

University of Nebraska - Lincoln

**DigitalCommons@University of Nebraska - Lincoln**

---

Library Philosophy and Practice (e-journal)

Libraries at University of Nebraska-Lincoln

---

7-31-2015

# Managing Disasters in University Libraries in South East Nigeria: Preventive, Technological and Coping Measures

Richard N. C. Ugwuanyi Dr.

*University of Nigeria Nsukka, Nigeria, richard.ugwuanyi@unn.edu.ng*

Mercy Ebere Ugwu

*University of Nigeria Nsukka, Nigeria, cyprian.ugwu@unn.edu.ng*

Kelechi Chukwunonso Ezema

*University of Nigeria Nsukka, Nigeria, kelechinonso99@gmail.com*

Follow this and additional works at: <http://digitalcommons.unl.edu/libphilprac>



Part of the [Library and Information Science Commons](#)

---

Ugwuanyi, Richard N. C. Dr.; Ugwu, Mercy Ebere; and Ezema, Kelechi Chukwunonso, "Managing Disasters in University Libraries in South East Nigeria: Preventive, Technological and Coping Measures" (2015). *Library Philosophy and Practice (e-journal)*. 1289. <http://digitalcommons.unl.edu/libphilprac/1289>

# **Managing Disasters in University Libraries in South East Nigeria: Preventive, Technological and Coping Measures**

**By**

**Richard N. C. Ugwuanyi (Ph.D)**  
[richard.ugwuanyi@unn.edu.ng](mailto:richard.ugwuanyi@unn.edu.ng)

**Ugwu, Mercy E. cyprian.ugwu@unn.edu.ng**

**Kelechi C. Ezema**  
[kelechinonso99@gmail.com](mailto:kelechinonso99@gmail.com)

## **Abstract**

This study examined the types of disasters that occur in university libraries and the extent of application of preventive, technological and coping measures in managing these disasters. The study adopted descriptive survey design and the major instrument for data collection was questionnaire. Data collected were analyzed using mean and standard deviation. The results showed that university libraries in South East, Nigeria had experienced disasters which resulted in adoption of some preventive measures. It was however found that no significant technological and coping measures were applied in managing disasters in the university libraries. The study recommended that policy framework or disaster plan and comprehensive insurance policy should be in place to safeguard and preserve library resources. Finally, the study recommended that technological systems such as Geographic Information System, Remote Sensing Technology, Satellite Communication network, and fire suppressants should be installed for disaster mitigation in university libraries in South East, Nigeria.

**Keywords:** Disaster, University Libraries, technological measures, preventive measures, coping measures.

## **Introduction**

The dramatic increase and the unprecedented damages caused by disasters in recent past have become a cause for national and international concern. Over the past decade, the number of natural and human induced disasters have relentlessly risen and had considerably inflicted unquantifiable strife and injury on their impeccable victims. The unpredictability of their occurrences, how they occur and which one occurs, first has been a great concern to individuals and organizations world wide. Disasters are situations whereby environmental phenomena or armed conflicts produce stress, personal injury, physical damages or economic

disruption of great magnitude. They are regarded as an overwhelming ecological disruption, occurring usually on a large scale.

The sporadic hits of disasters in different segments of the society have not exempted libraries, especially academic libraries where a great amount of national wealth is stocked. In a world of copious digital technologies, university libraries have enough shares of disasters. University library disaster has to do with any event that directly or indirectly affects the smooth administration of a university library by disrupting its normal services to its users. It is an unexpected event which puts library resources or collections at risk. According to Alegbeleye (1993), disaster occurs in a library when any event causes a sudden removal of records and documents from accessibility and use. He further argues that libraries are very prone to disasters. Man-made disasters include armed conflicts, wars, terrorism and fire while natural disasters encompass floods, hurricanes, and earthquakes.

University libraries have remained the incontrovertible seats of wisdom, and the basis for cultural continuity and knowledge dissemination. The endemic damages by disasters in libraries, whenever any of them strikes, leave the affected library in a deplorable condition. No matter how the threats appear, or how they influence university libraries, the ability to safeguard and preserve their collections should be uppermost in their policies. The key to achieving this goal lies in preservation management that enables long-term planning and reasonable decision making.

Disaster management encompasses all management issues necessary to deal with incidents that threaten library buildings, collections, services and human lives. Since university libraries of today are technology-driven, many nascent disasters are evolving. For instance, changes in energy systems and lack of electricity supply endanger traditional library materials, just as digital materials are useless without energy supply. No university library is

immune to these disasters; depicting that any of them could befall any university library any moment since it is totally inescapable without appropriate control measures.

