

Disaster preparedness of university libraries in Nigeria: strategies and challenges

Research – Full text

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Arumuru Lawrence

Delta State University, Faculty of Social Science.

Department of Library and Information Science, Abraka, Nigeria

arus.lawrence@gmail.com

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Arumuru Lawrence, Toyo
David Oghenevwogaga



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Toyo David Oghenevwogaga

Delta State University, Faculty of Social Science.

Department of Library and Information Science, Abraka, Nigeria

dotoyodelsu.edu.ng@gmail.com

Abstract

Background of Study:

The study looked at the level of disaster preparedness in South-South Nigerian university libraries. University libraries play an important role in supporting academic activities, so ensuring their continuity during and after a disaster is critical. However, the study found that South-South Nigerian university libraries lack proper disaster mitigation plans, leaving them unprepared to handle disasters effectively.

Purpose:

The study aimed to look into disaster preparedness strategies and challenges in South-South Nigerian university libraries.

Specifically, it sought to answer four research questions about the available disaster preparedness tools, librarians' experience with these tools, disaster preparedness challenges, and strategies for improving disaster preparedness in libraries.

Method:

The study followed a descriptive survey research design. The sample included 234 librarians working in South-South Nigerian university libraries, and the entire population was surveyed using the census sampling method. A structured questionnaire administered in person was used to collect data, and 218 of the 234 questionnaires were deemed sufficient for the analysis, yielding a return rate of 93 percent. The data were analyzed using descriptive statistics.

Findings:

The study discovered that the most common disaster preparedness tools found in university libraries were fire extinguishers, sand buckets, insect and rodent repellents, thunder arrestors, and anti-virus and spyware software. However, most librarians lacked experience with using these tools for disaster mitigation. The primary challenges faced by university libraries in disaster preparedness included the lack of a disaster management strategy or plan, insufficient funding for disaster preparation and management, and a lack of expertise in disaster mitigation equipment.

Conclusion:

The study concluded that South-South Nigerian university libraries are unprepared for disasters due to a lack of proper disaster mitigation plans and insufficient disaster preparedness tools and

equipment. The study recommended that university libraries allocate funds for disaster management, purchase disaster mitigation equipment, and train staff and users on disaster preparedness, mitigation, and management.

Keywords

Disaster; Preparedness; Strategies; University Libraries, Nigeria

Introduction

University libraries are intended to meet the academic community's needs for studying, research, leisure, and teaching by gathering relevant information resources and providing services that enhance the parent institution's educational requirements. (Udoh, Luke, 2022). University libraries are considered assets because they collect, preserve, and protect very important materials, buildings, and machinery (Siddiqua, Ansari, & Ansari, 2021). Because academic libraries in poor countries receive limited funding, it is critical to protect their facilities and resources by implementing safety and disaster preparedness measures to avoid costly incidents. Libraries are vulnerable to disasters, some of which can be predicted, while others are unavoidable or unexpected, and can have devastating effects. According to the International Federation of Red Cross (2021), a disaster is an unplanned, tragic event that significantly impairs a community or society's ability to function and causes losses in terms of people, property, money, or the environment that exceed what the community or society can control with its available resources.

A disaster is defined as any incident that has caused serious harm to the environment, property, or human life. It could also be used to describe situations in which unforeseen natural or man-made disasters disrupt regular activities or everyday life (United Nations Office for Disaster Risk Reduction, 2022). Natural disasters are primarily caused by uncontrollable natural events such as earthquakes, volcanoes, floods, and so on, which occur with little to no human interference. Human activity is primarily responsible for man-made disasters, which include those caused by war, arson, explosions, exposure to hazardous chemicals, and insufficient safety and preparation measures. According to Khalid and Dol (2015), several libraries and information centers have been destroyed or severely damaged as a result of disasters throughout history, including those caused by war, bombing, and fire, either intentionally or unintentionally. Given that the majority of disasters occur unexpectedly, libraries must have a disaster preparedness strategy in place to avoid, limit, control, and mitigate the effects of disasters. To back up the aforementioned assertion, Sharma et al (2018) claimed that adequate disaster planning is critical to mitigating the devastating impact of disasters.

