

---

# Preservation of library materials at the University of Botswana Library

**Thatayaone Segaletsho**

University of Botswana, Department of Library Services, Gaborone, Botswana  
[segaetshot@mopipi.ub.bw](mailto:segaetshot@mopipi.ub.bw)

**Nathan Mnjama (PhD)**

University of Botswana, Department of Library and Information Studies, Gaborone, Botswana  
[mnjamanm@mopipi.ub.bw](mailto:mnjamanm@mopipi.ub.bw)

## Abstract

Preservation is the most important building block in ensuring the long term preservation and accessibility of documentary heritage. This article sought to assess preservation practices at the University of Botswana Library. The aim of the study was to establish the preservation challenges faced by the University of Botswana Library and the measures in place for ensuring the long term preservation of library collections. Data for the study was collected through questionnaires, interviews, observation and content analysis. The findings of the study indicate that while the Library is housed in a magnificent building and holds vast collections of printed materials as well as electronic resources, there is need to implement the draft preservation and conservation policy, improve the house keeping practices and supervision of users using the collections, develop a disaster preparedness plan and develop a strategy for the long term preservation of its electronic resources.

**Keywords** Preservation, conservation, University of Botswana Library, Library materials

## 1 Introduction

The major objective of archival and library services is to facilitate access to collections under their care so that these are accessible for education and research purposes. The other equally important aspect is the preservation of materials under their care so that they can be available to future generations. These two goals are contrary to each other as there is no way collections can be used without them being damaged. Ogden (2010:1) asserts that “libraries, archives, museums, and historical societies are responsible not only for collecting, interpreting, and exhibiting significant materials that document history, but also for the long-term preservation, security, and accessibility of these materials.” The primary goal of preservation is to prolong the life of documentary heritage and to ensure the long term accessibility of such collections by government agencies, institutions, business organisations and the public at large (Forde 2007; Millar & Roper 1999).

According to Harvey (1994:6) “preservation is firmly rooted on the idea that mankind learns from the past and the evidence of the past therefore has considerable significance to the human race and is worth saving.” Harvey (1994:6) defines preservation as “all managerial and financial considerations including storage and accommodation provision, staffing levels, policies, techniques, and methods involved in preserving library and archive materials and the information contained in them.” He further defines conservation as “those specific policies and practices involved in protecting library and archive materials from deterioration, damage and decay, including the methods and techniques devised by technical staff.” According to Morgan and Smith (1997) library resources are very useful due to the information

---

they carry as well as for their physical beauty. The written and documentary heritage which they house provides the raw material that allows society to understand, explain, order and enjoy the visible and invisible world. Forde (2007) argued that the primary goal of preservation is to prolong the life of documentary heritage and to ensure the long-term accessibility of such collections by government, agencies, institutions, business organisations and the public at large. The importance of preserving library collections was summed up by Cloonan (2001:235) when he wrote saying “preservation allows for the continuity of the past with the present and the future.” Similarly it would be a waste of resources if after institutions have devoted considerable sums of money in acquiring and processing the collections these remain inaccessible to scholars and other *bona fide* users.

Although preservation challenges are known throughout the world, there are specific problems faced by conservators in different parts of the world. For instance, the National Archives of the Netherlands (2010) has stated that problems encountered by conservationists in many developing countries are often more complex than their own. England and Evans (1988:1) stated that in 1814 the Library of Congress lost some valuable information resources when the Capitol Building in Washington was burnt down by the British. The investigations that were conducted following the incidence revealed that due precaution and diligence were not exercised to prevent the destruction and loss of collections. In November 1966, floods in Florence, Italy, resulted in severe damage to over two million rare and irreplaceable volumes of collections (England & Evans 1988:1). The disaster became the impetus for disaster planning in libraries and other information centres. Lessons learnt from the 1966 Florence floods have resulted in disaster programs being put in place by many information centres (McCracken 1995).

Preservation of library and archival materials in Africa has not received adequate attention. Ramokate (2006:85) was of the view that “the preservation aspect which is seen as a support function, though not completely neglected, has generally been relegated to the background.” Agreeing with Ramokate, Ngulube (2007:48) asserted that “despite the fact that preservation as part of collection management strategies can prolong the life of public records and archives, and ensure long term access to them, very little attention has been paid to the issue in sub-Saharan Africa.” Rosenberg (1995) also noted that very few studies have been conducted on preservation of library materials in Africa. In a review of literature ESARBICA (2002), Kemoni and Wamukoya (2000), Ngulube (2001), Wamukoya and Mutula (2005) revealed that the major factors contributing to the poor state of preservation and conservation of these materials include inadequate finance, lack of suitable or inadequate equipment, lack of trained conservators, lack of preservation policies and the poor quality of paper and ink used in the production of books and other information materials. A study conducted by Hlabangaan and Mnjama (2008) on disaster preparedness among libraries and information centres in Botswana showed that most of these institutions are yet to develop policies and procedures that are necessary in the event of both manmade and natural disasters. This study focuses on preservation strategies at the University of Botswana Library. The section that follows provides background information on the University Library.

## **2 The University of Botswana Library**

The history of the University of Botswana (UB) Library can be traced back to 1971 when it was a constituent Library of the then College Library of the University of Botswana, Lesotho and Swaziland (UBLS). The Library was moved to Gaborone in 1986. When the Library started operating it had a small collection of about 1,000 volumes. Today, the University of Botswana Library is acknowledged as one of the best in sub-Saharan Africa and

---

provides the following facilities and services to support the teaching, learning and research needs of its users:

- Information resources of integrated workstations and Online Catalogue on dedicated terminals.
- Reader space for individual and group study; i.e. quiet reading areas, seminar rooms and individual open and closed study carrels for use by graduate and PhD students.
- Seminar rooms are available upon booking with the respective floor coordinators.
- Subject Librarians provide specialised research support for learning, teaching and research. Each faculty has a team responsible for a cluster of subjects.
- IT enabled lecture theatre that accommodates 150 patrons is available strictly on a booking system and at a cost. It may be used for workshops or public lectures, and is available to members of the University community for academic purposes only. (UB Library 2010).

