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INVESTIGATION OF THE EFFECTIVENESS OF FIRE RISK EMERGENCY PREPAREDNESS IN HIGH INSTITUTIONS IN THE NIGER DELTA REGION OF NIGERIA

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Abstracts

The study was carried out to investigate the effectiveness of fire risk emergency preparedness in high institutions in the Niger delta region of Nigeria. Three objectives and two hypotheses were raised to captivate the aim the of the study. The study adopted survey design, and 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 for data collection. Descriptive statistics (percentage and weighted mean score WMS) and ANOVA were used for data analysis. The results of descriptive statistic showed that; the current and existing fire risk assessment methods in the high institution in the Niger-delta is below average (46.80%), the level of awareness and knowledge of students and other stakeholders on fire risk assessment methods among the high institutions in the Niger delta is substantially good (WMS= 3.79 > 3.00) and the level of effectiveness of existing fire risk assessment methods. in the high institution in the study area is substantially good (WMS= 3.91 > 3.00). The ANOVA results used to test the hypotheses revealed that; there is no significant variation in awareness and knowledge levels regarding fire risk assessment methods across the eight states (p-value 0.883 > 0.05 significance level) and there is no significant variation in level of effectiveness of the fire risk assessment methods across the high institutions in the eight states (p-value 0.238 > 0.05 significance level). It was concluded that the effectiveness of fire risk emergency preparedness in high institutions in the Niger delta region of Nigeria is good but required more improvement. It was recommended that the authorities and fire service department in the high institution should improve coordination in emergency response by addressing identified areas for enhancement, such as equipment readiness and communication systems

Keywords; Fire Risk Emergency Preparedness, High Institutions, Niger Delta Region, Nigeria.

1.0 Introduction

Fire risk emergency preparedness is defined as pre-fire disaster activities designed to increase the level of readiness or improve operational capability, for responding to a fire emergency ((Cheung et al., 2014). Fire risk emergency preparedness is one of the important elements in disaster risk reduction and it encompasses awareness, readiness to render appropriate responses and quick recovery. Despite its importance, less has been done globally to improve the levels of fire disaster preparedness. Fire emergency safety preparedness in learning institutions is attained when there is sufficient understanding of fire safety and when equipment and policies are made available to serve as measures taken beforehand so that harm is prevented in such situations (Cheung et al., 2014). However, this is not usually the case as a number of learning environments have been found to unknowingly risk the lives of its users to fire hazards which usually have adverse consequences on their health and safety. Usually, the onus is on both staff and students to be compliable with given safety regulations to protect their lives during fire emergencies. For instance, an understanding of how to use fire extinguishers serves as the vanguard to any fire protection endeavor (Cheung et al., 2014)

There is no doubt that adequate firefighting and protection measures are needed in learning environments, it will go a long way to minimize losses and damage that may occur in the event of a fire outbreaks. Prevention, they often say is better than cure. It is however not certain if most institutions of learning in Nigeria are adequately equipped and users well prepared, to tackle fire outbreaks, because there is a dearth of empirical studies in this regard. Such studies are necessary as they are most likely to reveal grey areas for possible improvements (Lucheli & Masese, 2009).

According to Moore (2012), fire disasters are increasingly uncertain and complex events that occur at different magnitudes due to rapid environmental and socio-economic changes. To respond effectively and manage such events, adequate knowledge needs to be accumulated about the kind of hazards that may lead to fire disaster and its associated impacts. Also, it is essential to understand the local, socio-economic and institutional capabilities of institution involved in responding to and managing fire emergencies, as well as the needs created by fire disasters in affected institution, so to enhance fire preparedness and allocation of resources (Nakitto & Lett, 2012).

According to Nakitto & Lett, (2012), facing current and future fire risk challenges requires a combination of approaches involving mitigation, prevention and preparedness measures. This kind of approach is invaluable, especially in situations where emergency management and response to fire disasters involves combined efforts across different entities such as federal, state and local government, and other NGOs and CSOs. In this case, the understanding of vulnerability to different kinds of hazards that may affect any institution, their pattern of occurrence and the capabilities of the various organizations involved in response would enable an improvement in the level of preparedness.

However, the adequacy of fire risk reduction measures not only depends on the way they are being implemented but also requires an understanding of the physical, political and socio-economic situations in which such measures are being anticipated together with their potential benefits and drawbacks (Nakitto & Lett, 2012). As emergency management in Nigeria is based on a shared responsibility between government and its agencies, NGOs, private sector institutions, groups and individuals, considering different views of different stakeholders would enable a balanced assessment of the socio-political, environmental and economic impacts of decisions in disaster risk reduction.

