1.   LITERATURE REVIEW

2.1   Preservation and conservation practices of print resources in university libraries

Whereas the need for every generation to document events peculiar to it underpin preservation and conservation of information resources practices in libraries, the maintenance culture built around them (print or digital) is significant to their usefulness and life span. Quite a number of studies have been done to examine the perception, extent, relevance, methods and challenges facing preservation and conservation practices in libraries with mixed reactions emerging. It was revealed from a study that seeks to determine the preservation and conservation methods being applied to library materials in university libraries in Southwest Nigeria that dusting, cleaning and proper shelving to allow free flow of air were the major preservation and conservation activities (Osunride & Adetunla, 2016). A comparative analysis of the preservation and conservation practices of selected special and academic libraries in Southwest Nigeria also showed similar results. Besides adequate security measures put in place to curb vandalism and mutilation which ranked highest for academic libraries, the study further revealed that next to cleaning and dusting are binding and photocopying; highlighted as the most regularly practiced preservation and conservation activities in the studied libraries.

Preventive activities mostly engaged in by libraries towards safeguarding resources in order to ensure that they are not exposed to deterioration include digitization, lamination, photocopying and binding (Ogbodo, 2011). Similarly, Njeze (2012) surveyed the challenges of preservation and conservation in six private university libraries in Southwest Nigeria. The study found that the techniques commonly employed for preserving and conserving library resources include binding, photocopying, cleaning, dusting and proper shelving as specified by 85 per cent respondents who are in the majority. Also, 42 per cent averred that they preserve and conserve their resources through lamination and use of insecticides. Only an insignificant 3 per cent indicated the use of micro-filming and de-acidification measures. The finding of Adekannbi and Wahab (2015) lent further credence to this

outcome where it was revealed that the least used preservation and conservation technique for library resources was de-acidification.

From the foregoing, good house-keeping routines techniques like cleaning, dusting, proper shelving, binding and photocopying of library resources are dominant among the measures engaged towards preserving and conserving the materials among libraries in the region. In contrast, the maintenance of an ideal room temperature level through the use of air-conditioners, prevention of direct sunlight on paper-based collections using window blinds, removal of excessive moisture from the stack area using dehumidifiers and control of biological agents using insecticides among others measures are not given their pride of place in the preservation and conservation practices.

2.2   Digital preservation practices in university libraries

The proliferation of information-bearing materials calls for urgent deployment of technology to safeguard electronic resources. The fragility and volatility of digital resources constantly mount pressure on libraries to adopt or engage unique activities commonly referred to as 'digital preservation' towards sustaining them. Digital preservation entails the processes involved in the maintenance and accessibility of digital objects on a long-term basis (Velmurugan, 2013). Similar definition that captures accessibility, authenticity and integrity of digital objects has also been provided (Sadiku, Shadare & Musa, 2017). The maintenance activities for digital resources differ significantly from those of prints as a result of their peculiar nature. Thus, digital preservation embraces various activities which help to ensure a continued access to information existing in digital format. As Styblińska (2006) noted, the need to preserve and have access to digital resources is currently increasing and at exponential pace.

Quite a number of techniques have been proposed for the preservation of digital resources—digitized or born digital. These include migration, emulation, refreshing, encapsulation and replication (Gaur & Tripathi, 2012). Whereas it has been reported that there is no agreed-upon 'best approach' for all digital resources (Kim, 2018; Tristram, 2002) among available strategies, evidence abound that migration and emulation are better methods (Rosenthal, 2015; Guttenbrunner & Rauber, 2012). However, it has been argued that of the two methods, migration is a

preferred relative to emulation; due to the far-reaching economic implications of the latter (Rosenthal, 2015) and its ability to hide technical context (Rieger, Murray, Casad, Alexander, Dietrich, Kovari, Mericle, Muller & Paolillo, 2015). A view earlier shared by Granger (2000).

While some of these methods have been implemented and are still being implemented to safeguard and prolong digital records in the Nigerian academic library environment, the same situation may not hold sway for others. Gbaje (2011) surveyed the National Library of Nigeria (NLN), the National Archives of Nigeria (NAN) and the National Bureau of Statistics (NBS) to ascertain the extent of digital preservation practices and structures put in place. It was found that migration of data was the most adopted digital preservation strategy with no structures in place. Five years down the line, refreshing, migration and technology preservation were observed as the most utilized digital preservation approaches in special and academic libraries in Southwest Nigeria with a low extent of implementation reported (Osunride & Adetunla, 2016). This position aligned perfectly with a study carried out in the Indian academic context (Sawant, 2014).