Disaster preparation methods in libraries can help to avoid and respond to disasters by reducing the impact on the collection, premises, equipment, and librarians who provide information services. According to Ijiekhuamhen et al. (2020), disaster preparation provides a platform for university library managers to develop effective and organised disaster response plans, reduce duplication, and improve overall disaster response/mitigation actions. There is currently a knowledge gap regarding the disaster preparedness and safety practices of

university libraries in South-South, Nigeria, as only a few studies have been conducted on the subject. This study is being conducted to fill a knowledge gap and provide guidance to other researchers working on similar projects.

Objectives of the Study

The objective of the study is to:

1. Determine the availability of disaster mitigation strategies in university libraries in South-South, Nigeria;
2. Find out the disaster mitigation equipment available in university libraries;
3. Determine the competency level in the use of disaster mitigation equipment by information professionals in university libraries; and
4. Identify the challenges that university libraries face as regards disaster preparedness.

Research Questions

The following research concerns were addressed by the study:

1. What are the disaster mitigation strategies available in university libraries in South-South, Nigeria?
2. What is the disaster mitigation equipment available in university libraries?
3. What is the competency level in the use of disaster mitigation equipment by information professionals in university libraries?
4. What are the challenges that university libraries face as regards disaster preparedness?

Literature Review

The literature review was completed under the study's goals.

Availability of Disaster Mitigation Strategies in University Libraries

Ilo et al. (2018) examined the significance of disaster preparation and response in Nigerian university libraries. According to the findings, the primary mitigation and readiness measures implemented in the libraries under investigation are periodic electrical inspections and repairs, ensuring emergency equipment is properly positioned, and replacing fire extinguishers as soon as they expire. Nongrang and Khongtim (2021) conducted a survey of Shillong University libraries and colleges regarding disaster management. The study's findings revealed that none of the 12 college libraries and two university libraries in Shillong examined had any plans in place to mitigate the effects of disasters because they were all vulnerable and ill-prepared. Khalid and Dol (2015) conducted exploratory research into Malaysian university libraries' disaster preparedness. According to the survey results, less than half of academic libraries (47.1%) did not have a library disaster plan. This implies that Selangor and Kuala Lumpur's academic libraries are still not disaster-ready. Rasaki (2019) examined disaster management techniques at some Nigerian university libraries. According to the findings, security personnel, air conditioning, and fire extinguishers were provided as disaster management tools. The study concluded that adequate employee training, disaster preparation, business continuity plans, and the ability to support outreach initiatives for library staff should all be considered in disaster management readiness. Chiderah and Iroeze (2021)

investigated the level of disaster management preparedness using academic libraries in Nigeria's Southern State as a case study. The findings revealed insufficient staff involvement in disaster planning, as well as a lack of a clear disaster preparedness strategy at the academic libraries under investigation.

Disaster mitigation equipment is available in university libraries

Verma and Shahane (2018) examined the availability of disaster preparedness and mitigation tools in libraries. Their findings suggested that libraries should have fire extinguishers strategically placed throughout the building, an emergency pack containing flashlights, helmets, and spotlights, rubber boots and gloves, first aid kits, and a water spray bottle, among other things. The study also emphasises the importance of exterior security lighting for security purposes (Verma and Shahane, 2018). Ahenkorah-Marfo and Borteye (2010) studied disaster preparedness at Kwame Nkrumah University of Science and Technology in Kumasi, Ghana. The study states that the library has fire extinguishers and smoke detectors as disaster mitigation measures. The measures employed by Nigerian university libraries for disaster planning and mitigation were examined by Ijiekhuamen et al. (2020). The study is centred on Nigeria's federal and state university libraries in the South-South region. The research indicates that the university libraries use a variety of disaster preparation goods and equipment, including emergency escape doors, fire extinguishers, air fresheners, anti-virus software, thunder arrestors, sand buckets, and emergency escape tools. Ilo et al. (2018) found that emergency escape doors, sand buckets, fire extinguishers, thunder arrestors, and anti-virus software were all readily available at the university libraries they examined. To successfully prevent fires and other disasters from starting and spreading, Ayoung et al. (2015) emphasise the need for equipment, including smoke alarms, sprinklers, fire detectors, fire blankets, extinguishers, and emergency exits to be provided in libraries.