In the same way, Sattler et al., (2014) argued that effective implementation of emergency management and disaster risk reduction measures at different levels of government depends on factors such as the kind of information available about the disaster, the availability of resources (including skills of emergency response

personnel), the availability of technological facilities and equipment to aid information sharing, access to decision-making processes by populations affected by disasters and financial availability to support organizational planning for emergencies. Fire emergencies often trigger the need for additional support, so collaboration, cooperation and integration of efforts across different entities become essential to ensure adequate allocation of resources and improved preparedness to mitigate, prevent and reduce vulnerability in society. To achieve this, communication remains invaluable in sharing exact information about disasters and understanding the capacity of each entity involved. Also, the operation of Emergency-related agencies would foster coordination and allocation of resources, while adequate resource availability and utilisation would promote rapid response and minimise impacts when disasters occur. For instance, Perry, and Lindell (2014) and Sattler *et al.* (20014) stated that the extent of damage induced by any given fire disaster depends not only on the degree of the hazard but also on the ability of organizations involved in implementing emergency management activities to cooperate and integrate with one another. As Nigeria's emergency management involves different actors across different levels of government, adopting such practice would foster vulnerability reduction and enhance adequate utilization of resources when disasters occur, as they cannot be completely avoided.

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 (Lucheli & Masese, 2009).

In Nigeria, the major fire safety regulations for buildings are provided in the Nigerian National Building Code of 2006. The safety provisions contained in Building Code includes among others the following: safety measures such as structural fire resistance, detection, alarm, and extinguishing apparatus; measures of egress encompassing configuration features and support characteristics and; general safety such as safety and means of egress parameters. Some of the other provisions in the Code include smoke detector installation at elevator lobby, provision of designated main floor level for emergency personnel for firefighting or rescue purpose (Ogbonna & Nwaogazie, 2015). Expressing its unambiguous understanding of the significance of fire safety awareness, the code highlighted the need for fire safety awareness campaign and life safety education to the general public within the jurisdiction of the Nigeria NBC scope.

No law is without criticisms. The criticisms could be in the technicalities of the law or in the apparatus of its enforcement. Substantiating this contention, Ogbonna and Nwaogazie (2015) explained that even though Nigerian federal laws police safety practices in the country, every so often, the effects of these laws are not felt and this is due largely to poor enforcement. Citing an instance, they also noted that more often than not, manufacturing industries in Nigeria see government safety standards as an attempt to increase production costs. Consequently, this sets in motion a practice of pseudo-adherence to the provisions of the law at the expense of people's safety. Ogbonna and Nwaogazie (2015) highlighting that developing nations often adopt standards modeled after technologically advanced countries, thus, making the standards complex and difficult for the developing nations like Nigeria to implement. Consequently, there is need for strict adherence with safety provisions especially fire safety in buildings by owners and users.

In Nigeria, fire outbreaks have erupted in various tertiary institutions with buildings in Nile University in Abuja, University of Nigeria in Nsukka, Enugu State and Redeemers University, Ede in Osun State being some of the most recent victims of this menacing disaster. Olufemi reported that a combination of carelessness and lack of fire-fighting equipment saw these fires escalate quickly beyond manageable levels. These fire

disaster cases are few examples of the degree to which school buildings are susceptible to fire outbreaks as a result of inadequate preparedness of the learning environments towards firefighting and protection measures. Regrettably, training is also seldom given to occupants or users of buildings or building managers on how to use extinguishers usually hung on walls. In most cases, building occupants also lack the training required for directly reacting to infernos.

According to Mangoa (2012) schools around the country have failed to emphasis on installing fire protection equipment, alarms, and first-aid and Fire Fighting. Mann (2007) also noted that little efforts have been made to save schools from exposure to fire incidences. Matthews and Eden (2008) in his report observes that the Education Ministry has put in place rules to improve safety in the Universities and schools have been asked by the government to designate a safety committee but, most schools have not complied.

Mangoa (2012) observe that firefighting tools and lifesaving machines ought to be displayed in a place where they can easily be accessed. Teachers and students should be reminded on a routine basis concerning the presence and use of fire extinguishers. Mwenga (2008) studied the importance of fire disaster preparedness among secondary schools in Kyuso District, Kenya. The results showed the existence of inadequate firefighting tools in schools. Similarly, Lucheli and Masese, (2009) found that cost of firefighting equipment discouraged most schools from accessing the equipment in the North-Rift. Lucheli and Masese (2009) also noted that schools lacked fire extinguishers and the few available were in bad condition.