The vision of the University Library is to “be a leading customer-centred provider of excellent, globally competitive information services and access to resources” (UB Library 2010). Currently, the Library serves a population of over 15,000 students and a teaching staff of over 800 lecturers. In order to ensure the long-term preservation and accessibility of the collection, the University has employed a team of professionally trained information professionals which include subject librarians, Information systems experts and archivists. The library also benefits from a pool of library, archives and records management lecturers from the department of Library and Information Studies based at University of Botswana. However, despite the excellent building housing the Library, preliminary observations by the authors indicated that the Library faces various preservation challenges which include mutilation of library materials by users of the Library, fluctuations in temperature and humidity, and others.

Botswana is a country that experiences semi arid climatic conditions with very high temperatures and low humidity. The country’s weather can be unpredictable. The University of Botswana is experiencing problems of material deterioration. However, there are no statistics data that can clearly show the rate of materials deterioration in the university library. The University of Botswana Library is not the only Library that is experiencing preservation challenges. Similar challenges are being encountered by other libraries across the world. On average preservation needs survey shows that library staff is not aware of the care and handling procedures of paper materials. This study, therefore, sought to determine the challenges faced by the University of Botswana Library in preserving its collection and thus ensuring that it remains accessible to the users.

### **3 Statement of the problem**

As indicated above, the University of Botswana Library is one of the most modern libraries in sub-Saharan Africa. It is “a Learning resource centre (LRC) providing an integrated learning environment where traditional library services and electronic information resources are easily accessible” (UB Library [n d]:1). The primary mission of the Library is “to provide total support for student centred learning, teaching and research in a technologically advanced environment” (UB Library [n d]:1). For the Library to continue to safeguard its vast collections and ensuring continued accessibility of the same to its patrons there is need to ensure that its collection is stored under appropriate environmental storage conditions. Preliminary investigations by the authors indicated that although the collections are housed in a purpose built library, temperature and relative humidity were not regulated at satisfactory levels, and no measures were in place to adequately safeguard the collection against pest in-

---

festation. This study, therefore, sought to determine the challenges faced by the University of Botswana Library and to make recommendations that will ensure the long term preservation and accessibility of its collections.

#### **4 Objectives of the study**

The broad objective of the study was to establish the preservation challenges faced by the University of Botswana Library and to make recommendations for the long term preservation and accessibility of its collections. Specifically the study sought to determine:

- 1 The availability of a preservation and conservation policy at the University of Botswana Library.
- 2 The types and formats of materials held in the University Library.
- 3 The major preservation challenges facing the University Library.
- 4 Make recommendations for the effective management and preservation of all materials held by the University Library.

#### **5 Research Questions**

The study sought to answer the following research questions:

- 1 Is there a policy relating to the preservation of Library materials at the University of Botswana Library?
- 2 What constitutes library materials at the University of Botswana?
- 3 What are the major causes of deterioration of the library materials?
- 4 What preventive measures are in place at the University Library to ensure the long term preservation of library materials UB library?
- 5 What preventive measures should the Library undertake in order to improve the environment in which the materials are held?

#### **6 Scope and limitations of the study**

This study was limited to the study on preservation practices at the University of Botswana Main Library located in Gaborone Botswana. Due to time constraints, the study did not include preservation practices at the Okavango Research Centre located in Maun, Botswana nor at the Francistown Branch Library located 439km away from Gaborone.

#### **7 Methodology**

Data for this study was collected through the use of a questionnaire, personal observations and literature review. A structured questionnaire was distributed to 92 staff working in the Library department and all respondents were given two weeks to respond to the questionnaire, after which the completed questionnaire was collected by the researchers. The questionnaire was successfully completed by 100% of the staff. The responses from the questionnaire were analysed into themes. Personal observations were conducted in the Library to determine preservation practices, methods and chemicals used to clean the library and also to check the presence of pests. A review of pertinent literature on preservation was also undertaken. Daily temperature and relative humidity recordings were also taken for a period of 12 months in 2008. Discussions with library staff managing different sections of the Library were held. Based on preliminary findings, a seminar paper was presented to the Library where comments and observations were made. The comments from the Library

---

management staff were incorporated into the findings of the study. The major findings of the survey are presented below.

## 8 The findings of the survey

### (a) Preservation policies at UB Library

According to ISO (15489-1:2001:4), “All the organisations need to identify the regulatory environment that affects their activities and requirements to document their activities. The policies and procedures of organisations should reflect the application of regulatory environment to their business processes. An organisation should provide adequate evidence of its compliance with the regulatory environment in the records of its activities.” For this reason, this study sought to establish if the University has any policies relating to the preservation of its vast collection. The findings of the study indicated that a well formulated preservation and conservation policy developed by the Library is available. The policy stipulates that “We recognize the importance of identifying and monitoring the condition of our collections, and that high quality conservation procedures form a central tenet of a preservation and conservation programme. We also recognize there will be a need to prioritize conservation treatments based on conservation requirements, access issues and the objectives of the collection policy” (University of Botswana Archives Preservation and Conservation Policy 2005). The policy aims to “provide a comprehensive statement of intent regarding the care of current and future archive and special collections under the management of the University Library. It outlines the aims and objectives for preservation, and issues to be considered. It also aims to inform preservation activities for all other University Library collections. It is a plan of action for safe keeping” (University of Botswana Archives Preservation and Conservation Policy 2005). As can be seen from the foregoing, the University has formulated an elaborate archives preservation and conservation policy. The question that needs to be addressed is the extent to which the contents of the policy are being complied with. Observations carried out the by the researchers revealed that the preservation and conservation policies are not complied with fully.

### (b) Types and formats of materials held by the Library

The second objective of the study was to determine the nature and composition of library collections held by the University Library. The findings indicate that currently the Library holds more than 400,978 volumes and 18,069 pamphlets. In addition, the Library subscribes to various databases which include subscription to journal titles. A special collection on Botswana consisting of Botswana publications, newspapers, pamphlets, etc and a small number of private papers is held in the Library’s Archives Unit. Moreover, the Library houses around 64 VHS videos, sound and moving image collection items, more than 150 items of long playing record collections, (45 rpm and 33 rpm vinyl), 40 reels, 25 canisters of 35mm and 16 mm film collection items, and more that 100 audio recordings on different subjects. (University of Botswana (UB) Library 2010). According to Nfila (2004:129) the Library acquires “an average of twenty thousand titles a year.” Due to its designation as one of the legal deposit libraries in the country, the Library holds extensive published on Botswana locally and internationally. Many of these materials are held in the Botswana Documentation & Special Collections which include the University of Botswana Archives, the Tshekedi Khama Papers and the Noma Award Archives. From the above results, it is evident that the largest amounts of materials are still in paper format, though increasingly, the Library is acquiring electronic resources. This finding is similar to that of Yeboah (1999) who noted that

---

the Library holds one of the best collections of academic resources in the Southern African region.

