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FACTORS CONTRIBUTING TO FIRE RISK AND CHALLENGES IN THE IMPLEMENTATION OF FIRE EMERGENCY PREPAREDNESS PROGRAM IN HIGH INSTITUTION IN NIGER-DELTA, NIGERIA

By

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Abstract:

The research was focused on the factors contributing to fire risk and challenges encountered in the implementation of fire assessment and emergency preparedness program in high institutions in the Niger delta region of Nigeria. Three objectives and two hypotheses were raised. The study adopted survey design. Systematic and purposive sampling technique was used to select eight high institutions from eight states in the Niger-Delta while Krejcie and Morgan, table was used to determine sample size of three hundred and twenty-three (382) student, Structured questionnaire, designed using 5-point Likert scale, was used in data collection. Descriptive statistics (percentage and weighted mean score WMS) and ANOVA were used for data analysis. The results of descriptive statistic showed that; one, the current and existing fire risk assessment methods in the high institution in the Niger-delta is below average (46.80%), two, the most critical factor contributing to fire risk in the high institution in the Niger-delta is Aging or faulty electrical systems (WMS = 4.28>3.00), The most critical challenge encountered in the implementation of fire risk assessment and emergency preparedness program in high institutions in the Niger delta is Insufficient financial resources allocated to fire risk assessment(WMS= 4.37> 3.00). The ANOVA results used to test the hypotheses revealed that; there is no significant variation in the factors contributing to fire risk in the high institution in the Niger-delta (p-value 0.407 > 0.05 significance level) and there is no significant variation in the challenges encountered in the implementation of fire risk assessment and emergency preparedness program in high institutions in the Niger delta (p-value 0.145 > 0.05significance level). It was concluded that Aging or faulty electrical systems is among the factors contributing to fire risk in higher institutions in the Niger delta region while Insufficient financial resources allocation to fire risk management is among the major challenge faced by the high institution regarding fire risk management. It was recommended The school management should increase budget allocation to fire service department in University within the Niger-delta.

Keywords:

Fire Risk. Fire Emergency Preparedness Program, High Institution, Niger-Delta.

1.0 Introductions

Every operation within any organization has impact on the safety not only of those undertaking and managing the work but also of others who may be affected by their work activities. Failure to adequately manage safety often results in death or injury, chronic ill health and damage to property and/or the environment. Such results have a significant impact on the physical and economic wellbeing of society. Hence, fire outbreaks in institutions are a public concern because of the increase incidences, injuries and deaths of students not to mention the destruction of properties (Cheung et al. 2014). Without fire preparedness, institutions will continue to lose lives, property and learning time. Despite the importance of fire disaster preparedness, fire safety preparedness has been a thing of neglect in most schools in Nigeria and this has been a contributing factor to the never-ending fire incidents. This issue has continued to generate a lot of concern among the public as well as construction professionals. Whether humans learn from history remains a subject of enormous cogitating. Unfortunately, existing literature suggest that only a little has been recorded on the levels of preparedness for specific types of disasters, particularly in developing countries like Nigeria (Anyanwu, 2015)

Fire outbreak and emergency preparedness entails the read response to deadly fire outbreaks by fire service stations in the institution. Fires in schools are 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. Without fire preparedness, schools will continue to lose lives, property and learning time. School buildings are structures where the implementation of fire safety is of utmost importance because according to Cheung et al. (2014) majority of the occupants in schools consist of children and youths who easily panic and become difficult to manage in the event of an emergency or crisis. Such emergency practices play important roles by ensuring that workers and employers are well equipped and prepared during hazards. For this reason, industries and safety standards regard emergency preparedness and response (EPR) key to safety countermeasures.