It is stating the obvious that university libraries in Nigeria are poorly funded. These libraries depend solely on government grants for their survival and development. In the face of poor funding and uneven development of university libraries across the six geo-political zones in Nigeria, disasters both natural and man-made appear to be another major threat to the existence of these libraries. In almost all the university libraries in South-East Nigeria, there have been reported cases of mutilated and stolen books by delinquent users and also cases of volumes of books damaged by rainfall. It becomes imperative from the foregoing that a study on disaster management be carried out with a view to identifying the preventive, technological and coping measures that are in place for disaster mitigation in university libraries in South-East Nigeria.

### **Objectives of the Study**

The specific objectives of this paper are to:

1. Ascertain the types of disasters that occur in university libraries in South East Nigeria
2. Examine the extent to which preventive measures for disasters have been in university libraries.
3. Determine the extent to which technological measures for managing disasters have been applied in university libraries in South East Nigeria.
4. Identify the coping measures for disaster mitigation in University libraries.

### **Literature Review**

#### **An Overview of library disasters**

Libraries like any other organization are most likely to experience disaster which are likely to result in their loss of expensive, precious or even elusive materials. International Council on Archives (ICA, 1997) classified disasters into natural and man-made. Natural disasters are those caused by natural phenomena such as earthquakes, hurricane, cyclone typhoon, volcanic eruption and drought while man-made include, water leakages, fire (including arson), explosion and impact, terrorist action, war and armed conflict. Some of the water related disasters include: flood, resulting from heavy rain or high tide caused by hurricanes, typhoons or overflowing rivers due to heavy rain or internal sources. The external sources include storms that could cause a linkage of water from the building or localized external flooding that seeps into the building. The internal sources include accidental discharge from internal plumbing such as the internal sprinklers, burst water pipes and overflowing sinks. For instance, Bolger (2003) reported that in 2000, the Central Library, Forth-worth, Texas was struck by a powerful tornado, causing over ₦1.6 million worth damage to the library. “The library’s 50,000 volumes and archival materials sustained water damage and there was another problem of cleaning up the shattered glasses, resulting in non-resumption of normal library services until three weeks later. According to Adedibu et al (2009), rain storms destroyed many books in the library of the Forest Research Institute of Nigeria, Ibadan in 1988.

Fire disasters appear to be the most common disaster in libraries especially accidental fires due to electrical faults, cigarettes, carelessness by either library staff or library users. Some cases of fire disasters in libraries include, fire outbreak at the Department of Theatre Arts of the University of Ibadan, South West Nigeria, and its library in 1995; the 1990 fire incidence which engulfed the Alafin Oyo palace library (Nigeria) (Ajala and Adekanye, 2007). Also, Jimoh (2004) reported the more recent fire incidence at the Federal Polytechnic, Idah, North Central Nigeria which burnt down the institution’s library (arson by

protesting students). The most serious fire disaster was suffered by the Academy of Science Library in St. Petersburg which in 1988 lost 300,000 books with a further 3.6 million volumes damaged (ICA, 1997). The Royal library of Alexandria established in the third century B.C., was destroyed by fire first in 47 B.C. during the time of Julius Caesar and again in 373 A.D. (Ngulube, 2004).

In the time of war and armed conflicts, library and library resources usually are exposed to severe risks. The library resources are deliberately burnt, destroyed, stolen or vandalized. Adedibu et al (2009) reported the damages done to the various libraries in Eastern Nigeria during the Nigerian Civil War (1967-1970) and lamented on the intensity of the destruction. On September 11, 2001, terrorists bombed the world Trade Centre and Pentagon libraries in the United States of America, destroying records, books and other documentary materials. Also, the National Library and Archives, a priceless treasure of Ottoman historical document including the Royal Archives of Iraq, were turned to ashes in 3000 degrees of heat on 14<sup>th</sup> April, 2003 during the United State's invasion of Iraq. (Buchanan, 2003). Akussah (1991) in his study of traditional library and archival materials in Ghana reported that even though there were many attacks on these libraries, terrorist attacks were minimal.

Earthquakes are caused by movements in earth's crust. According to Adedibu et al (2009), out of the three library disasters that have occurred in Ghana, one of them is the 1939 earthquake which destroyed the Aglionby library, Ghana. Other cases of earthquake in libraries and archives include the National Archives of Mexico which was damaged by the Mexico earthquake of 1985 and the San Francisco City Archives in U.S.A. damaged by the Loma Prieta earthquake of 1989 (ICA, 1997).

