ASSESSMENT OF ARCHIVES PRESERVATION AND CONSERVATION AT THE
MINISTRY OF WATER AND ENVIRONMENT

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MAKERERE UNIVERSITY

AUGUST, 2018
DECLARATION

I Biyinzika Justine hereby declare that the information given in this dissertation is my original work and has never been submitted to any institution for education award.

[Signature]

Biyinzika Justine

[Date]

01/03/2017
APPROVAL

This is to certify that, this research report was done under my supervision as a university supervisor.

................

Mr. BATTE RICHARD
Supervisor

Date: 2019
DEDICATION

I dedicate this piece of work to my father Mr. Kibwiika Joshua and my friends especially Mr. Epajja Eddie for the tireless effort in supporting me throughout my course and in all situations may the almighty God bless you abundantly.
ACKNOWLEDGEMENT

First and foremost, I would thank the almighty God who has made it possible for me to undergo my academics and seen me through in every difficult situation during my research.

I also extend my sincere thanks to my supervisor Mr. Batte Richard for the parental and material guidance you have rendered to me throughout the period of the research study.

I would also like to extend my sincere thanks to the entire staff of Ministry of Water and Environment for the assistance they rendered to me during data collection especially the Registry department.

Lastly, I would like to acknowledge the support of my father Mr. Kibwiika Joshua and friends especially Eddie may the lord bless you abundantly.
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<thead>
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<th>Full Form</th>
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<tbody>
<tr>
<td>CHR:</td>
<td>Commissioner of Human Resource</td>
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<td>CM:</td>
<td>Cabinet Minister</td>
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<td>CS:</td>
<td>Contract Files</td>
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<tr>
<td>DEA:</td>
<td>Directorate of Environmental Affairs</td>
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<td>DWD:</td>
<td>Directorate of Water Development</td>
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<tr>
<td>DWRM:</td>
<td>Directorate of Water Resource Management</td>
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<tr>
<td>MSE:</td>
<td>Minister of State for Water</td>
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<td>MWE:</td>
<td>Ministry of Water and Environment</td>
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<tr>
<td>NFA:</td>
<td>National Forest Authority</td>
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<tr>
<td>NWSC:</td>
<td>National Water and Sewerage Cooperation</td>
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<tr>
<td>OA:</td>
<td>Office Attendant</td>
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<td>PS:</td>
<td>Permanent Secretary</td>
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<td>RO:</td>
<td>Records Officer</td>
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<tr>
<td>RWSSD:</td>
<td>Rural Water Support and Sanitation Department</td>
</tr>
<tr>
<td>SPA:</td>
<td>Senior Personal Officer</td>
</tr>
<tr>
<td>UNM:</td>
<td>Uganda National Metrological Authority</td>
</tr>
<tr>
<td>US:</td>
<td>Under Secretary</td>
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<tr>
<td>WMO:</td>
<td>World Metrological Organization</td>
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ABSTRACT

The aim of the study was to assess the archives preservation and conservation at the Ministry of Water and Environment Registry. The objectives of the study were to identify the kinds of archival collections and associated threats at Ministry of Water and Environment, assess the methods used in preserving and conserving archives at the Ministry of Water and Environment, find out the challenges faced in preserving and conserving archives at the Ministry of Water and Environment, suggest ways to improve preservation and conservation of archives at Ministry of Water and Environment.

Qualitative research design was used and a sample size of four respondents was selected using purposive sampling technique. The researcher consulted the head of records department, the records manager and his assistant and the records clerks. It was qualitative in nature and Data was collected using the interview and observation method and was analyzed qualitatively.

The researcher found out the kinds of archival collections, threats to archival collections, methods of archives preservation and conservation, challenges of preserving and conserving archives and the possible solutions to the problems being faced during preserving and conserving of archives as stated by the respondents.

