AN ASSESSMENT OF FIRE OUT BREAK AND CONTROL MEASURES IN MARKET BUILDING

(A CASE STUDY OF OGBETE MAIN MARKET ENUGU)

AN ESSAY PROJECT SUBMITTED TO THE DEPARTMENT OF BUILDING TECHNOLOGY SCHOOL OF ENVIRONMENTAL STUDIES AUCHI POLYTECHNIC, AUCHI.

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CERTIFICATION

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EXTERNAL EXAMINER

DEDICATION

This research work is dedicated to GOD Almighty, my creator, the secret behind my success, the one whose mercy and grace has kept me this far. He alone be praised.

ACKNOWLEDGEMENT

I give all praise, glory, honour and adoration in heaven and on earth to GOD ALMIGHTY, the highest authority in heaven and on earth, the creator of all things in the universe who has seen me through from the inception to the conclusion of this research work.

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Words are not enough to send my appreciation to my beloved friends, Ifeoma, Nwachimereze, jonah, Favour, Cy, Chisom who always stood by me at all times throughout the process of realizing my dream.

May God Bless you all.

ABSTRACT

The research investigated the causes of fire outbreak in market buildings with a view to prevent outbreak which leads to loss of lives and properties. To analyses this, specific objectives were set forth to; investigate the causes of fire outbreaks in markets in Ogbete Main Market Enugu; evaluate the effect of fire outbreaks on markets in Ogbete Main Market Enugu; and determine possible ways to mitigate against fire outbreaks in markets in Ogbete Main Market Enugu. The population for the study include; Federal and State Fire Fighting Service, Mechanical/Electrical Engineer. Civil Engineer, Builder, Architects, Town Planner, Market Users and Market stakeholders within the study area. Data's for the research were collected through the means of well-structured questionnaires. The data's collected were then analyzed using statistical tools such as percentage, Mean Score and regression analysis. The study revealed; Fire outbreak may not be unstoppable but preventive or mitigating measures can be put in place to fight or arrest fire outbreak when they arises. Meanwhile, the government stands a focal point in the mitigating process of fire outbreak in providing necessary firefighting devices in case of incidence. Meanwhile, in cases where they arises they should be ready to provide financial assistance to market or shop owners who loses their lives or properties in the incidences. More so, alternative lighting devices that are less susceptible to fire outbreak should be used instead of candles or kerosene lamps. Since the study has revealed this as one of the most potent cause of fire outbreak. However, Laws should be made and stiff penalty should be in place for defaulters who refuse to put off all lighting points and sockets after close of the day's activity, Regular sensitization and monitoring of market users is very necessary in order to mitigate against fire outbreak, Government should provide firefighting devices in strategic locations of the market in order to prevent incidences of fire outbreaks. In addition, Contractors and investors who want to handle market projects in the future should ensure that they use fire resistance building materials in order to curb the outbreak of fire.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Fire disasters particularly have become so rampart that they now occur almost on daily basis in most part of the country, (Cavallini, Papagni&Preis, 2007). Although, Laugharne, Van de Watt &Janca, (2011). opined that the risk of fire outbreaks is higher during the dry season than in rainy seasons. However, the number of fire incidents that has occurred in quick succession in recent times across the nation is still alarming and calls for quick action to be taken against this menace.

Fire can be defined as the rapid or sudden oxidation of a material in the exothermic chemical process of combustion, releasing heat, light and various reaction products. (Krebs, Pezzatti, Mazzoleni, Talbot &Conedera, 2010). Once initiated, by either malicious acts or human errors, fire can spread rapidly and become extremely hard to control or extinguish with an increasing alarming speed and grievous destructive consequences, affecting both the innocent and the initiator(s), making them both helpless victims. Fire is often described as the greatest servant but the worst master. It is often difficult to control when it turns into inferno as its wrath on burning and scorching everything on its path is very destructive. Fire outbreak generally is caused by several factors. Leistikow, Martin & Milano, (2000).posited that improper electrical fittings, use of substandard electrical materials, defective generators, power fluctuations resulting from frequent power outages and illegal tapping from the national grid are some of the possible causes of fire outbreak. On the other hand, Ma, Shu, Shen, Song, Li & Liu, (2014) opined that the rise in fire outbreak could be traced to intense harmattan, overloading of electrical appliance on the same fuse and improper electrical installation in buildings especially public building spaces. This

is in contrast with the finsings of Wu, Hu, Chen& Li, (2018) who submits that 75% of fire outbreak in some West Africa countries including Ghana and Nigeria are caused by smoking, 15% out of ignorance and 10% out of accidents.

Marketplaces are economic, social, political and cultural institutions (Lu, Guo, Jian & Xu, 2018).Apart from traders; markets employ several auxiliary workers such as porters, truck pushers, revenue collectors, security men, among others. Market places provide avenues for various forms of interactions that lead to the development of relationships among traders and even between traders and their customers. Some of these social relationships may extend beyond the market and can have long lasting effects. Lastly, Nigerian markets serve as places for various forms of cultural exchanges because traders are usually of heterogeneous ethnic backgrounds.Fire disasters in markets are not mere events striking each particular time but the result of various processes

Oladokun&Isohola, (2010). Many factors are responsible for fire outbreaks in Nigeria Markets. In some places, one of the factors is keeping of petrol in markets, and other factors are adulterated fuel, wrong connection of electricity, power surge, sparks, lighted match, stoves, gas cylinders and throwing away of remains of cigarette at offices and markets Mann, Hanson & Thornton, (2010). Thus, to reduce fire out breaks in markets in Nigeria, there is a need to critically consider major causes of fire outbreaks putting in mind the peculiarity of Nigerian environment in order to check the high frequency of fire outbreaks in markets in Nigeria. Having reached a verge of recording higher economic growth in Nigeria, there is a need to take steps to curb these raging fire outbreaks through preventive measures to avoid further loss of lives, goods and properties Popoola, Adekalu, Audu, Adeleye&Jiyah, (2016). Therefore, a study on the causes of fire outbreaks in markets in Nigeria is of paramount important, in order to find a way

to reduce fire outbreaks in Ogbete Main Market Enugu, Nigeria so that further loss of lives, goods and properties can also be reduced in Ogbete Main Market Enugu.

1.2 Statement of Research Problem

Over time, market buildings have become larger and more complex in design and features. But Market are built without the introduction of fire compartments, Assemble, fire hydrant, muster point. (Adamu, Abubakar&Maina, 2020). There for there is a need to introduce them when building and educating people on fire alarm and detective, compartments, assemble and muster points in building facilities have increased greatly in size and more people can be taken in than before.This usage in the advent of fire outbreak in Nigeria is still yet to be known by most of public building users. The rapid rate at which fire develop means that people often fail to realize how quickly they must respond to a fire incident. And also to know the materials that has high resistance to fire like concrete, brick and Gypsum. The major problem of fire disaster in market places is identification. If fire outbreak is early detected if it arises, fire source in public buildings and the action to be taken for easy management would have been effective (Omodanisi, Eludoyin& Salami, 2014). This implies that there is no proper fire education, awareness and prompt information sharing in market public premises to enable personnel deal with a fire timely at the initial stage of development before it goes out of hand. The increasing incidents of market fire in particular has a serious economic consequences of depriving traders and homes means of livelihood thereby threatening the survival of several market men and women not to talk of the huge investment loss caused by industrial fire outbreaks. Without any iota of doubt, fire outbreak has led to considerable amount of loss of lives and properties thereby leading to a deep fall into economic problems, ranging from individual family's to the nation at large.Hatmoko&Larassati, (2021) opined that one major problem at the advent of fire outbreak in Nigeria is passive or weak

response of fire services and emergency first responders, who have been reputed to always arrive late and without sufficient firefighting equipment, even when they arrive early to the scene of fire incidents.

1.3 Research Questions

The following research questions were put forth;

i. What are the causes of fire outbreaks in markets in Ogbete Main Market Enugu?
ii. What are the effect of fire outbreaks on markets in Ogbete Main Market Enugu?
iii. What are the possible ways to mitigate against fire outbreaks in markets in Ogbete Main Market Enugu?

1.4 Aim and Objectives of the Research

The aim of this study is to investigate the causes of fire outbreak in market buildings with a view to prevent outbreak which leads to loss of lives and properties. In order to achieve this aim, the study is set out with the following objectives:

i. To investigate the causes of fire outbreaks in markets in Ogbete Main Market Enugu;
ii. To evaluate the effect of fire outbreaks on markets in Ogbete Main Market Enugu; and
iii. To determine possible ways to mitigate against fire outbreaks in markets in Ogbete Main Market Enugu.

1.5 Justification for the Study

The causes of fire outbreaks in Nigeria Marketshave been identified by some researchers. Yanus, (2021) opined that they are mostly traceable to electrical faults. Alabi, Adekalu&Popoola, 2021) argued that, about 70 percent of fire incidents in markets in Nigeria is traceable to electrical faults; that is why there is a need for a research of this nature to study the causes and solution of fire outbreak in Ogbete Main Market, Enugu.

Sunday, Zubairu&Isah, (2019) Fire service received 4,541 calls between 2020 and 2021; 31 market fires recorded in 18 months, Lagos tops list of states with highest cases, followed by Anambra, hence, and Incidents drive inflation figures, crime rate. Nigeria's economy is no doubt bleeding financially from damaging impact of fire incidents, especially market fires, which has, over the years, brought immense hardship on Nigerians, leaving an already struggling economy on its knees. Hardly a month passes by without reported case(s) of fire incident, especially in public places such as markets. Experts say this portends huge financial damage to the economy by worsening the nation's poverty indices. Hence, this make a study of this nature very important.

The study would enhance public knowledge on market buildings fire management and causes to this great menace. It would also help market residents to know the fire safety measures and causes to be particularly vigilant about. The outcome of this study would serve as a reference material for students, researchers and policy makers. More so, the ability to understand and predict the patterns of fire outbreak will also help managers and decision makers to improve the effectiveness of fire prevention, detection and control. In this study, different causes of fire outbreaks will be pointed out and different issues associated with them will be assessed.

1.6 Scope of the Study

Markets have been classified by different researchers based on different factors such as location, time, competition, function, legality, transactions, regulation, volume of business, nature of commodity, demand and supply Thus, the scope of this study is the regional built-up markets in Nigeria using a Case study of Ogbete Main Market in Enugu State. The Market women in the study area will be assessed and relevant stake holders to the topic of discussion will be assessed to gather relevant informations needed to carry out this research.