Biological agents like insects, fungi and rodents cause damages to books and other library materials particularly in tropical Africa (Alegbeleye, 1993). There are over seventy varieties of insects that have been identified as enemies of library materials. The most

common of these pests are cockroaches, silverfish, termites and moths. Termites feed on grass, humus, woodwork of buildings, library books, files, catalogue cards and photographs. When they invade a library, they can do serious damages in a single night. Termites have actually destroyed libraries and archival materials in tropical countries. Perker (1987) and Alegbeleye (1993) observed that the common rodent in libraries was the house mouse. Mice cause damages by destroying materials for nesting purposes and by urinating and defecating on library materials. Rodents chew insulation of electrical wires causing them to short-circuit, and this could cause fire disaster. Library users also constitute a serious threat unto university libraries: They mutilate and rip off useful library materials. In his study of security management of collections in Ethiopian libraries, Teferra (1996) found out that mutilation was a serious security threat in 93% of the libraries studied. The materials, most frequently mutilated were books and periodicals.

### **Preventive measure/disaster preparedness**

It is imperative that a library takes necessary and possible steps to prevent disaster, or to reduce its effects if it strikes. In addition, every library should have a disaster plan. Lyall (1993) describes a disaster plan as a document which describes the procedures devised to prevent and prepare for disasters and those proposed to respond to and recover from disasters when they occur. Ngulube (2005) pointed out that disaster planning could facilitate efficient and quick response to an emergency, or could protect items against theft or deliberate damage or destructions. Disaster plans should be contained in a document which must be made available to all staff of the library and kept for reference at strategic points within the building and at points off site for temporarily in inaccessible building (International Council on Archives (ICA), 1997). The responsibility of producing disaster plan is usually assigned to various staff members who comprise the disaster team. The disaster team recommends actions to prevent most disasters such as the repair of leaking roofs, improvement of

maintenance and upgrading of security, provision of freezing facilities and training of staff to enable them to respond to different disasters (Isa et al, 2012). The risk of fire is perhaps the greatest and the most destructive risk that confronts all institutions. An automatic fire detection system with a sufficient number of detectors and linked to a central monitoring panel should be provided. This must be supported by a manual fire alarm system as back-up (ICA, 1997). The alarm systems should have the means to send an automatic signal to the emergency fire service. It is equally important to provide automatic fire suppression system to deal with any ignition which might take place especially, gaseous based systems (carbon dioxide). Gaseous systems deal effectively with fire in confined areas and are useful in special collection rooms and computer suites because of their ability to suppress the fire without causing permanent damage to the collections equipment unlike sprinkler systems (ICA, 1997).

In 1974, Nwamefor studied the security problems of university libraries in Nigeria and recorded that their greatest problem came from water leakage and rain storm. Continuing, he recommended constant checking of roofs and air conditioners as preventive measures. The need for libraries to take insurance policy against materials damage, equipment, buildings, theft, personal accidents etc. cannot be over-emphasized. Adekanye (2010) stated that University Library Administration must take a realistic view of security or put measures in place to help university libraries rectify a security breach or recover after disaster. Location of library buildings at the side of rivers and below river water levels should be avoided (ICA, 1997).

## **Technological measures**

Technological approach to disaster management helps to minimize the impact of disasters by reducing the magnitude of loss of human and material resources. The limitations of traditional approaches in reducing the severity of natural disasters have created the need for the application of modern technologies in disaster management. Such modern technologies like: Satellite communication networks, Geographic Information system (GIS), remote sensing technology and fire suppressants are needed for disaster management in libraries and other institutions (Sahu, 2009).

Satellite communications are very vital in disaster mitigation. One way of improving the chances that an emerging link will remain operational during a disaster is to connect it to satellite. This is because satellites are the only wireless communications infrastructure that are not susceptible to damage from disasters because the main equipment that sends and receives signals (Satellite Space Craft) is located outside the earth's surface. According to Venkatachary et al (2004), two kinds of satellite communications networks support disaster management and emergency response activities, namely: geo-stationary satellite systems (GEO) and Low – earth orbit satellite (LEO). GEO satellites are capable of providing a full range of communication services, such as voice, video, and broadband data. These satellites operate with ground equipment ranging from gateway antennas to mobile terminals, the size of cellular phone. LEO satellites operate in orbits between 780km and 1500km and provide voice and low speed data communications. Even before disaster strikes, these networks are used to provide seismic and flood-sensing data that makes it possible for early warning of an impending crisis. They also broadcast disaster warning notices and facilitates general communication and information flow (Sahu, 2009).