**(c) Causes of deterioration of materials at the University Library**

The third objective of the study sought to determine the major causes of deterioration to library materials at the University Library. According to Porck and Teygeler (2000), paper quality varies from flimsy, short-lived newsprint to durable ledger papers suited for storage and archiving. These different paper qualities respond differently to light, temperature, and moisture. Moreover, the low quality of paper as well as poor quality inks used in the production of books and other library materials are some of the contributing factors to the deterioration of library collections. For this reason this study sought to determine if Library staff are aware of the types and quality of paper used in the majority of the holdings. The findings indicate that currently the level of acidity in all documents within the University of Botswana Library is not yet understood. From the observations made, it was noted that most documents within the Library collections show evidence of mechanical and chemical instability. It was observed that some of the documents are discolouring and show signs of particulate loss. It was also observed that some books were turning yellow. Although it was not possible to determine the cause of the discoloration, normally deterioration of this nature may be attributed to some of the following factors:

- (i) **Improper paper manufacturing techniques:** The fibres from which paper is made are from different structural plants. This indicates complex mechanical and chemical reactions that would have taken place during synthesis hence poor manufacturing techniques will result in weak paper materials.
- (ii) **Sizing:** During paper manufacturing, different mechanical and chemical reactions occur. This occurs at certain PH conditions, some at acidic conditions while others at basic and neutral conditions (most common source of acidic condition in paper is the alum-rosin sizing agent which is introduced in the manufacturing process). Acidic conditions tend to produce acidic paper which is highly unstable to chemical reactions. At this stage it is not possible to determine the extent of damage caused by sizing to UB library collections.
- (iii) **Lignin:** Paper material which is made with too much lignin turns to yellow after a few years (Figure 1.0). These colour changes indicate chemical instability within the paper material hence showing paper deterioration. An example of yellowish pages due to the presence of lignin and chemical instabilities is shown below (Ververisa, Georghioua, Danielidisb, Hatzinikolaoua, Santasc, Santasc & Corletid 2007).

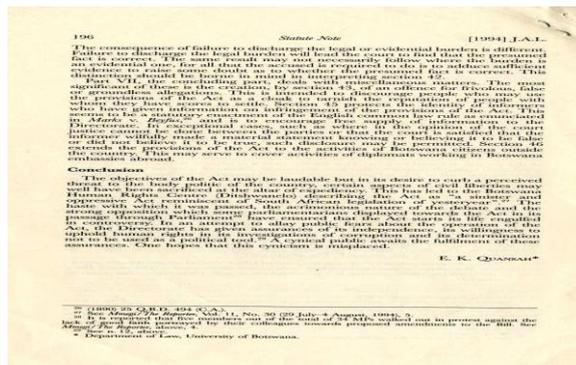
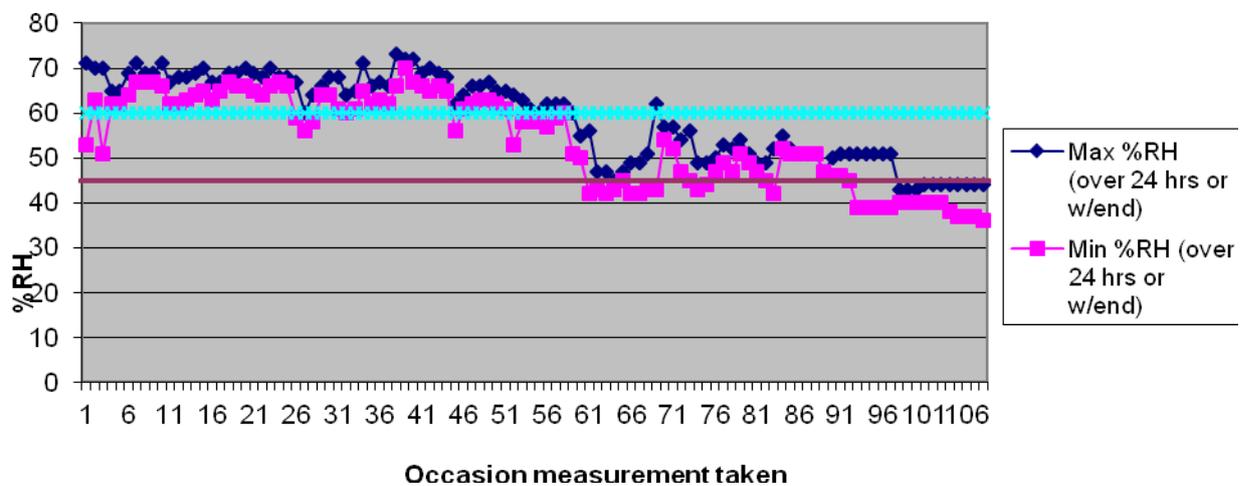


Figure.1.0 showing yellowish pages due to presence of lignin and chemical instabilities.