Koskan et al. (2012) found that college students seek information in a different way than the broader public. There are four different notification systems on most campuses. Email, website, text message, and landline phones account for the biggest percentage of techniques used (Scafer et al, 2014). Guth (2013) found that 75% of institutions have emergency information on their websites. Only 15% of the websites, on the other hand, had emergency information in an easily accessible location (Guth, 2013).

Shaw (2012), found 53.4% to 91.2% of college students performed poorly in disaster coping awareness and abilities examinations, and 65.6% to 88.5% of students seemed to have no prior disaster rescue training. According to a study by Shaw (2012) the biggest issue in terms of disaster preparedness among participants was dealing with fire. Training is a crucial part of improving disaster preparedness for college students, and disaster preparedness should be a core component of the standard curriculum. In China, as in many other nations, the level of effectiveness of fire risk emergency preparedness and awareness training at the university level is unknown.

Hence there is the need to investigate the level of effectiveness fire risk emergency preparedness in high institutions in Niger-delta so as to ascertain the need and area for further improvements. Therefore, the objective of the study includes; one to ascertain the existing fire risk assessment methods in the high institution in the study area, two, examine the awareness and knowledge level of the students on fire risk assessment methods and finally, to determine the level of effectiveness of existing fire risk assessment methods. in the high institution in the study area. The null hypotheses proposed and tested in this study are; there is no statistically significant difference in the level of awareness and knowledge of the student in fire risk assessment methods among the various high institutions considered, two there is no statistically significant difference in the level of effectiveness of fire risk assessment methods among the various high institutions considered

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.

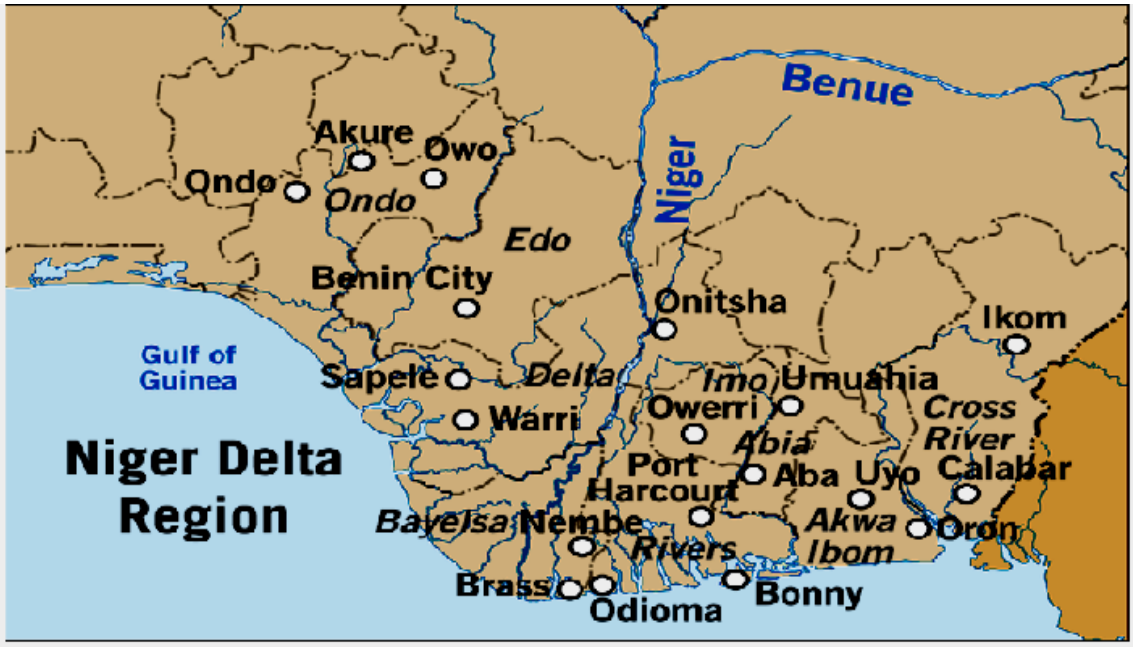

Figure 1. Map of Niger-Delta region showing the major cities

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 1: Krejcie and Morgan Table

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.
Source: Krejcie & Morgan, 1970

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 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 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 awareness and knowledge level of the students on fire risk assessment methods in the high institution in the study area,

Table 3 provides a comprehensive overview of the stakeholders' awareness and knowledge regarding fire risk assessment methods, as evidenced by their responses to ten statement items. Fire risk assessment is perceived as a systematic process to identify, evaluate, and manage fire hazards, with a majority (88.9%) of respondents agreeing. The respondents demonstrated a strong agreement (4.37 mean score) with the concept that fire risk assessment is a systematic process to identify, evaluate, and manage fire hazards. Regarding legal requirements for conducting fire risk assessments in the workplace or residence, a significant proportion (76.2%) of stakeholders demonstrated awareness. Participants, on average, expressed a solid understanding (3.89 mean score) of the legal requirements associated with conducting fire risk assessments in their workplace or residence.

