



**Factors Affecting Preservation and Conservation of Educational Resources in African  
Tropical Countries: A Review of Literature**

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**Abstract**

The paper examined various factors affecting preservation and conservation of educational resources in African tropical countries. Specifically, it focused on some general features of a tropical climate as they affect educational resources stocked in the libraries for use, concepts of preservation, conservation, and restoration of library resources were highlighted, causes of deterioration of library information resources in tropical African countries, among which are: natural aging process, level of usage of the library materials, inherent chemical content used in the process of producing paper, high temperature and fluctuating relative humidity, improper handling of library materials among many others were equally discussed. Various preventive measures were equally discussed. Some useful preservative measures were pointed out to ameliorate the ugly atmospheric conditions affecting educational resources in tropical African countries. The paper recommended that tropical libraries should be adequately funded. Therefore, governments at all levels are urged to provide enough funds for the preservation of information resources in libraries. Also, all the information resources acquired must be adequately preserved to prolong their lifespan in the libraries among other useful measures.



**Keywords:** Educational Resources, Tropical Countries, Information Resources, African Libraries, Preservation, Conservation

### **Introduction**

Library can be regarded as a well-ventilated room (s), spacious place, or building sited in a conducive and quiet environment where books and other educational resources are being selected, acquired, processed, organized, preserved, and displayed for reading, research, and reference purposes. The library preserves and conserves the intellectual heritage of any information society. To this end, libraries can be seen as knowledge storehouses of any enlightened society. These resources appear either in print or non-print format that need regular maintenance to enhance their life span. In other words, the library is one of the social institutions that have the primary roles of acquiring, processing, organizing, preserving as well as conserving the print and non-print information resources for users. Library is a repository of knowledge and a social institution saddled with the responsibility of disseminating organized knowledge to various information seekers without any discrimination. Information collections are the priceless heritage of mankind as they preserve facts, ideas, thoughts, accomplishments, and evidence of human development in multifarious areas, ages, and directions.

Similarly, information resources according to Oluwaniyi (2015) can simply be defined as information carrier resources that are systematically processed and stored in the library shelves for easy accessibility and retrieval to meet the information aspirations of various information seekers. These consist of book materials, microforms, and electronic information materials capable of meeting the information needs of the users. It can be observed that different information resources are acquired and carefully presented in the Library to meet the information needs of various information seekers. Library collections according to Oluwaniyi (2015), are those materials which enable libraries to carry out their functions effectively. These are known as information-bearing materials. Library resources can be classified library information resources into three (3) broad categories: print resources, non-print resources and electronic resources.

Library information resources are very essential because they are librarian's stock in trade; there is no way a library can offer any meaningful service without these library resources. Moreover, Babalola (2012: 206) asserted that educational resources stocked in the library can be damaged by some environmental factors. Aina (2003) posited that preservation is the maintenance of library information materials so that they can be closed to the original condition as much as possible. The Aina (2003) reiterated that many preservation methods such as eliminating or reducing the factors that accelerate deterioration of information resources especially paper-based materials such as high temperature, relative humidity, and long exposure to sunlight rays. Singh and Kaur (2009) opined that preservation and access to knowledge and information resources are the main mandates of libraries alongside supporting the mission of its



establishment. Preservation as a collection management strategy has been relegated if not neglected by librarians and information experts for a very long time in most African countries, especially in Nigeria.

Conservation and preservation of deteriorating information resources in libraries have become a global phenomenon to which libraries must aggressively respond if their mission of providing information needs of their patrons would be met (Akande, 2009). Ogunmodede and Ebijuwa (2013) noted that libraries acquire different educational materials to meet the informational or recreational needs of their clientele. When those materials in one's care are allowed to deteriorate unchecked or become damaged in any way, it may be difficult to access the information stored in them to use in meeting one's information needs. It is the responsibility of the library staff to keep these materials in good physical condition so that they are available for users at all times. Materials in many libraries and archives throughout the country are still housed in conditions that leave much to be desired (Olatokun, 2008).

