



## **ANALYSIS OF FIRE DISASTER PREPAREDNESS AMONG SECONDARY SCHOOLS IN PORT HARCOURT METROPOLIS, RIVERS STATE/ NIGERIA**

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### **Abstract**

*Fire emergency has become a recurring phenomenon in school environment. Unlike the developing countries, the availability of preparedness measures in most of the schools in developed countries has tremendously reduced the impact of incidences (U.S. Fire Administration, National Fire Data Centre, 2007). In developing countries, however, the contrary is the case, the lack of or inadequate preparedness measures in most schools, and the increase in fire incidents are raising alarm. The physical, financial and emotional devastation are the common impacts to both developing and developed countries. The closure of schools, damage of school properties, death, injuries and trauma are very common depending on the magnitude and severity of the fire itself (Blackaby, 2007). This study was conducted to analyze fire disaster preparedness among secondary schools in Port Harcourt metropolis. The objective was to establish the adequacy of firefighting equipment within the schools premises, to determine the extent to which schools building are constructed in accordance to fire safety standard, to establish how secondary schools in the study area have put in place fire evacuation/ safety plans as a measure of fire disaster preparedness, also to determine whether secondary schools train teachers, workers, and student in appropriate response procedure in case of fire incident. Descriptive design method was adopted for this study. A sample size of 132 secondary schools was selected from a total of 661 secondary schools in the study area. The study area was stratified into 5 constituencies and 30% of the total number of schools was selected from each constituency. Primary and secondary method of data collection was used including questionnaire, interview and observation as well as published data from the state ministry of education and other published source. The result from the study reveals that fire disaster preparedness among secondary schools in port Harcourt was very inadequate as there was inadequate fire fighting equipment, inadequate structures built to fire safety standard, inadequate training for secondary schools stakeholders, as well as inadequate fire evacuation plans. On the other hand the t- test result shows that there was a statistically significant difference between public and private schools on the above measured variables at 0.005 levels of significant, 12.180 and 22.142 t, with a mean difference of 2.452 and 2.485 for public and private schools respectively. This means that private secondary schools fare better in the provision of some of the above variable. It was therefore concluded that secondary schools in Port Harcourt metropolis are highly vulnerable to fire disasters and need to take fire safety measures seriously in their daily operation to prevent fire emergencies. More specifically, government needs to allocate more resources to improve on the fire safety situation in public schools.*

**KEYWORDS: FIRE DISASTER, FIRE SAFETY, SECONDARY SCHOOLS, VULNERABILITY, PORT HARCOURT LGA, OBIO/AKPOR LGA.**

## 1.0 CHAPTER ONE

### 1.1 INTRODUCTION /BACKGROUND TO THE STUDY

The threat of fire disasters is always present, and it is important that people are aware of how to properly respond in order to lessen loss of property, injuries and deaths. This is especially true for learners in schools (Marion and Maingi, 2010). Schools should have emergency preparedness plans to guide students to safety. According to Makhanu (2009) fire is one of the commonest disasters in learning institutions. Like any other disaster, whenever it happens, it causes a serious disruption of the functioning of the institutions since it results into widespread human, material, economic or even environmental losses which exceed the ability of the affected institutions to cope using their own resources.

Although a fire disaster need not necessarily reach catastrophic proportions, it does present some of the characteristic aspects of a disaster because of the highly destructive action of fire and of the considerable number of victims (UNISDR, 2007). The surviving casualties often have mainly serious and extensive burns requiring immediate rescue procedures that cannot always be provided by local resources. Preparedness planning is to ensure a rapid and efficient action when disaster occurs, taking into consideration the local disaster management system and adjusting it according to the local condition. The school ought to prepare human resource, facility, infrastructure and financial support for disaster management to ensure the school's disaster preparedness (Kukali, 2009).



Resource mobilization is based on the capacity of school and school stakeholders. The mobilization should be open for other stakeholders to take part.

Shaw (2002) observes that international efforts have been made on promoting school safety, manuals have been written, curriculum adjustments, guides and training materials have been distributed as well as national, regional and international meetings have been organized by bodies such as the World Conference on Disaster Reduction (WCDR). A WCDR resolved that education should help build a culture of safety at all levels and this begins at school by mobilizing efforts to integrate disaster preparedness infrastructures and procedures into school curricula (UNISDR, 2007). This development has reinforced the need to work in more collaborative, comprehensive ways in improving safety in schools. A number of countries have developed cross-sectional, national, regional or local strategies on implementing school safety that recognize the multidimensional causes of school safety problems and the need for preventive long term plans that encourage partnerships between schools and other stake holders. The strategies also provide information necessary for funding of project development and implementation, including training and technical assistance.

Disasters are worldwide phenomena that range from being highly localized to global in scope. Regardless of their origin and classification, all disasters have a public health importance due to their potential to cause loss of lives and properties (Marion and Maingi, 2010).



In 1998, a kerosene lantern overturned and killed 23 girls in a dormitory in Nigeria (Rowan, 2001). In July 2004, fire in an Indian school killed 90 pupils because of lack of emergency doors and equipment (Reuters, 2004) and 21 girls in Budo boarding school in Uganda lost their lives through arson (Mzungu, 2008). The report documenting the Indian school fire of July 2004 blames the disaster on failure to implement safety norms. The school building in this case was overcrowded and had only one exit. There were no emergency doors or equipment. School fire disasters in India, are blamed on failure by authorities to enforce safety norms. For instance, schools may stay for as long as three years without being inspected (Reuters, 2004).

## 1.2 STATEMENT OF THE PROBLEM

Fire occurrence in secondary schools is a public concern because of the increased incidences, injuries and deaths of students not to mention the destruction of property. Even if schools may face other problems like strikes and indiscipline, these rarely result into deaths like fire disasters. From the literature in the background, it is clear that schools seem not well prepared for fire disasters. Without fire preparedness, schools will continue to lose lives, property and learning time.

The wave of fire disasters sweeping through Nigerian schools has left many puzzled as to what exactly could be going on in schools and what can be done to contain the situation. Several students have lost their lives to fire incidents. Interventions to curb fires have brought to light the living conditions of students and the disregard of government policies. In 1998, 26 girls perished in a secondary school in Lagos when their dormitory caught fire (International Committee of the Red Cross, 2001). Reports indicated that the dormitory was overcrowded, doors to the dormitory were narrow and locked from the outside and the windows were barred. There were also no fire extinguishers (Mangoa, 2012).

The increasing frequency of fire disasters in educational institutions is causing loss of lives, enormous destruction of property, disrupting education programmes and causing a lot of concern to the public. These incidences of fires in educational institutions are indication of poor disaster preparedness (Kirui, et al, 2007).

According to Artim (1999), the most worrying aspect is that society has adopted a reactive rather than proactive perspective to the problem of fire in schools; many a times, preventive measures are not put in place, but rather its only after the disaster strikes that funds are mobilized for reconstruction of the destroyed facilities and little psychosocial support (if any) offered to the survivors. This has resulted in the problem recurring over and over again, thus adversely affecting the resources' sustainability by retarding development through reconstruction and repair work.

From the forgoing discussion, it becomes obvious that fire disaster is a usual occurrence in schools with antecedent consequences. Port Harcourt city is a rapidly growing city in Nigeria with increase number of schools and school enrolment with the high probability of being exposed to fire disaster. Thus it becomes pertinent to carry out this study on fire disaster preparedness among secondary schools in Port Harcourt city. The study sought to establish the adequacy of facilities, whether schools structures are built to fire safety policy provision, and whether schools have fire safety plans

in place as well as issue of training for schools administrators in fire safety respond and procedures. These and other issues form the focus of this study.

### 1.3 AIM AND OBJECTIVES OF THE STUDY

This study was carried out to analyze fire disaster preparedness among secondary schools in Port Harcourt metropolis. The following are the objectives that this study aims to achieve.

To establish the availability of adequacy of fire fighting equipment within the school premises in Port Harcourt city

To determine the extent to which school buildings are constructed in accordance to fire safety standard.

To establish how secondary schools have put in place fire evacuation / safety plans as a measure of fire disaster preparedness.

To ascertain if secondary schools in the study area have training program for teachers, workers and students on fire disaster response.

To compare private and public secondary schools in terms of compliance with fire safety standards.

### 1.4 RESEARCH QUESTIONS AND HYPOTHESIS

In this research, attempt shall be made to answer the following questions.

- 1) Do schools in Port Harcourt city have adequate fire-fighting facilities?
- 2) To what extent are secondary school buildings constructed in relation to policy provisions pertaining to fire disaster preparedness?
- 3) To what extent have secondary schools put in place fire safety plans as a measure of fire disaster preparedness?
- 4) Do secondary schools train teachers, workers and students on appropriate responses in case of fire?
- 5) Are the school buildings certified by fire and rescue department?

#### 1.4.1 HYPOTHESIS

1 HO: There is no significant difference in the availability of fire fighting equipments between public and private secondary schools in Port Harcourt metropolis.

2 HO: there is no statistically significant difference between the public and private schools in terms of number of building constructed to fire safety standard.

## 1.5 SIGNIFICANCE OF THE STUDY

This study is important because the findings will help to create awareness among the school management, teachers, workers and the students on for efficient fire emergency preparedness. The finding will also contribute to the literature and fill the gap in knowledge on fire disaster preparedness in secondary schools in port Harcourt city particularly and Nigeria in general. In addition, the findings could lead to more comprehensive policy implementation on safety in schools. Finally, the school stakeholders will be aware of the level of fire disaster preparedness in their schools and therefore see the need to improve on it.

## 1.6 SCOPE AND DILIMITATION OF THE STUDY

In order to understand the education sector regarding fire emergency mitigation, prevention and preparedness in secondary schools, the research focused in preparedness in terms of prevention and protection level in secondary schools. It will also examine strategies, policies and legislations dealing with safety and/or risk reduction in the education sector. It will look on how these are integrated with other sector indirectly or directly in the protection of school children and school community from hazards and emergencies. The study is delimited to both public and private secondary schools in Port Harcourt metropolis in River State, Nigeria.

## 1.7 STUDY AREA

This study is conducted in Port Harcourt city made up of two local government area of Obio Akpo and Port Harcourt. It is the largest city in the south- south region of Nigeria with an estimated population of about 1,148,753 inhabitants according to 2006 census figures. Port Harcourt city is the capital of rivers state and lies between latitude 4,7892 (447°21.012"N) and longitude 6,9986 (659°54.996"E) with an altitude of 463m above sea level.

Port Harcourt host most of the oil and gas company operating in Nigeria making it making it one of the most sort after city to live in Nigeria. There are also agro base business like logging and timber processing as well as tobacco industry. Some landmarked in the metropolis include university of port Harcourt (UNIPORT), Rivers state university of science and technology (RSUST), Rivers state secretariat, International airport, F.O.T Onne and port Harcourt wharf among others.

### 1.7.1 RAINFALL

There is normally a high rain fall of between 2,000mm to 2,700mm per annum recorded in the area which study reveals that it has double maxima (NOBDA, 1978). Rain fall is all year round with intermittent break such as the august break. Convectional and frontal rain are predominant in the area while the former occur early in the day, the later occur in the evening and is usually associated with thunder/lightening.

### 1.7.2 SOIL

The soil of the study area consist of muddy surface material of various type of deposit, over-laying thick Tertiary sandy clayey deposit, which have depth of over 1000m in thickness (Allen, 1965).

This muddy flat with high organic matter which varies in thickness from place to place but is usually 3-5 meter thick and are underline by sand.

The map of rivers state showing the two local governments of ObioAkpor and Port Harcourt is presented below:



**Figure 1.1 MAP OF RIVERS STATE SHOWING PORT HARCOURT AND OBIO/AKPOR LGA**

(Source: [www.satellitecitymaps.com](http://www.satellitecitymaps.com)>africa-map)



## 2.0 CHAPTER TWO

### 2.1 LITERATURE REVIEW

### 2.2 THEORETICAL /CONCEPTUAL FRAMEWORK

### 2.3 THEORETICAL FRAMEWORK

#### 2.3.1 THE PROTECTION MOTIVATION THEORY (PMT)

The theoretical frame work model adopted for this study is the Protection Motivation Theory (PMT). This is a health behaviour-change model, which explains how individuals adopt protective behaviours when faced with a risk (Rogers, 1983). The theory stresses that a fear-arousing communication works to the extent that it arouses “protection motivation” or motivates the individual to protect himself/herself against a threatening outcome (Perloff& Bay, 1991).