Sambo, Omeluzor and Usman (2014) sampled 603 certified librarians in Nigerian using a conference to determine their awareness level of preservation strategies. Regrettably, 70 per cent indicated that they have not had any digital preservation training and as a result, they were not equipped with relevant skills to appreciate the exercise. Three years after, the situation has not changed significantly as Sambo, Urhefe and Ejitagha (2017) found that lack of training was second, behind hardware and software obsolesces, on the list of challenges confronting digital preservation programmes in Nigeria. Similar challenges have been observed in the Zimbabwean National Archives context (Sigauke & Nengomasha, 2011). As reported, relevant expertise is core to the implementation and management of digital preservation system (Rinehart, Prud'homme & Huot 2014). The situation tend to be different from the South African context as Masenya and Ngulube (2019) revealed the availability of formal digital preservation programme as 68.2 per cent of the academic libraries surveyed indicated. Furthermore, the study showed that an overwhelming majority of 95.5 per cent of the respondent stated that preservation of digital resources has been undertaken in their various institutions.

2.3. Librarians' perception of disaster preparedness in Nigerian university libraries

Individual assessment and understanding of any subject matter is perception-based. Whether or not the perception would be positive or negative; high or low is a function of other variables. For example, Nigeria is not predisposed to natural disasters. This could affect Nigerians' general perception on disaster—whether natural or man-made. This may not be unconnected to why it has been reported that some librarians pay little or no attention to disaster preparedness, due to the assumption that Nigeria and indeed Africa are not prone to disasters and that library disasters are not widespread in the region (Echezona, Ugwu & Ozioko, 2012).

Disaster preparedness embraces activities, programmes, policies as well as measures which are taken up before (to prevent or mitigate), during (to respond) and after (to recover) from the loss accompanying emergency. The importance of these activities has been long emphasized. For example, the International Federation of Red Cross and Red Crescent (1970) posited that the objectives of disaster preparedness are to increase the efficiency, effectiveness and impact of disaster mitigation, response and recovery mechanisms. Disaster preparedness comprises every action geared towards maintaining a satisfactory level of readiness for a corresponding rapid response to emergency situations. It equally embraces the measures put in place for enhancing life safety in the face of disaster, actions towards the protection of property as well as those meant for restoration and recovery (Sutton & Tierney, 2006).

Considering the value of any information system, no amount of preparedness activities engaged in to safeguard information resources from decay or total lost is sufficient. But it appears disaster preparedness awareness level among librarians in developing economies is the bane of the obvious neglect reported in literature (Idiegbeyan-Ose, Izuagbe, Ifijeh, Ilogho, Iwu- James & Osinulu, 2018; Ilo et al., 2018; De Silva, 2004). A scenario was reported from the Ghanaian context where Management staff averred that staff members of the library were adequately prepared to effectively prevent or respond to emergencies. In contrast, staff members' opinion from the responses provided indicated otherwise (Ahenkorah-Marfo & Borteye, 2010). This paradox is an indication of low emergency preparedness both at the

individual and organizational levels. In a recent study, librarians' perception was identified as one of the challenges confronting effective disaster management in Nigeria (Ilo, Ngwuchukwu, Michael- Onuha & Segun-Adeniran, 2019).

2.4. Preservation activities, disaster preparedness and library resources

The ultimate goal of preservation is to slow down the wear and tear of library information stock thereby prolonging the life-span and ensuring long-term access to the resources. Whereas achieving this goal dependent on factors such as adequate funding (Olatokun, 2010; Ogunmodede & Ebijuwa, 2013), the availability of relevant technology infrastructure and technical expertise are also essential to the success of the entire process. As much as closed circuit cameras are key components of disaster preparedness in libraries (Ilo et al., 2018; Donald, 2012) towards early detection of possible hazards and monitoring emergencies, they are being used to foster preservation activities in order to monitor and deter mutilation, vandalism and outright theft of library resources (Segaetsho & Mnjama, 2012; Akussah & Bentil, 2010).

While Ilo, et al (2018) listed strong anti-virus software, dust extractors, insecticides/pesticides, plastic sheet cover, hard drive and other storage devices among disaster prevention measures, evidence of the use of these items in preservation and conservation activities abound in literature (Adekannbi & Wahab, 2015). Preservation activities (e.g. digital preservation) and some aspects of disaster management (e.g. digital disaster) are intertwined; as some equipment and processes designed to manage disaster could also be helpful in preventing and mitigating the effect of the deterioration of library resources, vice versa.

Good housekeeping practices could be essential both to preservation of information resources and disaster management. It is a good housekeeping principle to strategically position all relevant equipment for effective deployment when the need arises. The proximity of these items (e.g. humidity control cassettes, dryers, dust extractors/vacuum cleaners, fire extinguishers, insecticides/pesticides and mops) to the stack areas play an important role in the speed and efficacy of response the library can offer in the event of emergency (Wong & Green, 2006). The degree of effectiveness of the response process will in turn determines the resuscitation and

restoration attention affected library materials will require.