The study concluded that, in order for archives to be effectively stored at MWE Registry, they must be managed by well-trained staff, storage system must be automated to create enough storage space and more lockable filing cabinets should be purchased to restrict access of records to unauthorized users.
CHAPTER ONE

1.1 Background to the Study

Ogden (2010) asserts that libraries, archives, museum 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. However, Preservation is a crucial element in the whole operation of archives management programme. The aim of records and archival preservation is to prolong the usable life of useful information. This information is explained in two ways that is to say preventive preservation, which seeks to reduce risks of damage and to slow down the rate of deterioration and prescriptive preservation, identifies and treats damaged materials to restore useful access to the information. This aim is usually accomplished by selecting good quality materials and by providing suitable storage environments and safe handling procedures.

Forde (2007) states 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 and the public at large. The importance of preserving archival collections was assumed by Celoonan (2001), in his works Celoonan writes saying “preservation allows for the continuity of the past with the present and the future”.

Preservation of records faces a budget and time limitation which require priorities to be set, standards to be established by the professional to determine what should be preserved in the collection, considerations include existing conditions, rarity, evidentiary and market values.

Walker (2013) states that to preserve books in health is to treat your own children who are sure to sicken if confined to an atmosphere which is impure, too cold, too damp or too dry. Thus insects and rodents were controlled, staff was trained preservation methods, policies
were formulated and financial commitment was formed to ensure that information materials survive for a long time.

The international Records Management Trust (2009), states that, preservation is an ongoing process. There is no ending point to digital preservation, unless a digital object ceases to be considered worthy of preservation, the fact is equally true in the world of traditional preservation, although it may be less apparent because of the much great time scales between preservation interventions in the environment. For example, a paper records may be safely stored for 100 years or more in an acid-free file folder in a stable storage environment.

Gunlnaugsdottir (2006) suggests that only historical documents and records vital to the organization are preserved permanently. Other records are all disposed off sooner or later.

According to Feather (1991) the term archive also refers to a place where collections containing records, documents or other materials of historical interest are maintained. Such places exist either as a department or as independent agencies. Roper notes that to avoid confusion, the term archives is mostly used to refer to an institution only with formal titles such as records and archives institution or National archives.

Mnjama (2005) forwards several challenges hampering management of archives. Among those include poor system of archival arrangement, inadequate number of professional archivists, poor storage and preservation facilities.

However, timely access to archives has not been possible with the consult which has affected the smooth running of the Ministry programs. Important archives that can help in decision making either take long to be retrieved or end up getting lost completely.

Nandian (2006) states that the registry is a dumping place for those officers with disciplinary cases, whose performance is low with unskilled staff and with the assumption that any person can work in the registry. He adds that the registry staff is regarded as the lowest on the cadre in most organizations with no support, poorly motivated and remunerated with poor working environment and this result into a big discouragement, which challenges the records management staff.
Limited storage space was still a challenge where by the offices especially the registry is very small and some records were kept on the floor, placed in corners, tables and on top of file cabinets. This led to deterioration of the records because papers absorb water easily especially those, which were kept on the floor thus resulting into loss of important information of the Ministry which would be used in future.

The study examined how preservation and conservation of archival materials benefit the community. The study examined preservation and conservation outcomes within a society of Luzira in Kampala and suggested solutions to the problems faced in the preservation and conservation of archival materials at Ministry of Water and Environment.

1.1.1 Background of the Organization

The Ministry of Water and Environment was established in 2006 after splitting of the Ministry of lands. The Ministry is located in Luzira, Kampala-Uganda along port bell road on box number 20026.

The Ministry is divided into three directories; these are DWRM (Directorate of Water Resources Management), DEA (Directorate of Environmental Affairs) and DWD (Directorate of Water and Development.

Ministry of Water and Environment as a Ministry was mandated by the 1995 constitution of Uganda to ensure and provide clean and safe water in both the desirable quantity.

The Ministry of Water and Environment is the overall government organization responsible for the management of Water and Environment and all Resources for the betterment of the population through addressing a number of management issues.

The vision of the Ministry

“Sound management and sustainable utilization of Water and Environmental Resources for betterment of population of Uganda.”