According to the theory, people’s intentions to protect themselves from harm are enhanced by four critical beliefs or perceptions, regarding severity of risks, vulnerability to the risks, perceived efficacy of a protective response and self-efficacy at performing advocated behaviour. Additionally, the theory posits that people’s intentions to protect them are weakened by the perceived costs of the advocated risk-reduction behaviour and the perceived benefits of the opposing risk-enhancing behaviour (Pechmann, 2003). Since people can be motivated to engage in desirable behaviours not only to avoid risks but also to avoid social or interpersonal risks, the Protection Motivation Theory has been subsequently extended to include social risks as well (Ho, 1998).

The PMT posits that in most cases beliefs will affect intention directly and additively, though at times some beliefs will function interactively or synergistically (Pechmann 2003). PMT outlines the cognitive responses resulting from fear appeals, Rogers (1983) proposed that various environmental (e.g. fear appeals) and intrapersonal (e.g. personality) sources of information can initiate two independent appraisal processes: threat appraisal and coping appraisal. Threat appraisal focuses on the source of the threat, and factors that increase or decrease the probability of maladaptive responses (e.g. avoidance, denial, wishful thinking). Individuals' perceptions of the severity of and their vulnerability to, the threat are seen to inhibit maladaptive responses.

The theory is applicable to fire disasters as explained by Pechmann, (2003) who added that in relation to fire disaster, individuals may consider the seriousness of fire and their chances of destroying property and people in the future. Fear is an additional, intervening variable, between perceptions of severity and vulnerability and die level of appraised threat. Thus, greater levels of fear will be aroused if a student or a teacher perceives him/herself to be vulnerable to a serious fire threat and this will increase an individual's motivation to engage in protective behaviour. While perceptions of severity and vulnerability serve to inhibit maladaptive responses, there may be a number of intrinsic (e.g. pleasure) and extrinsic (e.g. social approval) rewards that increase the likelihood of maladaptive responses. Coping appraisal focuses on the coping responses available to the individual to deal with the threat and factors that increase or decrease the probability of an adaptive response, such as following behavioural advice.

Both the belief that the recommended behaviour will be effective by reducing the threat (i.e. response efficacy) and the belief that one is capable of performing the recommended behaviour (i.e. self-efficacy) increase the probability of an adaptive response. For example, schools may consider



the extent to which preparedness would reduce their chances of developing destructive fires in the future and whether they are capable of doing so. While perceptions of response efficacy and self-efficacy serve to increase the probability of an adaptive response, there may be a number of response costs or barriers (e.g. availability of resources) that inhibit performance of the adaptive behaviour. This means that the schools administration may perceive fire disasters as dangerous and therefore make plans to equip the schools with fire-fighting equipment. However, they might be limited by finances and this implies that they would be forced to use fewer strategies for fighting fire disasters thus increasing their level of fire disaster unpreparedness.

## 2.4 CONCEPT OF DISASTER PREPAREDNESS PLANNING

In defining disaster preparedness planning, Social scientists, emergency managers, and public policy makers generally organize both research and guidance around four phases of disaster loss reduction: mitigation, preparedness, response, and recovery. According to a newly-released report by the National Research Council (NRC 2006), the core topics of hazards and disaster research include: hazards research, which focuses on pre-disaster hazard vulnerability analysis and mitigation; and disaster research, which focuses on post-disaster emergency response and recovery. Preparedness intersects with both of these two areas, serving as a temporal connector between the pre-impact and post-impact phases of a disaster event.

Preparedness planning is typically understood as consisting of measures that enable different units of analysis—individuals, households, organizations, communities, and societies—to respond effectively and recover more quickly when disasters strike. Preparedness planning efforts also aim at ensuring that the resources necessary for responding effectively in the event of a disaster are in place, and that those faced with having to respond know how to use those resources. The activities that are commonly associated with disaster preparedness planning include developing planning processes to ensure readiness; formulating disaster plans; stockpiling resources necessary for effective response; and developing skills and competencies to ensure effective performance of disaster-related tasks.

The concept of disaster preparedness planning encompasses measures aimed at enhancing life safety when a disaster occurs, such as protective actions during an earthquake, hazardous materials spill, or terrorist attack. It also includes actions designed to enhance the ability to undertake emergency actions in order to protect property and contain disaster damage and disruption, as well as the ability to engage in post-disaster restoration and early recovery activities.

Preparedness planning is commonly viewed as consisting of activities aimed at improving response activities and coping capabilities. However, emphasis is increasingly being placed on *recovery preparedness*—that is, on planning not only in order to respond effectively during and immediately after disasters but also in order to successfully navigate challenges associated with short- and longer-term recovery.

The Capability Assessment for Readiness (CAR), which was developed by FEMA and the National Emergency Management Association (NEMA) identifies thirteen elements that should be addressed by states in their preparedness efforts. Those elements are:

- a. Laws and Authorities
- b. Hazard Identification and Risk Assessment

- c. Hazard Mitigation
- d. Resource Management
- e. Direction, Control, and Coordination
- f. Communications and Warning
- g. Operations and Procedures
- h. Logistics and Facilities
- i. Training
- j. Exercises, Evaluations, and Corrective Actions
- k. Crisis Communications, Public Education, and Information
- l. Finance and Administration.

#### **2.4.1 ELEMENTS AND DIMENSIONS OF DISASTER PREPAREDNESS PLANNING**

As used in the disaster literature, the concept of preparedness has a variety of dimensions that are in turn supported by a number of activities. *Dimensions* of preparedness consist of the various goals or end-states that preparedness seeks to achieve.

*Activities* are concrete actions that need to be taken in order to meet those goals. Sources vary in terms of how dimensions and activities are defined. Recommendations on public education campaigns for households emphasize four dimensions of preparedness; as noted above, FEMA's CAR specifies thirteen areas for targeted preparedness efforts; standards for business and industry focus on twelve different dimensions, while efforts to create accreditation standards for communities have highlighted fifteen, and the Department of Homeland Security (DHS) has identified 37 "target capabilities" for all hazard preparedness.

The terms "dimensions" and "activities" are used here to discuss preparedness concepts. Other guidance and survey material examined in this work chose other ways to describe these concepts. For instance, in his research on Bay Area businesses, Mileti, (2000) identifies preparedness as a "concept" and a number of activities such as planning; mutual aid, drills, and training are identified as "variables." The Emergency Management Accreditation Program (EMAP) discusses "program areas" in contrast with dimensions.

FEMA's Capabilities Assessment for Readiness (CAR) describes "attributes" of preparedness and "characteristics" that fulfill these attributes.

Despite these differences, common themes appear both in research on preparedness and in guidance documents. In the following section discuss key dimensions of preparedness and their associated activities, with an emphasis on dimensions and activities that cut across different units of analysis.

At the most general level, it is possible to identify eight dimensions or desired end-states for preparedness activities: (1) hazard knowledge; (2) management, direction, and co-ordination of emergency operations; (3) formal and informal response agreements; (4) resource acquisition aimed at ensuring that emergency functions can be carried out smoothly; (5) life safety protection; (6) property protection; (7) emergency coping and restoration of key functions; and (8) initiation of recovery activities. Descriptions that follow focus on each of these key dimensions and their associated activities.

#### **2.4.2 HAZARD KNOWLEDGE: HAZARD IDENTIFICATION AND RISK, IMPACT, AND VULNERABILITY ANALYSIS**

All preparedness activities must be based on knowledge about hazards, the likelihood of different types of disaster events, and likely impacts on the natural and built environment, households, organizations, community institutions and communities. Types of information that provide a focus for preparedness activities include the potential for detrimental impacts of the hazards on health and safety, continuity of operations and government, critical facilities and infrastructure, delivery of services, the environment, economic and financial conditions, and regulatory and contractual obligations. Loss estimation tools such as HAZUS and HAZUS-MH were designed specifically to help communities envision the potential impacts of future disasters and mitigate and prepare for such events. Community-based disaster scenarios also provide a solid basis for preparedness efforts. Community outreach and the development of plans for crisis communications and public information are vital for the continuity of operations in businesses and to ensure public trust within a community. Partnerships between public and private entities that have been established and maintained prior to a disaster event will influence the sharing of resources through mutual aid and enable a capability to deliver emergency public information through previously identified channels. Activities include the identification of publics that will be in need of information and developing communications plans and identifying private resources that can be used in service to the community for response and recovery

#### **2.4.3 MANAGEMENT, DIRECTION, AND COORDINATION (MDC)**

This dimension of preparedness centers on strategies that make it possible for households, organizations, and other units of analysis to manage both preparatory activity and response processes. The MDC dimension includes identifying lines of authority and responsibility and specifying how resources will be managed, information analyzed, and decisions made. For example, guidance documents advise businesses to prepare for disaster by organizing an emergency management group that includes representation from the affected area, security, safety and health, environment, maintenance, human resources, planning and logistics, and public relations. Local emergency management agencies and crisis-relevant organizations must now adopt the National Incident Management System (NIMS) which requires the identification of organizational roles, titles, and responsibilities for each incident management function specified in the emergency operations and response plan. The MDC dimension also includes activities that are designed to ensure that emergency operations will be carried out effectively when disaster strikes. These activities include training, drills and exercises, and educational activities for members of the public, households, and businesses. MDC also includes developing policy, vision, and mission statements; developing and using enabling authorities; setting performance objectives; and assigning responsibilities in areas such as oversight and coordination.

#### **2.4.4 FORMAL AND INFORMAL RESPONSE AGREEMENTS**

This dimension of preparedness consists of activities targeting the development of disaster plans and other agreements. Such plans can be either informal or formal.

Households, for example, can plan informally to address challenges such as evacuation, sheltering in place, and reunification of family members who are separated when disasters strike. A family disaster plan consists of elements such as communications between family members, identifying safe locations for shelter, determining evacuation routes and how to reconnect when separated from loved ones.

For organizations, multi-organizational response networks, and communities, preparedness activities center on the development and adoption of formal disaster plans, memoranda of understanding, mutual aid agreements, and other agreements that facilitate coordinated response activities. The concept of mutual aid or the “sharing of personnel, equipment, and facilities...which occurs when local resources are inadequate to meet the needs of the disaster” (McEntire, p. 34-35) is applicable across a wide spectrum of groups, organizations, and jurisdictional levels.

Also important are formal and informal arrangements that link households, community organizations, and businesses with broader and more comprehensive preparedness efforts. For households, this could include participation in CERT (Community Emergency Response Teams) teams, Citizens Corps, and volunteer networks. Non-profits and community-based organizations may link with broader VOAD (Volunteer Organizations Active in Disaster) networks. In the Bay Area, CARD (Collaborating Agencies Responding to Disaster) performs this linking function for local community agencies. Individual businesses can also establish linkages with private sector and industry-based partnership networks.

#### **2.4.5 SUPPORTIVE RESOURCES**

Management activities and preparedness agreements are of little use unless resources are available to support response activities. The goal of resource management is to identify and establish internal and external resources necessary for disaster response and recovery. Identifying resource needs, acquiring resources, and storing and distributing resources are thus key preparedness dimensions. The resource management dimension of preparedness is closely tied to the planning dimension in that plans commonly involve strategies for resource sharing, such as mutual aid agreements.

Included in the concept of resources are human, material, and informational sources of support. Skilled, well-trained personnel and staff constitute critical resources. Communications resources are critical for all response activities at all levels of analysis, although communications media can vary from low-tech to very high-tech. Disaster response tasks—such as evacuation and other self-protective measures, search and rescue, emergency medical care, fire suppression, debris removal, emergency transportation, security and credentialing, and response coordination—have specific resource and logistical requirements that must be taken into account during the planning process.

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Technologies to assist with important crisis-relevant tasks such as public warning are also critical for effective response. Communications and warning systems are essential to any business operation or community emergency response. They are needed to report emergencies, warn personnel of the danger, keep families and off-duty employees informed about what’s happening at a facility or within a department, coordinate response actions, and keep in contact with customers and suppliers. Preparedness for communications and warning include the development of a communications plan,

the establishment of a warning system including developing protocols and procedures, regular testing and support, and addressing the interoperability of multiple responding organizations and personnel.