Fire incidences in university buildings pose a serious threat to public health. Despite the fact that fire outbreaks are not always reported in Nigeria, the damage left behind is evident, taking a heavy toll on persons, schools involved and the nation at large. Some studies have shown that fire outbreaks pose a frequent threat to academic buildings in Africa. The reoccurrence of this scenario makes it expedient to investigate the current situation in an academic environment in Nigeria. Managing the risk of fire demands fire safety precautions based on a combination of appropriate prevention and protection measures depending upon building use and occupancy characteristics. According to Anyanwu (2015), 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 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

. One important factor affecting disaster management activities generally, is the lack of trained personnel with inadequate skills to respond to emergencies (Perry and Lindell, 2014). Nigeria is not free from this problem. According to Guth (2013), The lack of disaster management training platforms for Nigerians to acquire the necessary knowledge that would aid emergency response is a great setback to disaster management in Nigeria currently. As indicated by Moore (2004) and Perry and Lindell (2014), effective disaster management is not exclusively government responsibility and

the emergency response agencies involved but extends to the general public. Therefore, it is important for responsible authorities to provide adequate training for staff and volunteers, so as to improve their knowledge and prepare them better for unforeseen circumstances. In developed countries such as the United States, government has instituted programmes to train and develop the manpower of emergency management in the public through the establishment of schools. There are over 180 schools in the USA, for instance, with emergency management related programmes (Mann, 2007; Martin, 2009). But this is not the case with Nigeria, and disaster management is thus increasingly difficult as disasters become more serious over time.

Human factors such as carelessness, negligence and lack of fire safety awareness are some of the leading causes of fire outbreaks. But the common causes of fire outbreak in a university premise fall under the following broad headings of Electrical appliances and installations, Cookers, associated cooking equipment and installations, Naked lights and flames, Heaters and heating systems, Chemical and LPG (hazardous materials), Smokers and smokers' materials, Waste and waste management and Arson. Outsider setting fire deliberately, fires that are caused by electrical appliances and installations like the inverter, air conditioner. According to Andrew and Martins, there are a variety of different ways that electricity flowing through equipment and installations can cause a fire, these include: overloaded wiring, loose wiring connections, and electrical 'arcing' (sparking) (Matthews, & Eden, 2008)

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.

Mangoa, (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.

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.

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. 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. It becomes obvious that fire disaster is a usual occurrence in schools with antecedent consequences. Niger Delta is the delta of the Niger River sitting directly on the Gulf of Guinea on the Atlantic Ocean in Nigeria with increased number of universities and enrolment with the high probability of being exposed to fire disaster. Thus it becomes pertinent to carry out study on factor contributing to fire risk in the high institutions and challenges encountered in the implementation of fire risk assessment and emergency preparedness programin select institutions in Niger Delta Region of Nigeria. Therefore, the objectives of the study include; one, determine the existing fire risk emergency preparedness methods in the selected institutions, investigate the key factors contributing to fire risks in University building and facilities and determine the challenges encountered in the implementation of fire risk assessment and emergency preparedness program. The null hypotheses raised in the study are; one there is statistically significant different in the factors contributing to fire risks in Universities sampled in the study. two, there is statistically significant different in the challenges encountered in the implementation of fire risk assessment and emergency preparedness program in the selected schools.

2.0 Methodology

This section deals with the various procedures, steps, techniques, instruments, population, the method of data collection and analysis which the researcher adopted in this study in order to achieve the objectives of the study such procedures include:

2.1 Research Design

The research design adopted in this study was survey method. survey method is a process of extracting information from a target population through the use of observations, questionnaire or interviews and subjecting the data that are obtained to statistical or descriptive analysis for the purpose of drawing conclusion.

2.2 Study area

The Niger Delta, as now defined officially by the Nigerian government, extends over about 70,000 km2 (27,000 sq mi) and makes up 7.5% of Nigeria's land mass. Historically and cartographically, it consists of present-day Bayelsa, Delta, and Rivers States. In 2000, however, Obasanjo's regime included Abia, Akwa-Ibom, Cross River State, Edo, Imo and Ondo States in the region. The Niger Delta is a very densely populated region sometimes called the Oil Rivers because it was once a major producer of palm oil. The area was the British Oil Rivers Protectorate from 1885 until 1893, when it was expanded and became the Niger Coast Protectorate.

Figure 1. Map of Niger-Delta region showing the major cities

2.3 Population of the Study

The population of the study consists of selected Niger Delta Universities. The universities include; Akwa-Ibom State University (AkSU), Abia State University (ABSU), Niger Delta University (NDU), Edo State University Uzairue, Cross Rivers University of Technology (CRUTECH), Delta State University Abraka, Imo State Univeristy (IMSU), Ondo State University of Science and Technology. The estimated total population of the universities is 144, 313. Some of the staff of the Fire Service Department of the various universities was selected.