In the present era of electronic communication, the internet provides a useful platform for disaster mitigation communication. The internet becomes a valuable asset, provided the

rate of illiteracy in the disaster area is insignificant, the residents understand the language in use and are familiar with the computers, and the software, and has the physical access to both the internet and the computers. Well-defined website has been a cost-effective means of rapid, automatic, and global dissemination of disaster-related information. A number of individuals and groups, including several national meteorological services, are experimenting with the internet for real-time dissemination of weather observation, forecasts, satellite and other data. Access to internet also permits continuous updates of disaster information, accounts for material and human resource available for response, and for state-of-the-art technical advice.

Geographical Information System (GIS) was defined by Sahu (2009) as a system of hardware and software used for measuring, storing, retrieving, mapping, monitoring, modeling and analyzing a variety of data types related to geographical and natural phenomena. The analytical capabilities of GIS support all aspects of disaster management: planning, response, recovery and records management. Geographical Information System technology plays a critically important role in disaster management (Gupta, 2000). GIS can provide current weather indexes based on location and surrounding areas. Wind information is relevant in predicting the movement of chemical cloud release or anticipating the direction of wildfire spread upon early report. Also earthquake, reservoir level at dam sights, radiation monitors and so forth can all be monitored and displayed by location of GIS.

Remote sensing technology is a powerful tool in disaster management. It is an investigative technique that uses a recording instrument or device to measure or acquire information on a distant object or phenomenon with which it is not in physical or intimate contact. This tool is used in locating the area of natural disaster and monitor its growing proportions while the forces of disaster are in full swing, providing information on the disaster rapidly and reliably, and thereby ensuring that the extent of destructions is evaluated

precisely (Sahu, 2009). Again, remote sensing technology helps in monitoring or assessing the disaster event which provides in turn, a quantitative base for relief operations. Such assessment can be used to map the new scenario and update the database used for the recovery of lost library resources and also in preventing the recurrence of such disaster in future.

Alegbeleye (1993) reported that libraries in Africa did not emphasize the use of heat smoke detectors probably because of cost of purchase or maintenance. He further stated that libraries depended more on human guards which could be unreliable for detecting fire on time. Ojo-Igbinoba (1993) opined that only few libraries possessed fire suppressant systems. In their contributions, Alegbeleye (1993) and O'Connell (1983) stated that every staff should be trained to use fire extinguisher and that there should be drills to practice what each staff would do in the event of fire disaster. Library buildings should be provided with smoke detectors, fire extinguishers, fire alarms and fire pulls. In addition, sand buckets should be provided to compliment fire extinguishers and up-to-date emergency phone lines should be maintained.

These advanced technologies are expensive, inaccessible, and unavailable to a great extent. Also, the large population of the library staff lack the necessary skills for the applications of the new technologies (Rao, 2004).

### **Coping/Mitigation Measures**

Library materials are usually damaged by water. Materials affected by or water damaged materials need swift and correct action. The objective is to stabilize their conditions so that no further damage takes place (ICA, 1997). The most acceptable method for stabilizing the affected materials is freezing. Wet materials will usually develop fungal growth within 48 hours. It is therefore, necessary to consider the need to avoid secondary

damage of the wet materials by stabilizing them. Some methods of stabilizing wet collections as a result of water related disasters in libraries include: dehumidification, freezer drying, vacuum thermal-drying and vacuum freezer-drying.

Dehumidification is one of the current methods to gain credibility in the library and archival world, although it has been used for many years to dry out building. Temperature and humidity can be controlled to users' specifications. This method is successful for drying damp to moderately wet books and records, equipment and furnishings. This action must be initiated before swelling becomes a problem or mold appears, i.e. within 48 hrs. of the emergency (Betrand Library, 2005). It is advisable to choose a company with experience and expertise in drying library or archival collections.

In freezer-drying, books and records which are only damp or moderately wet may be dried successfully in self-defrosting, last-freezer, if left there long enough. Materials should be placed in the freezer as soon as possible after water damage. Books will dry best if their bindings are supported firmly to inhibit swelling. The equipment should have the capacity to freeze very quickly, and the temperature must be 10 to 40 degrees F. to reduce distortion and to facilitate drying (Betrand Library, 2005). Coated paper may adhere with this technique.

Books and records can be dried in a vacuum thermal-drying chamber into which they are placed either wet or frozen. The vacuum is drawn, heat is introduced, and the materials are dried, either in cycles of freezing and thawing or slightly above 32 degrees F. (Betrand Library, 2005). It is a very acceptable method of drying wet records. It also causes adhesion of coated paper. This method is a good solution for unbound materials which have suffered extensive water damage.