The resource dimension also includes efforts designed at mobilizing resources to continue with operations when key resources are destroyed. Businesses and communities must prepare for the possibility that an alternate facility, in addition to the primary facility, will be needed for recovery and resumption of services following a disaster event. Emergency preparedness for a community may include an alternate emergency operations center, efforts to introduce redundancy into key response systems, and procedures to locate, acquire, store, and test back-up resources.

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#### **2.4.6 LIFE SAFETY PROTECTION**

Protecting the health and safety of family members, vulnerable populations, employees and customers, and community members is a top priority during an emergency or disaster. Preparing to take action includes the creation of a disaster supplies kit with items such as food, clothing, first aid supplies, tools, and key documents. It also includes the designation of evacuation routes and exits, shelter, training and information on safety procedures, incident stabilization, damage assessment, and the identification of resources needed to support response and recovery operations.

#### **2.4.7 PROPERTY PROTECTION**

Property protection and hazard mitigation include preparedness activities to protect homes, buildings, facilities, equipment and vital records that are essential to restoring operations once an emergency has occurred. Activities include the use of applicable building construction standards; hazard avoidance through appropriate landuse practices; relocation, retrofitting, or removal of structures at risk; removal or elimination of the hazard; protection systems such as fire and smoke alarms or emergency power generation systems; records preservation; facility shutdown; and the establishment of hazard warning and communication procedures.

#### **2.4.8 EMERGENCY COPING AND RESTORATION**

At the organizational level, planning activities seek to develop strategies to address problems that are likely to develop when a disaster strikes, and training seeks to ensure that all those involved in the response are able to carry out their assigned duties.

Household emergency plans seek to do the same thing at the household level. However, disasters almost invariably bring surprises, and for that reason preparedness activities must also focus on improving the ability to improvise, innovate, and think creatively.



Preparing to improvise may seem like a contradiction, but in fact the two concepts are complementary. Preparations seeking to enhance adaptive capacity in disasters may include extensive “what if” explorations, various kinds of thought experiments, exercises in which players are required to assume others’ roles, and discussions centering on potential worst cases. Although a family may have an evacuation plan, it is also useful to consider what would be done if the plan cannot be executed or if evacuation is impossible. What if help does not arrive in 72 hours, or if the wait for assistance is even longer? What if both main and back-up EOCs are unavailable, as was the case for New York City at the time of the terrorist attacks of September, 2001? What if an event is so severe that the local community is totally paralyzed, as New Orleans was following Hurricane Katrina? What if critical resources are unavailable? If recent disaster experiences have taught us anything it is that systems can and do fail and that disaster plans can provide wholly inadequate in the face of unexpected contingencies.

Emergency response activities also include measures to initiate restoration activities as soon as is feasible following a disaster. Restoration of critical services and facilities is essential, both to contain further losses and to serve as a basis for initial recovery activities. Utility restoration, for example, plays a key role in making dwellings habitable and containing business interruption losses. Transportation system restoration is crucial to ensure that needed supplies and personnel can reach the impact area.

#### **2.4.9 INITIATION OF EARLY RECOVERY ACTIVITIES**

Business continuity planning focuses on avoiding costly downtime, lost revenue, and disaster-induced unemployment. Preparedness for business recovery includes such elements as making contractual arrangements with vendors for post-emergency services such as records preservation, equipment repair, and engineering inspection services. It also includes measures to get employees back to work as soon as possible—even if they must work at another location. Preparedness for recovery is also important for households and communities – especially with respect the purchase of hazard insurance designed to provide financial protection from disaster-related economic losses (NRC 2006).

Communities must also plan in advance for recovery. Such planning should include the use of hazard and vulnerability analyses to determine which neighborhoods, groups of residents, and businesses will be especially hard-hit in future disasters, and then, based on this information, to decide what should be done following those events.

Decisions must be made regarding emergency ordinances (e.g., to restrict access to hazardous locations) as well as new measures that may need to be undertaken to acquire vacant land for redevelopment and to ensure that mitigation issues are addressed during the recovery process. Community recovery planning also includes support that communities can provide to businesses and households to help ensure that they recover as rapidly as possible.

#### **2.5 FREE DISASTER PREPAREDNESS IN SCHOOLS (objectives 1, 2, 3, 4&5)**

According to Makhanu (2009) schools around the country have failed to emphasis on installing fire protection equipment, alarms, and first-aid and fire fighting. Vulnerability of schools to fire disasters is usually attributed to the following factors. Foremost, hostels may not be of fire-resistive materials;



they lack important fire protection equipment or are not operational at the time of the fire. Such a state is hazardous and a recipe for fire disaster. Common examples include: installed ventilators that are not in operation; exits that are permanently locked or grilled especially windows; no installed alarm system; no fire protection devices such as fire extinguishers and standpipes; rotten hose pipes; hostel exit 12 doors that open inwards instead of outwards, such that in event of emergency so many students pushing toward the door would jam it and eventually caught up as none would escape. Also entry roads for extinguishers may be inaccessible especially.

Akali, Khabamba and Muyinga (2009) observe that little has been done to prepare schools for fires. Only a handful of schools have fire extinguishers in offices, laboratories, stores and kitchens and even these are not regularly serviced. Furthermore, many public schools run on a shoe-string budget and cannot afford the luxury of fire-fighting equipment. School inspectors hardly perform safety assessment during routine checks in schools. Limited supply of water i.e. many schools experience water shortages more often and lack hydrant points that would be effective in putting out fires. Every school was requested by the government to set up a safety committee. However, there are many schools which have not complied with such rules.

Makhanu (2009) adds that fire-fighting equipment and other life saving devices should be generously displayed where they can be easily spotted even when one is extremely frightened. Teachers, learners and the subordinate staff should be routinely reminded about their existence and how to use them. For established institutions, automatic sprinkler, alarm and kitchen hood fire protection must be installed during the reconstruction or major repairs phases. There should be promptness in notifying the fire department for external assistance as employees and students attempt to extinguish the fire themselves. Construction, installation and maintenance processes, including periodic inspections should be done in a manner to insure safety and usability of fire - fighting equipment. Fire-fighting resource persons could be invited for such exercises. However, most of these activities have not been carried out in the secondary schools. Even the schools that have fire extinguishers may not teach learners how to use them. Resultantly, in case of a fire disaster, schools are still unprepared.

## **2.6 EMPIRICAL REVIEW**

### **2.6.1 FIRE HAZARD IN SCHOOLS – A GLOBAL PERSPECTIVE (objectives 4&5)**

The world population is ever increasing and has been increasing by 2.2 percent annually (United Nations, 2005). Around 27 percent of the populations are below fourteen years (United Nations, 2005). More children are being born who will need education. In general, the children spend between twelve to seventeen years from kindergarten to university depending on the education system of the country. In the systematically process of grooming them as fathers, mothers, leaders and experts of tomorrow, a lot challenges have been cropping up one of which is fire disaster, a threat that has been experienced all over the world.

The safety of children at some schools has been questionable due to recurrence of fire incidents. The availability of preparedness measures in most of the schools in developed countries has tremendously reduced the impact of incidences (U.S. Fire Administration, National Fire Data Centre, 2007). In developing countries, however, the contrary is the case, for the lack of or inadequate

preparedness measures in most schools, and the increase in fire incidents are raising alarm. The physical, financial and emotional devastation are the common impacts to both developing and developed countries. The closure of schools, damage of school properties, death, injuries and trauma are very common depending on the magnitude and severity of the fire itself (Blackaby, 2007).

The magnitude and severity of the fire varies depending on the level of preparedness. In this regard, most of the secondary school fire incidents in developing countries had severe impact on human being due to the poor level of preparedness. While school management, parents and children themselves need to be keen on the safety of school environment, United Nations agencies and other humanitarian organizations have been advocating for school safety. The protection of children from disaster has been alluded to in the Humanitarian Charter and International Humanitarian Law (Geneva conventions, 1949). It describes the critical tenets that guide humanitarian action and asserts the right to protection and assistance (Geneva conventions, 1949). The charter recognizes that preparedness in the education sector advocates for preservation of the right to life with dignity, protection against threats and availability of basic needs in case of disasters (Sphere standards project, 2004).

The United Nations Convention on the Right of the Child outlines the rights of children worldwide. It has five broad areas; (i) Survival rights: these are basic rights to life and include shelter, food and medical care. (ii) Developing rights: these are requirements that enable a child to reach his/her fullest potential and include access to information, education and freedom of thoughts, play and cultural activities. (iii) Protection rights: these relate to safeguarding children from neglect and other forms of abuse. iv)

Participation rights: advocate for children to actively engage in various roles in their community and (v) Environmental rights: every child has a right to a clean environment (UNCRC, 1989).

The African charter of the rights and welfare of the child also advocates for mentally or physically disabled children to have the right to special protection in keeping with their physical and moral needs and under conditions which ensure their dignity, promote self-reliance and active participation in the community (UNCRC, 1989).

Fire emergencies that happen in schools might directly or indirectly deprive the survival, development, protection, participation and environmental rights of children, as stipulated in the convention on the rights of children. The right of teachers according to the 5th October 1966 recommendation concerning the status of teachers by UNESCO in collaboration with ILO, in Paris, France, among other things stipulates the safety to teachers in regards to school buildings in two tiers, (i) School buildings should be safe and attractive in overall design and functional layout; they should lend themselves to effective teaching. They should be constructed in accordance with the established sanitary standards and with a view to durability and easy, economic maintenance. (ii) Authorities should ensure that school premises are properly maintained, so as not to threaten in any way the health and safety of pupils and teachers (ILO/UNESCO, 1966).

Both the Humanitarian Charter, United Nations convention on the right of the child and the recommendation concerning the status of teachers affirm the importance of safety for school, school community and the pupils. It affirms that the safe environment is one of the contributing factors for better education environment at school. The safe environment at schools will only come if people are aware and prepared, and more importantly are willing to spend more resources for disaster preparedness and prevention.

The staff writer of the website dealing with safety issues, safety products and safety tips in community(safetyissues.com), said that *'If you trust a school to educate your children and to house them you would not want to worry about fire in the dormitories of college and school'*(Blackaby,2007).

The point above raises a lot of questions to the parents and guardians. Do they really trust the school, which educates their children? Are they aware about fire preparedness? (Blackaby,2007) If the answer is yes, how many times the parents have visited the school asking questions or advising about the safety features at school; talked to students and teachers about fire drills asked them if they have experienced fire at school?(Blackaby,2007). The parents are part and parcel of school community. They have a responsibility to advise the school management on any important issue, particularly, the safety of school in general. All together, they have to be fire wise; therefore protect and prevent fire in the schools (Blackaby, 2007).

### **2.6.2 FIRE HAZARDS IN SCHOOLS: A COMPARISON OF DEVELOPED AND DEVELOPING COUNTRIES. (objectives 3,4&5)**

Fire incidents in secondary schools have been happening worldwide, and no country is spared from this problem. Though the magnitude and severity differ from one country to another, the awareness and preparedness level do differ. United Kingdom, one of the developed countries has also experienced several fire incidents in schools. According to the survey conducted in United Kingdom by Arson Control Forum in 2006, nearly half of all secondary schools surveyed had experienced a fire serious enough to call fire and rescue services in the past three years, (Arson Control Forum, 2006). The Government has created awareness to school children through providing fire safety education and give advice on fire prevention, risk assessment, evacuation and anti – arson measures (Arson Control Forum, 2006). Despite of prevention and protection measures in place, fire and rescue services in England and Wales attend around 1200 school fire episodes every year (Arson Control Forum, 2006). The survey results by the Arson Control Forum showed that 64 percent of the schools they taught fire safety education and 62 percent had taken some precautions against fire. Fire incidences in schools were reported to have long term and short-term impacts depending on the magnitude and severity of the fire itself. Among the common effects noted were temporary closure of schools, disruptions of lessons, loss of teaching notes, and loss of morale amongst teachers and pupils and negative publicity of the school. The most common causes of schools fires in England and Wales were identified to be of two types, the one started by suspicious or deliberate circumstances or accidental (Arson Control Forum, 2006). The suspicious or deliberate circumstances are like setting fire on the bin, toilet rolls or paper, rubbish or litter. The accidental fire causes are careless disposal of cigarette butts (Arson Control Forum, 2006).