The mission of the Ministry

“To promote the rational and sustainable utilization, development, effective management of Water and Environment Resources for socio-economic development of the country.”
The Ministry of Water and Environment is mandated to; policy making, standard setting, national planning, regulations and coordination, inspection, monitoring and back up technical support in relation to water and environment including weather and climate.

### 1.2 Statement of the problem

According to ISO 15489 (2001), archives are very vital for the continuity of the organization because of the value they hold. Most organizations in Africa pay less attention to the management of archives. Despite the fact that archives are records of enduring historical, cultural and evidential value, their safe custody has not been given enough attention at Ministry of Water and Environment. These original and delicate materials that are needed for research and reference purposes are being preserved in such ways that do not guarantee their stay in some years to come. This was evidenced by lack of preservation and conservation strategy that enables their proper management and description. The storage room itself was much disorganized where by files in boxes were kept on the floor at Ministry of Water and Environment Registry. The arrangement for the case of materials on the shelves was poor as files of 1900 were in the same shelves with those of 2000 and up to date. This state of the archives was most likely to cause deterioration and delays in retrieval as a result of poor storage, thus it needed effective preservation, storage and conservation to ensure their durability. It was on this basis that this research was carried out to suggest solutions to the problems faced in the preservation and conservation of archival materials at Ministry of Water and Environment using the case study of Ministry of Water and Environment Registry.

### 1.3 Research Objectives

#### 1.3.1 General objective

The study aims at assessing the preservation of archives and conservation and suggests solutions to the problems faced in the preservation and conservation of archival materials at the Ministry of Water and Environment to ensure the good and orderly physical and administrative management of the entire organization.
1.3.2 Specific objectives

The study sets out to achieve the following objectives:

1. To identify the kinds of archival collections and associated threats at Ministry of Water and Environment.
2. To assess the methods used in preserving and conserving archives at the Ministry of Water and Environment.
3. To find out the challenges faced in preserving and conserving archives at the Ministry of Water and Environment.
4. To suggest ways to improve preservation and conservation of archives at Ministry of Water and Environment.

1.4 Research questions

The study was guided by the following research questions:

1. What kind of archival materials are housed at the Ministry of Water and Environment Registry?
2. What are the existing threats to archival materials at the Ministry of Water and Environment Registry?
3. How are archival materials managed at the Ministry of Water and Environment Registry?
4. What solutions could be suggested to improve on the preservation and conservation of archival materials at Ministry of Water and Environment Registry?

1.5 Scope of the study

The research was limited to the Ministry of Water and Environment Registry department. The study covered preservation and conservation methods of archival materials in the Ministry of Water and Environment Registry and established the different problems facing preservation and conservation of archives for a period of 5 months.

1.6 Significance of the Study

The study was of great importance in assessing the preservation and conservation programs, ensuring that if they were in place, they were to be followed and appropriate
towards prolonging the usability of archival materials. The findings of the study were therefore continued to benefit both the users and various individuals and organizations as explained below.

The findings of the study created awareness about the different preservation and conservation programs of archives, which enabled timely completion of work thus saving time for the archivists.

Readers of the study findings and particularly policy makers in Archival agencies used the findings of the study as a basis for decision making especially in relation to making policies related to archival preservation, conservation and restoration.

The study was a basis for literature review for future researchers. On the basis of the literature reviewed from this study, further research was conducted in the field of archival preservation, conservation and restoration.

The study also presented knowledge about the different methods of preservation and conservation of archival materials. This ensured good and orderly physical and administrative, management of the entire organization.
CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

According to Neelankavil (2007), literature review is the identification, reading, summarization and evaluation of previously published articles, books, reports or internet materials on a particular topic. This chapter reviewed and illustrated the literature available in relation to the objectives of the study. It examined the following; kinds of archival collections, methods used in preserving and conserving archives, challenges faced in preserving and conserving archives and ways to improve preservation and conservation of archives at Ministry of Water and Environment.

2.1 Definition of key operational terms

Archive
Abioye (2007) defines archives as a collection of historical records of an organization or nation. These have been selected for permanent or long term preservation because of their enduring cultural, historical and evidential value.