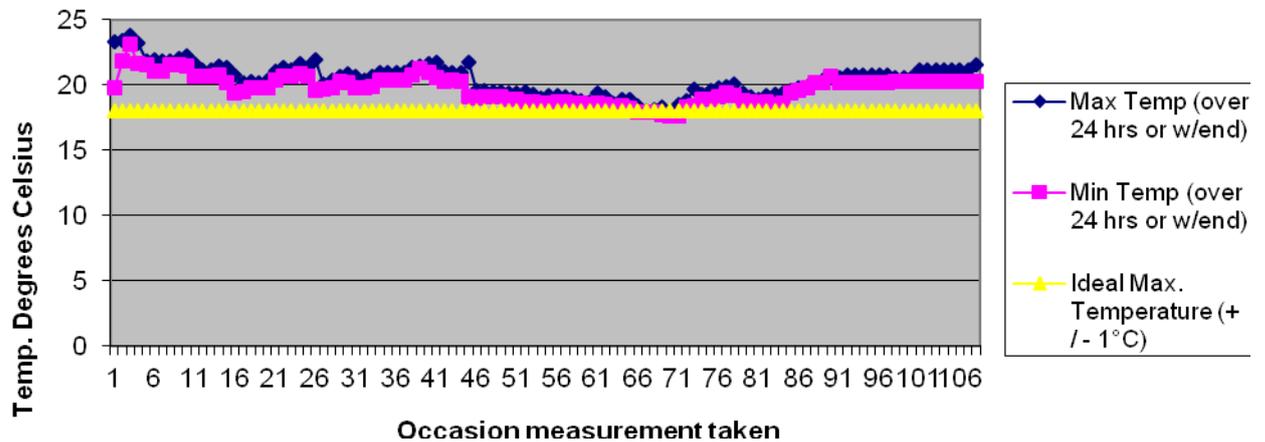
#### (d) Storage and environmental conditions in the Library

A major requirement in the long-term preservation of library collections is to ensure that temperatures and relative humidity are monitored and controlled. Books and non-book materials require different environmental conditions. It was however, observed that that, apart from the Botswana collection which is housed separately in the lower basement floor, there are no separate storage areas for book and non-book materials. All collections in the Library are stored under the same environmental conditions irrespective of their format requirements. It is crucial that fluctuations in temperatures be guarded against materials. For this reason, this study sought to establish whether temperatures and relative humidity are regulated in the Library. The findings of the study indicated that there is high fluctuation in temperatures depending on the external environmental conditions. The University of Botswana Library building is designed for students, staff and public use. The heat and air condition program for patrons and staff is set to maintain a comfortable environment for access. Available literature shows that storing paper at high temperatures and relative humidity increases the rate of material deterioration. High temperatures and relative humidity provide conditions which are conducive for micro-organisms and pests infestation. Statistics on environmental monitoring at the Botswana Document and Special Collection (BDSC) rooms taken in 2008 shows that relative humidity ranged from between 35% and 70% and temperature ranged between 18°C and 24°C (from January to June 2008 as shown in Figure 2 and 3).



**Figure 2 Relative humidity monitoring at Botswana Documentation and Special Collection (BDSC) area, Jan-June 2008**

As from July to December 2008, Relative Humidity ranged between 25% and 50% and temperature ranged between 20°C and 25°C as shown in Figure 4 and 5 below.



**Figure 3 Temperature monitoring for Botswana Documentation and Special Collection (BDSC) area, Jan-June 2008**

As can be seen from Figure 2 above, the Library collections are currently stored at temperatures around 19°C  $\pm$  5°C and unpredictably highly fluctuating relative humidity that ranges from 25% to 70% depending on the season of the year. This clearly shows that there is need to improve the environmental monitoring system. Based on the above findings, and taking into account available evidence from other sources the environmental conditions in the BDSC 2008 if allowed to remain unchecked for long would render the collections a life of less than 50 years from now.

High temperatures with lower humidity result into an accelerated dehumidification of paper materials (paper material is hygroscopic, loses and absorbs moisture) hence culminating into an increased rate of the paper becoming brittle (Van der Reyden 1991). As regards Relative Humidity in the Library, the findings indicated that over the years, the Library special collections have been maintaining records of temperatures and relative humidity. The relative humidity for the Botswana Collection between July and December 2008 are as shown in Figure 4 below.

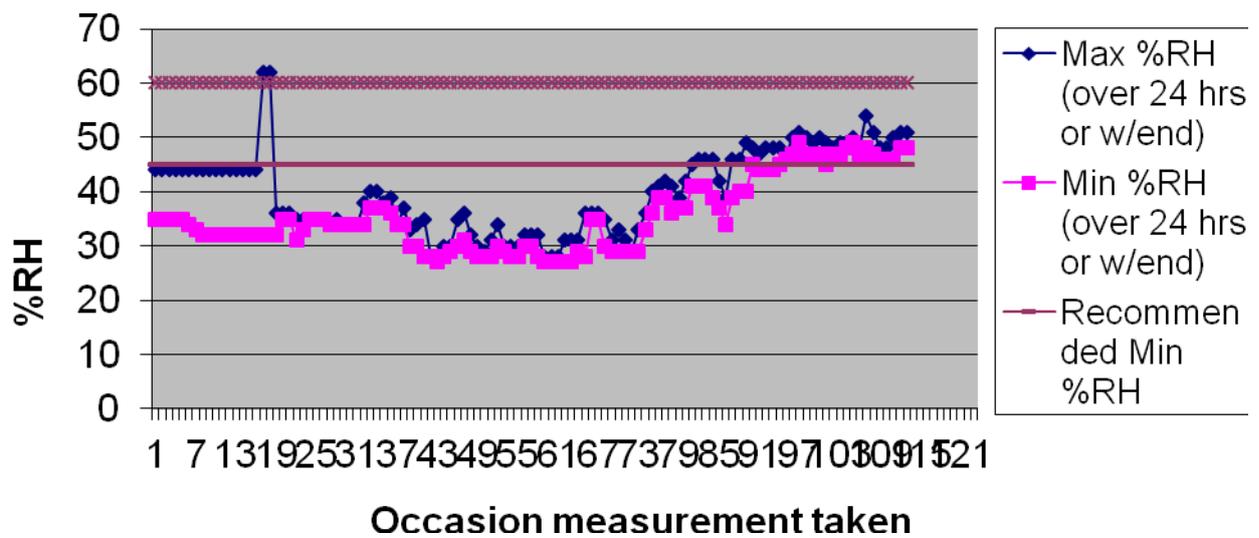


Figure 4 Relative humidity monitoring at Botswana Documentation and Special Collection (BDSC) area, Jul-Dec 2008