In the United States of America the cases of fire in secondary schools have decreased tremendously, which reflects the high level of preparedness which is in place. A Report from United States Fire Administration, National Fire 2007 revealed that there were no reported school related fire deaths in 2007. This does not mean that there were no fire cases in secondary schools, but the impact to the life of people was minimal. This situation is contributed by the enforcement of policies and strict monitoring. Fire drills and fire education in schools are taken very seriously (United States Fire Administration, 2007).

The fire accidents in secondary schools in both the United States of America and United Kingdom have some similarities, in both prevention and protection measures, as both awareness and equipment have been put in place. Preparedness reduces the severity of the fire accident to the people and properties. There is significant reduction in death cases in most of the fire accidents in UK and USA compared to other countries.

In Africa, fire cases in secondary schools are very common and frequent. For example, in 2001, fire gutted a girl secondary school in Gindiri village, Northern Nigeria (Independent newspaper, March 2001), which killed twenty-three students and injured fourteen. Students were trapped in the dormitory because it was locked and fortified with iron bars and a chain. Local residents managed to save some of them by opening a bathroom door. The fire was caused by overturned kerosene lantern (Independent newspaper, March 2001).

In Uganda, in March 2009, a dormitory of Alliance Secondary School in Ibanda district was gutted by fire and property worth millions of Uganda shillings was destroyed (New Vision, March 2009). Despite Police Fire Unit arrival at the fire scene, the truck could not be driven closer to the dormitory because of lack of access (New Vision, March 2009). In April 2008, fire gutted Ugandan Budo Junior School near Kampala and at least 19 girls and two adults died. It was not clear how many children were in the room. It was established that the hostel doors were locked from outside (BBC, 15th April

2008). In March 2008, Maracha Secondary School in MarachaTerengo district in Uganda was gutted by fire at 7.30 am and two boys' dormitories were burnt (New Vision, March 2008). There were no injuries but properties of students and school were destroyed. A land dispute involving the school and the community and animosity among teaching staff were suspected to be one of the causes that led to fire (New Vision, March 2009). In July 2006, thirteen children were killed and several injured when fire gutted an Islamic Secondary School in Western Uganda (New Vision, July 2009). One of the dormitories gutted by fire at Uganda Junior School (BBC, April 2006)

In Kenya, the fire accidents in secondary schools have been increasing every year. More than thirty secondary schools were closed by the end of July 2001, the main reason being riots, strikes and arson attacks (T&C Inc Kenya, September 2001). In March 26, 2001 fire killed fifty-nine boys at Kyanguli Secondary School in Machakos, Kenya. The cause was a petrol bomb thrown by students. Exit routes and doors were locked from outside (Associated Press, 2002). In March 2000, Bombolulu Girls School in Coast province in Kenya was gutted by fire and twenty-six girls were killed.

However, we have observed a series of fire incidents in secondary schools where the doors were locked from outside.

From the selected three African countries, Nigeria, Kenya and Uganda, the fire incidents at schools seem to have similarities in several aspects. The fire safety regulations are not effectively enforced due to several reasons. The issue of non-adherence to the building codes has been manifested in several cases, a situation which hinders accessibility of fire vehicle to reach incident site, hence failing to fight the fire. Lack of emergency exit doors is also very common. Furthermore school unrest, lack of awareness of school management and parents on matters relating to fire safety, contributed to fire incidents in most of the Africa secondary schools

### **2.6.3 ADEQUACY OF FIRE FIGHTING EQUIPMENT IN SCHOOLS (objective 1)**

There are many schools which do not have adequate fire-fighting equipment (Shaw, 2002). Ians (2010) on a study in India discovered that as many as 1,200 schools in the national capital, including some top privately run institutions, are flouting fire safety norms. He said most schools seemed more interested in admitting a large number of children instead of providing them a safe environment. He further noted that many schools in the capital start operation with a “temporary” no objection certificate (NOC) on the understanding that they would install the necessary equipment within one year. However, many educational institutes never go back to the fire department for getting a permanent NOC. While many government schools do not have basic equipment, many private schools have not bothered to get their facilities certified from the fire department.

Mwenga (2008) on a study to establish the safety preparedness of secondary schools in Kyuso District, Kenya established that in this district there is no adequate fire-fighting equipment in the schools as majority, 43% had between 1 - 5 fire-fighting equipment. In addition, the number of fire-fighting equipment, fire-fighting points and first aid kits were found to be un-proportional to the size of the schools and the number of students hence inadequate to deal with any emergency. The schools rarely trained their students on safety measures as indicated by 44.5%; hence the students were not well-equipped with necessary training needed to handle emergencies in the schools. In addition, the members of staff and school matrons were not well-trained on fire-fighting techniques since only 56.0% were fairly trained.

Lucheli and Masese (2009) also noted that the high cost of fire-fighting equipment has made it impossible for North Rift schools to install the kits. Though many schools have removed grills from windows and installed double doors in dormitories, they lack fire extinguishers. Following the 2001 fire disaster at Kyanguli in Machakos, where 67 students lost their lives, the Government gave money to secondary schools for safety measures. However, Lucheli and Masese (2009) observed that most schools lacked fire extinguishers and where they were available; they were not in good working condition. Most schools have tried to meet the safety requirements, but fire extinguishers are still a challenge. The principals reported that schools acquired fire-fighting equipment from one company with Government funding, but what the company delivered was substandard. After the Government stopped funding, schools started single sourcing, but stringent budgets frustrated their efforts. In Nyanza, more than 1,000 secondary schools do not have sufficient fire-fighting equipment. This shows how ill-equipped schools are to fire in case of a fire disaster hence fire unpreparedness.

### **2.6.4 SCHOOL BUILDINGS AND FIRE SAFETY STANDARD (objective 2)**

Fire safety measures include those that are planned during the construction of a building or implemented in structures that are already standing, and those that are taught to occupants of the building. For some buildings the doors could be too small for speedy intervention or that buildings were not well designed to allow free movement beyond some points (Rowan, 2001). In such cases, fire extinguisher materials may not adequately reach targets. Combustible materials must not be used for decorations or in building components-this would usually accelerate heat transfer to sufficient temperatures raising the combustible materials to the point at which they would burn. Occupancy limit requirements should be strictly enforced so that hostels should accommodate beyond

recommended numbers. Exits need to be kept clear of obstructions and plainly marked. In this regard windows should not be grilled to allow complete opening in event of an emergency. Exit doors should swing in the direction of exit traffic flow. Public assembly buildings/halls must have two separate means of exit, remote from each other. As an outdoor event fire safety, avoid waterproof measures on equipment like tents which in themselves carry potency for disaster or are hazardous. For instance, coating tents with a covering of paraffin thinned by using gasoline presents a highly flammable covering (Marion &Maingi, 2010).

Odu (2012) observes that the Ministry of Education introduced recommendations that classrooms should only accommodate between 30 and 40 students to reduce congestion. One evident thing with fire disasters is that boarding facilities in most schools as observed in Kenya are designed to lock students in, whatever the circumstances; the country's conservative society apparently does not trust its youth to do the right thing. A Disaster like the one in Kyanguli province of Kenya however, show that this approach, where students are barricaded in dormitories designed like security facilities, invites disaster. This is a further implication that even though schools have made effort to prevent and manage fire disasters, fire disaster preparedness is still poor.

Fire disasters are by far the most common disasters in learning institutions in African countries (MOEST, 2001). Vulnerability of learning institutions to fire disasters is contributed by, among other factors, lack of safety measures like adequate exits, fire-fighting equipment and insufficient fire-fighting resources; absence of an evacuation plan in event of fire strike; unawareness by vulnerable persons (students) about imminent fire; being within the risk factor, for example, being in the burning building and becoming a victim; poor installation and storage of inflammable material; easy access to hazardous fuels and flammable materials. The culture of student unrest in learning institutions has increasingly taken a violent and destructive trend.

More badly, MOEST studies indicate that such unrests are premeditated, planned and executed to yield maximum harm to human life and extreme destruction to property. There is need for a tangible disaster preparedness and risk reduction policy targeting learning institutions as a way of raising awareness particularly on the unpredictable disasters like fire. Years of development efforts are destroyed and subsequent operations of the affected institution grossly disrupted. Reactive measures like seeking assistance from Constituency Development Funds, well-wishers and going back to already impoverished parents does not yield much. Disaster preparedness and risk management interventions will empower learning institutions to safeguard against fire related disasters. This implies that there are many strategies that the educational institutions can use to improve fire preparedness in schools.

### **2.6.5 FIRE SAFETY EVACUATION PLANS IN SCHOOLS (objectives 3)**

According to White (2011), every fire safety system should also include an emergency preparedness plan that documents important information on procedures for responding to an emergency, such as fires, earthquakes, terrorism, and school violence incidents. Because the safety of the students is of the utmost importance, this plan is essential. In addition, schools can also serve as emergency shelters, so it is recommended that there is plan for town-wide crisis situations as well. The document should follow the National Incident Management System (NIMS) and should outline standard operating procedures and guidelines, provide for fire drills, include a list of key contacts



with addresses and night-time phone numbers and establish a chain of command and appropriate officers. The document may contain maps or plans of egress routes and locate safe havens.

Nakitto and Lett (2012) did a study on the preparedness of Ugandan schools for fires. Fifty schools (day and boarding) were randomly chosen in the five divisions of Kampala. The findings of the study showed that 84 percent of schools had no fire safety plans in place. They further established that majority of Ugandan schools are not prepared to deal with fires. They proposed that fire safety policies and standards should be addressed by the Ministry of Education and School Management (Nakitto&Lett, 2012).

Ndiang'ui (2006) on a study on vulnerability of Kenyan schools to fire disaster observed that to some extent, the degree of exposure to fire disasters in schools is influenced by the administrative framework of the school. For example, lack of early warning systems to help control fire in its early stages; lack of disaster preparedness plans; lack of fire drills and First Aid Kits; lack of basic training on security; lack of fire extinguishers in key areas or lack of emergency exits etc. expose schools to disasters. She concluded that adequate strategies have not been put in place to cope with fire disaster and schools are not prepared at all for disasters. She proposed that to achieve reasonable levels of minimization, it is necessary to reduce the adverse effects of disasters through effective precautionary measures like having fire safety plans.

#### **2.6.6 TRAINING OF TEACHERS, WORKERS AND STUDENTS ON FIRE SAFETY (objective 4)**

Makhanu (2009) observes that fire and safety departments in most learning institutions are non-existent or members are not trained or equipped to fight a fire in the school. This could either be as a result of naturalist attitude that God would take care of all unpredictable disasters or could be as a result of sheer negligence or both. The safety of school occupants will be enhanced if staff knows what to do both before and during an outbreak of fire or other emergency. This can be achieved by ensuring that staff including temporary and part-time personnel receives appropriate instruction and training. All new entrants to a school be it students pupils, staff or support staff, should be conducted around the primary escape routes of the school. They should also receive instruction on the school fire evacuation routine and receive instruction and training appropriate to their responsibilities in the event of any emergency.

Makhanu (2009) added that all members of staff should each receive a personal copy of prepared written instructions as well as receive verbal instructions given by a competent person. Such instruction shall include details of how to call the Fire Brigade. A record of the training and instructions given and fire drills held shall be entered in the log book and will include the following: date of the instruction or fire drill, duration, name of person giving instruction, name of the person receiving instruction, nature of instruction or fire drill. Fire drills, which may be combined with the instruction given above, should be carried out at least once per term. The fire drill should simulate that one escape route is not available. Each fire drill should be started by a pre-determined signal and the whole premises checked as if any evacuation was in progress. In large schools a specific person shall be made responsible for organizing staff training and to co-ordinate the actions of the staff in the event of fire. Effective arrangements should be made for a deputy or deputies to carry out the

above duties in the absence of the nominated persons. The fire safety policy guideline requires that fire drills to be done twice every term.