Deterioration of information materials is one of the basic challenges facing library materials which are prone to wear and tear shrinkage, cracks, brittleness, warping, bio-infestation, discoloration, abrasion, hole, dust, and dirt accumulation. External causes of deterioration of collections include poor handling or storage, theft or vandalism, fire and flood, pests, pollution, light and incorrect temperature, and relative humidity (Popoola, 2003; Alegbeleye, 2002). Therefore, knowledge of the causes of deterioration of library information resources is very essential for librarians and others who are concerned about the preservation of information stored in books and non-book formats (Varlamoff, 2005).

## **LITERATURE REVIEW**

### **Concepts of Preservation, Conservation and Restoration**

The terms Preservation, Conservation, and Restoration are three essential terminologies that would enhance the sustainability of any educational resources stocked in the library for reading, research, and reference purposes. Those three terms are to be clearly understood, and the distinction between them is carefully maintained. Kamila (2012) asserted that preservation is vital to the sustenance, growth and development of educational materials stocked in the library. It can be noted that well preservatory measures enhance the average lifespan of both printed and non-printed library resources for future generations. Preservation is as old as a human being. It is done on a different aspect of human life. In our homes, schools, markets, hospitals, farms, and so on, we preserve the items we make use of. This is done using different means in order to elongate the lifespan of such items. Means of preservation include drying, smoking, photocopying, stitching, and so on. Due to the deterioration of library and information materials, preservation is necessary for libraries, information centers, museums, records centers, and archives. Preservation involves measures taken to slow the deterioration of library collections by careful handling and providing a sympathetic environment to such collections. (Adcock, 2014).



Preservation is an aspect of the management of the library. Its objective is to ensure that information survives in a usable form for as long as it is wanted. In many cases, this implies the survival for the same period of the physical medium which contains that information, whether it is a manuscript, a printed book, a videotape, or a floppy disk. In most cases, the medium will be that in which the information was originally stored and disseminated by its originator or publisher, although this is not a necessary condition for the preservation of the information. Indeed the preservation of the original medium is sometimes undesirable and occasionally impossible. The essential characteristic of preservation is that it is a large-scale operation, concerned with the effective management of the library's stock, or information resource.

Preservation is all the managerial and financial considerations including storage and accommodation provisions, staffing levels, policies, techniques, and methods involved in preserving libraries and archive materials and information contained in them. As stated by IFLA, it is used to refer to all necessary strategies, measures, and steps invested into prolonging the life of library information resources. It also includes surveying the proper storage and handling techniques, security including theft, vandalism, disaster, prevention, education, training, and outreach program for staff, patrons, clientele, and public (Makwae, 2017).

Conservation, on the other hand, is a direct method of treatment in which an information resource physically or chemically changed and these include, cleaning, repairing, rebinding, and reformatting. Conservation is one aspect of preservation activity in any library. It is an important preventive measures, or processes of repair of damaged material, to ensure the continued existence of individual items. Even here, however, there is an important managerial element. (Kamila, 2012). The term 'conservation' is being used widely today in various fields such as conservation of forests, conservation of documentary, and cultural heritage. Conservation is the concept used for safety and security towards life against endangering agencies.

Restoration according to Kamila (2012), is the least common and the least useful of the three terms, for in this context it has a very precise meaning. It is taken to mean the attempt to restore a damaged item to its original condition by careful imitation of materials and techniques. Such activity can, of course, be justified in aesthetic and historical terms. We do not repair medieval cathedrals with reinforced concrete; it would be equally insensitive to restore a medieval manuscript with a binding covered in imitation leather. The cost of restoration, and the use of rare skills which it demands, can be justified only in a very few cases of books of outstanding beauty or importance whose significance as museum objects is at least as great as their significance as carriers of information.

