physical damage. It threatens life and property and it is unpredictable. People are often affected by what they see during and after a fire outbreak. The study thereby discovered that for any management method of fire disaster to be successful, it requires mass participation, public awareness and education about fire disasters, involvement of local volunteers, citizens, organizations and businesses, there is need to review urban and regional planning laws, especially the building code to reflect the prevailing circumstances in Nigeria among others. The study thereby concluded that inclusive decision making should be encouraged to integrate the knowledge and views of all stakeholders in development and disaster management.

Keywords: Review, causes, effects, management and fire disaster.

Introduction
Fire disaster can be described as the phenomenon that occurs whenever a combustible material comes into contact with oxygen and emits out light, heat and smoke. His the chemical reaction that occurs when heat stored in a flammable hem is released together with light and smoke. The numerous benefit of fire often suppresses the massive destructive ability it possess which threatens a nations delicate economy fire outbreak is one of the world's most rampant and damaging disasters and has been a serious and recurring issue, especially in the developing countries. This disastrous impact of fire to the environment and economy has attracted attention to strategies to prevent, control or eliminate it when it occurs (Oloke, et al 2021).

Disasters are exceptional events that interrupt normal human development and require external humanitarian actions to mitigate the attendant losses (Olorunfemi, 2009). There are numerous causes of fire outbreak, while some are caused by mankind, others are as a result of nature. Some of the factors teaching to the incessant outbreak of fire are; irregular discharge of electricity, over voltage, illegal electrical connection, improper electrical fittings, use of low quality materials, lack of supervision of infants in the house, keeping contaminated fuel in the domestic property. The causal factors of fire outbreak are; dryness of weather, storage of petrol in the house, improper discarding of cigarette stub, contaminated fuels, high voltage, illegal connection of electricity and so on. In a built up environment, preventing fire outbreak totally can be very costly or even unattainable. However, necessary measures to prevent the occurrence of fire in the buildings and the neighborhoods must be engaged to subdue the menace. The rapidly increasing population of many urban and peri-urban settlements in developing countries which has led to an uncontrolled expansion of these neighborhoods in terms of development of different kinds of properties necessitated the review of the level of exposure to fire disaster. (Oloke, et al 2021).

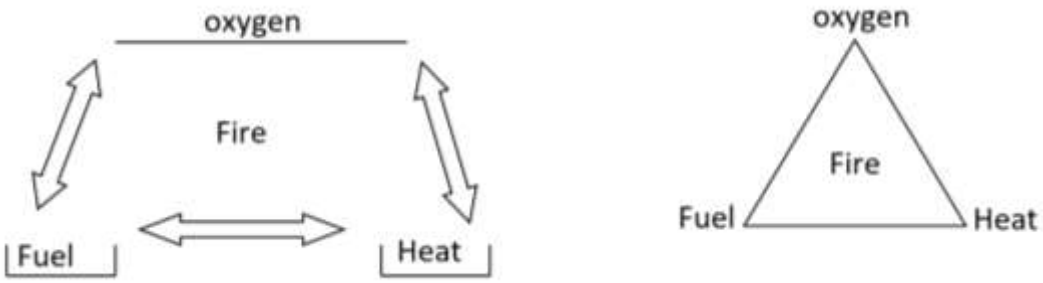
Fire Development Concept

Fire spread through out a structure and in most cases, fire development involve diffusion flames. Pyrolysis products release from heated solid fuel mix with air at the point of combustion. Sometimes, this takes place at a considerable distance from the solid fuel. When fuel and air mix prior to combustion, ignition of the fuel-air mixture can release a tremendous amount of energy. Combustion requires fuel and oxygen in the correct proportion as well as sufficient heat energy to start the reaction. Heat is the energy to start the reaction. Heat is the energy necessary to increase the temperature of the fuel to a point where sufficient vapours are given off for ignition to occur. Most of the time, this process is considerably more complex. For instance, in a typical building fire, the wide variety of fuel (furniture, clothes, papers, plastic and other household combustibles) and limited ventilation produce of complex, toxic and flammable mixture of solid, gas and vapour through oxidation reaction (Hartin, 2005 cited by the NITP & Toprec, 2013).

A fire naturally occurs when the elements are present and combined in the right mixture, and a fire can be prevented or extinguished by removing any one of the elements in the fire triangle. For example, covering a fire with a fire blanket removes the oxygen part of the triangle and can extinguish a fire. Although fire triangle consists of fuel, heat and oxygen, other materials can have a significant impact on how a fire develops. Non-combustible materials absorb heat energy and slow the process of ignition and combustion. A simple demonstration of the concept is to take two sheets of newspaper and spray one with a fine mist of water and then try and ignite each sheet. The moist sheet will be difficult, if not impossible, to burn due to the need for the match to heat up the water and drive it off the fuel. Materials that absorb heat, but do not

participate actively in the combustion reaction are referred to as thermal ballast. This concept is important in understanding fire development, it is also effective for fire control or reduce the probability of rapid fire progress (Hartin, 2005).