1.7 Definition of Terms

Market: A market is an arrangement whereby buyers and sellers come in contact with each other directly or indirectly to buy or sell goods. (Obioji&Eze, 2019)

Assessment: Assessment is the systematic basis for making inferences about the learning and development. It is the process of defining, selecting, designing, collecting, analyzing, interpreting, and using information to increase learning and development. (Harlen, 2006)

Fire Outbreak: A *fire* is an occurrence of uncontrolled burning which destroys buildings, forests, or other things. (Genevra, Ikechukwu&Anulika, 2018).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The word fire refers to the natural phenomenon that occurs whenever a combustible fuel comes into contact with oxygen from the air and gives out light, heat and smoke. Fire is the byproduct of a chemical reaction in which heat stored in a combustible fuel is converted to a heat and accompanied by light. A fires flame refers to the visual indication of light that occurs once the gas is heated, and is evidence that a fire has taken place (Tonui, 2009). A fire can result in extensive damage and destruction of property as well as injuries and death to occupants of a given premise (Obioji&Eze, 2019). Fire outbreak can also disrupt activities quite significantly and bring most operations to a standstill. Fires can lead to the destruction of property and loss of important records and information hence the need for clear fire safety rules to minimize outbreaks and the loss that can result from such hazards (Obasa, Mbamali&Okolie, 2020). Osaro (2013), defined fire disasters as those events that displace the structural, economic, organizational, cultural and spiritual well-being of communities by destroying their means of existence. Fire disaster could either be human-induced or natural occurrences. Fire disasters are natural if they just happen without being induced by humans like bush burning, electric sparks, fuel and gas explosion. According to United Nations International Strategy for Disaster Reduction (UNISDR, 2008), when fire disaster occurs, human beings are among the most vulnerable population group, especially those present in times of the fire event. Furthermore, during fire disasters, buildings are destroyed, taking away the precious lives of people and stalling access to activities in the aftermath of fire disaster (Dowd, 2012). Fire disaster could be natural or man made, however, its occurrence cannot be eliminated out rightly in the built environment, but could be prevented, reduced or mitigated through preparedness measures as

indicated by (Chen, Chuang, Huang, Lin, C. Y., and Chien, 2012). There have been several incidences of fire outbreak in Commercial buildings in Imo State which have resulted in loss of human lives, valuable property and documents destroyed. These fires have continued to render many jobless, damage the built environment. The effective solution to these fire incidents will require enhancing the capacity of the relevant regulatory authorities in evaluating the proneness of any building to fire outbreak with the view to proffering remedial measures to this fire threat (Buchanan, 2001).

2.1.1 Types of Fire

If a fire starts, it can spread quickly. Not every fire is the same. Different fires can have different hazards and risks. Using the wrong type of fire extinguisher could do more harm than good. There are different types of fires and they can be caused by a variety of different things and may take place in any business or home. All companies must be aware of fire safety and even if you are not working with clearly flammable materials, there is still a risk that fires can start.

The four main type of Fire are

1. Bush Fire

2. Chemical Fire

3. Electrical Fire

4. Material fire

BUSH FIRE; This are forest fire which burn the bushes around and could be caused by man Accidentaly, Carelessnessly or willfully. It can also be caused by thunder bolts.

We have 3 types of Bush Fire

i. Surface fire

ii. Crown Fire

iii. Ground Fire

2**. Chemical Fire**; A chemical fire is any flame that begins due to a chemical reaction that ignites a solid, liquid, or gas chemical compound. Just as run-of –the-mill fire can be extremely destructive, chemical fires are incredibly dangerous, cause severe and fatal burns, and stand destroy most living or material things that stand in their way. To properly defined against chemical fires, it is crucial to understand how they stand and stay burning.

Some example of those Chemical are;-

i. **Asides;-** this can be very dangerous when mixed with heavy chemicals such as lead or copper. They degrade quickly when exposed to heat, giving them explosive potential.

ii. **Ether:** A very common, highly flammable and potentially explosive compound found in anaesthetics, refrigerants, and alcohol. Ethers have low flash points, below 73 degrees f Fahrenheit, meaning it doesn't take much heat to set them off.

iii. **Gasoline:** Gasoline is a mixture of approximately 150 different chemicals, many flammable chemicals. This makes gasoline vapors extremely dangerous when close to heat sources. Gasoline is incredibly volatile and explosive.

iv. **Glycerol:** This chemical has widespread use in pharmaceuticals and is combustible at about 140 degrees, F.

v. **Per chloric Acid:** Per chloric acid is a laboratory reagent that can ignite when in contact with products containing cellulose (plant products) like wood and paper.

Picric Acid: Also a reagent, picric acid is mainly used in solid form and detonates when struck, rubbed, or heated.

vi. **Petroleum:** At the base of gasoline, diesel, kerosene, and really every other oil product lies petroleum. Depending on the product the petroleum is used in, the volatility may vary, but care should be taken when handling any petroleum product.

3. Electrical fire; Do to devolvement of new light and the danger associated with its usage, the institution of Electrical Engr. [IEE] formulated roles and regulation for the preparation of fire risk arising from electrical light. Government also make their law known as statutory regulation worldwide. In Nigerian it is known as electricity ordinances that is design to be observed by those carrying out electric insulations work so as to secure the safety of users and workers of electricity.

4. Material Fire; this is class a fire, this type of fire that can obstruct from wood, paper etc. it is mainly fund in the living house.

2.1.2 Classes of fire

The 5 main classes of fires are categorized by what caused the fire or what the fire uses as fuel, and are as follows:

- **Class A:** solid materials such as wood or paper, fabric, and some plastics
- **Class B:** liquids or gas such as alcohol, ether, gasoline, or grease
- **Class C:** electrical failure from appliances, electronic equipment, and wiring
- **Class D:** metallic substances such as sodium, titanium, zirconium, or magnesium
- **Class K:** grease or oil fires specifically from cooking

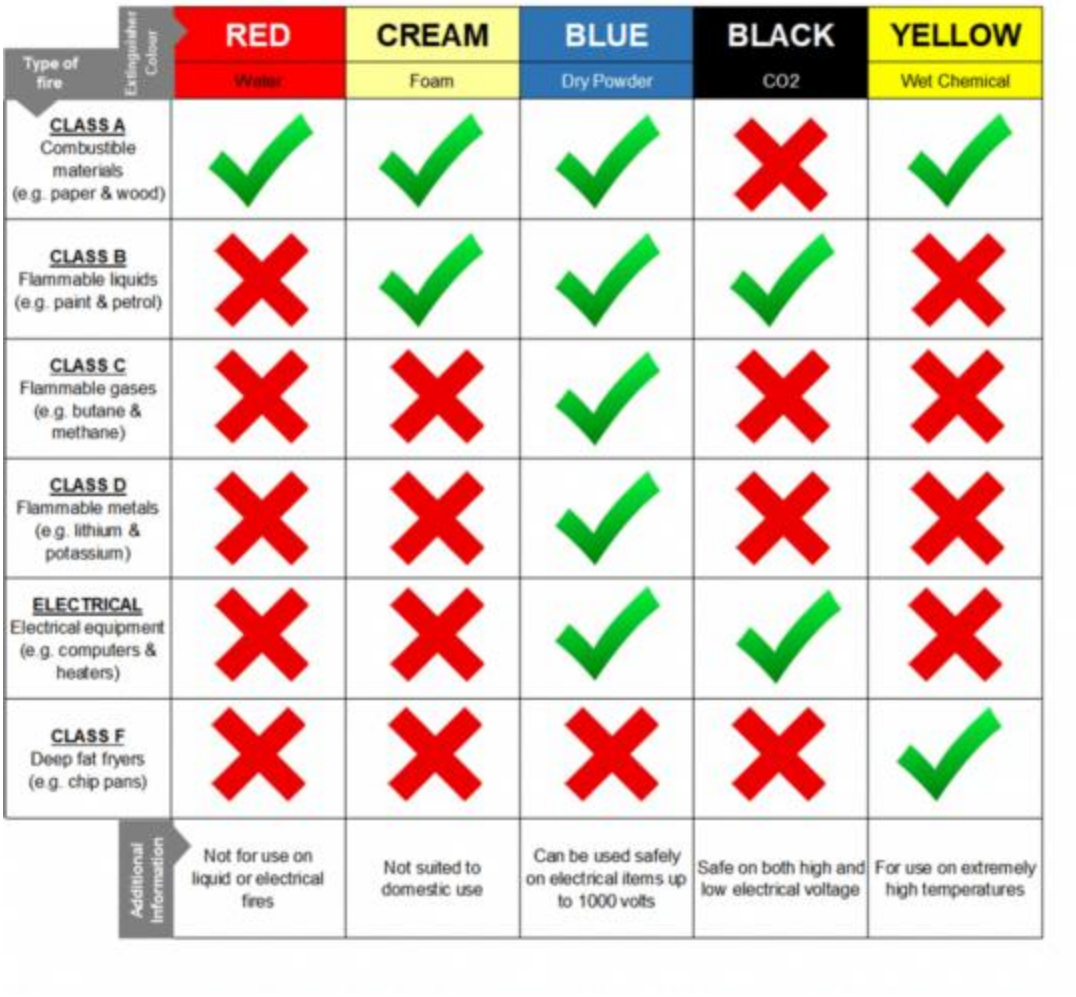
Understanding the 5 different classes of fires can help you determine the biggest fire risks at your facility, depending on the fuels and fire hazards present as well as how best to prepare in case of a fire emergency.

Let's break down each of the 5 different classes of fires more thoroughly.

Class A Fires: "Ordinary" Fires

Class A fires are the most common of the 5 different classes of fires. They occur when common combustible materials like wood, paper, fabric, trash, and light plastics catch fire. These accidental fires are ubiquitous across a variety of industries, so it's recommended to have adequate protection against "ordinary" fires in addition to other condition-specific fires.

Despite being "ordinary", don't rule this class of fire as low-risk. If there's an abundance of fuel present, these fires can intensify quickly. It's best to put out a Class A fire quickly before it spreads using water or monoammonium phosphate.