### **Conservation Practices in African Libraries**

Preservation is a crucial element in the process of managing information resources in the library. It can be generally observed that most African libraries especially in Nigeria are within the tropical zones which. Nanzip (2020) noted that tropical climates are unfriendly and very harmful



to any printed materials and thereby endanger the lifespan of average library resources. Therefore, there is a need for the preservation and conservation of these intellectual resources for use by both present and unborn generations. Besides, it is imperative to note that preserving and conserving the library's intellectual resources become not only the academic commitment but also the statutory responsibility of the librarians/information scientists, who are in charge of these repositories as well as various library stakeholders (users).

Preservation aims to prolong the life span of information resources. Yet several factors are responsible for the quick deterioration and decay of information resources in libraries. Therefore, it is the responsibility of the librarians to see that their information resources are preserved for the maximal use of the clientele.

Preventive measures should be put in place for the preservation of information resources in libraries. Jyotshina (2005) opined that preservation of information resources in libraries is divided into two (2) aspects:-

1. The preventive measures
2. The curative measures

1. The preventive measures: - These include all forms of indirect actions aimed at prolonging the life span of library information resources. It comprises all the methods of good housekeeping, caretaking, dusting, installation of thermometer and fire extinguisher on the library walls, use of humidifiers, periodical supervision, and prevention of any possibility of damage by physical, chemical, biological, and human factors.

2. The curative measures: - These include all forms of direct actions aimed at prolonging the life span of library information resources. It includes repairing, mending, fumigation, de-acidification of information resources in the libraries.

However, Oluwaniyi (2015) noted that there are dos and don'ts which the librarians and the library users should follow to increase the longevity of information resources in the libraries. These are among others:-

1. Installation of thermometer at the wall of school to regulate the temperature as at when necessary;
2. Rare information resources and manuscripts should be kept in specially prepared containers;
3. The use of a humidifier to regulate the atmospheric moisture;
4. Installation of a fire extinguisher in case of fire outbreak;
5. Regular dusting of shelves and information resources available in the libraries by using a vacuum cleaner or fine brush;
6. Maintenance of optimum storage condition is necessary to control the propagation of biological agents of deterioration such as insects, rodents, moulds;
7. Provision of photocopying machine to reproduce rare information resources to keep the original copy;



8. Care should be taken while photocopying any information-bearing materials because as at that time stress is imposed on such material. The binding and the spine may damage;
9. Fumigation and constant mopping of the floor of the libraries to prevent any destructive microorganisms that are a threat to information resources;
10. All library staff should be trained on how to handle information resources and likewise the library users;
11. A disaster plan for the school library should be prepared and reviewed at regular intervals;
12. When information resources are displayed open, never use metal clips or pins to hold book pages open;
13. Do not deface the information resources either by biro or any other writing material;
14. Preservation policies for the libraries should be adhered to at all times;
15. The libraries should ensure that food items and water are prohibited in the library premises to avoid ants and other agents of destruction and
16. Air conditioning system and fans for cooling the library information resources and the users are very essential in libraries for preservation as well

### **Causes of Deterioration in Libraries**

Men are unquestionably the greatest enemies of the materials on which they record their thoughts. To the long list of great libraries vandalized by conquering armies or burned in hate, must be added the incalculable loss and damage caused by petty theft, malicious mischief, and careless handling by individuals. Improper and faulty actions taken by the library staff may cause deterioration to library materials. Cheap and improper materials are often used for mending and repairing. Wrong insecticides are used for fumigation, repairing, restoration and lamination work, which are usually done by untrained personnel. And all these conditions cause deterioration or worse, aggravate deterioration of library materials (Mahapatra & Wamukoya, 2004).

In a previous study, Kamila (2012) revealed the enemies of library materials to include: book worm; booklice or psocids; cockroaches; silverfish; moths; crickets; mice; human beings through touch/war; bio-deterioration of fungi; foxing; white ants; natural calamities like cyclone, tsunami, flood, landslide, earthquake; excessive heat, humidity, and light; dust; air pollution, and so on; chemical reaction; termite; damp library building, among other destructive elements widely common in the tropical region. Also, Edhebe (2004) noted that much avoidable damage is done to books by well-meaning but uninformed librarians through the following: use of pressure-sensitive tapes; indeterminate use of polyvinyl acetate and other synthetic adhesives. Use of highly acidic paper for protective wrappers; Use of wood backing in print, picture, and map frames; amateur lamination; and improper storage. While Information resources deteriorate as a result of internal or inherent vices and external agents of deterioration.