According to Kukali (2009) lack of basics about fire safety issues or on how to react in event of fire disaster is to blame for the large number of casualties experienced. Basic fire emergency drills to workers or students are often taken for granted to the extent that in event of a fire very few workers or students may know what to do. In fact a number of them, faced with the prospect of a horrible death by fire, may choose to leap to their deaths from windows or roof tops of the fated buildings at whichever height. On the other hand, some employees who are first to spot the fire burning could be too frightened, and may choose to run away instead of raising alarm. Basic training on the use of firefighting equipment and other life-saving skills in event of fire disaster must be regularly done. All new members of the institutions must be inducted in basic fire safety skills. In many schools, this kind of training does not occur. Teachers and learners may be told on what to do generally in case of a fire disaster but its practicality is rarely done. This implies that fire disaster preparedness in schools is still poor.

From the above presentation, it could be observed that there is a gap in term of reliable data on fire disaster preparedness in different states of Nigeria and Port Harcourt in particular. To have a full grasp of fire disaster preparedness in secondary school in Port Harcourt metropolis, there is therefore a need for detail analysis of fire disaster preparedness which will help stakeholders in the secondary school sector to plan adequately against fire emergencies.



### 3.0 CHAPTER THREE

#### 3.1 RESEARCH METHODOLOGY

##### 3.1.1 RESEARCH DESIGN

Descriptive research design was adopted for this study. Descriptive research is preplanned and structured in design so the information collected can be statistically inferred on a population. The main idea using this type of research designs is to better define an opinion, attitude or behavior held by group of people on a given subject. It adopts a multiple choice question for respondent's to choose from which provide statistically inferable data (fluid survey, 2014). This type of design provide the opportunity to measure the significance of a result on the overall population of the study as well as the change of respondent's opinion, attitude and behavior over time. Descriptive design also measures the characteristic of the environment without changing the environment, it helps to describe how the character of the environment are being affected by the study variable (fluid survey, 2014)

##### 3.1.2 TARGET POPULATION FOR THE STUDY

The target population for this study consisted of all public and private secondary schools in Port Harcourt metropolis made up of ObioOkpor and Port Harcourt LGAs. According to the Rivers State Ministry of Education official data, there were 86 pubic (government owned) secondary schools and 311 private secondary schools in ObioAkpor LGA.,68 public secondary schools and 196 private schools in Port Harcourt LGA, as of 2014. This makes it a total of 661 secondary schools in all and that becomes the target population for this study.

##### 3.1.3 SAMPLING PROCEDURE AND SAMPLE SIZE

This study employed stratified simple random technique. Stratified sampling technique was used to select the schools to be included in the sample. Stratified sampling technique is a technique that identifies sub groups in the population and their proportions and select from each sub group to form a sample. It aims at a proportionate representation with a view of accounting for the differences in sub-group characteristics (Oso&Onen, 2005). Stratified random sampling technique ensures that each sub group in the target population is represented in a sample in a proportion equivalent to its size in the accessible population. In this case 30 % of the schools were selected from each of public and private secondary schools in each of the stratified constituencies as described in the table below:

**DISTRIBUTION OF SCHOOLS BY STRATIFIED CONSTITUENCY**

Constituency	No. Of Private Schools Selected	No Of Public Schools Selected
Obio/Akpo I	25	6
Obio/Akpo II	32	8
Port Harcourt I	20	7
Port Harcourt II	13	6
Port Harcourt III	11	4
Total	101	31

### **3.1.4 NATURE AND SOURCE OF DATA COLLECTION**

Qualitative and quantitative data of primary and secondary sources were used for this study as explained below:

Qualitative data were obtained from focal group discussion with ministry of education staff, interview with principals of the sample secondary schools, desk survey of policies and document that guide secondary schools fire safety operation in the area of study as well as data from observation. Quantitative data were obtained from questionnaire as well as figures from the ministry of education. Primary sources of data include questionnaire, interview, observation and focal group discussion, while secondary data include published work, desk study and review such as data from Rivers state ministry of education.

A total of 132 check list Questionnaires were prepared and used to evaluate the sampled schools. The questionnaire consisted of open ended and closed ended questions. Check list Questionnaires are preferred for collecting data because their wordings and sequence are fixed and identical to all respondents. This had the advantage of obtaining standard responses to items in the questionnaire, making it possible to compare between sets of data.

### **3.1.5 METHOD OF DATA ANALYSIS**

Data collected was analyzed through descriptive statistics. The process consisted of editing which involved examination of raw data to detect errors and omissions in questionnaires and making corrections where possible; coding which involved assigning numerals to answers so that responses can be classified into a limited number of categories or classes appropriate to the research problem under consideration; classification which involved reducing the data into homogenous groups according to attributes or in class intervals, frequencies, percentages means and cross tabulations. Statistical package for social scientists (SPSS) was used to analyze the data whereby relationships between variable were used to come up with trends. The data was presented in different forms of statistical forms such as pie charts, histograms etc.

### **3.1.6 VALIDITY/ RELIABILITY OF INSTRUMENT**

Mugenda and Mugenda (2003) define validity as the accuracy and meaningfulness of inferences which are based on the research results. Content validity in this research design was assured by careful choice of indicators which have informed the construction of the questionnaires. Validity was further enhanced by undertaking a pilot study prior to collecting the final data. The part of the population (two schools) engaged in the validity test were not involved in the final data collection exercise in order to avoid bias. In addition, validity was ensured through consulting research experts that is supervisors to ensure that the instruments of data collection can measure what they are intended to measure.

### **3.1.7 INSTRUMENT RELIABILITY**

Reliability is the tendency of an instrument to yield consistent results when applied on several occasions. The reliability of the questionnaires was tested through test- retest technique, data being collected with the instruments from a few selected subjects of the population at two different

schools. Same respondents were given the questionnaire to fill two times with an in-between period of two weeks.

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{[\sum x^2 - (\sum x)^2] [\sum y^2 - (\sum y)^2]}$$

Where

x = results for first test  $\sum x^2$  = A summation of the square of first test results

y = results for second test  $\sum y^2$  = A summation of the square of second test results

$(\sum x)(\sum y)$  = A product of the summation of first and second test results

$n\sum x$  = Product of number of scores and summation of first test

$n\sum y$  = Product of number of scores and summation of second test 31

The positive correlation coefficient can range from 0.00 to 1.00. The closer to 1.00; the stronger the relationship is. The closer the scores are, the more reliable the research instrument is (Litwin, 1995). A correlation coefficient of 0.8 was established. This is an indication that the instruments were reliable.



## 4.0 CHAPTER FOUR

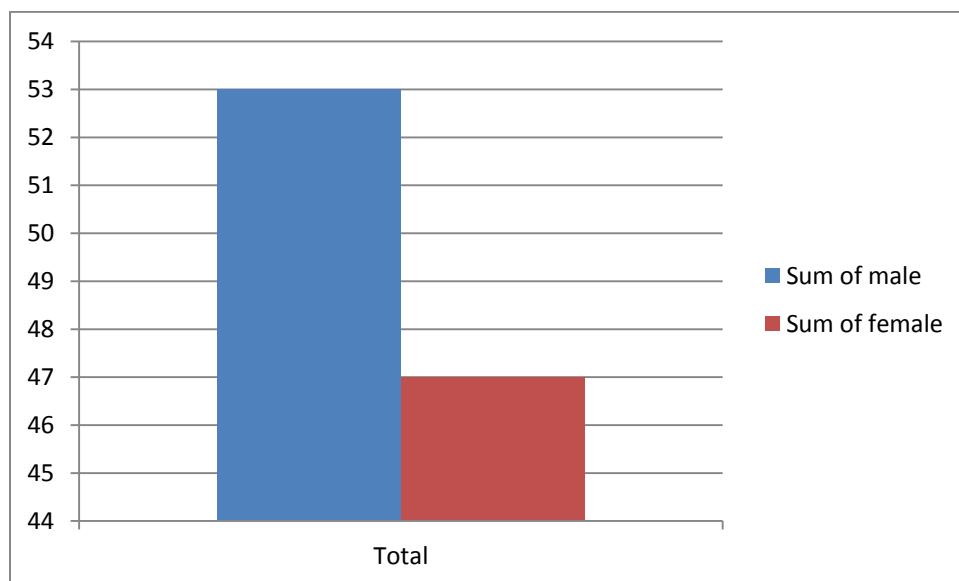
### 4.1 DATA ANALYSIS AND DISCUSSION OF FINDINGS

In this chapter deals with the analysis of the data generated from the field work. It presents the data, analyzed the data, answers the research questions and tests the hypothesis as well as discussed the findings of the study.

### 4.2 SEX DISTRIBUTION OF RESPONDENTS

From figure 4.1 as shown below, there were 70 (53%) male respondents and 62 (47%) female respondents that participated in this study. This means that both sexes were fairly represented in the study though the men still dominate the secondary education sector in the study are as can be deduced from the data presented.

**Table 4.1 SEX OF RESPONDENTS**



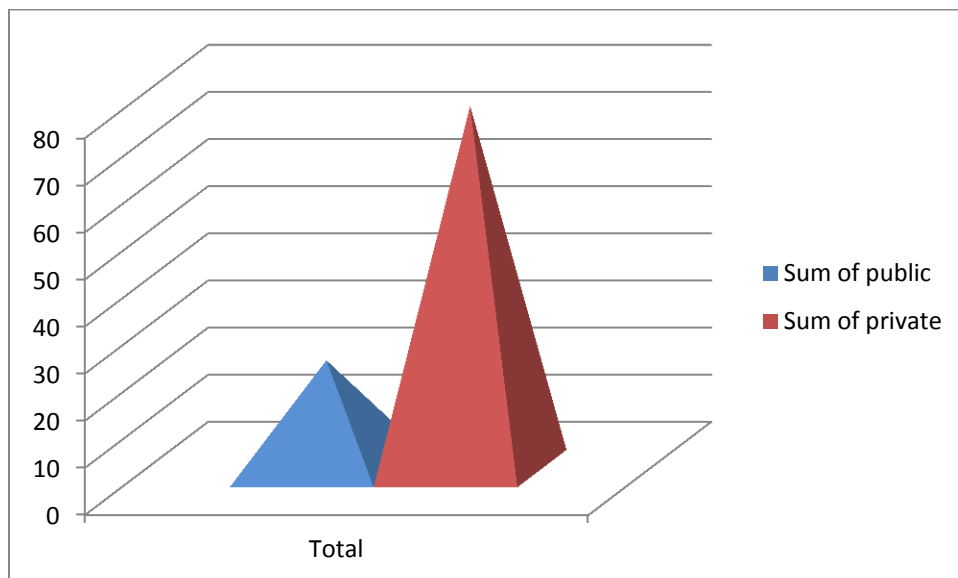
Source: field work, 2016

### 4.3 CATEGORY OF SCHOOLS

The data in figure 4.3 as shown below reveals that 31 (23%) schools in the study were public schools (owned by government), while 101(77%) schools in the study were private schools owned by private individuals, community and missionary or churches. It therefore means that majority of schools in the study area are owned by private individual and other non- governmental organizations.



**Table 4.2 CATEGORY OF SCHOOL**

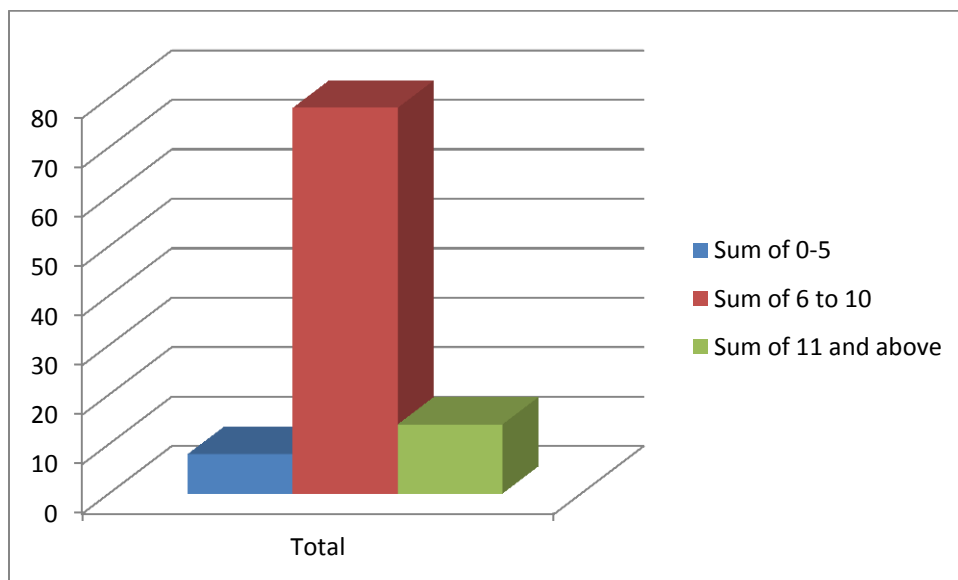


Source: field work, 2016.