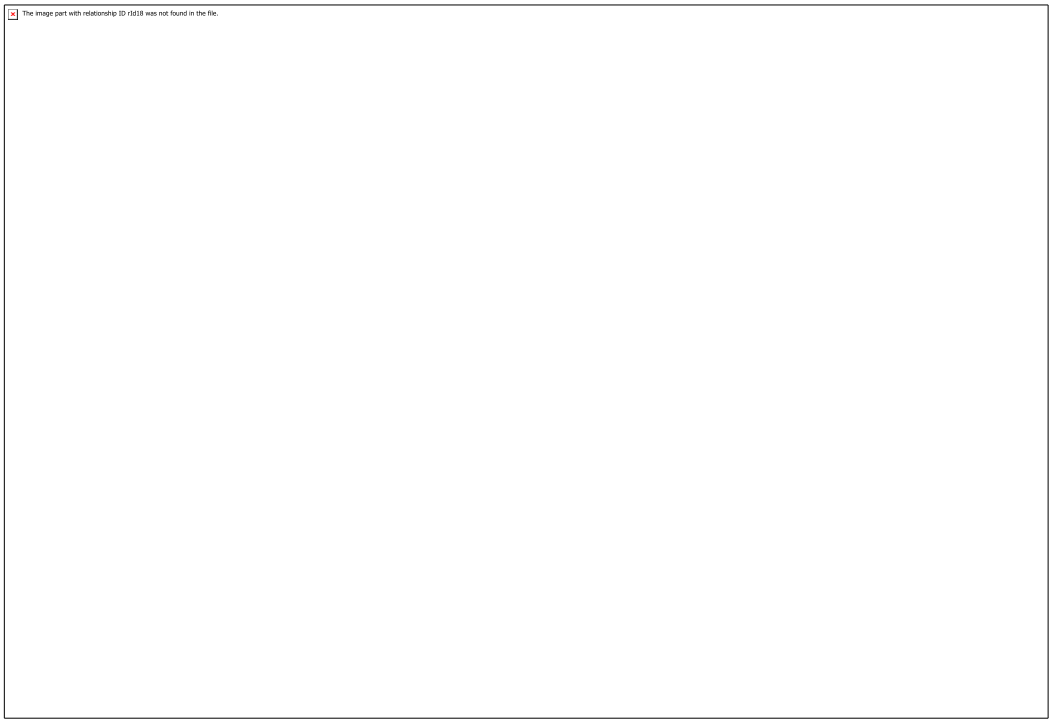
2.4 Sampling technique

Systematic random sampling technique and purposive sampling techniques were used in this study. in this case, the researcher has the prerogative to decide what interval the element should be chosen.

2.4.1 sample size determination

This sample size was selected using Krejcie and Morgan, table which contain different populations with their corresponding sample size. From the table, when there is a population size of 144,313, the sample size of 382 is considered adequate.

Table 3.1: Krejcie and Morgan Table



2.5 Instrument for Data Gathering

Copies of the questionnaire were used in the collection of data. The questionnaire was designed to receive responses from the students of the selected universities on Fire risk assessment and emergency preparedness of Fire Service Department in the school The questionnaire contains the views of the questions relating to the views of the respondents on the subject matter which the respondents are meant to answer in a four-point likert rating scale of; Strongly Agreed (SA), Agreed (A), Disagree (D), Strongly Disagree (SD) and Undecided (U). Due to the coverage area, the use of Google forms was deployed and data with all responses were automatically received on the database electronically and analyzed. The five-point Likert rating scale was used because it is a rating scale of agreement and disagreement of opinion. The items in section B of the questionnaire were couched to address the research objectives and questions. It took 2 weeks to administer and collect the research instrument. Out of the 382 copies of the instrument administered, 377 copies were well competed and found useful for data analysis.

2.6 Method of Data Analysis

Descriptive statistic and Analysis of Variance (ANOVA) were used for analysis. The questionnaire generated were presented using table of frequencies. it was analyzed using the weighted mean score. The score 3.0 was used as the criterion for decision on the responses to the items. Any

mean response that is more than 3.0 is accepted while any mean less is rejected. Descriptive statistic was used to achieve the objectives of the study while ANOVA was usd to test the null hypotheses.