**Internal or inherent vices** are caused by: weakness in the chemical or physical make-up of an object introduced during its manufacturing. Early paper was made from clean lines, cotton, flax,





and strong fibers. It was not treated with bleaching agents and was not sized with rosin and alum. This type of paper was permanent, durable, and was chemically and physically strong enough to endure the wear and tear of the ages. Modern paper (paper produced since the 19th century) has wood pulp as its basic raw materials instead of cotton and line rages. The wood pulp is bleached with chlorine and the paper is sized with alum and rosin. This makes the paper acidic thereby placing the paper in a low PH condition. PH is a symbol used to signify the degree of acidity or alkalinity of any organic material.

**The external agents** can be classified as:

- a. Biological causes
- b. Environmental causes
- c. Chemical causes
- d. Mechanical causes

a. **Biological Causes:** Mold, mildew can cause serious, often irreparable damage to paper materials. The most common species affecting library and archives information resources are silverfish, bookworms, booklice, and cockroaches. Most insects are not attracted to the paper, but rather to sizing, adhesives, and starches that are dark, wet, dirty, clustered, and undisturbed. Mold and mildew are types of fungi, micro-organisms that depend on other organisms for sustenance. Molds excrete enzymes that allow them to digest organic materials such as paper and book bindings, altering and weakening those materials. It can be noted that a clean, well-ventilated, and climate-controlled environment goes a long way toward preventing infestation by any of these pests.

b. **Environmental causes:** Researches indicate that cooler temperatures are preferred for library materials. According to Library of Congress' preservation recommendations, an ideal environment for books is 55°F storage areas. Mixed-use storage areas should be kept at 70°F. If library materials are stored separately from use areas, the temperature can be brought down further to 65°F or less. Uncontrolled humidity levels can cause mechanical damage. If conditions are too humid, material will swell and warp, resulting in cockling and other physical distortions. These dimensional changes weaken physical bonds and set up stresses that can shorten the life of most materials. If conditions are too dry, materials will become brittle and more susceptible to cracking, particularly during handling. Light is very vital in the provision of library services since materials have to be identified and read. On the other hand, it is one of the greatest enemies of library materials, especially paper.

c. **Chemical causes:** Airborne contaminants in the form of gases and particulates can jeopardize the preservation of library materials. Gaseous pollutants can originate indoors from photocopiers, painting, cleaning supplies, untreated wood, and certain kinds of adhesives and plastics.



Particulate pollution is also a great concern. Particulates come in the form of tiny solid substances from smoke, dust, and vehicle engines. The library should be fully air-conditioned, air conditioners are highly recommended for books. Air conditioners help in stabilizing the temperature and humidity for libraries. They also help to filter out particulates and chemical pollutants.

d. **Mechanical causes:** Mechanical damage to library materials includes the human factor and natural disasters. Gabriel Alegbeleye argued that archives and libraries are prone to disasters that can be classified broadly as natural and man-made. Natural damage to materials can be caused by earthquakes, fire, flood, or water, while the human factors include careless handling, vandalism, and improper support during storage

### **Problems Associated with Preservation and Conservation in Tropical African Libraries**

A survey of literature on preservation and conservation of library materials in Africa especially in Nigeria as submitted by Popoola (2003); Olatokun (2010) as well as Ogunmodede and Ebijuwa (2013) revealed the prominent inhibitors to effective and efficient preservation of information materials in African libraries, archives, and record centers include the following:

(i) **Inadequate Finance:** Almost all African libraries, archives, and information centers do not allocate adequate funds in their annual budget for the preservation and conservation of information materials in their holdings. This has caused the low priority or lack of desired attention given to the preservation and conservation of information resources by the management of such libraries and archives.