There is a shared understanding (85.8% agreement) among participants about the importance of considering potential ignition sources during a fire risk assessment. Stakeholders exhibited a high level of agreement (4.14 mean score) regarding the importance of considering potential ignition sources during a fire risk assessment. Stakeholders generally agreed (61.1%) that they possess the knowledge to identify and assess potential fuel sources contributing to a fire. The mean score of 3.50 suggests a moderate agreement among respondents regarding their knowledge of identifying and assessing potential fuel sources contributing to a fire.

Awareness of different fire risk assessment methods, including qualitative and quantitative approaches, is acknowledged by 67.4% of participants. The mean score of 3.68 indicates a moderate agreement regarding stakeholders' awareness of various fire risk assessment methods, including qualitative and quantitative approaches. The majority (72.7%) of stakeholders understand the significance of assessing the likelihood and potential severity of a fire in the risk assessment process. On average, participants strongly agreed (3.78 mean score) on the significance of assessing the likelihood and potential severity of a fire in the risk assessment process. Knowledge on how to evaluate and prioritize fire safety measures based on the findings of a fire risk assessment is shared by 56.4% of respondents. The mean score of 3.39 suggests a moderate agreement among stakeholders in terms of their knowledge on evaluating and prioritizing fire safety measures based on the findings of a risk assessment.

Familiarity with the concept of fire compartmentation and its role in preventing fire spread is evident, with 63.5% expressing agreement. Respondents exhibited a moderate agreement (3.62 mean score) with the concept of fire compartmentation and its role in preventing the spread of fire. An understanding of the importance of emergency planning and evacuation procedures in a fire risk assessment is demonstrated by 70.6% of stakeholders. The mean score of 3.82 indicates a strong agreement among stakeholders regarding the significance of emergency planning and evacuation procedures in a fire risk assessment.

Table 3 The awareness and knowledge level of the students on fire risk assessment methods in the high institution in the study area

S/N	Statements	SA	A	SD	D	UD	Mean	Remarks
1	Fire risk assessment is a systematic process to identify, evaluate, and manage fire hazards.	76(60.3)	36 (28.6)	6 (4.8)	1(0.8)	7(5.6)	4.37	Agreed
2	I am aware of the legal requirements for conducting fire risk assessments in my workplace or residence.	34(27.0)	62(49.2)	18(14.3)	8 (6.3)	4(3.2)	3.89	Agreed
3	I understand the importance of considering the potential ignition sources when conducting a fire risk assessment.	55(43.7)	53(42.1)	8(6.3)	2(1.6)	8(6.3)	4.14	Agreed
4	I know how to identify and assess the potential fuel sources that could contribute to a fire.	27(21.4)	50(39.7)	21(16.7)	15(11.9)	13(10.3)	3.50	Agreed
5	I am aware of the different fire risk assessment methods, such as qualitative and quantitative approaches.	28(22.2)	57(45.2)	20(15.9)	15(11.9)	13(10.3)	3.68	Agreed
6.	I understand the significance of assessing the likelihood and potential severity of a fire in the risk assessment process.	27(21.4)	64(50.8)	20(15.9)	10(7.9)	5(4.0)	3.78	Agreed
7.	I know how to evaluate and prioritize fire safety measures based on the findings of a fire risk assessment.	19(15.1)	52(41.3)	27(21.4)	16(12.7)	12(9.5)	3.39	Agreed
8.	I am familiar with the concept of fire compartmentation and its role in preventing the spread of fire.	27(21.4)	53(42.1)	23(18.3)	17(13.5)	6(4.8)	3.62	Agreed
9	I understand the importance of emergency planning and evacuation procedures in a fire risk assessment.	32(25.4)	57(45.2)	23(18.3)	11(8.7)	3(2.4)	3.82	Agreed
10	I am aware of the need for regular reviews and updates to the fire risk assessment to ensure its effectiveness over time.	34(27.0)	48(38.1)	25(19.8)	10(7.9)	9(7.2)	3.69	Agreed
	Overall Mean						**3.79**	Agreed