#### 4.4 WORKING EXPERIENCE (YEARS) OF RESPONDENTS

In figure 4.2 as shown below, 11 (8%) of the respondent have been working in the secondary school for a period of 1-5 years, 103 (78%) have been working for 6-10 years while 18(14%) have been a worker in the various schools for more than 11 years. This means that they have a good understanding of situation and policies and programs in their schools and thereby an extension on fire safety condition in their various schools.

**Table 4.3 WORK EXPERIENCE OF RESPONDENTS**



Source: field work, 2016

## 4.5 ADEQUACY OF FIRE FIGHTING EQUIPMENT

A total of 25(20%) suggested that fire hydrant was inadequate while 106(8%) suggested it was very inadequate. No respondents suggest very adequate and adequate respectively as show in table 4.1 below. On fire extinguisher, 4(3%) respondent suggested that it was adequate, 85(64%) suggested that it was inadequate while 43(33%) of them suggested that it was very inadequate. No respondent suggested very adequate as shown in table 4.1 below. Also as is presented in table 4.1 below 17(13%) suggested that fire resistant materials used in the schools were inadequate. 115(87%) suggested that it was very inadequate, while no respondent suggested very adequate and adequate.

Accordingly, data as shown in table 4.1 below reveal that 6(5%) respondents suggested very adequate exits in the schools, 21(16) suggested adequate exits, 25(19%) suggested inadequate that exits were very inadequate. Also, 30(23%) respondents suggested that fire protective device in the schools were inadequate, 102(77%) suggested that it was very inadequate. No respondent suggested it to be very adequate or adequate in the schools. Subsequently, 11(8%) respondents suggested that fire blanket was inadequate, 121(92%) of them suggested it to be very inadequate. No respondent suggested it to be very adequate or adequate. 2(2%) of the respondents suggest that fire escape ladder was adequate, 17(13%) said it was inadequate, 113(86%) said it was very inadequate. But no respondents suggest it was very adequate as shown in table 4.1 below. On heat and smoke detector, 5(4%) respondent said it was adequate, 16(12%) said it was inadequate, 111(84%) said it was very adequate in the schools. No respondents suggest it to be very adequate. 4(4%) respondents said that fire alarm was adequate in the schools, 16(12%) said it was inadequate, 111(84%) respondent said fire alarm was very inadequate in the schools. No respondents suggest very adequate of fire alarm in the schools.

Furthermore, 51(39%) respondents said that fire hose and nozzle was inadequate in the schools, 81(61%) said it was very inadequate. No respondent suggest very adequate and adequate to fire hose and nozzle in the schools. 14(11%) respondent said that fire fighting outfit was adequate in the school, 54(41%) of them said it was inadequate, 64(48%) respondents said it was very inadequate. No respondents suggested very adequate to fire fighting outfit in the schools as is presented in table 4.1 below. On availability of fire sand bucket, 12(9%) said it was very adequate in the schools, 26(20%) of them choose adequate, 56(42%) choose inadequate, 38(29%) said it was very adequate. Also, from the data in table 4.1 as shown below, 2(2%) said that self contained breathing apparatus was inadequate, 130(98%) choose very adequate while no respondents choose very adequate or adequate of self contained breathing apparatus. And finally on adequacy of fire fighting equipment, 9(7%) respondent said that reliable water supply was very adequate, 16(12%) said reliable water supply was adequate, 35(27) of the respondents said water supply was inadequate, while 72(55%) said that reliable water supply was very inadequate in the schools as is shown in table 4.1 below.

**Table 4.4 ADEQUACY OF FIRE FIGHTING EQUIPMENTS**

<b>Fire fighting equipments</b>	<b>Types of school</b>	<b>Very adequate</b>	<b>Adequate</b>	<b>Inadequate</b>	<b>Very inadequate</b>	<b>Total</b>
<b>Fire hydrants</b>	Public	0	0	3 (10)	28 (90)	31 (100)
	Private	0	0	23 (23)	78 (77)	101 (100)
	Total	0	0	26 (20)	106 (80)	132 (100)
<b>Fire extinguishers</b>	Public	0	0	5 (16)	26 (84)	31 (100)
	Private	0	4 (4)	80 (79)	17 (17)	101 (100)
	Total	0	4 (3)	85 (64)	43 (33)	132 (100)
<b>Fire resistant materials</b>	Public	0	0	3 (10)	28 (98)	31 (100)
	Private	0	0	14 (14)	87 (87)	101 (100)
	Total	0	0	17 (13)	115 (87)	132

**Adequacy of Fire Fighting Equipment continue**

<b>Fire equipments</b>	<b>Types of schools</b>	<b>Very adequate</b>	<b>Adequate</b>	<b>Inadequate</b>	<b>Very inadequate</b>	<b>Total</b>
<b>Fire exit</b>	Public	1 (3)	5 (16)	10 (32)	15 (48)	31 (100)
	Private	5 (5)	16 (16)	15 (15)	65 (64)	101 (100)
	Total	6 (5)	21 (16)	25 (19)	80 (61)	132 (100)
<b>Protective fire device</b>	Public	0	0	10 (32)	21 (67)	31 (100)
	Private	0	0	20 (20)	81 (80)	101 (100)
	Total	0	0	30 (23)	102 (77)	132 (100)

<b>Fire blanket</b>	Public	0	0	0	31 (100)	31 (100)
	Private	0	0	11 (11)	90 (89)	101 (100)
	Total	0	0	11 (8)	121 (92)	132 (100)

**Adequacy of Fire Fighting Equipment continued**

<b>Fire equipment</b>	<b>Types of schools</b>	<b>Very adequate</b>	<b>Adequate</b>	<b>Inadequate</b>	<b>Very inadequate</b>	<b>Total</b>
<b>Fire escape ladder</b>	Public	0	0	2 (6)	29 (94)	31 (100)
	Private	0	2 (2)	15 (15)	84 (83)	101 (100)
	Total	0	2 (2)	17 (13)	113 (86)	132 (100)
<b>Heat and smoke detector</b>	Public	0	0	0	31 (100)	31 (100)
	Private	0	5 (5)	16 (16)	80 (79)	101 (100)
	Total	0	5 (4)	16 (12)	111 (84)	132 (100)
<b>Fire alarm</b>	Public	0	0	0	31 (100)	31 (100)
	Private	0	5 (5)	16 (16)	80 (79)	101 (100)
	Total	0	5 (4)	16 (12)	111 (84)	132 (100)

**Adequacy of Fire Fighting Equipment continued**

<b>Fire equipments</b>	<b>Types of schools</b>	<b>Very adequate</b>	<b>Adequate</b>	<b>Inadequate</b>	<b>Very inadequate</b>	<b>Total</b>
<b>Fire horse and nozzle</b>	Public	0	0	0	31 (100)	31 (100)
	Private	0	0	51 (50)	50 (50)	101 (100)
	Total	0	0	51 (39)	81 (61)	132 (100)
<b>Fire fighting outfit</b>	Public	0	0	3 (10)	28 (90)	31 (100)
	Private	0	14 (14)	51 (50)	36 (36)	101 (100)
	Total	0	14 (11)	54 (41)	64 (48)	132 (100)
<b>Fire sand bucket</b>	Public	2 (7)	5 (16)	14 (45)	10 (32)	31 (100)
	Private	10 (10)	21 (21)	42 (42)	28 (27)	101 (100)
	Total	12 (9)	26 (20)	56 (42)	38 (29)	132 (100)

**Adequacy of Fire Fighting Equipment continued**

<b>Fire equipments</b>	<b>Types of school</b>	<b>Very adequate</b>	<b>Adequate</b>	<b>Inadequate</b>	<b>Very inadequate</b>	<b>Total</b>
<b>Self contained breathing apparatus</b>	Public	0	0	0	31 (100)	31 (100)
	Private	0	0	2 (2)	99 (98)	101 (100)
	Total	0	0	2 (2)	130 (98)	132 (100)
<b>Reliable water supply</b>	Public	3 (10)	6 (19)	10 (32)	12 (39)	31 (100)
	Private	6 (60)	10 (100)	25 (25)	60 (59)	101 (100)
	Total	9 (7)	16 (12)	35 (27)	72 (55)	132 (100)

Source: field work, 2016

#### 4.6 WHETHER SCHOOLS STRUCTURES ARE BUILT TO FIRE SAFETY STANDARD

On the above statement, many criteria were used to measure it. Accordingly, 42(32%) respondents strongly agreed that exits are clear of obstruction at all time, 58(44%) agreed with the statement, 21(16%) disagreed with the statement while 11(8%) strongly disagreed with the statement. 10(8%) respondents agreed that fire extinguishers are place at strategic position for easy access, 57(43%) disagreed with the statement, 64(49%) respondent strongly disagreed with the statement while there was no respondents that strongly agreed with the statement. Again, 10(8%) respondent agreed that combustible material have not been used for decoration, 108(82%) disagreed with the statement, 14(10%) strongly disagreed with the statement, but no respondent strongly agreed with the statement as shown in table 4.2 below.

From the data as presented in table 4.2 below on, 12(9%) respondent strongly agreed that windows in the school have not been grilled, 38(29%) agreed with the statement, 58(44%) of them disagreed with the statement and 24(18%) strongly disagreed with the statement. Also 44(332%) strongly agreed that exits in the buildings swings outward, 73(55%) agreed with the statement, 15(12%) disagreed with the statement but no respondents strongly disagreed with the statement. 29(22%) strongly agreed that exit do not lock in students

,70(53%) agreed with the statement 23(17%) disagreed with the statement and strongly disagreed with the statement. 16(12%) respondent strongly agreed, that classes are constructed in a way that student and teacher can escape easily in case of fire, 99(75%) agreed, 12(9%) disagreed and 5(4%) respondents strongly disagreed with the statement.

Furthermore, From table 4.2 shown below, 54(50%) respondents agreed that halls have emergency and fire extinguishers, 61(46%) disagreed with the statement, 17(13) strongly disagreed with the statement but no respondents strongly agreed with the statement. 15(11%) respondents strongly agreed with the statement that laboratory have fire fighting equipment, 45(34%) agreed with it, 58(44%) disagreed with the statement and 14(11%) strongly disagreed with the statement as shown in table 4.2 below. Also, 15(11%) respondents strongly agreed that offices have fire fighting, 45(34%) agreed with it, 58(44%) disagreed with it and 14(11%) strongly disagreed with the statement as shown in table 4.2 below. And finally on this topic, 15(11%) respondents strongly agreed that kitchen have fire fighting equipment, 45(34%) agreed with it, while 58(44%) disagreed and 14(11%) strongly disagreed with the statement as shown in table 4.2 below.



**Table 4.5 SCHOOL STRUCTURES BUILT TO FIRE SAFETY STANDARD**

<b>Statements</b>	<b>Type of school</b>	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>	<b>Total</b>
<b>Exit are clear of obstruction</b>	public	6 (19)	18 (58)	2 (4)	5 (16)	31 (100)
	private	36 (36)	40 (40)	19 (19)	6 (6)	101 (100)
	Total	42 (32)	58 (44)	21 (16)	11 (8)	132 (100)
<b>Fire extinguisher are place at strategic position</b>	Public	0	0	5 (16)	26 (84)	31 (100)
	Private	0	10 (10)	52 (51)	39 (39)	101 (100)
	Total	0	10 (8)	57 (43)	65 (49)	132 (100)

Source: field work, 2016

**SCHOOL STRUCTURES BUILT TO FIRE SAFETY STANDARDS CONTD.**

<b>Statement</b>	<b>Type of school</b>	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>	<b>total</b>
<b>Combustible materials has not been used for decoration</b>	Public	0	10 (32)	15 (48)	6 (19)	31 (100)
	Private	0	0	93 (920)	8 (8)	101 (100)
	Total	0	10 (8)	108 (82)	14 (10)	132 (100)
<b>School windows have not been grilled</b>	Public	2 (6)	15 (48)	10 (32)	4 (13)	31 (100)
	Private	10 (10)	23 (23)	48 (47)	20 (20)	101 (100)
	Total	12 (9)	38 (29)	58 (44)	24 (18)	132 (100)
<b>School exit door swings outward</b>	Public	0	21 (68)	10 (32)	0	31 (100)
	Private	44 (44)	52 (51)	5 (5)	0	101 (100)
	Total	44 (33)	73 (55)	15 (12)	0	132 (100)

Source: field work, 2016

SCHOOL STRUCTURES BUILT TO FIRE SAFETY STANDARDS CONTD.