(ii) **Inadequacy of equipment/materials:** Lack of suitable or inadequate equipment and materials contributes significantly to the present poor status of preservation and conservation of information materials in African libraries, archives and information centers. Some of the essential materials and equipment required for setting up functional conservation and restoration laboratories in African libraries and archives are not available locally (ESARBICA, 2002).

(iii) **Unfavorable government economic policies:** The economic policies of most African governments do not favour library and archival services, so preservation and conservation activities are not given the priority attention they deserve. Such economic policies include those concerning high duties and tariffs charged on imports of preservation and conservation equipment.

(iv) **Unpleasant tropical climate:** The effects of tropical climate of excessive temperature, high relative humidity, dust, and rodents that feed on paper-based materials cause rapid deterioration and decay of information resources in African Academic Libraries and archives. These agents of





rapid deterioration and decay of information materials add more to the costs associated with conservation and restoration of information materials in African library's archives and records offices (UNESCO, 2000). Mwiyeriwa (1998) while stressing the great need for well-established document repair and conservation units in Africa observes that with the exception of air, fungi, insect, and pest are more pronounced in the continent than elsewhere.

(v) **Manpower and other infrastructure:** For any preservation and conservation programme to succeed in libraries and archives there must be adequate and well-trained manpower (Ngulube, 2005). This is because preservation and conservation of information resources is a specialized field of knowledge that requires information professionals who understand the physical and chemical nature of the materials in their library and archive holdings. Popoola (2003) advocates the need to expose librarians and archivists to conservation and restoration practices during their training. Unfortunately, most African countries have not been able to train students adequately in the area of conservation and restoration of information resources due to a lack of functional laboratories where students could undergo practical works. Added to this is the problem of inappropriate buildings, poor power supply, and water supply that pose a great threat to the preservation and conservation of information resources in African countries (Kemoni & Wamukoya, 2000). Also, a lack of information technology (IT) skills due to inadequate training as one of the impediments to the management of electronic records.

(vi) **Lack of preservation and conservation policy:** Most African countries do not have a national information policy which makes the formulation of preservation and conservation policies in the libraries and information centers to be difficult to implement (Wamukoya & Mutula, 2005). The absence of such a plan means that in the event of a disaster, they would not be in a position to respond to the disaster with the urgency that is required.

(vii) **Quality of paper and ink:** The low quality of paper and ink used in the production of information materials especially library book materials and paper-based records in archives and records offices pose danger to the preservation and conservation of information materials in African countries (Popoola, 2003; Mahapatra & Chakrabarti, 2003).

(viii) **Lack of maintenance culture:** African countries generally lack maintenance culture. The management of libraries and archives in Africa nations has poor maintenance culture of infrastructural facilities such as telephones, electricity, water supply, laboratory equipment, buildings, disaster control devices, and so on, meant for their preservation and conservation operations. This factor is responsible for the quick deterioration of their collections. Preventive preservation of information resources calls for constant cleaning of the library/archive building as well as information materials therein. Restoration techniques such as binding and lamination of paper-based information may be used to reduce conservation costs (Popoola, 2003).



(ix) **Administrative problem:** The majority of the library and archive managers concentrate much on the effective provision of information services to users. There is a lack of proper recognition of the need for preservation, conservation and restoration of information resources. This has greatly affected workers' job performance in the organization as it failed to provide them with good condition of service (Popoola, 2003; Olatokun, 2008).

(x) **Cooperative preservation and conservation venture:** African countries lack cooperative preservation and conservation venture either at the regional or local level. With limited resources and diminishing budgets, African libraries and archives can undertake cooperative ventures which may involve the setting up of a joint conservation and restoration laboratory or microfilming unit. Such a venture can deal with the repair of information materials and the training of conservation and restoration staff. Allied institutions like libraries or archives can pool resources together at the regional or local levels to establish a national preservation and conservation center well stocked with modern equipment and materials, qualified manpower, and adequate finance for the repair of damaged information resources. Kemoni (1996) supported this view; he submits that the need to set up a national preservation office in Kenya to coordinate all preservation and conservation issues cannot be underscored. He stresses that the broad objectives of such an office will include:

- a) Creating and promoting awareness of the need to preserve and conserve archival materials;
- b) Organizing seminars, workshops and conferences to discuss issues related to the conservation of archive materials;
- c) Acting as a center for information dissemination;
- d) Soliciting for funds nationally and internationally to purchase equipment and materials; and
- e) Bearing responsibility for the publication of a journal where archivists can exchange ideas through their contributions on issues related to the preservation of archival materials.