3.3 Thee level of effectiveness of existing fire risk assessment methods. in the high institution in the study area

Table 4 resented perception of stakeholder on the effectiveness of existing fire risk assessment methods through responses to fourteen statement items. It was notice from the table that majority (80.1%) of stakeholders strongly agree or agree that the current fire risk assessment method effectively identifies potential fire hazards, resulting in a mean score of 3.89, indicating agreement. A substantial proportion (73%) of participant's express agreement that the fire risk assessment method in use effectively evaluates the likelihood of fire incidents, yielding a mean score of 3.68, supporting the consensus. Stakeholders overwhelmingly (77.8%) agree that the fire risk assessment method accurately assesses the potential severity of fire incidents, with a mean score of 3.71, signifying agreement.

Regarding the consideration of specific industry or setting needs, 72.2% of stakeholders agree, leading to a mean score of 3.61, suggesting general consensus. The majority (78.6%) of participants agree that the fire risk assessment method aids in prioritizing fire safety measures effectively, resulting in a mean score of 3.75, supporting the consensus. Participants widely agree (82.6%) that the fire risk assessment method assists in developing comprehensive emergency response plans, with a mean score of 3.87, indicating agreement. The assessment method is perceived as adequately addressing human factors contributing to fire risks, with 76.2% agreement and a mean score of 3.74, reflecting consensus. Although lower, a majority (53.2%) of stakeholders agree that the fire risk assessment method is easy to understand and apply in practice, yielding a mean score of 3.05, indicating agreement.

Stakeholders widely agree (73.8%) that the fire risk assessment method has been effective in reducing fire incidents and mitigating their impacts, resulting in a mean score of 3.79, supporting consensus. A significant majority (75.4%) agree that the fire risk assessment method adequately considers specific premises or facility

characteristics and layout, with a mean score of 3.88, indicating agreement. An overwhelming 86.5% of stakeholders agree that the fire risk assessment method helps in identifying and addressing potential fire hazards unique to their operations or processes, leading to a mean score of 4.26, suggesting strong agreement. Stakeholders strongly agree (91.1%) that the fire risk assessment method provides clear guidance for conducting regular reviews and updates, yielding a mean score of 4.43, indicating a high level of consensus.
The majority (94.5%) of stakeholders agree that the fire risk assessment method facilitates effective communication and collaboration among relevant stakeholders, resulting in a mean score of 4.52, signifying strong agreement. An overwhelming 96.1% of participants agree that the fire risk assessment method aligns with relevant fire safety codes, standards, and regulatory requirements in their region, leading to a mean score of 4.56, indicating a high level of consensus.
The overall mean score of 3.91 suggests that stakeholders generally agree with the effectiveness of existing fire risk assessment methods, reinforcing the positive consensus across all statements

Table 4 level of effectiveness of existing fire risk assessment methods. in the high institution in the study area

Nos	Effectiveness of existing fire risk assessment methods	SA	A	SD	D	UD	Mean	Remarks
1	The fire risk assessment method used adequately identifies potential fire hazards	42(33.3)	59(46.8)	7(5.6)	6(4.8)	12(9.5)	3.89	Agreed
2	The fire risk assessment method effectively evaluates the likelihood of fire incidents.	36(28.6)	56(44.4)	7(5.6)	12(9.5)	15(11.9)	3.68	Agreed
3	The fire risk assessment method accurately assesses the potential severity of fire incidents.	32(25.4)	66(52.4)	4(3.2)	8(6.3)	16(12.7)	3.71	Agreed
4	The fire risk assessment method adequately considers the specific needs and requirements of our industry or setting.	33 (26.2)	58(46.0)	8(6.3)	7(5.6)	20(15.9)	3.61	Agreed
5	The fire risk assessment method helps in prioritizing fire safety measures effectively.	33 (26.2)	66(52.4)	6(4.8)	4(3.2)	17(13.5)	3.75	Agreed
6	The fire risk assessment method assists in developing comprehensive emergency response plans.	34(27)	70(55.6)	6(4.8)	4(3.2)	12(9.5)	3.87	Agreed
7	The fire risk assessment method adequately addresses the human factors contributing to fire risks.	34(27)	62(49.2)	9(7.1)	5(4.0)	16(12.7)	3.74	Agreed
8	The fire risk assessment method is easy to understand and apply in practice.	28(22.2)	39(31.0)	9(7.1)	11(8.7)	39(31.0)	3.05	Agreed
9	The fire risk assessment method has been effective in reducing fire incidents and mitigating their impacts.	41(32.5)	52(41.3)	12(9.5)	8(6.3)	13(10.3)	3.79	Agreed
10	The fire risk assessment method adequately considers the specific characteristics and layout of our premises or facility.	51(40.5)	44(34.9)	9(7.1)	9(7.1)	13(10.3)	3.88	Agreed
11	The fire risk assessment method helps in identifying and addressing potential fire hazards unique to our operations or processes.	66(52.4)	43(34.1)	5(4.0)	6(4.8)	6(4.8)	4.26	Agreed
12	The fire risk assessment method provides clear guidance for conducting regular reviews and updates of the assessment.	73(57.3)	44(34.9)	3(2.4)	2(1.6)	4(3.2)	4.43	Agreed
13	The fire risk assessment method facilitates effective communication and collaboration among relevant stakeholders (e.g., employees, management, fire safety personnel).	82(65.1)	37(29.4)	1(0.8)	2(1.6)	4(3.2)	4.52	Agreed
14	The fire risk assessment method aligns with relevant fire safety codes, standards, and regulatory requirements in our region.	83(65.9)	38(30.2)	0(0)	2(1.6)	3(2.4)	4.56	Agreed
	Overall Mean						**3.91**	**Agreed**