Type of fire / Extinguisher Colour	RED	CREAM	BLUE	BLACK	YELLOW
	Water	Foam	Dry Powder	CO2	Wet Chemical
CLASS A Combustible materials (e.g. paper & wood)	✓	✓	✓	✗	✓
CLASS B Flammable liquids (e.g. paint & petrol)	✗	✓	✓	✓	✗
CLASS C Flammable gases (e.g. butane & methane)	✗	✗	✓	✗	✗
CLASS D Flammable metals (e.g. lithium & potassium)	✗	✗	✓	✗	✗
ELECTRICAL Electrical equipment (e.g. computers & heaters)	✗	✗	✓	✓	✗
CLASS F Deep fat fryers (e.g. chip pans)	✗	✗	✗	✗	✓
Additional Information	Not for use on liquid or electrical fires	Not suited to domestic use	Can be used safely on electrical items up to 1000 volts	Safe on both high and low electrical voltage	For use on extremely high temperatures

Class B Fires: Liquids & Gases

Class B fires involve flammable liquids and gases, especially fuels like petroleum or petroleum-based products such as gasoline, paint, and kerosene. Other gases that are highly flammable are propane and butane, which are common causes of Class B fires. The best way to deal with these types of fires is by smothering them or removing oxygen using foam or CO2 fire suppression equipment.

Be aware that Class B fires do not include grease fires or cooking fires, which belong to their own class, Class K.

Class C Fires: Electrical Fires

Electrical fires fall under Class C and are common in facilities that make heavy use of electrical equipment, but they can occur in a wide range of industries. For example, data centers might be an obvious risk area for Class C fires. They must have safeguards in place to deal with electrical fires. Construction are another common Class C fire risk: electrical power tools or appliances used for cooking can cause sparks to ignite combustible materials and intensify rapidly. Old buildings with bad wiring or space heaters present more concerns.

Electrical fires require non-conductive materials to extinguish the flame, so water alone is not a good solution. Facilities with sensitive equipment may prefer clean agent suppression because it won't leave residue or damage electrical equipment.

Class D Fires: Metallic Fires

Class D fires are not as common as the other classes, but they do require special attention because they can be especially difficult to extinguish. Metallic fires involve flammable materials like titanium, aluminum, magnesium, and potassium — all commonly occurring in laboratories.

Class D fires cannot be addressed with water, as this can exacerbate the fire and be potentially dangerous. Dry powder agents are the best solution for smothering the flames and limiting damage to property or people.

Class K Fires: Grease Fires or Cooking Fires

Class K fires involve flammable liquids, similar to Class B fires, but are specifically related to food service and the restaurant industry. These common fires start from the combustion of liquid cooking materials including grease, oils, and vegetable and animal fats.

Because they can spread quickly and be difficult to manage, Class K fires are some of the most dangerous. Water can make the situation worse, but smothering the flames or using a wet agent fire extinguisher is effective.

Now that we understand how each fire starts, we can prepare for how to fight them — or better yet, prevent them from happening in the first place.

A hazard is something which may cause you or someone else harm. Fires can cause a lot of harm to people and some examples of the hazards are –

Heat – The most obvious hazard from a fire is the actual flames. These flames can burn your skin as well as your eyes and lungs. Burns are life threatening to a large extent and extremely painful.

Smoke – When a fire burns, smoke is often given off. This smoke can be inhaled and cause serious harm to the lungs. It is a well-known fact that the majority of fires which result in death actually come about from smoke inhalation rather than burns.

Lack of oxygen –Since oxygen is one of the three components needed for a fire, it is used up quickly. This means that the fire can burn through the oxygen in a room and leave none for people in the vicinity to breathe.

Damage to the environment – As a fire burns it will cause damage to the surrounding building or other things in the environment. This has the potential to cause harm if the surroundings collapse.

2.1.2 Fire Behavior

There are a number of different behaviors that fire can show. Each one will work in a distinct way to spread the flames and heat from a fire to new areas. Heat is passed from one area to another through different objects and principles.

The main principles of heat transfer are – Direct contact. Conduction. Radiation. Convection. Flashover and Back draught.

Direct Contact

The first way that a fire will spread is through direct contact. This means that the flames themselves come into contact with other fuel sources which also catch fire. The fire will travel along the other source of fuel as long as it is combustible. This is seen very often and a good example is when paper or cardboard is set alight – the flame will travel down the fuel and spread. Combustible – able to catch fire or burn easily.

Conduction

Some materials may not be combustible themselves but could allow fire to spread through conduction. This is when the material does not burn but instead heats up to a high temperature when in contact with fire. This high temperature passes to the other side of the material. If there is a fuel source on the other side and the temperature is high enough, this can set on fire.

An example of conduction is through metal. If you heat a metal rod it is unlikely to catch fire. However, it will heat up to high temperatures and could set fire to something at the other side such as paper.

Radiation

Heat is transferred through electromagnetic waves and not just through contact. This is why we feel heat from objects even if we do not touch them. If an object is simply too close to a fire, it could pick up so many waves that its temperature reaches a point that allows it to set alight.

An example of this could be if you place a magnifying glass on to paper on a hot day. The heat (in the form of radiation) from the sun is magnified and can set the paper on fire.

Convection

Fire causes the air around it to heat up and smoke to be produced. Warm air rises above cool air and therefore the air that is heated by flames will rise up to the roof or ceiling in a building. This process is known as convection.

When convection takes place, the heat from the air can become trapped on the ceiling and, as the fire continues to burn, the heat will continue to rise. This build of heat can start new fires if there is enough oxygen and a fuel source. For example, a lot of offices have suspended ceiling tiles which may set alight if enough hot air rises during a fire.

Flashover

This method of fire spreading is closely linked to convection. Flashover happens when hot air from a fire rises to the top of a room which then radiates enough heat for objects in the room to heat up. As furniture and other objects get hot, they will begin to give off flammable gases. This gas can result in the materials in the room quickly catching fire simultaneously.

Flashover is what makes a fire spread very quickly. One minute, a fire can be seemingly small but, if the surrounding objects have been heated up, they can quickly ignite into a large-scale blaze.

Backdraught

When a fire is not well ventilated, it can start to use up the limited oxygen that is available. This will cause the fire to die down and the flames to reduce. This can result in a large number of areas where flammable gases are present but there is no actual fire due to oxygen being limited. A sudden introduction of oxygen such as a door opening or window breaking can then result in

the fire starting again. These restarts will often be very explosive as oxygen rushes back into the mix.

The risk of back draught is the reason why people should never re-enter a building that has been on fire. The opening of a door will allow oxygen to get back to the flames and could easily end in an explosion.

2.1.4 How can we prevent fires

Fire protection

Protection is about reducing damage and saving lives when a fire occurs. This can be done using a lot of methods which we will explore in this section of the course. Protection measures can be split into active and passive.

Active control measures

Active control measures are safety measures that require action from a person or situation. This means that active protection measures are either used or react when a fire takes place. Examples include fire extinguishers and blankets which are used by people. Other examples include sprinkler systems and emergency lighting as these are triggered when a fire happens.

Passive control measures

Passive control measures are physical features that do not require any action in protecting life. They are usually built into a building and are no different when a fire takes place to any other day. They include fire exits, signs leading to the nearest exits and any special fire safety equipment built into the location (such as fire resistant walls and doors).

2.1.5 How we react to fire

Once a fire has taken hold, it is important that we react calmly and quickly. Obviously, it is a lot easier to say this than do it in practice but carrying out regular fire drills and having a good understanding of how fire spreads is a huge help. This knowledge will result in you knowing what to do in situations where fire is present and help you to avoid some of the common mistakes people make.

When no training is taken, people that are caught in a fire can make mistakes such as –

Not knowing how long an evacuation takes.

Reacting slowly.

Not knowing the correct procedure.

Underestimating the way in which fire spreads.

Underestimating the time it takes for fire to spread.

What to do when you hear the fire alarm

If you ever hear a fire alarm you should stay calm and act according to the procedures set out in your workplace.

Always

Stay calm and act quickly.

Leave near the nearest fire exit.

Close doors and windows behind you.

Assemble at the nearest designated assembly point.

Never

Spend time collecting belongings.

Use lifts unless they are part of a specific personal evacuation plan.

Attempt to tackle a fire without correct training.

Go back into the building unless you are told it is safe to do so.

When evacuating a building due to an alarm being raised, you should stay calm and not take any risks. All belongings should be left as fire can quickly spread and the most important thing is to get out of the building as quickly as possible.

2.1.6 What to do if you cannot get out

At all times in the workplace, you should have access to an emergency exit. These exits should never be blocked as you do not know if these will be needed at any point.However, if you do become trapped in a building with no means of escape you must carry out certain steps.

Firstly, if the emergency services have not yet been informed you must call them. If the fire is not in the same room as you, make sure that the doors and internal windows are shut. This will create a barrier between you and the fire.

Grab any fabric that is available and place this in cracks around doors and windows to stop any smoke or flames from entering. If possible, it is also best to wet this material first. If an external window is present, open this and shout ‘Fire’.

If any smoke does start to get into the room, use some material to cover your nose and mouth and try to only breath through your nose.

Contact the emergency services if they have not already been informed of the fire

Close any internal doors and windows

Block gaps in doors and windows with damp cloth

Open external windows and shout ‘Fire’

Use a cloth or other material over your mouth and nose to block smoke.

If you are ever too close to a fire and your clothes catch alight, you can carry out the stop, drop and roll technique.

STOP – the first thing to remember is to never run if your clothes catch fire. This will add more oxygen to the flames and make the fire burn faster.

DROP – drop to the floor and lie down. This will stop the flames from moving up your body vertically and burning your head and face.

ROLL – Once on the floor, place your hands over your face and roll back and forth to smother the flames. This will reduce the oxygen to the fire and work to extinguish the flames.

DON'T STOP – Do not stop until the flames are out.

If someone else is present, they can use something like a rug or thick blanket to smother the flames. If possible, this should be soaked in water first.

2.1.7 When to Use a Fire Extinguisher

Fires should only ever be tackled if it is safe to do so. Without the correct training and equipment, attempting to tackle a fire is extremely dangerous and should never be done.

Fires should only be extinguished if –

Someone has raised an alarm.

Someone has called the emergency services already.

There are the right types of extinguishers available.

You have undergone training to use an extinguisher.

The fire is small and not growing.