(xi) **Public enlightenment campaign:** The lack of public enlightenment campaign has been the bane of poor preservation and conservation of information resources in African academic libraries. Information professionals often criticize the government of their countries in Africa for not giving sufficient consideration to the preservation and conservation of the national heritage. It must be noted that the information managers must embark on public enlightenment campaigns on the need to preserve and conserve national heritage in their countries. For proper conservation of library and archival materials in Africa, the consciousness of the general public and the authorities concerned must be raised on the need for the government to prioritize preservation and conservation of the recorded knowledge. (Oluwaniyi, 2015).

(xii). **Quality of paper and Ink:** The low quality of paper and ink used in the production of information materials especially library books and other paper-based information resources in



libraries pose a serious danger to the preservation and conservation of information resources in African countries (Popoola, 2003; Oluwaniyi, 2015).

(xiii). **Lack of preservation and conservation knowledge:** Akussah (2006) cited in Oluwaniyi (2015) observed that in most academic libraries, there are inadequate knowledge of preservation and conservation of educational resources, this has greatly affected the average lifespan of such vital information resources. This submission attests to the fact that knowledge plays a key role in preservation practices. In the same vein, Ngulube (2005) believes that the real impediment to having viable preservation programmes is not entirely resources-based, but a lack of preservation knowledge.

(xiv). **Lack of commitment of librarians:** Among the problems confronting preservation is lack of commitment by the available human resources, particularly, educating librarians about preservation is now widely recognized as an essential element of any plan to address the preservation problems. According to Harvey (1993) cited by Oluwaniyi (2015), preservation education courses for library professionals are typically in one of three formats: as a part of compulsory courses such as library administration in a first professional qualification; an optional course of about one semester; or a separate qualification, for example, one or two-year courses in preservation administration. He further argued that it is also essential to offer continuing education opportunities in resources preservation for those whose qualifications need updating or those who wish to build on their existing knowledge.

### **Conclusion and recommendations**

The paper discussed the preservation and conservation problems of library materials in African tropical libraries. It was revealed that it is impossible to cultivate the culture of preservation and conservation in such libraries, which places information-bearing materials at high risk of extinction. The main constraints to proper preservation and conservation in academic libraries are lack of funds, lack of qualified conservation librarians, a non-committal attitude of staff, and lack of adequate and dependable storage facilities. Very few librarians are conversant with preservation management, thus militating against any comprehensive preservation programme.

Therefore, the following recommendations are hereby suggested as a way forward in proffering solutions to some factors affecting educational materials stocked in tropical climate libraries :

1. Libraries should be adequately funded. It is when libraries are given priorities in terms of funding that will enable them to preserve their information resources from deterioration and sudden disasters. Therefore, governments at all levels are urged to provide enough funds for the preservation of information resources in libraries;



2. Training of library staff on the preservation of information resources is also recommended. Library personnel should also be sent abroad on the aspect of preservation of information resources because preservation activities are specialized and required information professionals who understand the human, physical and chemical nature of information resources in their libraries;
4. All the information resources acquired must be adequately preserved to prolong their lifespan in the libraries. It should be noted that whenever any library material is adequately preserved, it can serve the information needs of readers for several years but the reverse is the case whenever library materials are not well preserved; and
5. Librarians and other stakeholders in librarianship should be more committed to learning and implementing more modern techniques in tackling the menace affecting the educational resources stocked in their custody and thereby sustains the extension of knowledge to both present and the unborn generations.

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