Using vacuum freezer-drying, books and records are placed in a vacuum chamber either wet or frozen. The vacuum is pulled, a source of low heat is introduced, and the

collections are, dried at temperatures below 32 degrees F. and are kept frozen until dry. Then, the physical process known as sublimation will take place. This means there is no additional swelling or distortion beyond that incurred before the materials were placed in the chamber (Betrand Library 2005). Coated paper will dry well if it has been frozen or placed into the chamber within 6-8 hours. Rare and unique materials can be dried successfully this way, but leather and vellum may not survive. Other mitigation measures like effective monitoring of users and use of insecticides can as well as be applied. Ojo- Igbino (1991) in his study of libraries in Africa found out that the damage to library materials from terrorist attacks was not severe when compared to factors like actions of insects and rodents. He recommended the use of insecticides as useful coping strategy.

### **Previous studies on disaster management in university libraries**

The literature revealed very few studies in this area in Nigeria. A study by Suleman (2009) on disaster control measures in academic libraries in Nasarawa State, North East, Nigeria adopted descriptive survey research while instrument used for data collection was questionnaire. One of the findings of this study was that some of the libraries investigated did not have a comprehensive disaster plan and they were therefore, not ready to cope with disaster if it should occur. The study also revealed that there had never been any natural disaster like earthquake, volcanic eruption, hurricane or cyclone, rather what libraries experienced most were leakage roofs, theft, and mutilation and fire disasters. The researcher recommended installation of fire detectors as this would give early signal to any fire outbreak. In another study carried out by Adedibu et al (2009) on the state of disaster preparedness in fourteen libraries in Kwara State, South West, Nigeria, survey research design was adopted while questionnaire and checklists were used as instruments for data collection. The findings of this study revealed that none of the libraries had disaster control plan or even trained their staff in disaster control procedures. The study also showed that

70.37% of the respondents had not experienced any library disaster, while 29.63% of the respondents had experienced library disasters such as internal flooding from plumbing, leaking roof, rainstorm, theft, insect infestation and fire from defective electrical wires. The researchers recommended provision of fire alarms, smoke detectors and fire pulls, fire extinguishers and insurance coverage policy. It was also recommended that all the library staff should be trained and retrained in disaster management.

In a related study by Ritkata (2012) on disasters in libraries and their control different types of disasters in libraries were identified. The study also revealed that the most common disasters in Nigerian libraries were fire, flood, leaking roof, insects and theft. Other findings showed that fungi and insects were the most destructive elements to library collections. The study recommended constant vacuum cleaning, fumigation, spraying of insecticide and fungicide.

Another research carried out by Kostagiolas et al (2011) on disaster management approaches for academic libraries in Greece, adopted a survey method. The main purpose of the research work was to ascertain the level of risk and disaster preparedness in Greek academic libraries. The findings of this study revealed that in Greece, disaster management within academic libraries was almost, if not completely neglected. This was due to the economic crisis in the country in addition to other factors such as lack of personnel and equipment maintenance culture, inadequate buildings and insufficient funding.

## **Methods**

This study was based on descriptive survey design. This was considered appropriate because the study sought to capture the opinions of librarians on preventive, technological and coping approaches to disaster management in Federal University Libraries in South East, Nigeria. The population of the study was made up of 120 Librarians in University Libraries

in South East Nigeria. The population was considered small and data for the study were obtained from the 120 Librarians. Questionnaire was the main instrument for data collection. This instrument consisted of three clusters (A, B, and C). Each of the clusters was designed to provide information on a given dimension of disaster management, e.g., prevention, technology and coping. The instrument was subjected to pilot testing and the internal consistency of each of the three clusters were estimated using Cronbach alpha procedures. The reliability coefficients were obtained as follows: Cluster A ( $\alpha=0.72$ ), Cluster B ( $\alpha=0.81$ ) and Cluster C ( $\alpha=0.83$ ). A total of 120 copies of the questionnaire were distributed to respondents but 108 copies were returned and found to be correctly filled. This gave a response rate of 90%. Data collected were analyzed using descriptive statistics (e.g. Mean,  $\bar{x}$  and Standard Deviation, SD).