Figure 1: Fire Development Triangle



Source: Adapted from Hartin, 2005

Causal and Contributing Factors to Fire Outbreak

There are two-edged of disasters. One edge is the natural and man-induced mishap or the trigger mechanism which could be earthquake, tremor, thunder/windstorm, technological disasters, among others while on the other edge, the receiving end, are the damages done to the built environment, the injuries and losses of human life and property. It is important to note that in most disaster vulnerable environments, most victims are the destitute segment of the population. They tend to live in disaster prone areas, which are the least expensive and thus the only affordable accommodations to them. Therefore, vulnerability strongly correlates with the extent of a society's development. This correlation proves to be one of the vicious circles of perpetual under-development that renders a society more vulnerable to hazards and once hit by a disaster, the society suffers severe setbacks to degenerate further into under-development (Norimichi, et al 1991, Hanley, 2006).

Table 1: Causal and contributing factors to fire disasters

Causal Factors	Contributing factors
• **Cooking/heating equipment**	Wood shingle
• **Electrical**	High wind
• **International (Arson)**	Congested access
• **Open flame or Ember**	Inadequate water distribution system
• **Appliance, tool**	Lack of exposure protection
• **Child playing with fire**	Inadequate public protection (fire department inadequacy)

• **Natural causes (earthquake, volcanic lightning)**	Delay in discovery of fire
• **Smoking material**	Delay in ringing the alarm
• **Other heat source**	Unusual hot or dry weather condition
• **Other equipment**	Inadequate personal fire protection

Source: Adapted from Netherlands institute for safety, 2009

Classes of Fire and Types of Fire Extinguisher

Fire disasters are identified according to one or more fire classes. Each class designates the fuel involved in the fire and thus the most appropriate extinguishing agent. The classifications allow selection of extinguishing agents along lines of effectiveness at putting the type of fire out as well as avoiding unwanted side effects. The classification of fire depends mainly upon the fuel involved. According to the University of Pennsylvania Division of Public Safety (2010), there are five classes of fire and these are:

Class "A" – These classes of fires are fuelled by ordinary combustible materials, such as wood, cloth, paper, nylon, rag, plastics and so on. This type of fire is best extinguished by removing the heat side of the triangle.

Class "B" – These are fuelled by flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, alcohols and flammable gases. This type of fire burns on the surface of the fuels and is best extinguished by a blanketing or smothering action. A fire of this type is fast-spreading and capable of engulfing a large area in a very short time.

Class "C" – These fires occurs in energized electrical equipment where the electrical non-conductivity of the extinguishing media is of importance. Blanketing or smothering this type of fire with a non conducting extinguishing agent is of prime importance. Water or solutions containing water is not suitable for this class of fire. If possible, the source of the fire should be shut off as soon as possible.

Class "D" – These fires involve combustible metals, such as magnesium, titanium, zirconium, sodium, lithium and potassium. Generally, the extinguishing agent is referred to as dry powder. These extinguishers should be identified by a star containing the letter "D" if colour coded, the star is yellow.

Class "K" – These are fires in cooking appliances that involve combustible cooking media such as vegetable or animal oils and fats. The extinguishing agent is referred to as wet chemical. These extinguishers should be identified by the letter "K".

Table 2: Comparison of classes, types and identification codes for extinguishers

American	European	Australasian	Fuel/heat source	Type of extinguisher	Identification code and color
Class A	Class A	Class A	Ordinary combustible	Water and foam extinguisher	Letter "A" in a Green Triangle

Class B	Class B Class C	Class B Class C	Flammable liquid Flammable gas	Foam and carbondioxide extinguisher	Letter "B" in a red square
Class C		Class E	Electrical equipment	Dry chemical	Letter "C" in a blue cycle
Class D	Class D	Class D	Combustible metals	Dry powder	Letter "D" in a yellow star
Class K	Class F	Class F	Cooking oil or fat	Wet chemical	Letter "K" in a black hexagon

Source: Adapted from university of Pennsylvania Division of Public Safety, 2010

Effects of Fire Disasters

The effects of fire outbreak can never be over emphasized, fire causes emotional distress as well as physical damage. It threatens life and property and is unpredictable. People are often affected by what they see during and after a fire outbreak. The best predictor of post fire distress appears to be how frightening the experience of the fire was and the extent of the loss. Whenever there is a fire disaster, the affected people may have to first relocate his family members to a safe place, the family faces more problems, such as where they will find immediate shelter, food, water, clothing, money and permanent housing. Unlike natural disasters where residents of a community suffer similar losses, fire often strikes a single home. The family may have to seek shelter with extended family members, neighbors, or friends. If the family is separated temporarily, it can result in additional stress (Applegate, et al 2001). Losing one's home and property can lead to depression and elevated levels of distress, including aftermath stress disorder. In the aftermath of a fire disaster, families may face financial hardship and medical problems. Parents may feel confused and frustrated as they deal with insurance companies and disaster assistance agencies. Also, cumulative emotional effects of evacuation, displacement, relocation and rebuilding should not be underestimated (Barillo and Goode, 1996).