3.0 Results and Discussions

3.1 The current and existing fire risk assessment methods in the high institution in the study area,

Table 3.2 show the response of the respondents on the current and existing fire risk assessment methods in the high institution in the study area. The information provided outlines the results of evaluation regarding existing fire risk assessment methods in higher educational institutions. The responses are presented in terms of frequency and percentage for each of the 14 items. Findings showed that majority (66.7%) of higher educational institutions have well-maintained fire detection and alarm systems. Also, nearly half (48.4%) of the institutions conduct regular fire drills and emergency evacuation exercises, contributing to preparedness. Approximately one-third (34.1%) of the institutions ensure clear and easily accessible fire exit routes. A substantial percentage (44.4%) indicates that higher educational institutions provide adequate fire safety training to both staff and students. Around 40.5% have established effective communication protocols for notifying individuals during emergency situations.

A notable proportion (44.4%) regularly inspects and maintains firefighting equipment, including fire extinguishers and hydrants. Similarly, 44.4% have a designated emergency response team trained in handling fire incidents and other emergencies. The same percentage (44.4%) indicates that institutions conduct regular inspections of electrical systems and equipment to prevent fire hazards. A significant 41.3% have a well-defined emergency response plan that includes specific procedures for fire emergencies. Approximately 36.5% of institutions provide sufficient fire safety education and awareness programs to educate the campus community about fire prevention and response. About 37.3% have a comprehensive fire safety policy communicated to all members of the campus community. A considerable 38.9% of institutions conduct regular fire risk assessments to identify potential hazards and implement appropriate mitigation measures. About 48.4% have a well-established communication system to notify students, faculty, and staff during fire emergencies. About 40.5% of institutions regularly review and update their emergency response plans based on lessons learned and best practices.

From the entries, the information suggests that a substantial number of higher educational institutions have implemented various fire risk assessment measures. However, there may be room for improvement in certain areas, such as ensuring clear fire exit routes and increasing the percentage of institutions providing fire safety education programs. The findings highlight both strengths and potential areas of focus for enhancing fire safety in higher education settings.

Table 3.2 The current and existing fire risk assessment methods in the high institution in the study area,

S/N	Existing fire risk assessment methods.	Frequency	Percentage
1	The higher educational institution has well-maintained fire detection and alarm systems.	84	66.7
2	The higher educational institution conducts regular fire drills and emergency evacuation exercises.	61	48.4
3	The higher educational institution has clear and easily accessible fire exit routes.	43	34.1
4	The higher educational institution provides adequate fire safety training to staff and students.	56	44.4
5	The higher educational institution has established effective communication protocols for notifying individuals during emergency situations.	51	40.5
6	The higher educational institution regularly inspects and maintains fire extinguishers, fire hydrants, and other firefighting equipment.	56	44.4
7	The higher educational institution has a designated emergency response team trained in handling fire incidents and other emergencies.	56	44.4
8	The higher educational institution conducts regular inspections of electrical systems and equipment to prevent fire hazards.	56	44.4
9	The higher educational institution has a well-defined emergency response plan that includes procedures specific to fire emergencies.	52	41.3
10	The higher educational institution provides sufficient fire safety education and awareness programs to educate the campus community abut fire prevention and response.	46	36.5
11	The higher educational institution has a comprehensive fire safety policy that is communicated to all members of the campus community.	47	37.3
12	The higher educational institution regularly conducts fire risk assessments to identify potential hazards and implement appropriate mitigation measures.	49	38.9
13	The higher educational institution has a well-established communication system in place to notify students, faculty, and staff during fire emergencies.	61	48.4
14	The higher educational institution regularly reviews and updates its emergency response plan based on lessons learned and best practices.	51	40.5

3.2 The key factors contributing to fire risk in high institutions building and facilities in Niger-delta

Table 3 above reflect responses of stakeholder on the factors contributing to fire risk in Higher Institutions building and facilities. The results revealed that respondents strongly agreed that inadequate fire safety training and awareness among staff and students is a major contributing factors to fire risk in Higher Institutions building and facilitieswith Strongly agreed level of 85.0% and weighted mean score of 4.12.2 An overwhelming Majority of (90.5%) indicated Aging or faulty electrical systems, including wiring, outlets, and equipment with as major contributing to fire risk in Higher Institutions building and facilitieswith weighted mean score of 4.28. With a weighted mean value of 3.91, (73.8 %) of respondents agreed that improper storage or handling of flammable materials, chemicals, or hazardous substances is among the factors contributing to fire risk in higher institutions of Niger Delta of Nigeria