Statement	Types of school	SA	A	D	SD	total
<b>Building facilities has not been design to lock in student</b>	Public	5 (16)	12 (39)	8 (26)	6 (19)	31 (100)
	Private	24 (24)	58 (57)	15 (150)	4 (4)	101 (100)
	Total	29 (22)	70 (53)	23 (17)	10 (8)	132 (100)
<b>Classes have been constructed for easy escape in case of fire</b>	Public	2 (6)	25 (81)	4 (13)	0	31 (100)
	Private	14 (140)	74 (73)	8 (8)	5 (5)	101 (100)
	Total	16 (12)	99 (75)	12 (9)	5 (4)	132 (100)

Source: field work, 2016

SCHOOL STRUCTURES BUILT TO FIRE SAFETY STANDARDS CONTD.

Statement	Type of school	SA	A	D	AD	Total
<b>Halls have emergency doors and fire extinguishers</b>	Public	0	15 (480)	16 (52)	0	31 (100)
	Private	0	39 (39)	45 (54)	17 (16)	101 (100)
	Total	0	54 (50)	61 (46)	17 (13)	132 (100)
<b>Laboratory have fire fighting equipments</b>	Public	0	0	26 (84)	5 (16)	31 (10)
	Private	15 (15)	45 (45)	32 (31)	9 (9)	101 (100)
	Total	15 (11)	45 (34)	58 (44)	14 (11)	132 (100)
<b>Offices have fire fighting equipments</b>	Public	0	0	26	5	31 (100)
	Private	15 (15)	45 (45)	32 (31)	9 (9)	101 (100)
	Total	15 (11)	45 (34)	58 (44)	14 (11)	132 (100)
<b>Kitchen have fire fighting equipments</b>	Public	0	0	26 (84)	5 (16)	31 (100)
	Private	15 (15)	45 (44)	32 (32)	9 (9)	101 (100)
	Total	15 (11)	45 (34)	58 (44)	14 (11)	132 (100)

Source: field work, 2016

#### 4.7 FIRE SAFETY TRAINING FOR SECONDARY SCHOOL STAKEHOLDERS

On whether there used to organized fire safety training for secondary school stakeholders, the following result was obtained as shown in table 4.3 below. 10(8%) respondent disagreed that students have been trained in fire safety, 122(92%) strongly disagreed with it and no respondents strongly agreed or agreed with the statement. Again, 10(8%) disagreed that head teachers have been trained in the fire safety, 122(92%) strongly disagreed with it but no respondents strongly agreed or agreed with the above statement. 10(8%) disagreed that Teachers have been trained in fire safety, 122(92%) strongly disagreed with it but no respondents strongly agreed or agreed with the above statement.

Furthermore, 10(8%) disagreed that Kitchen staff have been trained in fire safety. 122(92%) strongly disagreed with it but no respondents strongly agreed or agreed with the above statement. 10(8%) disagreed that Lab technicians have been trained in fire safety, 122(92%) strongly disagreed with it but no respondents strongly agreed or agreed with the above statement. 10(8%) disagreed that School drivers have been trained in fire safety, 122(92%) strongly disagreed with it but no respondents strongly agreed or agreed with the above statement. Also, 10(8%) disagreed that School security have been trained in fire safety, 122(92%) strongly disagreed with it but no respondents strongly agreed or agreed with the above statement. And finally on the topic, 10(8%) respondents disagreed that School nurses have been trained in fire safety, 122(92%) strongly disagreed with it but no respondents strongly agreed or agreed with the above statement as shown in table 4.3 below.

**Table 4.6 FIRE SAFETY TRAINING FOR SCHOOLS STAKEHOLDERS**

Statements	school type	SA	A	SD	D	Total
<b>Students have been trained in fire safety</b>	Public	0	0	0	31 (100)	31 (100)
	Private	0	0	0	101 (100)	101 (100)
	Total	0	0	0	132 (100)	132 (100)
<b>Teachers have been trained in fire safety</b>	Public	0	0	0	31 (100)	31 (100)
	Private	0	0	0	101 (100)	101 (100)
	Total	0	0	0	132 (100)	132 (100)
<b>Kitchen staff are trained in fire safety</b>	Public	0	0	0	31 (100)	31 (100)
	Private	0	0	0	101 (100)	101 (100)
	Total	0	0	0	132 (100)	132 (100)

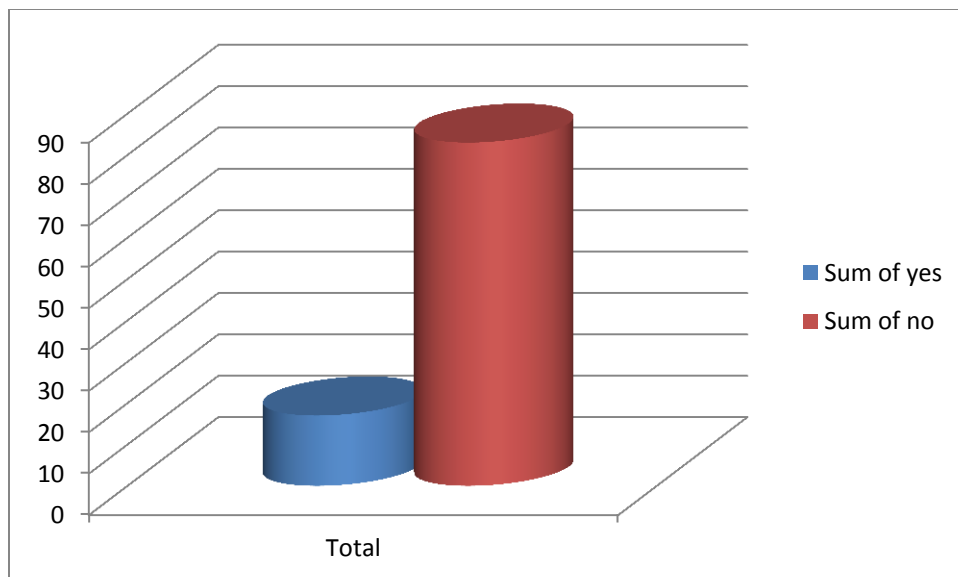
Statement	School type	SA	A	D	SD	Total
School drivers are trained in fire safety	Public	0	0	0	31 (100)	31 (100)
	Private	0	0	0	101 (100)	101 (100)
	Total	0	0	0	132 (100)	132 (100)
School secretary are trained in fire safety	Public	0	0	0	31 (100)	31 (100)
	Private	0	0	0	101 (100)	101 (100)
	Total	0	0	0	132 (100)	132 (100)
School nurses are trained in fire safety	Public	0	0	0	31 (100)	31 (100)
	Private	0	0	0	101 (100)	101 (100)
	Total	0	0	0	132 (100)	132 (100)

Source: field work, 2016



#### 4.8 FIRE EVACUATION PLAN

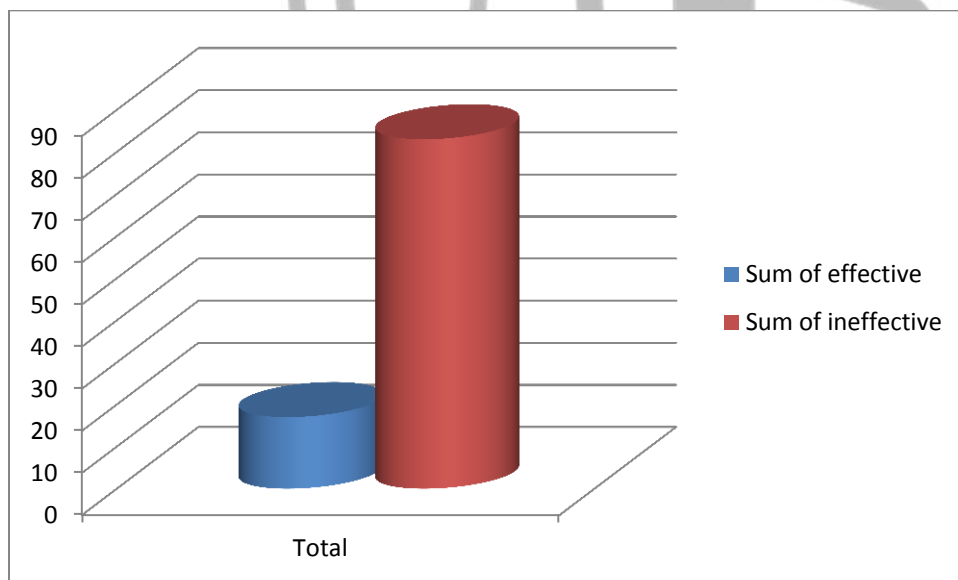
From figure 4.1 as shown below, 23 (17%) respondent accepted that there were fire evacuation plans in their schools while 109 (83%) respondent said there was no fire evacuation plan in their schools. This means that majority of the secondary schools in the study are vulnerable to fire disaster.



**Figure 4.1 FIRE EVACUATION PLAN**

#### 4.8.1 EFFECTIVE FIRE EMERGENCY PLAN

One thing is to have a plan another is for that plan to be effective when activated. Therefore to know how effective the fire emergency plans was, it reveals that 23 (17%) respondents believed that the plan is effective while 109 (83%) on the other hand said that the plan are ineffective as shown in 4.2 below.

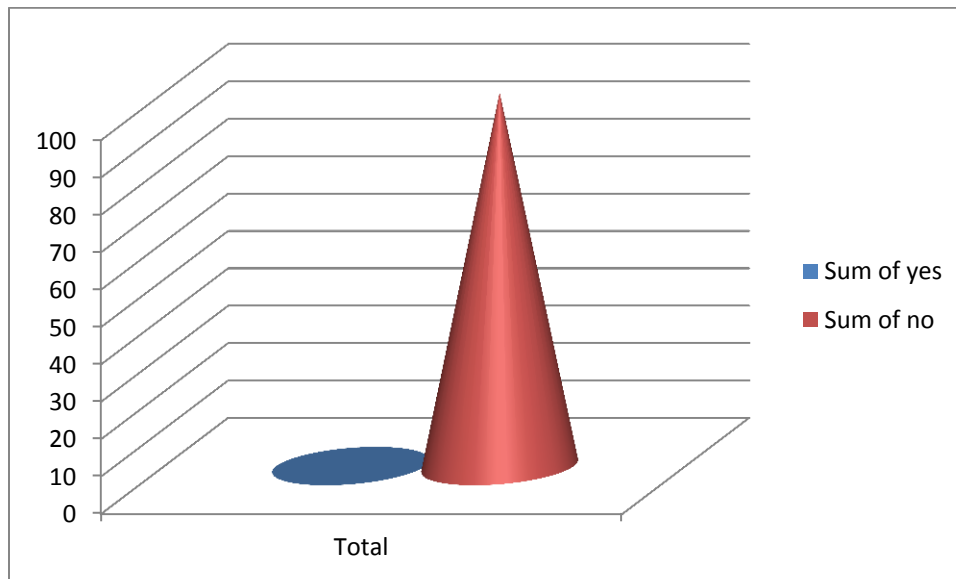


**Figure 4.2 EFFECTIVE FIRE EMERGENCY PLAN**

#### 4.8.2 EVACUATION PLAN FOR DISABLE PERSONS

This study when further to investigated if there were fire emergency plan for the disable in the schools and it was found that non of the secondary schools have fire evacuation plan for the disable

as shown in figure 4.3 Below. This means that if there is fire the disable persons in the schools will be more vulnerable and the worst affected.