Archival management
Sennabulya (2013) defines archival management as an administrative procedural system established by an organization to achieve effectiveness in the selection of maintenance, preservation, access and use of that portion of the records that has been selected for permanent preservation.

An archivist
Is a professional, who is responsible for the management of important records and aims at following, Appraise, Acquire, Arrange, describe, preserve and provide access and reference service to his or her clients (Sennabulya 2013)

Preservation
William (2006), states that, preservation refers to all actions that can be taken with the aim of ensuring the current and long term survival and accessibility of the physical form,
information content and relevant metadata of archival records, including action taken to influence records creators prior to acquisition or selection.

Conservation
Roper (1999) defines conservation as prescriptive approach that seeks to identify and treat or copying damaged materials to restore useful access to the information.

2.2 Kinds of archival collections at Ministry of Water and Environment
In order to conduct preservation and conservation procedures successfully, it is fundamental to first identify the collections in the archival institution. The collections were identified according to the following criteria; by physical form and by subject.

2.2.1 Physical form
On the basis of their form, collections were described on the basis of the material on which the information is contained. The collections at Ministry of Water and Environment were classified into the following classes; Collections on paper material, Collections on microform and microfilms, Collections in electronic formats and Cartographic materials.

Collections on paper material. As a material for archival management, paper is still by far the most used physical material in the world today especially in Sub-Saharan Africa. Britannica further defines paper material as a matted or felted sheet, usually made of cellulose fibers, formed on a wire screen from water suspension. In Ministry of Water and Environment Registry, paper also formed the largest part of the collection since records in Uganda have largely been managed on paper. These papers however vary in physical form basing on the way they were manufactured. It was very evident that the Ministry of Water and Environment Registry does not have control over the records that come to the archive during their active stage. Therefore, all sorts of paper types were used and just presented to the Registry department after the appraisal stage of the lifecycle. All this implied that different paper materials had different kinds basing on how they were manufactured. Therefore, preservation and conservation of such a myriad of forms, sizes, textures and quality required careful examination and execution.
**Collections on microform and microfilm.** Such collections involve information captured on microform material. Encyclopedia Britannica (2010) describes microform and microfilm as materials that emanate from any process, photographic or electronic, which involves reproducing printed matter or other graphic material in a much reduced size, which can be enlarged by an optical apparatus for reading or reproduction. In general such systems provide durable, extremely compact and easily accessible file records.

In Ministry of Water and Environment Registry these were in form of condensed periodicals and newspaper back issues, manuscripts, theses and dissertations captured on reduced scales. They were also frequently used for storage of past photos of historical significance. It was noted that in addition to being more durable in preserving records and archival materials, this kind of media occupies relatively less storage space. For all these benefits however, it was used on a very minimal level at Ministry of Water and Environment. It was noted that unlike paper, microform and microfiche were affected by different kind of physical strains and in varying degrees and such required special care and handling.

**Collections in electronic formats.** Ministry of Water and Environment has been gradually embracing information and communication technologies. One of the key pillars of this revolution was the registry which is transforming its collection into electronic formats. Though still in small quantities, it was noted that there were some archives which were being transformed into electronic files. It was evident that the digitization process was more of preservation strategy whereas the electronic archives were more of the backups of the originals. Though they were more of backups, electronic archives also represent a unique physical form of archival collections. Most of these types of records were kept on computer discs, Disc versatile Discs, computer hard discs and flashes.

**Cartographic materials.** Merriam-Webster online dictionary (2010) defines cartography as a science of making maps. This term can also be referred to as map making and it involves the practice of making maps or globes. Therefore, cartographic materials include all materials in form of maps. Such materials in Ministry of Water and Environment Registry were categorized into general maps that were constructed for a general audience.
and thus contain a variety of features. These maps exhibited many reference and location systems which were produced in series.