Competency level to use disaster mitigation equipment by information professionals

Ayoung et al (2015) examined the issue of disaster readiness of Ghanaian Polytechnic librarians on the competencies to be employed to use disaster mitigation equipment. In such institutions, the study revealed that untrained staff to operate equipment to respond to potential disasters is one of the biggest causes of concern. The employees should know what, when, and how to act during a crisis. In these conditions, only libraries have a chance to survive disasters. Ahenkorah-Marfo and Borteye (2010) studied the preparedness and the qualifications of staff of the Kwame Nkrumah University of Science and Technology (KNUST), Central Library, to fight disasters. The findings indicated that 44.7 per cent of the chosen respondents inferred that they were able to operate and follow through the use of a fire extinguisher, but 55.3 per cent of the respondents insisted that they were incapable of doing so. This has been the case in a study conducted by Owolabi et al. (2014) on disaster awareness and readiness in Nigerian Polytechnic Libraries since 140 participants were studied and most members of staff were not equipped with the required skills and thus ill-prepared for disaster occurrence. Nwokedi and colleagues (2017) examined the subject of disaster preparation and management in the University of Jos Library. Based on the results, the majority of the

respondents, 84 (80.76%) and 72 (75%) and 69.23% are not able to use fire extinguishers, fire buckets, or water in a tap or a tank. Also, one can find the emergency exits (73.07%), control switch (71.15%), or the emergency numbers of the firefighter (82.14%) (78.84%), which is understood by the majority of respondents. Kolawole et al. (2015) have investigated the practices of disaster management in 5 hospitals located in South-West Nigeria. The findings indicated that all the library boards had enacted appropriate disaster preparedness measures, and the majority of their personnel were completely informed of the measures undertaken as well as how to utilise the available emergency paraphernalia.

Challenges that university libraries face as regards disaster preparedness

However, there do exist abundant issues that university libraries have to grapple over before they can prepare and control disasters. Sharma et al. (2018) conducted research work on disaster management in the libraries of Assamese universities. The data made it clear that the non-supportive management and budgetary constraints become the biggest deterrents to the adoption of disaster management by most libraries. In his research study, Davou (2014) explored the Plateau State disaster management in university libraries in Nigeria. The research also indicated that the library lacked bomb detectors, fire alarms and thunder arrestors, which would be installed to ensure that bombs do not explode. It is also settled that one of the issues that were lacking in disaster preparedness was the lack of a disaster management committee and earthquake detectors or other monitoring devices. The study conducted by Azigba and Edet (2008) suggests that university libraries in West Africa ought to be given special emergency care because they do not have the financial allocation to meet even the cost of managing the disaster. The paper has also looked at the importance of disaster preparedness to libraries in the region. A survey study conducted by Superio et al. in 2017 identified the reaction of the academic libraries in the island of Panay, Philippines, towards natural disasters after Typhoon Haiyan. The study states that information professionals lacked knowledge and skills in disaster management, and this is the greatest problem that prevented them from being ready in case of a disaster. The preparedness of academic libraries with respect to disaster in Benue State, Nigeria, was examined by Adadu and Ianna (2019). The results of the research that are obtained point at the fact that there are specific gaps when it comes to the disaster preparedness of academic libraries at the universities. Such shortcomings involve a lack of a disaster management plan, insufficient or defective firefighting installations, a disaster management board, disaster management training, use of poor installation tools for electrical work and improper defence against lightning and thunder in the library.

Method

In this study, a descriptive survey research design was adopted. The study's population consists of 234 librarians who work in federal, state, and private university libraries in South-South Nigeria. The census sample strategy was selected for the study because it will allow the researchers to cover the entire population, given the controllable population size. The instrument utilised to get information from the respondents was a structured questionnaire. The researcher provided adequate training to two research assistants, who then helped to personally deliver the questionnaire to the participants at their work environment. 218 of the

234 copies of the questionnaire that were distributed to the respondents were gathered and found to be adequate for the study. A 93% return rate was observed in the study. The data gathered from the respondents was analysed using descriptive statistics, which mostly comprised frequencies and statistical means. Given the criteria, a value of 2.5 has been selected.