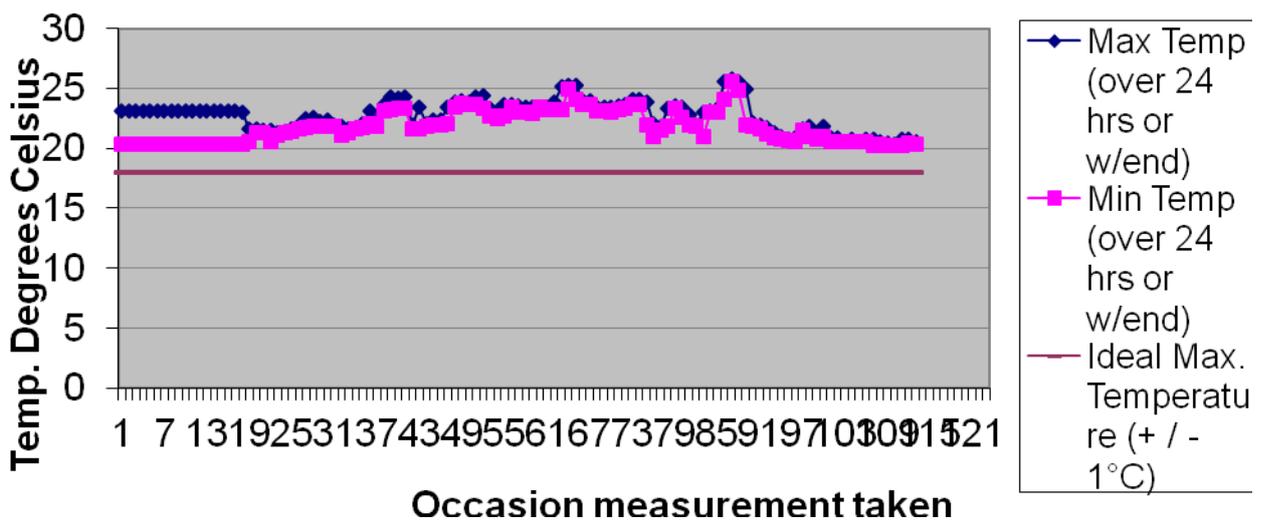


Figure 5 Temperature monitoring for Botswana Documentation and Special Collection (BDSC) area, Jul-Dec 2008

As can be seen from the above Figures, the library has made efforts to ensure that there are no major variations in terms of temperature and relative humidity.

**(e) Light**

Natural and artificial lights hasten the deterioration of library and archive materials by acting as a catalyst in their oxidation (Ngulube 2003). The surveyed literature has shown that most paper items are susceptible to damage from ultraviolet (UV) and visible light. Ultraviolet (UV) and visible light is known to be one of the causes of material deterioration in the library. UV radiation, which is emitted by the sun and fluorescent bulbs, is particularly damaging to paper items and the damage is not reversible. The intensity and length of exposure to light bulbs on documents in the library is almost 18 to 24hrs. Most of the aged paper

documents have faint and discolouring ink. This is due to too much exposure to light and acidic inks that have been used. This study therefore sought to determine if the library collection is exposed to excessive light. The findings of the study suggest that most of the collections are currently housed away from direct sources of light. However, the study also noted that in the early years of the Library development, some collections were exposed to light as evidenced by some books and newspapers which are already discoloured. It must be noted that prior to the Library moving into its present location, it had been housed in other buildings.

**(f) Pests**

Pests are agents of archival deterioration. Pests such as fungi, insects and rodents among others, can cause serious damage to the records and archival materials if left uncontrolled (Ritzenthaler 1993). The pests that are responsible for the deterioration of library and archives materials were identified by Harvey (1994:45). Harvey observed that “The insects which commonly cause damage in libraries are cockroaches, silverfish, termites, book-lice and beetles.” These eat and leave stains on books and other paper materials. For this reason, this study sought to investigate the presence of any of the above pests in the library. The findings revealed that the Library is aware of the role played by pests in the destruction of Library collections. The University of Botswana Archives Preservation and Conservation policy (2005) states that “We recognize that considerable damage can be caused by insects, rodents and birds both to the building and to archive material” (University of Botswana Archives Preservation and Conservation Policy 2005). The Policy further states that “We recognize that considerable damage can be caused by insects, rodents and birds both to the building and to archive material”.

While the Library is aware of the damage likely to be caused by pests, the findings revealed that almost 80% of the University of Botswana Library staff had the tendency of bringing food into offices and this is a serious threat with regard to document preservation. Pests’ infestation is always associated with sources of food. The findings of the study also indicated that pests that have found their way into the Library building. Table 1 shows some of the pests which were found in the Botswana special collections located in the lower ground floor of the building.

**Table 1: Common pests in BDSC Repository**

<b>PEST NAME &amp; PHOTO</b>	<b>WHAT THEY EAT &amp; DAMAGE</b>	<b>PEST NAME &amp; PHOTO</b>	<b>WHAT THEY EAT &amp; DAMAGE</b>
 <p><b><i>Strawberry seed beetle (harpalus rufipes)</i></b></p>	<p><i>They eat different plants and soft plant materials. They also eat insects, fungus, and are vectors of some diseases.</i></p>	 <p><b><i>Pirate bugs</i></b></p>	<p><i>They prey on thrips, mites, insect eggs and aphids.</i></p>

 <p><b>House cricket</b></p>	<p><i>They eat just about anything including soft plant matter, insects, young crickets, and decomposing matter</i></p>	 <p><b>House moth</b></p>	<p><i>They damage moulding around doors, and lay eggs on surfaces</i></p>
 <p><b>stink bugs (brown marmorated stink bug)</b></p>	<p><i>They do not eat fabric or furniture and are not known to bite people or pets. They congregate on interior walls. They emit an unpleasant odor when crushed or disturbed.</i></p>	 <p><b>Melanoplus grasshopper</b></p>	<p><i>Eat many different types of plants, including: grasses, weeds, crops, clover, and fruits.</i></p>
 <p><b>badister bullatus</b></p>	<p><i>They eat Fly eggs, different types of plants, and soft plant matter and insects.</i></p>	 <p><b>spider</b></p>	<p><i>Mostly preying on insects and on other spiders.</i></p>
 <p><b>Blue fly</b></p>	<p><i>They eat almost anything, lay eggs on surfaces</i></p>		

The extent to which damage has been caused by these pests is yet to be ascertained. In response to dealing with pest infestation in the Library, Library staff members have resorted to using insecticides. While the use of insecticides has contained the infestation there is need to establish systems for monitoring the impact of these insecticides on the collection and staff. Moreover, it was observed that there are no clear guidelines on how long insecticides should be left on the floors. Cleaners usually do not remove these insecticides during

---

the cleaning process and probably some of these chemicals have lost their effectiveness and can therefore not be relied upon to serve as a preventive measure.