## Findings

**Table 1:** Mean and Standard Deviation of Responses on Damage by Disaster on Library Materials.

S/No.	Statement	$\bar{X}$	SD	Decision
1	Explosion	1.72	1.04	Less Severe Damage
2	Terrorist Actions/Attacks	1.86	1.06	Less severe damage
3	Armed Conflict	1.94	0.97	Less severe damage
4	Water Leakage	3.03	0.77	Severe damage
5	Rain Storm	2.53	0.93	Severe damage
6	Natural Phenomuna	1.72	0.87	Less severe damage
7	Biological Agents	3.19	0.66	Severe damage
8	Mutilation by Library users	3.14	0.75	Severe damage
	Overall Mean	2.42	0.88	Less severe damage

Table 1 shows the mean responses on the severity of damage by disasters on library materials. It was found that of all the disasters either natural or biological that attacked library materials, the ones that caused severe damage on Library material were water leakage ( $\bar{x}=3.03$ ), biological agents ( $\bar{x}=3.19$ ), mutilation by library users ( $\bar{x}=3.14$ ), and rain storm ( $\bar{x}=2.53$ ).

2.53). However, disasters such as explosions ( $x=1.72$ ), terrorist attacks ( $x =1.86$ ), armed conflict ( $x=1.74$ ), natural phenomena ( $x=1.72$ ), etc. had all less severe damage on library materials. On the whole, both the natural phenomena or physical activities and biological agents had less severe damage on library materials.

**Table 2:** Mean and Standard Deviation of Responses on application of preventive measures to managing disasters in academic Libraries

S/No.	Statement	X	SD	Decision
1	Disaster plan should be developed	1.23	0.45	Little extent
2	There should be a disaster team	1.58	0.73	Little extent
3	Repairs of leaking roof	3.25	0.76	High extent
4	Upgrading of library system	1.78	0.79	Little extent
5	Provision of freezing facilities	1.42	0.55	Little extent
6	Training of staff	3.17	0.99	High extent
7	Provision of sand buckets	3.44	0.73	High extent
8	Comprehensive insurance policy	1.97	0.93	Little extent
9	Fire extinguishers	3.08	0.99	High extent
10	Fumigation	1.33	0.47	Little extent
11	Cleaning of the library regularly	3.00	1.15	High extent
	Overall Mean	2.29	0.78	Little extent

Table 2 above shows the extent to which preventive measures were applied to disaster management in academic libraries. The table revealed the measures that were applied to a high extent to disaster management. They were made up of repairs of leaking roof ( $x=3.25$ ), training of staff ( $x=3.17$ ), provision of sand buckets ( $x=3.44$ ), provision of fire extinguishers ( $x=3.08$ ) and total and regular cleaning of the library ( $x=3.00$ ). In contrary, some measures were applied to a little extent. These measures included developing disaster plan ( $x=1.28$ ), having a disaster team ( $x=1.58$ ), fumigation ( $x=1.33$ ), provision of freezing facility ( $x=1.42$ ) and upgrading library security system ( $x=1.78$ ). On the whole, though the preventive

measures were applied to a little extent, some of the measures, as earlier identified, were applied to a high extent to disaster management.

**Table 3:** Mean and Standard Deviation of Responses on the Application of Technological measures to disaster Management in Academic Libraries

S/No.	Statement	$\bar{X}$	SD	Decision
1	Satellite communication networks	1.17	0.51	LE
2	Geographic Information systems	1.17	0.51	LE
3	Remote-Sensing Technology	1.06	0.23	LE
4	Fire suppressant	1.89	0.88	LE
5	Internet connectivity	3.36	0.79	HE
6	Heat-smoke detectors	1.33	0.47	LE
7	Fire alarms and fire pulls	1.57	0.77	LE
	Overall Mean	1.65	0.59	LE

The extent to which technological measures were applied to disaster management in academic libraries was shown in table 3. The table revealed that the only technological innovation that was applied to a high extent was internet connectivity. The rest of the technological measures captured for the purpose of this research were found to be applied to a little extent. These measures included but not limited to fire alarms and fire pulls ( $x=1.57$ ), heat smoke detectors ( $x=1.33$ ), fire suppressant ( $x=1.89$ ) and automatic fire detection system ( $x=1.17$ ). Based on these results, it can be concluded that technological innovations were applied to a little extent ( $x=1.65$ ) to disaster management in academic libraries in South Eastern Nigeria. This may be due to the cost of ICT equipment and lack of ICT skills.

**Table 4:** Mean and Standard deviation of Responses on coping measures applied to disaster management in academic Libraries.

S/No.	Statement	$\bar{X}$	SD	Decision
1	Dehumidification	1.08	0.28	LE
2	Freezer-drying	1.03	0.17	LE
3	Vacuum thermal-freezing	1.06	0.23	LE
4	Vacuum freezer-drying	1.08	0.28	LE
5	Keeping the library at room temperature	2.00	0.67	LE
	Overall Mean	1.25	0.33	LE

Table 4 shows the extent to which coping measures are applied to disaster Management in Academic Libraries in South East Nigeria. The table revealed that all the coping measures identified for this research were applied to a little extent to disaster management in academic libraries. This implies that much attention is yet to be given or paid to coping measures. This might be the result of the fact that some of the libraries studied had not experienced any library disaster.