2.2.2 Subject

Subject in this case refers to the themes or topics contained in the archival collections. The content of the collections were described on the foundation by which the records were created. It was on the basis of this categorization (subject) that the archival collections at Ministry of Water and Environment were organized, identified and retrieved. According to the Ministry of Water and Environment archival list, the archival collection is significant to both for research and is the primary depository of Ugandan history. It contains papers, letters, notes, reports, diaries of events, travel, church memorandum, and registers which are important to the Ugandan colonial and early Independence Day’s legacy. The department also holds important historical documents referring to Kenya and Tanzania during the early years of colonization. The section also prides itself to hold a collection of materials mostly of non-government nature consisting of the minutes of the Uganda chamber of commerce from its beginning and there are also church missionary files within these holdings. All the above collected works exist in a variety of media. These include; paper based material, sound recordings on magnetic tapes, cassettes and Audio visual recordings on video tapes.

Such collection shows variety in prominence yet there is one thing in common; that all these are special collections to Uganda’s legacy and as such ought to be preserved and conserved for future generations. They are exceptional and should be treated with such reverence.

2.3 Threats to Archival Collections

Light; Natural or artificial lights fasten the rate of deterioration of library and archival materials acting as a catalyst in their oxidation (Ngulube 2003). The surveyed literature has shown that most paper items are susceptible to damage from ultra-violet and invisible light. Ultra radiation which is emitted by the sun and fluorescent bulbs is particularly damage aging to paper items and damage is not reversible. The intensity and length of exposure to bulbs on document in the records center is almost 18 to 24 hours.
Wear and tear; Abioye (2007) states that most of the collections are transferred to the archives after they have been used in registries and gone through records centre. This cycle ceases them to be used continuously and as such, they lose their integrity as they were from continual use. This is mostly true with paper based records which even lose some of the texts if they are used continuously.

Human activity; Nikki (2007) notes that deterioration relating to human activity account for most of the disasters that affect records and information in archival institution around the world. Destructive human behaviors on the archival collections may include; plucking the pages from documents, careless handling of documents, stealing of archival materials and illegal copying of documents, poor retrieval and poor filing practices.

Environmental factor; Verdegem and slats (2004) states that environmental factor is one of the threats to archival collections. In principle the higher the temperature, the more quickly archival materials deteriorate because the higher temperature increases the levels of humidity. It was noted that in an archival environment, changes in relative humidity have negative effects on records and archives.

Oxidation; Kiprono (2005) states that oxidation is another threat to archival collections which means a chemical change from good to worse in organic and inorganic materials to their reaction with oxygen in the atmosphere. Oxidized materials become weak and cannot live for long since most information materials like papers are organic in nature. Oxidation is considered as part of the natural aging. Long term oxidation however burns the materials without wreaking them up. In paper document oxidation process is usually accelerated by oxidizing catalysts such as moisture, heat and light.

Infestation; Wellheiser (2002) points out infestation as one of the threat faced by all archives, libraries and records centers. Collections of all types are subject to damage and deterioration by moulds, insects and sometimes rodents and other animals.
2.4 Methods used in preserving and conserving archives

Various methods are used by the information professionals in the preservation of archives to prolong their life and reduce or control deterioration of archives. Therefore, the following were the methods used at Uganda Christian University,

**Digital preservation:** Ramaiah and Sujatha (2008) states that preservation is not just for the paper based information materials but also digitalized information materials. Digital materials are especially vulnerable to loss and destruction because they are stored on fragile magnetic and optical media that deteriorate rapidly and that can fail suddenly from exposure to heat, humidity, airborne contaminants, or faulty reading and writing devices. Libraries and archives play a critical role in organizing, preserving, and providing access to the cultural and historical resources of society. In the relatively stable world of printed, written, and mechanically reproduced information, repositories managed to preserve a rich array of scholarly communications, documentary evidence, and useful information for specialized scholars and for the general public. The introduction of digital technologies into the processes of production, distribution, and storage of information challenges the capacity of libraries, archives, museums, and other cultural institutions to carry out their responsibilities for preservation. This problem has been the focus of numerous reports designed to raise awareness of digital preservation issues and to propose general strategies for addressing them.