**(g) Gases**

Another aspect this study sought to determine relates to pollutants, such as ozone and fumes from photocopy machines and heating systems like air conditioners can cause damage to paper media. Absorption of gaseous pollutants contributes highly to the formation of acids (Ritzenthaler, 1993). These are mainly sulfur, chlorides and nitrogen oxides. In most cases these gases come from perfumes used by people, building infrastructure and outside environmental air pollution effects. For this reason, the study sought to determine whether the library has any system for measuring the level of air pollution in the building. The findings of the study suggest that currently, the Library does not have a system in place to monitor the effects of gas pollution and this might be contributing factor to collection deterioration in the library.

**(h) Other factors contributing to the deterioration of library materials**

Providing a good environment, safe handling and storage conditions are critical to preserving paper documents. For this reason, the researchers sought to determine the level of deterioration due to poor shelving practices. It is, normally, advisable to store paper items flat, rather than folding and unfolding them, which can lead to creases and tears. The findings of the study revealed that although the shelving system used within the library is of high quality, there is lack of perfection on shelving properly. For instance, it was observed that the collections are damaged by shelving them too tightly or by failure to make use of book ends.

Mover over, the findings of the study showed that the greatest challenge that the Library faces is that of mutilation of books and journals especially for prescribed course materials. This problem was attributed to the fact that many of the recommended text books are only available in single or two to three copies. The University expects the students to buy their own personal copies of recommended textbooks. While the library staff has been very vigilant in supervising the reading areas, the problem of book and journal mutilation have not been eradicated completely and considerable damage seems to take place. These findings are similar to those which were reported by Akussah and Fosu (2001:8) who indicated that “more than half 58.3% of the libraries surveyed in Ghana were likely to experience mutilation through vandalism or mob action... and were likely to experience theft.” They went further to state that “stealing of library materials seems to be more widespread than the other problems” (Akussah & Fosu 2001:9). In a study conducted by Bankole and Abioye (2005:103) at Olabisi Onabanjo University in Nigeria it was observed that newspapers had the highest proportion of mutilation, followed by textbooks, dissertations and journals. A study conducted in Ghana by Akussah and Bentil (2010:108) revealed that the major cause of mutilation of library collections is due to limited number of copies available in the library. In order to address the problem of mutilation, the Library has installed a closed circuit camera to monitor the reading areas. However, the images produced are not of very good quality to enable the security officers to identify the culprits easily. A lasting solution to the mutilation of library books and journals is yet to be found.

## **9 Disaster management**

Eden and Matthews (1996:5) define a disaster as “any accident which threatens human safety and/or damages or threatens to damage a library’s building, collections, or items

---

therein.” Libraries are prone to disasters resulting in the loss of valuable information resources. Disaster management is one of the major issues that need to be addressed by the libraries. Based on this, the sought to determine how prepared the University Library was in dealing with disasters. The results of the survey showed that the Library, like many other information centres in Botswana are ill-prepared for disasters (Hlabangaan and Mnjama 2008). The findings further revealed that the Library in 2005 formulated an Archives Preservation and Conservation Policy (2005) which states that “We recognize that advance planning, training and up-to-date reaction plans are crucial to effective responses in fire, flood or other emergency situations.” The findings also indicated that the Library has a draft disaster preparedness policy which addresses among other thing disasters such as floods, pests, fire or similar disasters is yet to be approved by Library Management. The draft disaster preparedness policy has proposed the creation of an Emergency Response Team to be composed of individuals which would co-ordinate all efforts aimed at addressing disasters in the Library. The team would be activated in the event of an emergency that affects the work of the Section, its collections or has long term effects on the core activities.

## 10 Housekeeping

Day-to-day housekeeping was yet another aspect this study sought to assess. Proper cleaning of offices and storage areas ensures the long term preservation and accessibility of library and archives materials. Dust can be very destructive to paper materials. Cleaners should always be encouraged to dust out particulate material from documents. A poorly kept archival building disfigures materials through dust and soil which attracts biological organisms such as rodents, bacteria and insects (Cunha, 1988). For this reason, this study sought to determine the cleaning methods used by cleaners in the library. The findings indicated that the University of Botswana Archives Preservation and Conservation Policy (2005) contains statements indicating that “We recognize the importance of a regular programme of cleaning, undertaken with care and supervision.” However, observations made by the researchers showed that while regular cleaning is undertaken, no major effort has been taken to determine the chemical composition of the cleaning materials used. Cleaners use cleaning chemicals during their cleaning processes and there is likelihood that these chemicals may damage some of the library materials. Contact of chemicals to paper material can result in highly acidic conditions leading to initiation of chemical reactions that will cause deterioration of materials.

Another aspect this study sought to determine was the level of atmospheric particulate matter within the Library. The findings of the study indicate that there is a high concern of deterioration due to particulate matter. The Library uses feather dusters and brooms for sweeping. Feather dusters and brooms only distribute dust from one place to another. As a result the level of dust is rather high within the Library and this is observed mostly when there is increases in humidity due to pipe linkages and changes in weather. Dust is hygroscopic in nature and when it is mixed with high humidity, it is transformed into dirt and if this dirt sticks to the surface of the books, it becomes difficult to remove.

## 11 Conclusions

The first objective of the study sought to determine the availability of a preservation and conservation policy at the University of Botswana Library. The findings of the study indicate that a draft preservation and conservation policy for the Library was developed in 2005 by the then archivist Ms Gemma Bently who has since left the Library. However, the draft conservation and preservation policy is yet to be fully implemented.

---

The second objective of the study sought to determine the types and formats of materials held in the University Library. The findings of the study revealed that the University Library currently holds an extensive collection of books and pamphlets. In addition, the Library subscribes to various databases which include subscription to serial titles and journal titles. A special collection on Botswana consisting of Botswana publications, newspapers, pamphlets, etc and a small amount of private papers is held in the Library's Archives Unit. Moreover, the Library houses videos, sound and moving image. Furthermore, it was also observed that apart from the Botswana collection which is housed separately in the lower basement floor, there are no separate storage areas for book and non-book materials.