A safe route to an exit is available.

Fires should not be extinguished if –

The room is filling with smoke.

The fire is spreading.

There are other flammable hazards around (such as gas canisters).

More than one fire extinguisher is needed.

2.1.8 How To Use A Fire Extinguisher

Different types of fire extinguisher can have different instructions for use so these should be checked. However, in the case of a fire, it is unlikely that you will have time to read these instructions fully so you can follow general advice with the PASS method.

The PASS method –

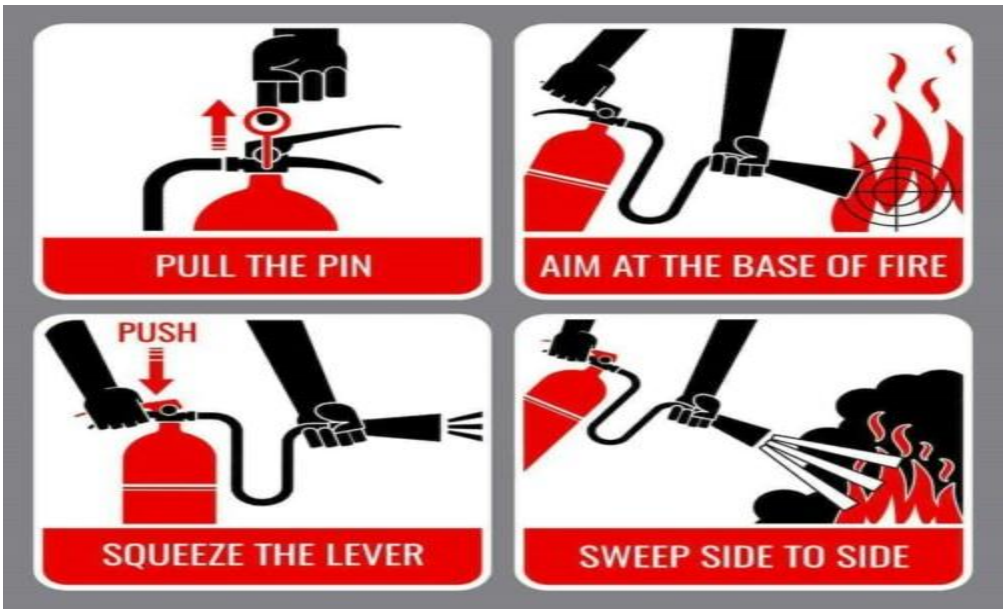
PULL – Firstly pull the pin from the fire extinguisher. This may have a small plastic seal around it (known as a tamper seal) which will break when the pin is removed.

AIM – Aim the nozzle low at the base of the fire and not at the flames.

SQUEEZE – Squeeze the handle slowly until the fire extinguisher discharges.

SWEEP – Sweep the nozzle from side to side in small motions at the base of the fire. This will act to cover the base of the fire and should be continued until the fire is out.

If the fire reignites afterwards, repeat steps 2 to 4.



Good fire safety housekeeping practices

The ways to minimize and prevent the risk of a fire breaking out is to follow good housekeeping practices, at home and at work.

Install at least one smoke alarm on every floor in the property and ensure they are tested often.

Ensure all appliances are switched off before you go to bed.

Do not leave candles unattended.

Equip your home with fire safety equipment.

Ensure all cigarettes are extinguished in an ashtray.

Do not leave anything close to an electric heater.

Do not over load plug sockets

2.1.9 Major Causes of Fire Outbreak

Fire outbreak in recent years has been at a high, especially in most developing countries. No day passes without news of a fire incident, despite being known to be caused by many factors. One of the leading factors that cause fire outbreaks in homes and offices has always

been **"Negligence"**. Failure to exercise ethical and appropriate measures in preventing fire outbreaks always results in unlikely consequences. This article concentrate on the four causes of fire outbreaks and how to avoid them.

Wrong Electrical Wiring: Wrong electrical wiring is one of the significant reasons of a home or office fire outbreaks. Faulty electrical installations or wiring can lead to many electrical or power problems in a building ranging from frequent electrical surges, sags and dips in energy, light switches not working correctly, circuit breaker frequently tripping to circuit overload. When it comes to the household or office electrics, the safety of the occupants is always paramount, and wrong wiring has always been one of the common problems of facility managers encounter at the course of their work, wavering lights, damaged appliances and high bills can be signs of electrical surges, this is probably as a result of an electrical device connected to wiring itself or the home grid. As mentioned above, let's elaborate on the problems experienced when there is a faulty wiring connection, with the most appropriate solutions or measures to take.

Electrical Surges: Electrical surges can be as a result of anything from damaged power lines, faulty appliances, lightning strikes and certainly bad electrical wiring in the house. Though actual waves only last a microsecond, frequent surges can damage the electrical components connected to your home, thereby degrading their life expectancy significantly. Electrical surges can lead to a high risk of fire outbreak in homes and offices. Try removing cheap or non-quality device power boards from the outlets to check if it prevents the surges otherwise consult the services of a professional electrician.

Light Bulbs Burning Out Too Often: Light bulbs burning out too often can be of many reasons like bad wiring on the circuit, this poses a high risk of fire outbreak, it can spark in

flames thereby leading to the burning of the cables. Light bulbs burning might seem to be a common problem in this part of the world; measures are frequently not taken to solve the problem until it has gotten to its worst.

Extension Cords and Power Boards: You must use the extension cords and power boards the right way at the office or home. Whenever possible, avoid not to use extension cords and power boards unless it's necessary. If at all you need to use extension cords and power boards, avoid overload caused by plugging too many devices or accessories. Also, to be sure extension cords and power boards dissipate heat efficiently as possible, ensure that they are not being covered with anything and keep off hot surfaces such as heaters.

Heating Equipment: Many times, people put them close to combustible surfaces such as clothing, chairs and couches, and curtains due to its portability. Coil space heaters are mainly dangerous in this regard because the coil will become so hot that it will almost instantaneously ignite nearby flammable materials. For space heaters, it is advisable to use the radiator type that diffuse heat over the whole surface of the appliance. These are most likely to ignite flammable items; therefore, they should be kept in a proper safe place.

Faulty Outlets, Appliances: Mainly electrical fires are caused by faulty electrical outlets, worn out, outdated appliances. Receptacles, appliance cords and switches can cause other fires. Never use a worn device or frayed cord that can send heat onto surfaces like curtains and rugs because of their combustible nature. Running cords under rugs or flammable materials is also one of the causes of electrical fires. Removal of a grounding plug from a cable so that it can work in a two-prong electrical outlet is capable of also causing a fire outbreak.

Concept of Market Fire Outbreak in Nigeria

Increase in the cases of settlement fire disaster has marked the era of urbanization. Urban centers due to congestion are prone to disaster outbreaks as a result of pressure, painlessness, and non-chalant dangerous actions of residents. Fire disaster as an example of an urban disaster can be human-induced or climate driven. Mutch, (1995) stated that periodic forest, grassland, and tundra fires are part of the natural environment, as natural and as vital as rain, snow, or wind. Increasing temperature coupled with heat has been identified as a natural causal factor of fire disasters. Human activities such as burning, improper electrical works, high voltage electricity, in-door/outdoor explosions are some of the causes of fire disaster. Incidences of fire are not restricted to time or season. Wikipedia, (2014) stated that from ancient times, periods dating about several hundred B.C (Before Christ), up till the 20th century, fires have been a major hazard to urban areas and the cause of massive amounts of damage to cities. City conflagrations were highly devastating spreading over a wide range with incredible loss figures. Most, if not all, major cities of the world had their share of the massive inferno mishaps. In the 13th century, one of the two medieval fires of London also called the Great Fire of Suthwark, broke out and left about 5000 people dead while fleeing on the London Bridge. Also, about 80% of all residential houses and almost all public buildings were destroyed when fire razed Reutlingen, Germany in 1726, displacing 1,200 families (Wikipedia, 2014). Although, fire disasters still ravages some urban centres of the world in recent times, the level of damage is minimal and can be attributed to increased awareness and precautions as well as improved fire combating techniques. Nigeria has also had its share of the ravaging fire story. The most devastating of the fire disasters in the nation's history was the pipeline explosion in Jesse, Delta State on 18th October, 1998 which claimed 1,082 lives, the highest number of casualties for a single fire event (Savid News, Sports and Politics, 2010). Bomb explosions at the Nigerian Military Cantonment in Ikeja, Lagos on

January 27, 2002 was another terrifying fire outbreak leaving 800 dead and thousands homeless. About 5,127 persons have died between 1998 and 2013 owing to fire disasters (Savid News, Sports and Politics, 2010). More so, about ₦50 billion worth of property was disclosed lost annually to fire disasters by the Minister of Interior, Abba Moro (Premium Times, 2012). Lagos, the commercial hub of Africa's most populous nation, has also been a victim of severe urban fires ranging from residential apartments, along transport routes, industrial and public buildings and even market places. Most of these fire incidences have claimed lives, properties worth millions of naira, displaced many and sad enough, the culture of insurance has not been sufficiently imbibed, thus making recovery from such mishaps take longer than necessary. Market fires have become a regular occurrence in Lagos State in recent times. Between the years 2012 and 2013, the frequency was phenomenal as market fire tales made headlines in the dailies almost every month within this period. One remarkable market fire during this period was the 2012 Boxing Day explosion in Jankara market, Idumota, Lagos. This fire, which began from a shop where assorted fireworks/firecrackers (knockouts) were stored, spread very quickly destroying several shops, residential apartments and sent people running in all directions even as some misconstrued it for bomb blasts due to the noise of the explosion (Nigerian Current, 2012). Millennium Development Goal (MDG) number one bothers on the eradication of extreme poverty, unemployment and hunger by 2015 (Sharma, 2012). Although according to the UN (2000), the MDG 1 reads: "Eradicate Extreme Poverty and Hunger", employment rate plays a significant role in its achievement. As a matter of fact, target two (1B) of the MDG 1 reads: "Achieve full and productive employment and decent work for all, including women and young children" (UN, 2014). Employment is therefore, pivotal to the eradication of poverty. This implies that as long as unemployment lingers, MDG 1 remains a mirage. For the African continent as a whole, Target 1A is not achievable within the time frame. The UN estimates that