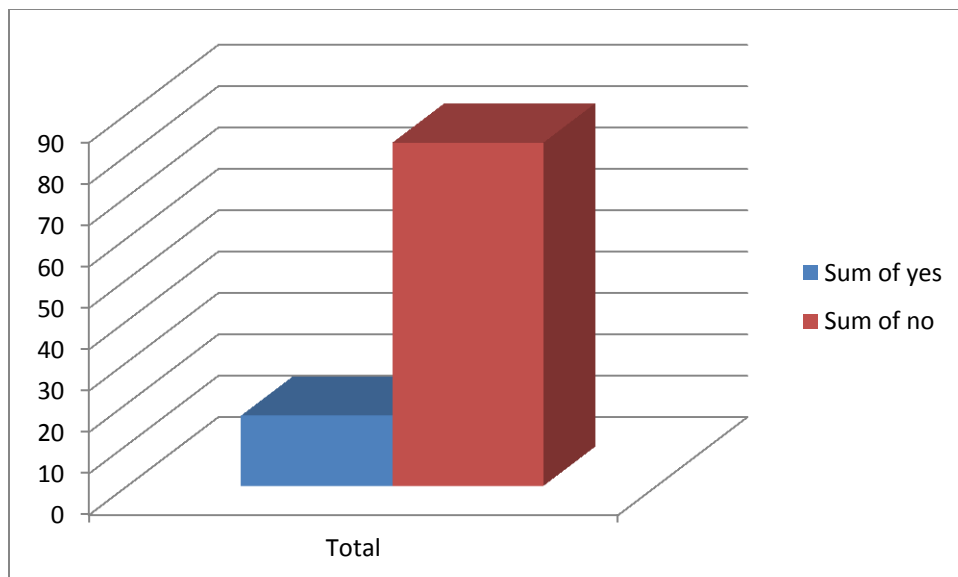


**Figure 4.3 EVACUATION PLAN FOR DISABLE PERSONS**

#### 4.8.3 PRESENT OF MUSTER POINT

In this study also, the availability of muster point in the secondary schools were also determined. Accordingly, 42 (32%) respondents said there were muster point in their schools, 90 (68%) of them said there were no muster point. This also support the other negatives revelation on fire evacuation plan as shown in figure 4.4 below.

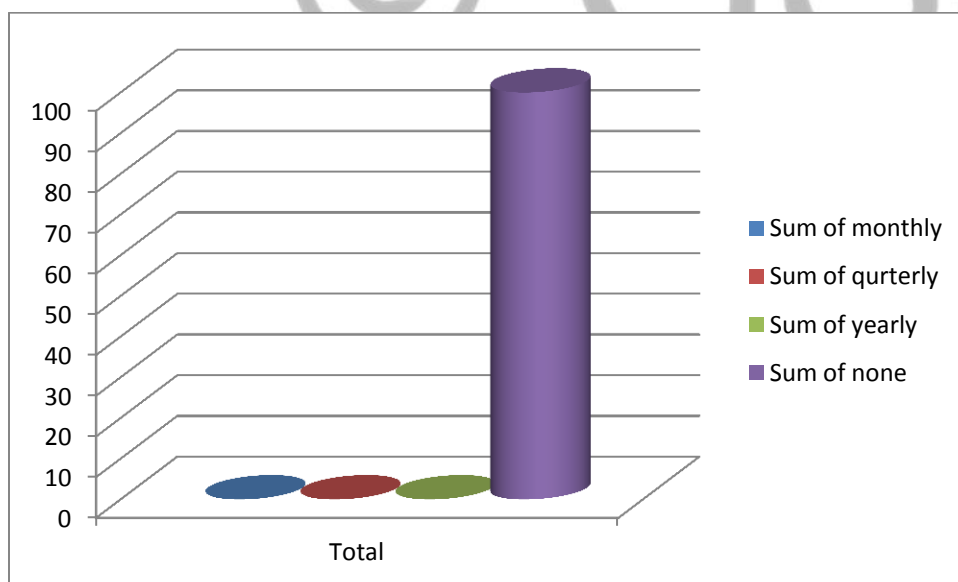




**Figure 4.4 MUSTER POINT**

#### 4.8.4 FIRE DRILL PROCEDURE

To know whether the schools do have fire drill practice and how often they do that, monthly, quarterly, yearly or no drill at all. It was therefore reveals that there was no such thing like fire drill practices in the secondary schools in the study area as shown in figure 4.5 below. This is also a very disturbing scenario.



**Figure 4.5 FIRE DRILL PROCEDURE**

#### 4.9 HYPOTHESIS TESTING AND ANALYSIS

HO: 1. there is no significant difference in the availability of fire fighting equipments between public and private secondary schools in Port Harcourt metropolis.

A t- test was used to test the hypothesis and the result as presented in table 7 and 8 below shows that the N was 31 for the public schools and 101 for the private schools, a mean of 2.45 for public and 2.49 for public schools. The std. deviation was 1.121 for public and 2.128 for the private schools with a std. Error mean of .201 for the public and .112 for private schools.

#### INTERPRETATION

The result shows that, there was a statistically significant difference in the availability of fire fighting equipments between public and private secondary schools in Port Harcourt metropolis at 0.005 levels of significant, 12.180 and 22.142 t, with a mean different of 2.452 and 2.485 for public and private schools respectively. This means that there was more fire fighting equipments in the private schools than public schools in the study are

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HO: 2. there is no statistically significant difference between the public and private schools in terms of number of building constructed to fire safety standard.

Also the t- test result as presented in table 9 and 10 below shows that the N was 31 for the public schools and 101 for the private schools, a mean of 2.45 for public and 2.49 for public schools. The std. deviation was 1.121 for public and 2.128 for the private schools with a std. Error mean of .201 for the public and .112 for private schools.

#### INTERPRETATION

The result shows that, there was a statistically significant difference between the public and private schools in terms of number of building constructed to fire safety standard at 0.005 levels of significant, 12.180 and 22.142 t, with a mean different of 2.452 and 2.485 for public and private schools respectively. This means that private school buildings were constructed in accordance to fire safety standard more that the public school buildings in the study area.

## 4.10 DISCUSSION OF FINDINGS

The findings from this study are discussed under the four objectives that were set initially in chapter one of this study which includes:

To establish the adequacy of fire fighting equipment in the schools, to determine the extent to which school building are constructed in accordance to fire safety standards. To established whether secondary schools have put in place fire Evacuating /safety plan as a measure of fire disaster preparedness and finally to determine whether school teacher, student and administrators are trained in fire safety.

### 4.10.1 ADEQUACY OF FIRE FIGHTING EQUIPMENT

Findings from this study reveal that fire fighting equipments was very inadequate among secondary schools in Port Harcourt metropolis. This is as shown in table 4.1. The fire fighting equipment, that was investigated include: fire hydrant, fire extinguishers, fire resistant material, fire exists, fire protective device, fire blanket, others were fire escape ladder, Heat and smoke detector, fire alarm, fire horse and nozzle, fire fighting outfits, fire sand bucket, self contained breathing apparatus as well as reliable water supply source.

However, on comparing public and private schools, it was reveals that there were significant differences in fire fighting equipment between public and private secondary schools in the study.

These findings aggress with shaw (2002), and Lans (2010) on fire safety equipments in Uganda secondary schools as was presented in the literature.

#### **4.10.2 EXTENT TO WHICH SCHOOL BUILDING ARE CONSTRUCTED TO FIRE SAFETY STANDARD**

Findings on the above statement as was made in this study reveals that generally secondary schools in the study area were not constructed to fire safety standard, thereby building that made this standard were very inadequate as shown in table 4.1. But, a comparison of the public and private schools reveals that some private schools structures were constructed to safety standard more than public schools. This finding aggress with the work of Rowan (2009) on schools structures that were build in accordance with fire safety standards in developing countries as was presented in the literature review.

#### **4.10.3 FIRE SAFETY TRAINING FOR STUDENT, TEACHERS AND ADMINISTRATORS**

The overall findings on the above objective reveals that students, Teachers, and administrators of secondary schools in the study are sincere not given adequate training in fire safety as shown in table 4.3. The findings also confirmed the result obtained by Makhanu, (2009) from fire safety training for schools stakeholders in Kenya as was presented in the literature.

#### **4.10.4 FIRE EVACUATION/SAFETY PLAN**

The findings on the above statement is not different either from the other ones as it was found that generally there was inadequate fire evaluation/safety plans among secondary schools in the study area while on comparing the two categories of schools, it was reveals that private schools performs better than public schools in fire evacuation/safety plans. Accordingly, a similar result was obtained by the duo of Nakitto and Lett, (2012) from their work in fire evacuation measures in Uganda secondary schools.



**Pictures showing fire incidents in secondary school hostel and class rooms.**

Location Port Harcourt  
Source: field work, 2016

## **5.0 CHAPTER FIVE**

### **5.1 SUMMARY, CONCLUSION AND RECOMMENDATION**

#### **5.1.1 SUMMARY**

This study was carried out to measure fire disaster preparedness among secondary schools in Port Harcourt Metropolis. It was divided into five major Chapters, each of the Chapters are Summaries below:

**CHAPTER ONE:** This Chapter introduce the topic and discussed the background of the study; statement of study problem, aim and objective of the study, Purpose and significant of the study as well as the study question and hypothesis.

**CHAPTER TWO:** Chapter two discussed literature review of the study, Conceptual and theoretical review of literature as well as empirical studies. Also the researcher made an attempt to contribute to the body of knowledge by discovering the gap in previous studies of this nature and making an attempt to close such gap in the current study.

**CHAPTER THREE:** This Chapter discussed population of the study, Sample size and technique, the instrument of data collection and analysis. Instrument validity and reliability was also discussed in this Chapter.

**CHAPTER FOUR:** In this Chapter, data that was collected from the field and collected were analyzed also the hypotheses were tested and finding discussed.

**CHAPTER FIVE:** in this chapter, summary and conclusion that were drawn from this study are discussed, recommendation that was made are also in this chapter.

### 5.1.2 CONCLUSION

The following conclusions are drawn from the findings of this study.

Secondary Schools in Port Harcourt Metropolis do not have adequate fire disaster preparedness measures in place in case of fire emergency.

Fire fighting equipments are very inadequate among secondary school in Port Harcourt metropolis.

Secondary school structures in Port Harcourt metropolis are not built to adequate fire fight standard.

Secondary School stakeholder in Port Harcourt metropolis including students teachers and administrators are not adequately trained in fire safety measures.

Secondary Schools in Port Harcourt metropolis do not have adequate fire evacuation plans and polices in place to protect life and properties in the event of fire disaster

Private Secondary Schools are better in the above measures than public schools in Port Harcourt and finally, Secondary Schools in Port Harcourt metropolis are highly vulnerable to fire disaster.

### 5.1.3 RECOMMENDATION

In view of the above conclusion drawn from this study, the following recommendations are made to ensure that secondary schools in Port Harcourt Metropolis are protected against fire disaster.

- (1) There should be a bill made by the state assemble that will make fire safety consideration compulsory for secondary schools before approval is given to such schools to operate.
- (2) For the schools that are in operation, the ministry of education should make it mandatory for firefighting equipments to be place at strategic position in the schools premises.
- (3) Secondary school stakeholders including students, teachers and administrators should be trained on fire safety including fire fighting.
- (4) Each secondary School in the metropolis should have a fire safety officer that will see to the day to day fire safety operation of the schools.
- (5) Government should increase attention on fire safety in public schools by allocating more resources to improving fire safety in these schools.
- (6) Finally there should be periodic stimulated fire drill in the schools to ensure that stakeholders are prepared for any fire emergencies.



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# APPENDIX

Appendix 3: Summary analysis table for Hypothesis 1

	N	Mean	Std. Deviation	Std. Error Mean
public schools with fire safety equipment	31	2.45	1.121	.201
private schools with fire safety equipments	101	2.49	1.128	.112

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
public schools with fire safety equipment	12.180	30	.000	2.452	2.04	2.86
private schools with fire safety equipments	22.142	100	.000	2.485	2.26	2.71

### Summary analysis table for Hypothesis 1

**One-Sample Statistics**

	N	Mean	Std. Deviation	Std. Error Mean
public schools constructed to fire safety standard	31	2.45	1.121	.201
private schools constructed to fire safety standard	101	2.49	1.128	.112

**One-Sample Test**

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
public schools constructed to fire safety standard	12.180	30	.000	2.452	2.04	2.86
private schools constructed to fire safety standard	22.142	100	.000	2.485	2.26	2.71