The third objective of the study sought to determine the major preservation challenges facing the University Library. The findings of the study indicated that the major challenges include mutilation of library materials by users, theft, lack of a well defined disaster preparedness plan, and pests. Furthermore, the findings of the study established that there is a high concern of deterioration due to particulate matter. The findings of the study indicated that currently, the library does not have a system in place to monitor this gas pollution effects and this might be contributing to material deterioration. Moreover, the results of the study revealed that the Library has a draft disaster preparedness policy which addresses among other things disasters such as floods, pests, fire or similar disasters. But the policy is yet to be fully implemented (Hlabangaan 2006). Finally, the study indicated that pests have found their way into the Library building, but the extent to which these pests has caused damage is yet to be ascertained. The findings also indicated that in response to dealing with pest infestation in the Library, the Library staff members have resorted to using insecticides. While the use of insecticides has contained the infestation there is need to establish systems for monitoring the impact of these insecticides on the collection and staff.

The fourth and last objective of the study sought to identify preventive measures that the library needs to undertake in order to improve the environment in which the materials are held. The measures and the recommendations suggested are addressed in the section that follows below.

## 12 Recommendations

The findings of the study have demonstrated that there are apparent weaknesses in the management of library collections at the University Library which demand that they be addressed if the Library is to ensure the long term preservation and continued accessibility of its collections. In order to address some of the weaknesses discussed in this study, there is a need to develop a preservation policy for the Library. Although the study has not revealed any adverse effects on the collection from the detergents used for cleaning the Library, there is need to be cautious as some of these detergents could be harmful to the collections. There is also need to educate the cleaners to ensure that the shelves are adequately dusted. Vacuum cleaning should be given first priority as compared to sweeping with brooms which only spreads the dust. Moreover, there is a need for the University Library to assign the responsibility for monitoring environmental conditions to the conservators. This will make it easier for communication of any damages and problems that require maintenances. The conservator should as part of his duties be responsible for the daily monitoring of temperature and relative humidity and in ensuring that constant temperatures and relative humidity are maintained as variation in these two will impact negatively on the long term preservation of the collections. High temperature and very low temperature are harmful to archival materials. In order to ensure the longevity of archival materials it is recommended that the ideal temperature levels should be at 18-20°C set points and not more than 20°C (Roper & Millar 1999).

---

The study also recommends that all items in the library should be stored far away from all sources of light and direct light from windows. This reduces the risk of damage from photo-catalysed oxidation reactions. Furthermore consideration should be given to storing different formats under different environmental conditions rather than storing all items in open shelves under the same environmental conditions.

In order to control the possibility of pest infestation in the Library, it is suggested that food should be strictly restricted in designated areas only. No food should be brought into offices since materials processing and cataloguing is done in offices. Even vases, potted plants and cups of coffee have a nasty habit of overflowing or spilling. Training of users in proper handling procedures is a necessity for the Library. The Library should, therefore, seek to ensure that all staff, researchers and office/security personnel understands the need to handle all materials carefully. It is further recommended that the Preservation and Conservation unit provides training and advice on handling collection materials to all staff and users.

In order to address theft and mutilation of library collections, Library staff members are encouraged to undertake regular patrols to the stack areas and make their presence in the reading rooms more noticeable. Educating the users on the value of books is another channel that may be used to encourage users to respect library collections. Above all disciplinary measures should be taken against those caught mutilating library materials. Ajegbomogun (2004) recommended that patrons caught mutilating library materials should be compelled to pay the full cost of replacing the item.

A lot of strategic thought and change is needed in order to maintain high quality materials that can be accessible longer. Generally, in this world of accelerated document deterioration, shortage of knowledge in terms of preservation measures contributes highly to the persisting poor care and handling of documentation. Frequent physical use of materials should be minimised wherever possible. Pilot sensitisation on care and handling of documents, both of staff, public clients, students and all entrusted stakeholders should be done frequently.

Finally, this study has indicated that the Library is increasing acquiring large quantities of information in digital format and also carrying out digitisation of some of its materials. While digitisation and acquisition of collections in digital format increases access to the collection, the digitisation process is not only costly, but the medium is unstable as compared to traditional information carriers such as paper or film (Conway 2000; Ngulube 2001). Moreover, access to digital information is dependent on machines and software hence if the appropriate technology is not available access becomes impossible (Ngulube 2001). Changes in technological developments also pose major challenges to the preservation of digital collections. (Ngulube 2001; Shepherd & Yeo 2003). Furthermore, it cannot be overstated that electronic data deteriorates over time, especially when it is not compliant with generic document standards. It is for this reason that this study recommends that the University Library addresses the issue of preserving digital images now rather than later, and develops strategies for their long term storage. The University of Botswana Archives Conservation and Conservation Policy (2005) indicated that the Library will continue to undertake copying of electronic records to meet requirements for media refreshment, security, disaster recovery and access. In addition to copying, new versions or manifestation of electronic records will be created through migration for preservation purposes. These are steps in the right direction and should be supported by management. One of the strategies is to convert records into other mediums by photocopying, microfilming and digitisation especially private collections held by the Library. Reformatting enhances durability, saves space, enables users to access

---

records from many locations at once and, to retrieve records faster and more sophisticated (Shepherd & Yeo 2003).