35.8% of the population in subSaharan Africa is still in a situation of extreme poverty. The population of working poor (i.e living below $1.25 per day) accounted for 39.1% of total employment in 2011 while vulnerable work accounted for 70% of employment growth from 2007 to 2011 in Africa (Sharma, 2012). This leaves the achievement of Target 1B also improbable by 2015. In Nigeria, unemployment rate increased to 23.90%, a record high value, in 2011 from 5.3% in 2006. This represents the number of people looking for a job as a percentage of the labor force (Trading Economics, 2013). This level of unemployment has caused many to resort to all forms of trading which appears to be the only 'job' without a gateway. Most trading activities take place in the markets and goods sold range from petty perishable items to heavy duty gadgets. This represents the sole means off livelihood of many of the traders. Yet, this means of livelihood is threatened by the incidences of fire disaster. The spate of fire mishaps in markets within Lagos State has stripped many traders of their jobs or means of livelihood; hence adding to the number of people seeking jobs. Despite the increasing rate of mishap, the incidences of fire disaster have not been fully documented. These market fire saga continued throughout 2013 and began also early in 2014. The lack of documentation as regards the characteristics of this fire has limited the understanding of the market inferno. This study is centred on providing a time series documentation of incidences of fire disaster in Lagos State markets. The objectives are to carry out a time-dimensional analysis of market fire incidences; examine the various causes of fire outbreaks; assess the impacts of fire incidences on traders and the immediate environment

Records of Market Fire Incidents in Nigeria

S/N	Market	Location	Date of Incident	Number of Casualties	Number of Burnt Shops
1	Ogbete main market Enugu	Enugu North	3rd Jan,2020	Not Given	NOT given
2	Wuse new market	Wuse FCT Abuja	25th Dec, 2002	Not Given	Not given
3	Part of Wuse Market	Wuse FCT Abuja	17th Jan, 2003	No life lost	Not given
4	Muhammadu AbubakarRimi market	SabonGari area of Kano State	2nd Nov, 2008	Not given	400 shops burnt
5	OseOkwuodu Food stuff market	Onitsha, Anambra state	13th April, 2014	Not given	200 shops and goods worth over 1 million naira destroyed
6	Alaba international Market	Ojo, Lagos state	3oth June, 2014	Not Given	5 phone accessories shops were burnt
7	Atakumosa market	Ilesa area of Osun state	9th August, 2015	No casualty	Properties worth over million naira destroyed
8	Area market	Garki, FCT market	30th Dec, 2015	Not given	Loss of properties worth over millions naira destroyed
9	Yola South Main Market	Yola, Adamawa state	4th January, 2016	Not Given	Goods worth over million naira destroyed
9	Jakande market	Ikosi-Ketu, Lagos	18th January, 2016	No life lost	Goods worth millions of naira destroyed
10	Muhammadu Abubakar	SabonGari area of Kano state	26th March, 2016	No life Lost	3800 shops burnt and led to the loss of good worth millions of naira

Source: federal Fire Service of Nigeria, 2002 - 2016

Measure to Prevent Fire in Public Buildings

Accessible Equipment

Make sure all of your fire protection equipment (ie fire extinguishers, control panels, etc.) are easily accessible. Also don't block the fire sprinklers or fire alarms with anything, such as dust, debris or paint. You don't want to hinder the functionality of your equipment.

Proper Disposal

Discard of any hazardous waste in a metal container that has a lid. Hazardous waste can include anything from oils to chemicals. Even flammable and combustible materials should be properly disposed of in order to prevent fire hazards.

Regular Maintenance

Schedule regular maintenance services for all of your fire protection equipment to make sure everything is up to code. It's also smart to make sure any machines in your building are properly maintained in order to prevent overheating or sparks created from friction.

Safe Storage

If you have chemicals, flammable materials or other hazardous substances in your building, you will want to make sure they are stored in a safe place. Make sure they are in a dry, secure closet or room that has adequate ventilation. It's also a good idea to keep fire protection equipment for flammable substances near the storage area just in case.

Clean Environment

There are many reasons that you should keep your building neat and tidy. One of the main reasons is because when there's a lot of clutter, especially flammable materials such as paper, boxes, etc., then a fire can spread faster. The clutter could also block exits and make it harder to escape if there is a fire. So make sure to keep the inside of your building clean and clutter free.

Precautionary Measures

Fire safety demonstrations can go a long way when it comes to the safety of your building. Make sure to teach building occupants how to react to a fire and how to use a fire extinguisher, along with the other fire protection devices. This can help to prevent a fire from spreading if one does occur in your building.

Building Security

Arson is one of the leading causes of building and structure fires. That's why it's so important to invest in building security. Building occupants should know to lock up the building behind them and they should know how to report suspicious behavior or people if they see something a little off.

Designated Smoking Area

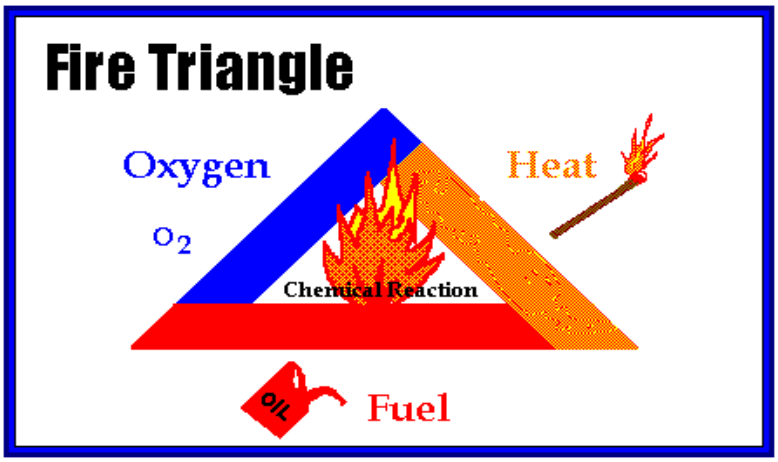
There should be a designated smoking area that's a safe distance away from the building. Also make sure to provide ashtrays or other safe options for people to properly extinguish and dispose of their cigarettes. This will help keep your building safe from accidental fires caused by lit cigarettes.

Emergency Plan

Emergency and evacuation plans are important to prevent further damages or issues if there's a fire. It's important that if someone needs to call for help, they know what to do, how to easily find the building address, and what the next steps should be. Fire prevention is just as important after a fire has already started because it can reduce the risk of it spreading, which can lead to more damages.

Adhere to OSHA & NFPA Guidelines

Today there are safety standards and regulations put in place to help businesses better prevent fires in the workplace. Both OSHA and NFPA provide a set of rules and guidelines to ensure fire protection and safety. You'll want to make sure that you meet all of their requirements to remain up to code and secure.



Oxygen, heat, and fuel are frequently referred to as the "fire triangle." Add in the fourth element, the chemical reaction, and you actually have a fire "tetrahedron." The important thing to remember is: take any of these four things away, and you will not have a fire or the fire will be extinguished. Essentially, fire extinguishers put out fire by taking away one or more elements of the fire triangle/tetrahedron. Fire safety, at its most basic, is based upon the principle of keeping fuel sources and ignition sources separate

Concept of Market

In ordinary speech, the term ‘market’ refers to a place where buyers and sellers meet for transactions, e.g: Onitsha market (Anambra), Computer village (Ikeja, Lagos), Balogun Market, (Marina, Lagos), Ladipo market (Mushin, Lagos), Ariaria market (Aba, Abia) and Bodija market (Ibadan, Oyo). Ogbete Main Market (Enugu) and others. But in economics it is used in a different sense. In economics, the term ‘market’ does not mean a particular palace, rather it refers to a particular commodity which is bought and sold, e.g., the rice market, the cloth market, the gold market and so on. It is used to indicate a commodity or service as also their buyers and sellers who are in direct competition with one another. So, a market consists of a group of buyers and sellers in sufficiently close contact with one another for exchange to take place among them.

In the above sense there is no restriction of locality. The market may be local, national or international depending on the commodities which are bought and sold. Local markets are found for the local produce or for the perishable commodities (e.g., vegetables, milk, eggs, etc.) or for animals like goats, horses, cows, etc. The market of wheat or cloth or gold is both national and international as these goods are bought and sold widely.Moreso, A market is an arrangement whereby buyers and sellers come in contact with each other directly or indirectly to buy or sell goods. But in economics, it may be a place, perhaps, may not be. In economics, market can exist

even without direct contact of buyers and sellers. The face-to-face contact of buyer and seller is not necessary for market.

Classification of Markets

Generally the market is classified on the basis of; Place, Time and Competition.On the basis of place, the market is classified into:

1. Local market or regional market
2. National market or country wide market
3. International market or global market

On the basis of time, the market is classified into:

1. Very short period market
2. Short period market
3. Long period market
4. Very long period market

On the basis of competition, the market is classified into:

1. Perfectly competitive market structure
2. Imperfectly competitive market structure

Type of market

Feeder Markets: These are usually small periodic markets in rural areas where household sell their products (good) to traders from the urban centres for subsequent sales in bugger markets. These small markets therefore, act as feeders to the bigger markets.

Bulk Centre (Markets): Goods are brought in small quantities from dispersed production centres and from feeder markets. This category now act as bulking point for produces meant for the area outside the immediate vicinity of local markets.Urban Retail Markets: In these markets, goods

are further broken down into small consumable units for retail. It is from here the urban residents mostly get their daily needs (both imported and locally manufactured goods).

Urban Wholesale Markets: These are markets where the bulk is broken down into small components and products are distributed to the retail traders. This may be regarded as the trader e.g. Onitsha Main Market, Balogun Market, Lagos etc.

Functions of Markets

Organised markets are concerned with the distribution of goods from the manufacturers via the wholesalers and retailers to the final consumers. These markets are vital to the whole process of production. As far as the economic significance and functions of markets are concerned.

(a) Their most obvious function is to bring together buyers and sellers usually in the same place.

(b) They also reduce price fluctuations due to the seasonal nature of the product. One function of market specialists is to carry stocks of goods in order to prevent prices falling too rapidly in periods of high output, or rising too rapidly in periods of low output. They thus benefit producers in the first case and consumers in the second.

(c) In this connection speculators, who are often condemned, contribute to stability by buying when prices are low (thus preventing prices falling further) and releasing their stocks as prices rise (thus preventing prices rising too far).