Technically speaking from the digital preservation context, it has been observed that during migration, authenticity of a digital record could be compromised, functionality and data could be lost (Dressler, 2010), since the process involves the relocation or copying of data from outdated or endangered file formats by means of technology to one that is modern or prevailing (Venkadesan, 2010). This method portends significant hazards to libraries and the collections with which they support scholarship. Therefore, if technological incompetence or non- deployment of relevant technology infrastructure occasion the loss of library data, disaster has occurred. It therefore follows that adequate preparedness measures put in place to ensure digital preservation could go a long way to prevent digital disaster. On the other hand, poor disaster preparedness measures could facilitate the destruction of important computer hardware hosting the programmes for accessing digital resources. As a result, the study hypothesizes that:

H1:   *There is no significant mean (X) difference between librarians' perception of preservation and conservation activities and disaster preparedness measures on information resource*
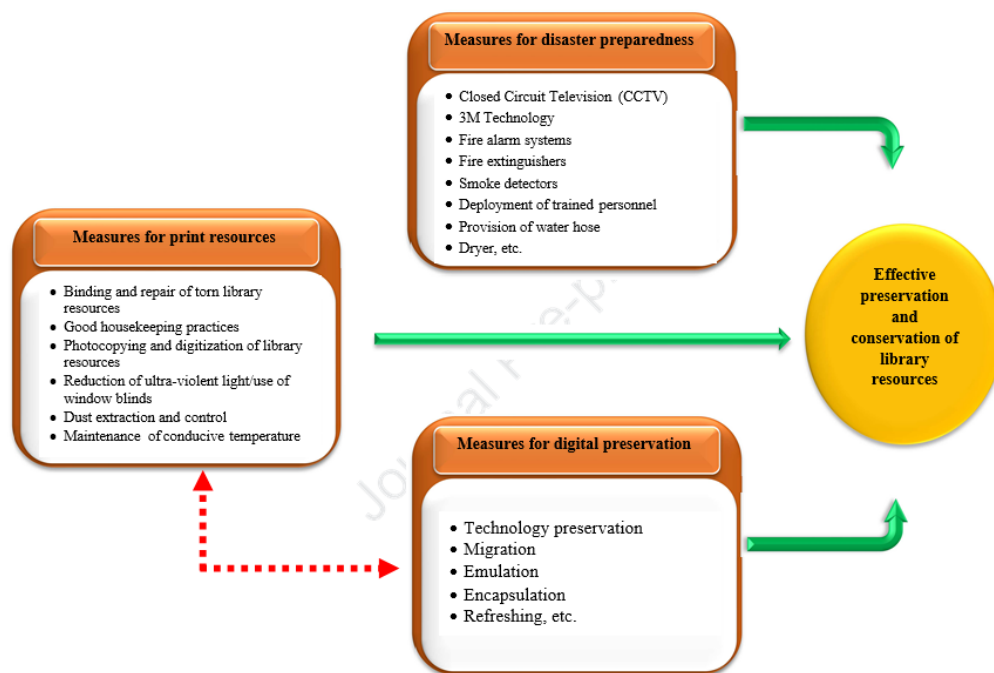
Measures for disaster preparedness

- Closed Circuit Television (CCTV)
- 3M Technology
- Fire alarm systems
- Fire extinguishers
- Smoke detectors
- Deployment of trained personnel
- Provision of water hose
- Dryer, etc.

Measures for print resources

- Binding and repair of torn library resources
- Good housekeeping practices
- Photocopying and digitization of library resources
- Reduction of ultra-violent light/use of window blinds
- Dust extraction and control
- Maintenance of conducive temperature

Measures for digital preservation

- Technology preservation
- Migration
- Emulation
- Encapsulation
- Refreshing, etc.

Effective preservation and conservation of library resources

Fig. 1: Schema diagram for librarians' perception of disaster preparedness, preservation and conservation of library resources

It has earlier been established in the study that any damage to library resources is a disaster considering its effect on scholarship. As a result, employing disaster preparedness approach was theorized as a broader and more effective means of safeguarding library collections from all forms of hazards and emergencies. This implies that librarians' view of disaster preparedness is a factor of the effectiveness of preservation and conservation methods employ to safeguard library resources. Figure 1 illustrates the role of each activity to effective preservation and conservation of library resources. The items listed as measures of the variables are based on extant literature which also guided the development of the measurement scale for data collection.

Besides the general disaster preparedness measures for either preventing disaster occurrence or responding adequately or at least, mitigating its impact and recovering with minimal consequences, the schema diagram further indicates that each library resource (print or electronic) requires unique measures for achieving effective preservation and conservation outcome. The diagram suggests that until a well-coordinated all-inclusive disaster preparedness approach is employed, the overall maintenance and sustainability of print and digital resources remains a mirage.