## References

- Ajebomogun, FO. 2004. Users' assessment of library security: a Nigerian university case study. *Library Management* 25(8/9):386-390.
- Akussah, H & Bentil, W. 2010. Abuse of library materials in academic libraries: case study of the University of Cape Coast Main Library. *African Journal of Library, Archives and Information Science* 20(2):103-112.
- Akussah, H & Fosu V. 2001. Disaster management in academic libraries in Ghana. *African Journal of Library, Archives and Information Science* 11(1):1-16.
- Bankole, OM & Abioye, A. 2005. Evaluation of deterioration of library materials at Olabisi Onabanjo University. *African Journal of Library, Archives and Information Science* 15(2):99-116.
- Cloonan, MV. 2001. W(h)ither preservation, *Library Quarterly* 71(2):231-242.
- Conway, P. 2000. Overview: rationale for digitization and preservation, in Sitts, MK(ed). *Handbook for digital projects: a management tool for preservation and access*. Andover, Mass: Northeast Document Conservation Center.  
<http://www.nedcc.org/resources/digitalhandbook/ii.htm> (Accessed 7 April 2011).
- Cunha, M.G. (1988). *Methods of Evaluation to Determine the Preservation Needs in Libraries and Archives: A RAMP Study with Guidelines, General Information Programme and UNISIST*, Paris: UNESCO.
- Eden, P & Matthews, G. 1996. Disaster management in libraries. *Library Management* 17( 3):5-12.
- England, C & Evans, K. 1988. *Disaster management for libraries: planning and process*. Ottawa: Canadian Library Association.
- ESARBICA. 2002. Minutes of the ESARBICA Executive Board meeting held at the Mountain Inn, Mbabane, Swaziland, 11-13 March.
- Forde, H. 2007. *Preserving archives*. London: Facet Publishing.
- Harvey, R. 1994. *Preservation in libraries: principles, strategies and practices*. London: Bowker.
- Hlabangaan, K & Mnjama, N. 2008. Disaster preparedness in information centres in Botswana. *African Journal of Library, Archives and Information Science* 18(1):63-74.
- Kemoni, H & Wamukoya, K. 2000. Preparing for the management of electronic records management at Moi University, Kenya. *African Journal of Library, Archives and Information Science* 10(2):125-135.
- McCracken, P. 1995. Disaster planning for museums and libraries: a critical literature review. <http://www.lis.uiuc.edu/review/summer1995/mccracken.html> (Accessed 23 February 2005).
- Millar, L & Roper, M. 1999. *Managing public sector records: preserving records*. London: International Records Management Trust.
- Morgan, G & Smith, JG. 1997. Disaster management in libraries: the role of a disaster plan. *South Africa Journal of Library and Information Science* 65(1):62-71.
- National Archives of the Netherlands. 2010. Common Cultural Heritage Policy Framework 2009-2012.  
[http://en.nationaalarchief.nl/sites/default/files/docs/common\\_cultural\\_heritage\\_policy\\_framework.pdf](http://en.nationaalarchief.nl/sites/default/files/docs/common_cultural_heritage_policy_framework.pdf) (Accessed 7 November 2012).
- National Preservation Office. 2001. *Building blocks for a preservation policy*. Foot, MM (ed). London: National Preservation Office.

- 
- Nfila, RB. 2004. Academic library-supplier relationship: the experience of supplier selection and evaluation at the University of Botswana Library. *African Journal of Library, Archives and Information Science* 14(2):125-138.
- Ngulube, P. 2001. Preservation reformatting strategies in archival institutions in Sub-Saharan Africa. Paper presented at XVI Biennial Conference of the Eastern and Southern Africa Regional Branch of the International Council on Archives Conference on Preservation, Access and Technology, held in Harare, Zimbabwe, 23-27 July 2001.
- Ngulube, P. 2007. Preserving South Africa's paper trail and making public records available for present and future generations. *ESARBICA Journal* 26:45-69.
- Ogden, S. 2010. What is preservation planning. [http://www.nedcc.org/resources/leaflets/1Planning\\_and\\_Prioritizing/01WhatIsPreservationPlanning.php#top](http://www.nedcc.org/resources/leaflets/1Planning_and_Prioritizing/01WhatIsPreservationPlanning.php#top) (Accessed 5 April 2010).
- Porck, HJ & Teygeler, R. 2000. *Preservation science survey*. Washington, DC: Council on Library and Information Resources:5-6.
- Ramokate, K. 2006. Preserving the African memory: critical challenges for ESARBICA organisations. *ESARBICA Journal* 25:84-93.
- Ritzenthaler, ML. 1993. *Preserving archives and manuscripts*. Chicago: The Society of American Archivists:45-50.
- Rosenberg, D. 1995. Everyday care of books in libraries, in Arnoult J, Kremp V & Musembi M (eds). Proceedings of the Pan African Conference on the Preservation and Conservation of Library and Archive Materials, Nairobi, Kenya, 21-25 June 1993. The Hague: IFLA:77-87.
- Shepherd, E & Yeo, G. 2003. *Managing records: a handbook of principles and practice*. London: Facet Publishing.
- Teygeler, R (ed). 2001. Preservation of archives in tropical climates: an annotated bibliography. *Comma: International Journal on Archives* 3/4:33-257.
- University of Botswana (UB) Library. 2010. About the Library. <http://www.ub.bw/library/about-library> (Accessed 7 November 2012).
- University of Botswana UB Library. [n d]. Introduction to the Library, Library Guide No 1. [http://www.ub.bw/documents/Introduction\\_to\\_the\\_library\\_Guide\\_1.pdf](http://www.ub.bw/documents/Introduction_to_the_library_Guide_1.pdf) (Accessed 7 November 2012).
- University of Botswana Library Archives. 2005. Preservation and Conservation Policy. Gaborone: University of Botswana Library.
- Van Der Reyden, D. 1992. Recent scientific research in paper conservation. *Journal of the American Institute for Conservation*. 31(1):117-138. [http://si.pddr.si.edu/jspui/bitstream/10088/8141/1/mci\\_JAIC1992-DvR.pdf](http://si.pddr.si.edu/jspui/bitstream/10088/8141/1/mci_JAIC1992-DvR.pdf). (Accessed 7 November 2012).
- Ververisa, C, Georghioua, K, Danielidisb, D, Hatzinikolaoua, DG, Santasc, P, Santasc, R & Corletid, V. 2007. Cellulose, hemicelluloses, lignin and ash content of some organic materials and their suitability for use as paper pulp supplements, *Bioresource Technology* 98(2):296-330.
- Wamukoya, J & Mutula, SM. 2005. E-records management and governance in East and Southern Africa. *Malaysian Journal of Library and Information Science* 10(2):67-83.
- Yeboah, T. 1999. The management of information literacy skills programme for science undergraduates at the University of Botswana. *African Journal of Library, Archives and Information Science* 9(2):143-152.