(d) Finally, the establishment of centralised markets allows both producers and consumers to take advantage of the specialised services which can only be sustained where markets are large enough to lead to economies of scale.The market is the place where goods are exchanged. Here, buyers and sellers talk about the articles and determine the price at which purchase and sale will be made. Bates and Parkinson, (2006). **"**It is preferable to speak of the market as the area in which producers, both manufacturers and distributors, compete and in which buyers seek to

satisfy their wants**."** In fact, the nature of the marketing problem depends on the product itself as also to some extent on the geographical distribution of markets and incomes. Markets are valuable institutions. They facilitate trade. More trade means more production. More production means more employment and a higher national income. Markets are, therefore, essential for the development of industries and the economic growth of a country. Markets and consumers are never static. They may change because of changes in buyers' incomes, or changes in tastes or preferences, or increasing competition. The changes may be due to changes in population, birth rates, marriage rates, age structure of the population, its geographical distribution and so on.

However, goods and services, including labor and capital services, are bought and sold in a multitude of markets, ranging in size from a village to the world. The key actors in each market are buyers and sellers, businesses buying labor from households, households buying from businesses, borrowers seeking loans from lenders, and so on. The market is a coordinating device, which brings buyers and sellers together and mediates their conflicting interests. It can also be viewed as a decision making device. How many people will be employed as bricklayers and how many as restaurant workers? The market answers such questions, but so implies that its effectiveness is likely to be overlooked unless one asks oneself how these questions would be answered in the absence of markets.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The method to be used for this study is in this order to provide data to investigate the research questions that is raised. This comprises of research design, population of the study, sampling frame, sample size, sampling technique, data collection instrument, procedure for data collection as well as method of data presentation and analysis.

3.2 Research Design

In this study, Survey research design will be adopted. This is considered suitable because survey research method helps in collecting data from a predefined group of respondents to gain information and insights into the research topic. Surveys also serve as a great method of opinion sampling and finding out what people think about different contexts and situations. Applying this to research means you can gather first-hand information from persons affected by specific contexts.

3.3 The Study Population

This research topic "An Assessment of Fire out Break and Control Measures in Market Buildings; (A Case Study of Ogbete Main Market Enugu)." is an important phenomenon that involves major stakeholders in a market settings; State Fire Fighting Service; Professional in the Ministry of works who serves as consultants on the market projects; Market Users. Therefore, the stake holders will select community dwellers and relevant government agencies

3.4 The Sampling Frame

The adequacy of a sample is assessed by how well it represents the population of participants from which the sample is intended to be drawn. The total population for this study will include; Federal and State Fire Fighting Service; Professional in the Ministry of works who serves as consultants on the market projects; Market Users. Table 3.1 shows the sampling frame of respondents. Market stakeholders, State Fire Fighting Service; Professional in the Ministry of works who serves as consultants on the market projects; Market Users. Therefore, the study will select community dwellers and relevant government agencies

Table 3.1: Sampling Frame of Respondents

S/N	Respondents	No
1	Federal and State Fire Fighting Service	20
2	**Professional in the Ministry of works(Consultants)**	
	Mechanical/Electrical Engineer	10
	Civil Engineer	5
	Builder	15
	Architects	5
	Town Planner	5
3	Market Users	30
4	Market stakeholders	10
	Total	**100**

3.5 Sampling Techniques

For the purpose of this study, convenient sampling technique will be adopted, which is one type of probabilistic sampling technique and in which case, in a population a sample/respondent is to be drawn from a group that does not constitute a homogeneous group, so as to obtain a representative sample/respondent during the administration of the questionnaire. This is considered simple and convenient to the achievement of the targeted number of respondents for this study.

3.6 Data Collection Instrument

A well-structured questionnaire will be designed into sections, section A contains personal data of the respondent and organization and section „B, C, and D" contains will contain questions based on the objectives set out to; investigate the causes of fire outbreaks in markets in Nigeria; evaluate the effect of fire outbreaks on markets in Nigeria; and determine ways to mitigate against fire outbreaks in markets in Nigeria.

3.7 Design and Content of the Questionnaire

The preliminary section of the questionnaire will be on background or general information about the respondents. These include the respondent designation, construction experience, academic and professional qualifications, order of project handled, location of the organization and number of employees. While the other section addresses the main issues of the study. Respondents opinions will be scored on a 1 – 5 likert scale.

3.8 Method of Data Presentation and Analysis

Data analysis involved the use of multiple analytical techniques to facilitate the case of communicating the results while the same time improving its validity. The questionnaire quantitative statistical analysis will be done by using Statistical Package for Social Sciences (SPSS) and Excel sheet.Both descriptive and inferential statistics will be used in the analysis. The statistical tools that will be used in this study are:

I. Frequency and Percentage

II. Mean Item Score

III. Standard deviation

IV. Multiple Regression Analysis.

3.9 Frequencies and Percentage

Percentile was used to analyze the profile of respondents (personal characteristics, profession, qualification, year of experience, etc.). Percentiles are ratios multiplied by 100 and help in rating several factors according to the degree of occurrence attached to them. The higher the percentage rating the higher or the more significant the importance attached to such factor(s). The essence of the percentile was to allocate a value ranging from 0 to 100 to a factor (where 100 is the highest possible value) using factor size and the total size. (Laryea, 2011).

It is represented Mathematically as;

$$\mathbf{P}\ (\%) = \frac{n \times 100}{N}$$

Where: P = percentage, n = Value of the item and N = Total value of the Population.

Mean Item Score (MIS)

The mean score formula is given by:

$$\textbf{Mean Item Score} = \frac{(Fx5)+(Fx4)+(Fx3)+(Fx2)+(Fx1)}{FX}$$

This method will be used to analyse the first and third objectives. "investigate the causes of fire outbreaks in markets in Nigeria and determine ways to mitigate against fire outbreaks in markets in Nigeria.

Standard Deviation

The Standard Deviation (SD) was a measure of the spread of scores within a set of a variable. Standard deviation was used for each of the identified variables relating to the outcome of the mean to determine the extent of deviation from the mean. Mean Item Score was used to rank each item while SD was used for cases where two factors have the same MIS value.

SD = $\sqrt{\frac{\Sigma(x-\mu)^2}{n}}$

Where: SD= standard deviation, ∑= sum of variable, μ= population mean, n= number of sample.

Multiple Regression Analysis

An inferential statistical method that was used in the analysis of data obtained fromt he field was the multiple regression model.The formula for the sample correlation coefficient is

$$r = \frac{Cov(x,y)}{\sqrt{s_x^2 * s_y^2}}$$

Where Cov(x,y) is the covariance of x and y defined as

$$Cov(x,y) = \frac{\Sigma(X-\overline{X})(Y-\overline{Y})}{n-1} \quad s_x^2 \text{ and } s_y^2$$

And the sample variances of x and y, defined as

$$s_x^2 = \frac{\Sigma(X-\overline{X})^2}{n-1} \quad \text{and} \quad s_y^2 = \frac{\Sigma(Y-\overline{Y})^2}{n-1}$$

This will be used to analyse the third objective "to determine the relationship between the effect of fire outbreaks on markets in Nigeria". Multiple regression is a flexible method of data analysis that may be appropriate whenever a quantitative variable (the dependent or criterion variable) is to be examined in relationship to any other factors (expressed as independent or predictor variables). One can examine the effects of a single variable (**Fire outbreak)** on multiple variables (**Markets)** with or without the effects of other variables taken into account (Cohen, West, & Aiken, 2003).

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Data Analysis

The data collection through structured questionnaire are presented and analyzed in this chapter

Table 4.1 :Academic Qualification of Respondent

Academic Qualification of Respondent	Frequency	Percentage
ND	21	30.00
HND	13	18.57
B.Sc/B.Tech	9	12.86
M.Sc/M.Tech	27	38.57
Ph.D	-	-
Total	**70**	**100.00**

Source: Analysis of Field Data (2022)

Table 4.1 above shows the Academic Qualification of Respondents. It can be observed that 38.57% of the respondents are M.sc/M.Tech holders, 30.00% of the respondents are ND holders, 18.57% of the respondents are HND holders and 12.86% of the respondents are B.Sc/B.Tech holders.

Table 4.2 :Types of the Organization

Type of organization	Frequency	Percentage
Contracting firm	37	52.86
Consulting firm	26	37.14
Government parastatals	7	10.00
Total	**70**	**100.00**

Source: Analysis of Field Data (2017)

Table 4.2 above shows the organizational status of the respondents. It can be seen that 52.85% of the respondents works in contracting firms, 37.14% of the respondents works in Consulting firm and only 10% are government workers.

Table 4.3: Professional Qualification of Respondent

Profession of respondents	Frequency	Percentage
Architects	21	30.00
Engineers	13	18.57
Quantity Surveyor	9	12.86
Builders	27	38.57

Total	**70**	**100.00**

Source: Analysis of Field Data (2022)

Table 4.3 above shows the profession of the respondents in the study area. It shows that 30% of the respondents are Architects. Again, it can be seen that 18.57% of the respondents are Engineers, 12.86% of the respondents are Quantity Surveyors and 38.57% of the respondents are Builders.

Table 4.4: Respondents Years of Experience

Years	**Frequency**	**Percentage**
1-5 years	-	----
6 -10 years	12	35.62
11 – 15 years	32	23.29
16 – 20 years	16	26.71
Above 20 years	20	16.38
Total	**70**	**100.00**

Source: Analysis of Field Data (2022)

Table 4.4 above revealed that 35.62% has 6-10 years of experience, 23.29% has about 11-15 years of experience, while 26.71% has up to 16-20 years of experience. Meanwhile, only 14.38% of the respondents has above 20 years' experience.

From all the above background information's, it can be agreed that the respondents has adequate knowledge of the subject matter and as such their information's can be relied upon.

Table 4.5: Respondents Designation

Category	**Frequency**	**Percentage**
Market Users	47	73.50
Market stakeholders	16	21.50
Total	**64**	**100.00**

Source: Analysis of Field Data (2022)

Table 4.5 above shows the designation of the respondents. It can be seen from the table that 73.5% of the respondents are Market users while 21.5% are Market Stake holders.

Hence, it can be seen from the above analysis that the respondents ha adequate knowledge of the subject matter and of such their information can be relied on for drawing relevant conclusion and recommendations in the subject matter.