### **Discussion of Results**

The results derived from the study of university libraries in South Eastern State of Nigeria showed that they experienced severe material damage caused by biological agents, mutilation by library users, rain storm and water leakage. The greatest of all these was rain storm. This agrees with Adedibu's (2009) study which found that rain storm destroyed many books in the library of the Forest Research Institute of Nigeria, Ibadan. Biological agents

were also found to cause more severe damage to library materials, but not of the magnitude of rain storm. This is in tandem with Alegbeye's (1993) work on libraries in Tropical Africa. These biological agents include the library pests, rodents and fungi as found out by Perker (1987) and Alegbeleye (1993). Mutilation was also a source of severe damage on library materials. This is consistent with Teferra's (1991) findings that books were the most frequently mutilated by library users. Rain storm and water leakage also accounted for severe damage on library materials in these university libraries. This agrees with Nwamefor's study of 1971. Less severe damage from terrorist attacks, armed conflicts and natural phenomena were in conformity with those of Ojo-Igbinoba (1993) and Akussah (1991).

### **Preventive Measures**

The mean responses of librarians showed that some preventive measures were adopted to a high extent. The measures consisted of repairs of leaking roof, training of staff, provision of sand-buckets, fire extinguishers and cleaning of the library regularly. More critical measures were however applied to a little extent, and they included disaster plan, disaster team, upgrading of library system, provision of freezing facility, fumigation and provision of comprehensive insurance policy. This explains why all the university libraries suffered severe damages from certain factors. While the application of these measures was shown to be of little extent, the finding agrees with those of Adedibu et al (2009) and contradicts Alegbeleye (1993) and O'Connell (1985).

### **Technological Measures**

On the application of technological measures to managing disasters in University libraries, the respondents indicated that nothing significant was being done. Only Internet connectivity was applied to a high extent. Satellite communication networks, geographic

information systems, remote sensing technology, fire suppressant, heat smoke detectors and fire alarms and fire pulls were applied to a little extent. This is in tandem with Alegbeleye (1993) whose report showed that libraries in Africa did not emphasize the use of heat smoke detectors probably because of cost.

### **Coping Measures**

The position of these libraries became more worrisome when out of the whole listed coping strategies, none was found to be applied to a high or very high extent. Moreover, the overall mean showed that low attention was paid to the application of the coping measures. This low application seems to signal the absence of serious disaster attacks on the libraries, which in turn, depicts lack of blue print or effective preparedness or coping measures against disaster emergence. This agrees with the findings of Suleman (2009), Adedibu et al (2009) and Ritkata (2012). They found out in their studies that most of the libraries studied were not adequately prepared against disaster emergence and management. Continuing, they reported that many of them did not have disaster plan nor experienced earthquakes and other natural phenomena that damage library materials.

### **Implications of the Study**

This study provides understanding of the concept of managing disasters in libraries. The theoretical foundation of this concept is yet to be clearly understood by Librarians because it cuts across disciplinary boundaries. In-depth research in this area has the obvious advantage of clarifying all contending conceptual issues and laying solid foundations for integrating disaster management into library operations.

This study has tried to help library managers and academic librarians to understand that disaster management can be considered from the perspectives of preventive, technological and coping measures. The advantage of this understanding is that for any

disaster plan to be comprehensive, all these measures must be captured. Aside from this, argument for more funding of University Libraries can be based on a comprehensive disaster plan.

Having a disaster plan has implications for University Library management. It requires that awareness has to be created followed by training and re-training of staff for use of technological equipment in disaster mitigation. With this training, organizational commitment towards preventing disasters rather than coping is bound to be enhanced.

### **Recommendations and Conclusion**

University libraries are the hearts and meeting points of university communities. The cost of maintaining such libraries is frightening and staggering. Because of the cost of developing a balanced and up-to-date collation in a university library, it becomes necessary to put in place measures to safeguard and preserve them. This implies that a policy framework or disaster plan is needed to achieve this. This plan will include a comprehensive insurance policy for both library staff and resources against disaster eruptions. Serious consideration should also be given to fumigation of university library materials, provision of vacuum thermal freezers, dehumidifiers, and back up for resources. Installation and application of technological systems like geographic information systems, heat smoke detectors and remote sensing technology are necessary and sufficient condition for disaster mitigation in university libraries in South East, Nigeria.