Lack of regular maintenance and inspections for fire safety equipment, such as fire extinguishers, fire alarms, and sprinkler systems was cited by (69.8%) of respondent among the factors contributing to fire risk in higher institutions of Niger Delta of Nigeria with weighted mean score of 3.70. Another majority, though with a lower value (65.9%) agreed that insufficient fire exits or blocked escape routes, hindering safe evacuation during an emergency is contributing factors with mean value of 3.65. also, inadequate fire-resistant construction materials and designs in buildings

were indicated by (67.5%) with mean value of 3.70 as contributing factors to poor management of fire risks in High institutions of learning in Niger Delta Region of Nigeria Also (67.5%) respondents with weighted mean value of 3.72 agreed that lack of proper fire safety signage and evacuation instructions throughout the premises is another contributing factors

The presence of cooking facilities or kitchens without adequate fire suppression systems was identified as key contributing factors by (72.2%) with 3.86 as the mean value. Respondents with (74.6 %) and 3.82 mean value agreed that non-compliance with fire safety codes and regulations in building construction and maintenance.is one of the contributing factors to fire Risks in our Institutions. Insufficient fire safety drills and emergency response planning among staff and students is another contributing factor as agreed by (71.4%) with mean value of 3.80.

Overall mean value of 3.84 was reflected as major contributing factors to fire Risk in our institution of higher learning in the Niger Delta Region of Nigeria.

Table 3 The key factors contributing to fire risk in high institutions building and facilities in Niger-delta

S/n	**Key factors contributing to fire risk**	**SA**	**A**	**SD**	**D**	**UD**	**WMS**	**Remarks**
1	Inadequate fire safety training and awareness among staff and students.	55 (43.7)	52 (41.3)	8 (6.3)	6 (4.8)	5 (4.0)	4.12	Agreed
2	Aging or faulty electrical systems, including wiring, outlets, and equipment.	59 (46.8)	55 (43.7)	4 (3.2)	4 (3.2)	4 (3.2)	4.28	Agreed
3	Improper storage or handling of flammable materials, chemicals, or hazardous substances.	47 (37.3)	46 (36.5)	15 (11.9)	11 (8.7)	7 (5.6)	3.91	Agreed
4	Lack of regular maintenance and inspections for fire safety equipment, such as fire extinguishers, fire alarms, and sprinkler systems.	40 (31.7)	48 (38.1)	14 (11.1)	8 (6.3)	16 (12.)	3.70	Agreed
5	Insufficient fire exits or blocked escape routes, hindering safe evacuation during an emergency.	39 (31.0)	44 (34.9)	13 (10.3)	20 (15.9)	10 (7.9)	3.65	Agreed
6	Inadequate fire-resistant construction materials and designs in buildings.	33 (26.2)	52 (41.3)	18 (14.3)	16 (12.7)	7 (5.6)	3.70	Agreed
7	Lack of proper fire safety signage and evacuation instructions throughout the premises.	37 (29.4)	48 (38.1)	18 (14.3)	15 (11.9)	8 (6.3)	3.72	Agreed
8	Presence of cooking facilities or kitchens without adequate fire suppression systems.	44 (34.9)	47 (37.3)	14 (11.1)	15 (11.9)	6 (4.8)	3.86	Agreed
9	Non-compliance with fire safety codes and regulations in building construction and maintenance.	42 (33.3)	52 (41.3)	8 (6.3)	15 (11.9)	9 (7.1)	3.82	Agreed
10	Insufficient fire safety drills and emergency response planning among staff and students.	46 (36.5)	44 (34.9)	14 (11.1)	9 (7.1)	13 (10.3)	3.80	Agreed
	Overall mean						**3.84**	**Agreed**

3.3 The challenges encountered in the implementation of fire risk assessment and emergency preparedness program

Table 4 presented summary of the results on the response of respondents concerning the challenges associated with proper implementation of fire risk and emergency preparedness. And the result showed that overwhelming majority 93.7% have agreed to the fact that Insufficient financial resources allocated to fire risk assessment and emergency preparedness efforts, with a mean score of