Data Analysis and Result Presentation

Questionnaire Return Rate

Table 1: Questionnaire Return Rate

Librarians in University Libraries	No. of Questionnaires Distributed	Number of Questionnaires Returned	Percentage (%) of the Returned Questionnaire
Total	234	218	93%

There were 234 copies of the questionnaire issued in all; 218 (93%) of them were returned and were deemed appropriate for study since, according to Dulle et al. (2010), most surveys should have a suitable response rate of 60%.

Section A: Respondents' Demographic Characteristics

Table 2: Sex Distribution of the Respondents

Gender	No. of Respondents	Percentage (%)
Male	122	56%
Female	96	44%
Total	218	100%

Table 2 reveals that male respondents accounted for 56%, while female respondents accounted for 44%. There are more males than females in this study.

Table 3: Educational Qualification of the Respondents

Qualification	No. of Respondents	Percentage (%)
B.Sc./ B.Ed.	132	61%
M.Sc./ M.Ed.	62	28%
Ph.D.	24	11%
Total	218	100%

According to Table 3, 132 (61%) of the respondents have a B.Sc. / B.Ed. degree, 62 (28%) have an M.Sc. / M.Ed. degree and 24 (11%) have a Ph.D. degree. As a result, first-degree holders make up the majority of those who took part in the survey.

Section B: Key Research Findings

Disaster Mitigation Techniques

Table 4: Disaster Mitigation Strategies Incorporated in the University Libraries

Disaster Mitigation Strategies	Agree		Disagree	
	Freq.	%	Freq.	%
Constant Inspection and servicing of Electrical installations	88	40	130	60
General vulnerability analysis and risk assessment of the library	80	37	138	63
Making sure disaster equipment is placed properly	76	35	142	65
Disaster Management Policy/ Plan	60	28	158	72
Frequent acquisition of Disaster Management Equipment	54	25	164	75
Regular backups of library websites and Electronic Resources	66	30	152	70
Acquiring Anti-Virus/ Spyware to Protect Library Systems	166	76	52	24
Good drainage and floodproof systems	124	57	94	43
Frequent Servicing of library Structure, Facilities and Equipment	110	51	108	49
Staff and User Training on Disaster Mitigation and Management	66	30	152	70
Regular fumigation of the library and its environment	128	59	90	41

As revealed in Table 4, the librarians agreed that acquiring anti-virus and spyware to protect their system- 166(76%), regular fumigation of the library environment and its environment- 128(59%), frequent servicing of library structure, facilities and equipment- 110(51%) are the incorporated disaster mitigation strategies in their university libraries. The librarians disagreed that frequent acquisition of disaster management equipment- 164(75%), disaster management Policy/ Plan- 158(72%), regular backups of library websites and electronic resources- 152(70%), staff and user training on disaster mitigation and management- 152(70%), making sure disaster equipment are placed properly- 142(65%), general vulnerability analysis and risk assessment of the library- 138(63%), and constant inspection and servicing of electrical installation- 130(60%) are yet to be fully incorporated as a disaster mitigation strategy in their university libraries.

Disaster Mitigation Equipment

Table 5: Disaster Mitigation Equipment Available in University Libraries

Disaster Mitigation Equipment	Frequency	Percentage
Emergency Pack	44	20%
Fire Extinguishers	218	100%
Smoke Detectors	28	13%
Fire Alarms	18	8%
Anti-virus and Spyware	164	75%
Thunder Arrestors	142	65%
Fire Blankets	98	45%
Water Sprinklers	62	28%
Sand Buckets	202	93%
Insects and Rodents Repellent	196	90%

Table 5 revealed the disaster mitigation equipment available in the university library. From the Table, all the respondents specified fire extinguisher- 218(100%), 202(93%) indicated sand bucket, 196(90%) indicated insects and rodent repellent, 164(75%) indicated anti-virus and spyware, and 142(65%) indicated thunder arrestors. Only a few respondents indicated they have Fire blankets- 98(45%), water sprinklers- 62(28%), emergency pack- 44(20%), smoke detectors- 28(13%) and fire alarms- 18(8%). This implies that the disaster mitigation equipment available in the university libraries, as noted by the respondents, is mainly fire extinguishers, sand buckets, insect and rodent repellent, anti-virus and spyware, and thunder arrestors.