After a fire, it is common for people to encounter sights, sounds, smell and feelings that remind them of the fire and their losses. The physical and emotional recovery process following a fire can be lengthy (NITP & TOPREC 2013). Children and families who experience residential fires may have continuing worry about another fire, increased worry about the safety of their loved ones, friends, neighbors and so on. They feeled move distress and anxiety when reminded about the fire incident.

Global Best Practices in Fire Management

The extent and impact of potential disasters are changing exponentially. The world is increasingly characterized by uncertainty, complexity and rapid change. The scale of crisis

impacts is also intensifying with more and more disasters under mining socio-economic and political systems, destroying infrastructures and eroding the fabrics for future development.

For any management method of fire disaster to be successful, it requires mass participation, which not only gives strength but also legitimacy and ownership to the project. When awareness and education about fire disasters are provided to people, disaster management becomes a simpler task. For example, according to Wisner (2001a), which poverty cannot be eliminated in a developing countries, vulnerability to disaster can be addressed through functional public awareness and education, what is important in the efforts to reduce disaster is to introduce an appropriate feasible package of measures that are not limited to conventional counter-disaster activities. Such a package should includes a rural and urban development programme, with particular emphasis on literacy campaign measures not regarded usually as counter-disaster measures. Most often, the structure of disaster vulnerability is unique to each country and such a comprehensive package can not be prescribed without thoroughly scrutinizing how and why the country in question is vulnerable (Thompson, 1995).

Preparedness and response to disaster according to Ijewere (2003) are not solely the work of experts and emergency responders from government disaster organizations. Local volunteers, citizens, organizations and businesses have active and important roles to play before, during and after major emergencies and disaster. The management of disaster is primarily the responsibility and duty of government. However, a multi-sectoral and multi-disciplinary cooporation between government agencies, community based organizations, corporate bodies, networks in disaster abatement and management is a serious one (Wisner, 2001b, and frances and Hanlon, 2001).

There is need to review urban and regional planning laws, especially the building code to reflect the prevailing circumstances in Nigeria. As necessary as legislative reform is, it is not a sufficient tool for increasing functionality, equity and participation. Legislation can set standards and boundaries for action, for example, by defining development control, building codes or training requirements and basic responsibilities for key actors in disaster management.

Legislation on its own cannot induce people to follow these rules. Legislation has its strength in societies where most activities take place in the formal sector and are visible to administrative oversight. In many disaster prone environments, the wide spread knowledge of legislation is not achievable in the short to medium- term because of financial and human resource constraints. However, the strategies to be adopted in disaster risk management should describe ways in which inclusive decision making could be encouraged to integrate the knowledge and views of all stakeholders in development and disaster management.

Another proactive disaster management strategy is insurance. For example, in the developed countries, insurance is an important loss sharing strategy to cushion the adverse effects of disaster. A property or business insurance arises when a risk is perceived and the owner pay a fee (premium), usually on an annual basis, to buy a contract (insurance policy) that transfers the risk to a financial partner (insurer). The insurer guarantees to meet specified costs in the event

of damage through disaster to the property. By this ways, the policy holder is able to spread the cost of a potentially unaffordable disaster over many years. Insurance mechanism is still weak in the developing country, especially in Nigeria, where poverty and other socio-economic disadvantage prevent the individual from taking insurance policy and the insurer is not able to encourage individuals to insure their property due largely to premium default. However, globally property insurance against fire disaster has been adopted as one of the feasible options in disaster management.

Conclusion

Fire disaster has been considered as the most devastating events, that usually resulting in loss of lives and property. The major cause of fire outbreak is due to human error which can be traced to the clustering of human activities within the urban environment. The effects of fire disaster are difficult to quantify in monetary terms, because, they involve emotional distress as well as physical damages that are not traded in the market place. As a matter of fact,it is important for nations to strengthen decision making and disaster response and management strategies. In Nigeria, despite the availability of laws and codes to order the development of human settlement against fire outbreak. Little has been done in enforcing the codes. It is also disheartening to note that the statutory agencies saddled with the responsibility to manage fire disasters have challenges of inadequate personnel, deficient equipment and lack of action plan to control and manage fire incidents effectively. From this development, the strategies to be adopted in fire disaster risk management should describe ways in which inclusive decision making could be encourage to integrate the knowledge and views of all stakeholders in development and disaster management.

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