4.2: Causes of Fire Outbreaks in Markets in Ogbete Main Market Enugu

Table 4.5: Causes of fire outbreaks in markets in ogbete main market Enugu

Quality Management Techniques	MIS	Rank
Extension Cords and Power Boards	3.81	1
Heating Equipment	3.71	2
Faulty Outlets, Appliances	3.59	3
Storage of Explosive substances	3.61	4
Wrong allocation of market spaces	3.53	5
Light Bulbs Burning Out Too Often	3.50	6
Smoking	3.14	7
Careless cooking	2.81	8
Poor Structural design	2.79	9
Negligence	2.74	10
Wrong Electrical Wiring Electrical Surges	2.50	11

Source: Analysis of Field Data (2022)

From the table above, the causes of fire outbreaks in the study was assessed. the assessment of fire outbreak in the study area was then ranked according the respondents rating. It can be seen from the table that; Extension Cords and Power Boards With mean item score of 3.81 was ranked first. Again, Heating Equipment With mean item score of 3.71 was ranked second. Moreso, Faulty Outlets, Appliances was ranked third with mean item score of 3.59. Storage of Explosive substances with mean item score of 3.61 was ranked fourth and Wrong allocation of market spaces was ranked fifth With mean item score of 3.53. Meanwhile, Light Bulbs Burning Out Too Often was ranked sixth With mean item score of 3.50, Smoking With mean item score of 3.14 was ranked seventh, Careless cooking With mean item score of 2.81 was ranked eight, Poor Structural design was ranked ninth With mean item score of 2.79 Negligence was ranked

tenth With mean item score of 2.74 and Wrong Electrical Wiring Electrical Surges was ranked eleventh With mean item score of 2.50

4.3: To Evaluate the Effect of Fire Outbreaks in Markets in Ogbete Main Market Enugu

Table 4.6: Effect of Fire Outbreaks on Markets in Ogbete Main Market Enugu

Classification	Sum of Squares	Df	Mean Square	F	Sig.
Regression	14.050	10	1.405	1.968	.043[b]
Residual	64.247	90	.714		
Total	78.297	100			
R = .424[a]					
R^2 =.179					
Adj R - .088					
Std. Error=.845					
a. Dependent Variable: Main Market					

Source: Analysis of field data, (2022).

Table 4.5.1 above shows that the coefficient of determination (R square) is 0.179 which shows the model accounted for 17.9%. This means that the combined influence of the predictor variables that is independent variable is high on the dependent variable. The correlation coefficient of 78.30% indicates that the combined influence of the predictor variables has a positive correlation with project delivery.

Analysis of variance (ANOVA) depicts that the combined effect of fire outbreak on Ogbete Market. The study shows that fire outbreak has a great effect on the economic activities of the market. From above table it can be concluded that the fitted model is significant as P-value of F statistics is 0.04 and it is less than level of significance level(α = 5% i.e 0.05).

Table 4.5.2: Regression Coefficient for Effect of Fire Outbreaks in Markets in Ogbete Main Market Enugu

Model	Unstandardized Coefficients		Stand. Coef.	t	Sig.
	B	Std. Error	Beta		
(Constant)	5.705	.941		6.063	.000
Loss of life	.036	.100	.234	.357	.722

Loss of valuable properties	.995	.456	.263	2.184	.032
Low income	-.884	.417	-.211	-2.118	-.037
Displacement of persons and properties	.521	.416	.148	1.255	.213
Shut down of economic activities	-.607	.371	-.164	-1.639	.105
Depletion of ozone layers	-.009	.016	-.060	-.542	-.589
Bad Representation	.995	.456	.263	2.184	.032
Dispute	-.884	.417	-.211	-2.118	-.037
Food shortage	.521	.416	.148	1.255	.213
Heat/Smoke	-.607	.371	-.164	-1.639	.105
Lack of oxygen	.330	.360	.099	.916	.362
Damage to the environment	-.082	.107	-.209	-.765	-.446

A. Dependent Variable: Economic Activity of Ogbete Main Market

Source: *Analysis of field data, (2022)*

Table 4.7.2 above shows the regression coefficient for the Effect of Fire Outbreaks in Markets in Ogbete Main Market Enugu and their indices as it is adopted for construction project delivery. It can be seen that for the Effect of Fire Outbreaks in Markets in Ogbete Main Market Enugu. Independent variables such as Loss of life .722, Loss of valuable properties 032, Displacement of persons and properties .213, Shut down of economic activities .105, Bad Representation .032, Food shortage .213, Heat/Smoke .105, Lack of oxygen.362 was tested. This means that these variables are having positive effect on dependent variable (project delivery), that is an increase in these independent variables will lead to increase in the dependent variable, while independent variables such as Low income -.037, Depletion of ozone layers -.589, Dispute -.037 and Damage to the environment -.446 were also tested having negative values. An increase in these independent variables with negative Coefficient will lead to a decrease in dependent variable.

4.4: Ways To Mitigate Against Fire Outbreaks In Markets In Ogbete Main Market Enugu.

Table 4.7: Ways To Mitigate Against Fire Outbreaks In Markets In Ogbete Main Market Enugu.

Mitigating Measures	MIS	Rank
Do not leave candles unattended.	3.81	1

Equip your home with fire safety equipment.	3.71	2
Do not leave anything close to an electric heater	3.14	3
Adoption of fire resistant building materials	2.81	4
Ensure all cigarettes are extinguished in an ashtray.	2.79	5
Install at least one smoke alarm on every floor in the property and ensure they are tested often.	2.65	6
Ensure all appliances are switched off before you go to bed.	2.51	7
Education of market users	2.49	8
Do not over load plug sockets	2.34	9
Siting fire fighters at strategic locations in the market	2.10	10

Source: Analysis of Field Data (2022)

The table above shows the Ways To Mitigate Against Fire Outbreaks In Markets In Ogbete Main Market Enugu..It can be seen from the table that Do not leave candles unattended with a Mean Item Score of 3.81 was ranked first and Equip your home with fire safety equipment was ranked second with a Mean Item Score of 3.71. Do not leave anything close to an electric heater was ranked third with a Mean Item Score of 3.14.was ranked third, next to this is Adoption of fire resistant building materials with a Mean Item Score of 2.81 ranked fourth./ meanwhile, Ensure all cigarettes are extinguished in an ashtray was ranked fifth with a Mean Item Score of 2.79, Install at least one smoke alarm on every floor in the property and ensure they are tested often with a Mean Item Score of 2.65 was ranked sixth. Again, Ensure all appliances are switched off before you go to bed was ranked seventh with a Mean Item Score of 2.51. Education of market users was ranked eight with a Mean Item Score of 2.49. Do not over load plug sockets was ranked ninth with a Mean Item Score of 2.49 band Siting fire fighters at strategic locations in the market with a Mean Item Score of 2.10 was ranked least.

4.5 Test on the Ways To Mitigate Against Fire Outbreaks In Markets In Ogbete Main Market Enugu

Table 4.5.3: Kendall's Coefficient of Ways To Mitigate Against Fire Outbreaks In Markets InOgbete Main Market Enugu

N	101

Kendall's W[a]	.247
Chi-Square	3.817
Df	14
Asymp. Sig.	.034

Source: *Analysis of field data, (2021)*

Table 4.8 shows the Kendall's coefficient of concordance (*W*) to determine the degree of agreement between the respondents on the ways to mitigate against fire outbreaks in markets in ogbete main market enugu. Kendall's coefficient of concordance (*W*) takes note of the variation between the ranks that constitute the mean score of each factor. Kendall's coefficient of concordance (*W*) of the components was based on the rating of professionals' experts which was 0.247. Kendall's coefficient is statistically significant at 0.034 significant level. It is therefore concluded that there is statistically significant agreement among the professional's experts. To further buttress the statistical output of Kendall's coefficient, a chi-square (χ^2) test was conducted. The chi-square value (χ^2) of ways to mitigate against fire outbreaks in markets in Ogbete main Market Enugu was 3.817 at the degree of freedom (df) of 14. The computed chi-square values (χ^2) from the statistical table at a significant level of 0.034 implied a robust consensus among professionals and other respondents.

4.6 Discussion of Findings

4.6.1 Causes of Fire Outbreaks in Markets in Ogbete Main Market Enugu

The objective here was to identify the main Causes of fire outbreaks in markets in ogbete main market Enugu. The study on the Causes of fire outbreaks in markets in ogbete main market Enugu revels that; Extension Cords and Power Boards, Heating Equipment, Faulty Outlets, Electrical Appliances and Storage of Explosive substances are the main Causes of fire outbreaks in markets in Ogbete Main Market Enugu

Extension Cords and Power Boards

Faulty extension boxes or power cables with meter boards most times cause sparks that leads to the outburst of fire. Naked wires are potential source of fire outbreak. Faulty or touching fuses on electric meter boards are also potential source of fire outbreak. This was ranked as the most common source of fire outbreak in the study area.

Heating or Cooking Equipment's

Electric heating or cooking devices such as electric dryers, hot plates/electric stoves and other electric heating devices were ranked to be the second common source of fire outbreak in the study area most times these heating or cooking devices may not be switched off by their users. The heating devices get dry and the heat continues to emerge on the material. Once the material exceeds their heating capacity, there is most likely chance that fire outbreak would occur. This is one of the most common sources of fire outbreak in the market as most fire incidents has been traced to people who forget putting off their cooking sources such as kerosene stoves, Gas cookers, electric cookers and other heating devices in their shops and by the time they discovered that they did not put these appliances off, they might have been at home or they might not even remember at all. This has caused great loss of lives and property in the study area in Enugu state

4.6.2 Effect of Fire Outbreaks on Markets in Ogbete Main Market Enugu

The objective here was to evaluate the Effect of Fire Outbreaks on Markets in Ogbete Main Market Enugu. The evaluation of the Effect of Fire Outbreaks on Markets in Ogbete Main Market Enugu reveals that; Loss of life, Loss of valuable properties, Displacement of persons and properties, Shut down of economic activities, Bad Representation, Food shortage, Heat/Smoke andLack of oxygen are the major Effect of Fire Outbreaks on Markets in Ogbete Main Market Enugu

Loss of life

It was discovered in the cause of this research that over 2000 people die of fire outbreak in Nigeria yearly. This is on the high side, as most valuable lives are being lost in fire incidents. Again, this was ranked as one of the major effects of fire outbreak in Ogbudu market, most lives and properties have been lost in past fire incidents in the market. This is sad as those life loss are more valuable to the society and the effect of those that are dead in those incidents cannot be forgotten in a short time. There are families who depend on them for survival, the pain caused in the heart of parents whose children lose their life in the fire outbreak cannot be recovered. This was ranked as the most effect of fire outbreak in the study area as there is nothing that can be used to compare the cost or worth of a life.