Competencies in Disaster Mitigation Equipment Usage

Table 6: Competencies Level in the Use of Disaster Mitigation Equipment by Information Professionals

Disaster Mitigation Equipment Competency Level	VHL	HL	LL	VLE	\bar{x}
Emergency Pack	16	6	32	164	1.42
Fire Extinguishers	34	20	44	120	1.85
Smoke Detectors	18	32	46	122	1.75
Fire Alarms	14	70	32	102	1.98
Anti-virus and Spyware	148	28	24	18	3.40
Fire Blankets	96	50	24	48	2.89
Water Sprinklers	58	32	20	108	2.18
Sand Buckets	136	44	28	10	3.40
Insects and Rodents Repellent	134	38	18	28	3.28
Aggregate Mean				2.46	

Scoring Scale: VLL (0.00 – 1.49), LL (1.50 – 2.49), HL (2.50 – 3.49), VHL (3.50 and above).

Based on Table 6, the aggregate mean score of 2.46 indicates that information professionals generally possess a *low level (LL)* of competency in using disaster mitigation

equipment. Competencies were highest in the use of antivirus and spyware ($\bar{x} = 3.40$), sand buckets ($\bar{x} = 3.40$), and insect/rodent repellents ($\bar{x} = 3.28$), reflecting *high competency levels*. Conversely, the lowest competencies were reported in the use of emergency packs ($\bar{x} = 1.42$), fire extinguishers ($\bar{x} = 1.85$), and smoke detectors ($\bar{x} = 1.75$), falling within the *very low to low competency range*. This suggests a need for targeted training and capacity building in physical disaster response tools among information professionals.

Disaster Preparedness Challenges

Table 7: Disaster Preparedness Challenges faced by University Libraries

Challenges Statements	Agree		Disagree	
	Freq.	%	Freq.	%
Inadequate funds for disaster preparedness and management	194	89	24	11
Lack of Skills to use Disaster Mitigation Equipment	182	84	36	16
Non-supportive University Management	148	68	70	32
Inadequate disaster mitigation equipment is available	172	79	46	21
No disaster management policy/ plan in my library	176	81	42	19
Poor maintenance culture	102	47	116	53
Irregular Assessment of Hazards and Vulnerability	167	77	51	23
Poor disaster control and mitigation Strategies	162	74	56	26
Inadequate capacity building of librarians and users of disaster management	122	56	96	44
Inadequate awareness campaign on Disaster Mitigation	86	39	132	61
Total absence of a disaster management committee	68	31	150	69
Use of Inferior building and electrical materials	154	71	64	29

The challenges university libraries have when preparing for disasters are depicted in Table 7. Based on the data presented in the table, the participants agreed to the following: insufficient funding for disaster planning and management (194/89%), insufficient expertise to operate disaster mitigation equipment (182/84%), absence of a disaster management policy or plan in the library (176/81%), insufficient availability of disaster mitigation equipment (172/79%), inconsistent evaluation of risks and vulnerabilities (167/77%), subpar disaster control and mitigation tactics (162/74%), use of subpar construction and electrical materials (154/71%), and unsupportive university administration (148/68%), and inadequate capacity building of librarians and users on disaster management- 122(56%) are the drawbacks in their disaster preparedness and management efforts. The respondents on the other hand disagreed that total absence of a disaster management committee- 150(69%), inadequate awareness

campaign on disaster mitigation- 132(61%), and poor maintenance culture-116(53%) are among the limitations in their disaster preparedness and management.