4.37 is among the challenges faced by institution in implementing fire risk assessment and emergency preparedness program. Substantial proportion (86.5%) agreed to the lack of awareness and understanding among staff and occupants about fire safety protocols and emergency response procedure as among the challenges with weighted meanscore of 4.08. another massive respondents proportion of about (86.5%) agreed that challenge of limited time and personnel available for conducting thorough fire risk assessments is among the challenges faced by institution in implementing fire risk assessment and emergency preparedness program, with mean value of 4.09. Also (86.5%) with mean score of 4.21 agreed that complex building structures or facilities pose challenges in identifying and mitigating fire hazards effectively

The respondents also widely agreed (86.5%) that compliance issues with fire safety regulations with mean value of 4.21 agreeing with difficulty keeping up with evolving codes and standards. Same massive majority with value of (86.5%) agreed that resistance or lack of cooperation from stakeholders in implementing necessary fire safety measures and protocols is among the challenges faced by institution in implementing fire risk assessment and emergency preparedness program, with a mean score of 4.21. Although lower, another majority (84.6-1%) with mean score of 4.07 agreed that inadequate communication and coordination between different departments or entities involved in fire risk assessment and emergency preparedness is among the challenges faced by institution in implementing fire risk assessment and emergency preparedness program. The greater majority of participants (87.3%) with mean score of 4.13 also agreed to Limited training and resources available for staff responsible for implementing and maintaining fire safety measures as one of the challenges. Challenges in ensuring regular inspections, maintenance, and testing of fire safety equipment and systems was notably agreed by a lower percent of 84.2 with a mean score of 4.08

Regarding the consideration on difficulty in effectively communicating fire safety protocols and evacuation procedures to diverse groups of occupants, such as non-native speakers orindividuals with disabilities. A good majority of (86.5 %) with mean score 4.09 agreed to this consideration. Another majority of (86.5%) agreed to Limited availability of specialized expertise or personnel for conducting detailed fire risk assessments. This too was with a mean score of 4.21. (84.1%) with mean score of 4.07 agreed to the fact of High turnover of staff or occupants leading to inconsistent knowledge and adherence to fire safety protocols as part of the myriads of challenging in fire risk and emergency preparedness in higher institutions in the Niger Delta Region of Nigeria. Inadequate integration of fire safety considerations in the design and construction of new buildings or renovations as agreed by overwhelming majority of (87.3%) of the respondents with a mean score of 4.13

Majority of the respondents of (84.2%) also agreed to Inadequate communication and coordination between university departments and external emergency response agencies (e.g., fire departments) as key challenge. Lack of regular drills and exercises to test the effectiveness of emergency response plans and identify areas for improvement.by (69.8%) with mean score of 3.70.A lower response rate of (65.8 %) with mean rate of 3.65 also agreed to Insufficient attention to the unique fire risks associated with specific facilities or activities on university campuses (e.g., laboratories, research facilities) as part of the challenge. Another (67.5%) with mean value of 3.70 agreed to Limited awareness and understanding of fire safety among students, who may engage in behaviors that increase fire risks (e.g., improper use of cooking equipment).Same majority at (67.5) value agreed to Inadequate documentation and record-keeping of fire risk assessments, inspections, and maintenance activities with a mean value of 3.72. An intriguing (72.2%) agreed to with mean

value of 3.86 agreed to challenge caused by Lack of regular monitoring and follow-up to ensure sustained compliance with fire safety protocols and measures.Challenges in ensuring consistent enforcement of fire safety regulations and addressing non-compliance issues effectively was equally agreed by another vast majority of (74.6%) with a mean value of 3.82.

An overall mean of 4.02 accepted the fact that there are several challenges in the management of fire risk and emergency preparedness of higher institution in the Niger Delta Region of Nigeria.