Loss of valuable properties

Many valuables worth millions of Naira are being loss yearly in fire incidents, next to loss of life's. Many valuable properties or assets have been lost yearly in incidents of fire outbreak goods worth millions of naira have been lost also this has a great negative effect on the financial or economic life of people off in a good state we discovered from this research that once there is fire outbreak in the market the economic turn out of the state is usually being affected because this is one of the biggest markets in Enugu state

Displacement of persons and properties

When there is incidents of fire outbreak in a market, people whose Goods and properties has been lost would be left with no choice to either re-locate or stop their business activities. This has caused many lives or families to be displaced or dislodged from Enugu State. Their source of livelihood which most times is the market once they are burnt, the people are left with no choice than to either re-locate or stop selling at the market

Shut down of economic activities

Shutdown of business or economic activities in the market was ranked as the Fourth effect of fire outbreak in the market. Most times, when there is fire outbreak the buildings are dilapidated and forensic tests are carried out on the structures so that they can be either reconstructed or maintained the period for this reconstruction and maintenance would stop business activity completely in the market and this has an adverse effect on the people whose means of livelihood is this shop and the entire economy activity of the state again the people in the market sometimes close down their shops when there are incidents of fire outbreak to mourn their diseased or loved ones who dies in the cause of the fire outbreak

4.6.3 Possible Ways to Mitigate Against Fire Outbreaks in Markets InOgbete Main Market Enugu

The objective here was to determine possible ways to mitigate against Fire Outbreaks in Ogbete Main Market Enugu. The findings of the possible ways to mitigate against Fire Outbreaks in Ogbete Main Market Enugu. Reveals that; do not leave candles unattended equip your home with fire safety equipment, do not leave anything close to an electric heater Adoption of fire resistant building materials are the major ways to mitigate against Fire Outbreaks in Ogbete Main Market Enugu.

Not Leaving Candles Unattended

Not leaving candles unattended too was ranked as the most preventive measure of preventing fire outbreak in Obudu main market Enugu state can do is one off alternative lightning or seen source other than electricity however from the research it was discovered that most people stay at the market till nightfall hence when there is no NEPA lights they have to put on alternative lighting source which is candle or electric lamps or fire lanterns. However these candles that are put on at

night as an alternative source of lightning most times are unattended too and they are put in dangerous places that when they are done lightning they can melt and the heat is transferred to the item or elements in which they are placed upon this item at midnight would cause fire in the market and most times the causes of fire outbreak in the market has been attributed to this cause. Hence, not leaving candles unattended too would go a long way to prevent fire outbreak in the Market. Fire or lighting sources must be put off when leaving the market place.

Equipping Shops with Fire Safety Equipment

Fire safety equipment are equipment that either help too prevents fire from coming up or up to resist or reduce the burning capacity of heat or fire. This implies that markets or shops should be equipped with fire-fighting devices in order to help curb the outburst of fire in the market. Firefighting equipment's include; fire extinguishers, hydrants, sand buckets, available water sources in strategic locations of the market and fire-fighting services. This would go a long way to prevent fire outbreak in the market as it was ranked the second most effective measure of preventing fire outbreak in the study area. From the research, it was discovered that firefighting equipment's are either not available or where they are available they are faulty or not working in the market, this has affected the market in times of fire outbreak as there are no equipment to arrest or reduce infernos.

Use of Fire Resistant Building Materials

Fire resistant building materials are materials that do not easily get burnt in times of fire outbreak. Fire resistant building materials do not easily get burnt when there is fire outbreak. They are made of materials that do not burn easily, such material include polystyrene materials which are made of high fire resistance quality. Again, cement used in making block walls or for rendering can be mixed with other chemicals or additives in reducing the effects of fire when such arises. In addition, fire resistant building materials such as roof finishes, doors and windows

can be used when constructing markets. This would prevent fire outbreak or even when there is fire outbreak the effect on the building will not be much felt.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study has assessed the causes of fire out break and control measures in Ogbete Main Market Enugu**.** Nigeria. This chapter therefore summarizes the findings from the analysis carried out in the previous chapter. Appropriate recommendations were also proposed to address the findings where necessary.

5.2 Conclusions

This study has assessed the causes of fire out break and control measures in Ogbete Main Market Enugu**.** Nigeria. The assessment of the causes of fire out break and control measures in Ogbete Main Market Enugu**.** Nigeria reveals the following conclusions;

1. Fire outbreak may not be unstoppable but preventive or mitigating measures can be put in place to fight or arrest fire outbreak when they arises.
2. The government stands a focal point in the mitigating process of fire outbreak in providing necessary fire fighting devices in case of incidence. Meanwhile, in cases where they arises they should be ready to provide financial assistance to market or shop owners who looses their lifes or properties in the incidences
3. Alternative lighting devices that are less susceptible to fire outbreak should be used instead of candles or kerosene lamps. Since the study has revealed this as one of the most potent cause of fire outbreak.

5.3 Recommendations

Based on the conclusion made, the following recommendation were given in the course of this research;

1. Laws should be made and stiff penalty should be in place for defaulters who refuse to put off all lighting points and sockets after close of the day's activity
2. Regular sensitization and monitoring of market users is very necessary in order to mitigate against fire outbreak.
3. Government should provide firefighting devices in strategic locations of the market in order to prevent incidences of fire outbreaks.
4. Contractors and investors who want to handle market projects in the future should ensure that they use fire resistance building materials in order to curb the outbreak of fire
5. Lamps and other lightning devices or heating devices should be placed at distance that are far from inflammable items
6. Smoke or fire alarms should be installed in all shops so as to alert fire fighters in advent of fire outbreaks in the market.

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APPENDIX

Department of Building Technology,

Auchi Polytechnic,

Auchi.

Edo State

October, 2022.

Sir/Madam

I'm a student of Building Technology Department in Auchi Polytechnic, Auchi, conducting a research on the topic; " **AN ASSESSMENT OF FIRE OUT BREAK AND CONTROL MEASURES IN MARKET BUILDING (A Case study of Ogbete Main Market Enugu)**

The exercise is purely academic for the fulfilment of the conditions for the award of HND degree in Building Technology. Any information offered here would be treated as strictly confidential.

I plead for your maximum cooperation in completing the questionnaire.

Please tick [ ] as appropriate.

Thank you.

……..

SECTION A: BACKGROUND INFORMATION OF THE REPSONDENTS

(Please Tick where applicable)

1. Academic Qualification of Respondent**:** (A) HND [ ] (B) BSC/B. TECH/PGD [ ] (C) MSC/M.TECH/M.PH [ ] (D) PH.D [ ] (E) Others (Specify) _____
2. Type of organization:(a)Contracting firm [ ] (b)Consulting firm [ ] (c)Government parastatals [ ]
3. Discipline of respondents (A) Architects [ ] (B) Engineer [ ] (C) Quantity Surveyor [ ] (D) Builders [ ] (E) Others specify _____
4. Professional qualification of respondents (A) probationer member [ ] (B) Corporate member [ ] (C) Fellow member [ ]
5. Respondents Years of Experience (A) 1-5 years (B) 6 -10 years (C) 11 – 15 years (D) 16 – 20 years (E) 20 years

SECTION B

TO INVESTIGATE THE CAUSES OF FIRE OUTBREAKS IN MARKETS IN OGBETE MAIN MARKET ENUGU;

6. The following possible causes of fire outbreaks in Ogbete Main Market Enugu, You are required to tick according to the degree of perceived significance using the scale below;

5=Very Significant, 4= Significant, 3= Neutral 2= Slightly Significant 1=Not Significant

S/N	Causes of Fire Outbreak	Level of Awareness				
		5	4	3	2	1
1.	Negligence					
2.	Wrong Electrical Wiring Electrical Surges					
3.	Light Bulbs Burning Out Too Often					
4.	Extension Cords and Power Boards					
5.	Heating Equipment					
6.	Faulty Outlets, Appliances					
7.	Poor Structural design					
8.	Storage of Explosive substances					
9.	Wrong allocation of market spaces					
10.	Smoking					
11.	Careless cooking					

SECTION C

TO EVALUATE THE EFFECT OF FIRE OUTBREAKS ON MARKETS IN OGBETE MAIN MARKET ENUGU

7. The following are effects of fire outbreaks , You are required to tick the level of severity of these factors using the scale below;

5=Very High, 4= High, 3= Moderate, 2=Low, 1=Very Low

S/N	Effects Of Fire Outbreaks	Level of Severity				
		5	4	3	2	1
1.	Loss of life					
2.	Loss of valuable properties					
3.	Low income					
4.	Displacement of persons and properties					
5.	Shut down of economic activities					
6.	Depletion of ozone layers					
7.	Bad Representation					
8.	Dispute					
9.	Food shortage					
10.	Heat/Smoke					
11.	Lack of oxygen					
12.	Damage to the environment					

SECTION D

TO DETERMINE POSSIBLE WAYS TO MITIGATE AGAINST FIRE OUTBREAKS IN MARKETS IN OGBETE MAIN MARKET ENUGU.

8. The following are possible ways to mitigate against fire outbreaks in markets in Ogbete market Enugu State. You are required to tick according to the degree of importance using the scale below;**5=Highly Agree, 4= Agree, 3= Neutral, 2=Disagree, 1=Highly Disagree**

S/N	Mitigating Measures	Level of Importance				
		5	4	3	2	1
1.	Install at least one smoke alarm on every floor in the property and ensure they are tested often.					
2.	Ensure all appliances are switched off before you go to bed.					
3.	Do not leave candles unattended.					
4.	Equip your home with fire safety equipment.					
5.	Ensure all cigarettes are extinguished in an ashtray.					
6.	Do not leave anything close to an electric heater.					
7.	Do not over load plug sockets					
8.	Education of market users					
9.	Siting fire fighters at strategic locations in the market					
10.	Adoption of fire resistant building materials					