Findings of the Study

The study evaluated South-South Nigerian university libraries' readiness for disasters. In the study, there were more men than women who responded. First-degree holders comprise the bulk of responders, with M.Sc./M.Ed. holders coming in second, and PhD holders last. The results showed that university libraries are still using very few catastrophe mitigation techniques. The only disaster preparedness measures included in university libraries are the purchase of anti-virus and spyware software to safeguard the system, routine fumigation of the library and its surroundings, and routine maintenance of the library's infrastructure, furnishings, and equipment. The survey participants revealed that their disaster mitigation strategy still lacks full implementation of the following: frequent acquisition of disaster management equipment; disaster management policy/plan; regular backups of library websites and electronic resources; staff and user training on disaster mitigation and management; ensuring that disaster equipment is placed correctly; general vulnerability analysis and risk assessment of the library; and constant inspection and servicing of electrical installation. The results showed that, due to a lack of appropriate disaster mitigation plans, university libraries are ill-equipped to handle emergencies when they arise. This result is consistent with a research by Khalid and Dol (2015), which discovered that less than half of Malaysia's academic libraries lacked disaster recovery plans and contingency plans for handling emergencies.

According to another study, the most often used disaster mitigation tools at university libraries include fire extinguishers, sand buckets, insect and rodent repellent, anti-virus and spyware programmes, and thunder arrestors. The results were in conflict with a research by Verma and Shahane (2018), which found that the most popular disaster preparedness item for libraries is an emergency pack that includes flashlights, helmets, spotlights, and robber boots. This result is consistent with a study by Ijiekhuamen et al (2020), which examined federal and state university libraries in the South-South region of Nigeria. The study found that the disaster mitigation tools available in South-South university libraries in Nigeria include fire extinguishers, air fresheners, anti-virus software, thunder arrestors, and sand buckets.

However, a further study revealed that the university librarians in South-South Nigeria are incompetent when it comes to using equipment for disaster mitigation. These results are consistent with the majority of earlier research, which found that most academic libraries do not have the necessary staff members who are competent in using equipment for disaster mitigation (Ahenkorah-Marfo & Borteye, 2010; Owolabi et al., 2014; Nwokedi et al., 2017). Ultimately, the study discovered that their disaster preparedness and management efforts were hindered by several issues, including insufficient funding for disaster preparation and management, a lack of expertise in using disaster mitigation equipment, the absence of a disaster management policy or plan in their library, inadequate disaster mitigation equipment available, irregular assessments of hazards and vulnerability, and subpar disaster control and mitigation strategies. This result is consistent with research by Azigba and Edet (2009), Deka

and Das (2018), and others that showed financial limitations to be the primary barrier to disaster preparedness and management in university libraries.

Conclusion

A university library's ability to effectively mitigate and address a disaster will depend on its preparedness, which will protect its personnel, buildings, infrastructure, and resources for future generations. The current investigation has revealed the level of university libraries' readiness for disasters in South-South Nigeria. The implementation of disaster mitigation measures remains relatively low; this may be due to budgetary limitations as well as a lack of staff and equipment to oversee and run disaster mitigation systems in university libraries. Since natural disasters can strike without warning and only well-prepared libraries will be able to survive and lessen their catastrophic effects, library and university management that prioritizes disaster preparedness and management will be able to prevent, control, and respond to disasters whenever they arise. According to the current study, university libraries are not yet prepared for catastrophes. Library administration needs to take disaster preparedness seriously to prevent significant losses from happening whenever a disaster strikes their facilities.

Recommendations

The study recommends that:

1. Budgetary allocation should be provided for disaster management in university libraries.
2. Disaster mitigation strategies like the frequent acquisition of disaster management equipment, establishment of disaster management Policy/ Plan, and regular backups of library websites and electronic resources should be incorporated in university libraries.
3. Training should be conducted for library staff and users on disaster preparedness, mitigation and management.
4. Digital mitigation equipment should be acquired in sufficient quantities in university libraries to enhance the preparedness to control and curb disasters whenever they occur.
5. University libraries should formulate disaster preparedness plans/policies which will serve as a reference document for disaster prevention, control and management in their domains.

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Authors' Contributions

All authors have contributed to the final manuscript. The contribution of all authors: conceptualisation, methodology, formal analysis, writing original draft preparation, writing review and editing. All authors have read and agreed to the published version of the manuscript.

Conflict of Interest

All authors have no conflict of interest related to this study.

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