Table 4; The challenges encountered in the implementation of fire risk assessment and emergency preparedness program

S/N	**Challenges of implementing fire risk assessment and emergency preparedness program**	**SA**	**A**	**SD**	**D**	**UD**	**Mean**	**Remarks**
1	Insufficient financial resources allocated to fire risk assessment and emergency preparedness efforts.	64 (50.8)	54 (42.9)	2 (1.6)	2 (1.6)	4 (3.2)	4.37	Agreed
2	Lack of awareness and understanding among staff and occupants about fire safety protocols and emergency response procedures.	45 (35.7)	64 (50.8)	5 (4.0)	6 (4.8)	6 (4.8)	4.08	Agreed
3	Limited time and personnel available for conducting thorough fire risk assessments and developing comprehensive emergency response plans.	49 (38.9)	60 (47.6)	3 (2.4)	7 (5.6)	7 (5.6)	4.09	Agreed
4	Complex building structures or facilities that pose challenges in identifying and mitigating fire hazards effectively.	60 (47.6)	49 (38.9)	6 (4.8)	6 (4.8)	5 (4.0)	4.21	Agreed
5	Compliance issues with fire safety regulations and difficulty keeping up with evolving codes and standards	49 (38.9)	60 (47.6)	3 (2.4)	7 (5.6)	7 (5.6)	4.09	Agreed
6	Resistance or lack of cooperation from stakeholders in implementing necessary fire safety measures and protocols.	60 (47.6)	49 (38.9)	6 (4.8)	6 (4.8)	5 (4.0)	4.21	Agreed
7	Inadequate communication and coordination between different departments or entities involved in fire risk assessment and emergency preparedness.	48 (38.1)	58 (46.0)	6 (4.8)	9 (7.1)	5 (4.0)	4.07	Agreed
8	Limited training and resources available for staff responsible for implementing and maintaining fire safety measures.	54 (42.9)	56 (44.4)	3 (2.4)	5 (4.0)	8 (6.3)	4.13	Agreed
9	Challenges in ensuring regular inspections, maintenance, and testing of fire safety equipment and systems.	54 (42.9)	52 (41.3)	6 (4.8)	4 (3.2)	10 (7.9)	4.08	Agreed
10	Difficulty in effectively communicating fire safety protocols and evacuation procedures to diverse groups of occupants, such as non-native speakers or individuals with disabilities.	49 (38.9)	60 (47.6)	3 (2.4)	7 (5.6)	7 (5.6)	4.09	Agreed
11	Limited availability of specialized expertise or personnel for conducting detailed fire risk assessments.	60 (47.6)	49 (38.9)	6 (4.8)	6 (4.8)	5 (4.0)	4.21	Agreed
12	High turnover of staff or occupants leading to inconsistent knowledge and adherence to fire safety protocols.	48 (38.1)	58 (46.0)	6 (4.8)	9 (7.1)	5 (4.0)	4.07	Agreed
13	Inadequate integration of fire safety considerations in the design and construction of new buildings or renovations.	54 (42.9)	56 (44.4)	3 (2.4)	5 (4.0)	8 (6.3)	4.13	Agreed
14	Inadequate communication and coordination between university departments and external emergency response agencies (e.g., fire departments).	54 (42.9)	52 (41.3)	6 (4.8)	4 (3.2)	10 (7.9)	4.08	Agreed
15	Lack of regular drills and exercises to test the effectiveness of emergency response plans and identify areas for improvement.	40 (31.7)	48 (38.1)	14 (11.1)	8 (6.3)	16 (12.7)	3.70	Agreed
16	Insufficient attention to the unique fire risks associated with specific facilities or activities on university campuses (e.g., laboratories, research facilities).	39 (31.0)	44 (34.9)	13 (10.3)	20 (15.9)	10 (7.9)	3.65	Agreed

17	Limited awareness and understanding of fire safety among students, who may engage in behaviours that increase fire risks (e.g., improper use of cooking equipment).	33 (26.2)	52 (41.3)	18 (14.3)	16 (12.7)	7 (5.6)	3.70	Agreed
18	Inadequate documentation and recoeeping of fire risk assessments, inspections, and maintenance activities.	37 (29.4)	48 (38.1)	18 (14.3)	15 (11.9)	8 (6.3)	3.72	Agreed
19	Lack of regular monitoring and follow-up to ensure sustained compliance with fire safety protocols and measures.	44 (34.9)	47 (37.3)	14 (11.1)	15 (11.9)	6 (4.8)	3.86	Agreed
20	Challenges in ensuring consistent enforcement of fire safety regulations and addressing non-compliance issues effectively.	42 (33.3)	52 (41.3)	8 (6.3)	15 (11.9)	9 (7.1)	3.82	Agreed
	Overall mean						**4.02**	**Agreed**

3.4 Hypotheses Testing

Ho1. There is statistically significant different in the factors contributing to fire risks in Universities sampled in the study.