3.4 Hypotheses Testing

Ho1. there is no statistically significant difference in the level of awareness and knowledge of the student in fire risk assessment methods among the various high institutions considered

Table 3.5 show the ANOVA table used to test the first hypotheses on whether there are statistically significant differences in the awareness and knowledge levels on fire risk assessment methods among high institution in the eight states sampled. The "Between Groups" F-statistic is 0.427, and the associated p-value (Sig.) is 0.883. Since the p-value is greater than the significance level of 0.05, we fail to reject the null hypothesis. The null

hypothesis (H0) that there are no significant differences in the awareness and knowledge levels on fire risk assessment methods across the states is accepted. In other words, based on the available data, there is not enough evidence to conclude that the awareness and knowledge levels differ significantly among the states. The results suggest that, based on the given data, there is no significant variation in awareness and knowledge levels regarding fire risk assessment methods across the eight states.

Table 5 ANOVA on the difference between level of awareness and knowledge fire risk assessment methods among the high institutions in the Niger delta

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	118.062	7	16.866	0.427	0.883
Within Groups	4656.795	118	39.464		
Total	4774.857	125			

Ho2. there is no statistically significant difference in the level of effectiveness of fire risk assessment methods among the various high institutions considered

Table 3.6 show the ANOVA table used to test the first hypotheses on whether there are statistically significant differences in the level of effectiveness of fire risk assessment methods among the various high institutions in the eight states sampled. The "Between Groups" F-statistic is 0.687, and the associated p-value (Sig.) is 0.238. Since the p-value is greater than the significance level of 0.05, we fail to reject the null hypothesis. The null hypothesis (H0) that there are no significant differences in the level of effectiveness of fire risk assessment methods among the various high institutions across the states is accepted. In other words, based on the available data, there is not enough evidence to conclude that the level of effectiveness of the fire risk assessment methods differ significantly among the states. The results suggest that, based on the given data, there is no significant variation in level of effectiveness of the fire risk assessment methods across the eight states.

Table 6 ANOVA on the difference in level of effectiveness of fire risk assessment methods among the various high institutions considered

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	112.23	7	12.816	0.687	0.238
Within Groups	3456.795	118	33.546		
Total	4458.857	125			

4.0 Conclusions

Based on the findings of the 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, the level of awareness and knowledge of students and other stakeholders on fire risk assessment methods among the high institutions in the Niger delta is substantially good but requires more improvement, three, the level of effectiveness of existing fire risk assessment methods. in the high institution in the study area is substantially good but also required further improvement. Four, there is no significant variation in awareness and knowledge levels regarding fire risk assessment methods across the eight states and finally, there is no significant variation in level of effectiveness of the fire risk assessment methods across the eight states.

5.0 Recommendations

Based the aforementioned conclusions of this study, the following recommendations were made

1. The authorities 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.
2. Government and 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.
3. Implement recommendations for improving school buildings, such as installing smoke detectors and upgrading electrical systems. These measures directly target the identified causes of fire outbreaks, addressing issues like electrical faults and contributing to a safer environment for students and staff.

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