### **References**

- Adedibu, I. A. et al (2009). The State of disaster preparedness in fourteen libraries in Kwara State, Nigeria. *Nigerian Libraries* 42:45-57
- Adekanye, E.A. (2010). Insurance Coverage in Nigerian academic libraries *Library Philosophy and Practice* 2010.Digital commons.unl.edu./libphilpract 712
- Ajala, S. F. and Adekanye, E.A. (2007). Incidences, patterns and preparedness for disasters in

- Nigerian Libraries: a case study of Lagos and Oyo States. *Gateway Library Journal* 10(1). 61-72
- Akussah, H. (1996). The preservation of Traditional Library and Archival Materials in the "Harsh" Ghanaian Environment. *African Journal of Library, Archival and Information science* 1(1), 19-28.
- Alegbeleye, B. (1993). Disaster Control Planning for libraries, archives and electronic data processing Centres in Africa. Ibadan: Option Book Information Services.
- Betrand Library (2005). Disaster Plan [www.facstaff.buckwell.edu/van\\_fleet/DPLAN.html](http://www.facstaff.buckwell.edu/van_fleet/DPLAN.html)
- Bolger, L. (2003). "Scared or prepared disaster planning makes the difference" [http://www.sla.org/documents/scared](http://www.sla.org/documents/scared_or_prepared.htm) or prepared htm.
- Buchanan, S. (2002). *Disaster Planning: Preparedness and recovery for libraries and Archives*" a RAMP study with guides. Paris: UNESCO.
- Buchanan, S. (2003). Disaster prevention, preparedness and action. *Library Trends* 30 (2), 241-252.
- International Council on Archives (1997) Guidelines on disaster prevention and control in archives Paris: International Council on Archives.
- Gupta, A. (2000). Information Technology and Natural Disaster Management in Indian. [http://www.gisdevelopment.net/aars/2000/ts8/hmi\\_0001.asp](http://www.gisdevelopment.net/aars/2000/ts8/hmi_0001.asp).
- Issa, A.O. et al (2012). Disaster Preparedness at the State Public Library, Ilorin, Kwara State, Nigeria. *Library Philosophy and Practice* 2012. Digital commons.unl.edu/libphilpract 712.
- Jimoh, Y. (2004 October, 19). "Poly Students set classes ablaze" Nigerian Tribune, p.3
- Kostagiolas, P. et al (2011). "Disaster Management approaches for academic libraries: An issue not to be neglected in Greece" *Library management* 32(8/9), 516-530
- Lyll, J. (1993). Staff papers: disaster planning for libraries and archives: understanding the essential issues. *Proceeding of the Pan-African Conference. on Preservation and Conservation of Library and Archival Materials*. Nairobi, Kenya.
- Ngulube, P. (2005). Disaster and security Management in Public Archival institution in ESARBIA region. *African Journal of Library, Archival and Information Science*, 15(1), 15-20.
- Nwamefor, R. (1974). Security Problems of University Library in Nigeria. *Library Association Record* 76(12) P244-245
- O'Connell, M. (1983). "Disaster Planning: writing and implementing plans for collections-holding institutions." *Technology and Conservation*.

- Ojo-Igbinoba, M.E. (1993). Monograph on African Librarianship No. 3: The Practice of Conservation of Library Materials in sub-Saharan Africa.
- Perker, T.A. (1987). Integrated pest management for libraries. In M.A. Smith (ed.) preservation of library materials (pp. 103-123) Saur verlap: IFLA publication.
- Rao, D.P. (2004). Disaster Management. <http://www.gisdevelopment.net/application.natural-hazards/overview/nho0004.htm>.
- Rifkata. I. (2012). Disaster in literary and their control available [online@sosfromdiasasters.blogspot.com/2012/02/disasters-in-libraries-and-their-html](http://online@sosfromdiasasters.blogspot.com/2012/02/disasters-in-libraries-and-their-html).
- Sahu, S. (2009). Guidebook on technologies for disaster preparedness and mitigation. <http://www.technologies> for disaster preparedness & mitigation. pdf.
- Suleman, M. (2009). Disaster control measures in academic libraries in Nasarawa State. *Unpublished MLS thesis, University of Nigeria Nsukka.*
- Teferra, B. (1996). Security Management of Collections in Ethiopian Academic Libraries. *African Journal, Archival and Information Science*, 6 (2) 121-127.
- Troll. D.A. (2002) "How and why libraries are changing: what we know and what we need to know. *Library and the Academy*" 2(1), 97-121
- Venkatachary, K.V., Manikian, B. and Srivastava, S.K.H. (2004). Harnessing Information and Technology Disaster Management. <http://www.aia.org/indians> 2004/Disaster management. pdf.