Table 3.5 show the ANOVA table used to test the first hypothesis one on whether there are statistically significant differences in the factors contributing to fire risks among high institution in the eight states sampled. The "Between Groups" F-statistic is 0.658, and the associated p-value (Sig.) is 0.407. Since the p-value is greater than the significance level of 0.05, the study fails to reject the null hypothesis. The null hypothesis (H0) that there are no significant differences in the factors contributing to fire risks among high institution in the eight states sampled is accepted. In other words, based on the available data, there is not enough evidence to conclude that the factor contributing to fire risk are different to significant level among the high institutions in states.The results suggest that, based on the given data, there is no significant variation in the factors contributing to fire risk across the high institution in the eight states.

Table 5 ANOVA on the different in the factors contributing to fire risks in Universities sampled in the study

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	112.062	7	13.866	0.658	0.407
Within Groups	4120.795	118	39.464		
Total	4231.817	125			

Ho2. There is statistically significant different in the challenges encountered in the implementation of fire risk assessment and emergency preparedness program in the selected schools.

Table 3.6 show the ANOVA table used to test the first hypotheses on whether there are statistically significant differences in the challenges encountered in the implementation of fire risk assessment and emergency preparedness program in the selected schools**.**The "Between Groups" F-statistic is 0.987, and the associated p-value (Sig.) is 0.145. Since the p-value is greater than the significance level of 0.05, the study fails to reject the null hypothesis. The null hypothesis (H0) that there are no significant differences in the challenges encountered in the implementation of fire risk assessment and

emergency preparedness program in the selected schools is accepted. In other words, based on the available data,there is not enough evidence to conclude that there is difference in the level of challenges encountered in the implementation of fire risk assessment and emergency preparedness programamong the high institution in the eight statesresults suggest that, based on the given data, there is no significant variation in level of challenges encountered in the implementation of fire risk assessment and emergency preparedness program in the selected high institutions in the eight states sampled.

Table 6 ANOVA on the difference in the challenges encountered in the implementation of fire risk assessment and emergency preparedness program in the selected schools.

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	172.238	7	19.816	0.987	0.145
Within Groups	3116.795	118	31.523		
Total	4888.851	125			

4 Conclusions

Based on the results, discussion and findings of this study, it was concluded that; one, current and existing fire risk assessment methods in the high institution in the Niger-delta is below average and required serious improvement. Two, there are several factors contributing tofire risks in high institutions in Niger-delta but the two most critical ones areAging or faulty electrical systems, including wiring, outlets, and equipment, and Inadequate fire safety training and awareness among staff and students. Three, there are several challenges facing theimplementation of fire risk assessment and emergency preparedness program in the high institution in Niger-delta but the two most critical ones, are Insufficient financial resources allocated to fire risk assessment and emergency preparedness efforts and Limited availability of specialized expertise or personnel for conducting detailed fire risk assessments. four, there is no significant variation in the factors contributing to fire risk across the high institution in the eight states. Finally, there is not variation in the level of challenges encountered in the implementation of fire risk assessment and emergency preparedness programamong the high institution in the eight states.

5.0 Recommendations

Based on these conclusions drawn from the findings of this study, the study recommended that;

1. The institution should recognize the challenges faced by the Fire Service Department, allocate increased budgetary resources to address limited funding and support advanced training programs. Regular equipment upgrades should be prioritized to ensure the department's effectiveness in handling fire emergencies on campus.
2. The school management and fire service department in the University should improve coordination in emergency response by addressing identified areas for enhancement, such as equipment readiness and communication systems. This could involve regular drills and training exercises to ensure a more efficient response during fire emergencies.
3. The Universities should allocate resources to upgrade operational equipment, including fire extinguishers, hoses, and fire trucks. This investment aims to optimize firefighting efforts, ensuring that the equipment is not only adequate but also technologically advanced to meet evolving safety standards.

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