In the IFLA letter on preservation, in the international preservation newsletter (2003), Bernard Smith agrees with what was compiled by UNESCO on preserving information materials through digitalization “the world digitalizing important information is at a very high rate where by a lot of space needs to be available for storing all information being digitalized since there is an information explosion”. Allan Caruso (2003) in his article originals and duplicates, preservation of audiovisual media at the National Library of France gives the various methods through which audiovisual materials can be preserved. He explained that a lot of cylinders, shellac discs, acetate discs which he describes as the “Durable carriers per excellence” can be used (international Preservation Newspaper, 2003).
**Microfilming:** is whereby information is transferred into microfilms after being photographed; the duplicate copies of microfilmed information are as good as the original ones. Microfilms accommodate mass information thus saving storage space. There are two primary forms of film used in the creation of microfilm: silver halide film and vesicular film. Silver halide is much like traditional film and the image is transferred to the film with a process using silver emulsion on a polyester strip. Vesicular film on the other hand utilizes microscopic bubbles to create the image on a polyester strip. Vesicular film is inexpensive and can be exposed to daylight without being damaged, making it the more popular. The machine used to view the microfilm is similar to a giant microscope. The lens on the machine enlarges the image on the microfilm which allows the user to read the contents. Microfilm can last up to 900 years if stored with special envelopes and placed in a controlled climate room. Microfilms are able to resist deterioration and helped save storage space (Wallace 1962).

**Lamination** is one of the methods of preservation and conservation of archival materials. According to Unomah, materials which are fragile and brittle due to degradation need lamination. Lamination is necessary because it impacts mechanical strength or durability and restores documents which may have been damaged in one way or another (Wallace 1962).

**Leaf-casting,** is the process of restoring paper documents that have deteriorated. A leaf-casting machine repairs documents (Wallace 1962).

**Encapsulation,** it involves containing a document or item within sheets of polyester which are sealed or joined at the edges; single sheets may be used and joined on all sides. The process provides a physical support for fragile or brittle materials and allows handling of items without danger of tearing. Encapsulation is easily reversed simply by cutting off the edge seal holding the polyester sheets together and removing the item. Edges are sealed using small polyester welding machine, heat and ultrasonic sealers are also used for encapsulation (Wallace 1962).

**Restoration:** books and other information materials that are damaged are restored to its original physical form. This method was invented/devised by the national library of China.
to prevent information materials from extinction. The restoration staffs are required to handle such material and they do this without changing anything on that particular information material (Zhignging, 2004).

2.4.1 How preservation is done at the Ministry of Water and Environment

The Ministry has only one records management system in place. The records are manually managed and this takes a wider space for managing the records since the records are paper based, this makes storage and retrieval of files difficult and time consuming hence causing delay in case a file is needed urgently by the action officer. However, plans are under way to introduce an automated records management system to simplify the process of records storage and retrieval procedures but still this plan is unreliable since it’s not yet in practice. The Registry had only one functioning computer compared to the number of staff and information users need quicker services and this negatively impacts on the Registry when it comes to information sharing. The Registry staff store records on metallic shelves, cupboards, and filing cabinets, acid free boxes, drawers and some records are just tied with ropes and put on the floor of the Registry due to lack of space. The Registry does not handle digitization of records because it does not have a system of storing and retrieving electronic records in the organization.

2.4.2 Challenges faced in preserving and conserving archives

Musembi (2005) states that evidence clearly shows that many developing countries have severe records management problems. As a result, effectiveness in public administration is directly undermined in a number of ways. He adds that the administration of justice is greatly compromised and government revenue cannot be fully collected because the records in which their calculations must be based are not comprehensive enough or were not created. He adds that since records are kept in a poor environment, proper auditing is practically impossible. He concludes that good governance cannot be achieved in an environment in which records are poorly managed and in situations in which records are regularly missing or lost.

Inadequate funds to carry out all the activities involved in preservation and conservation of archival materials. The registry department where archival collections were housed was
just a section under Ministry of Water and Environment Registry as such lacked an independent pool of funds to initiate and run its own activities. It was a fact that the conservation of most archives of different nature was the fundamental problem since it involved a variety of techniques and equipments which were costly.

Lack of skills to carry out conservation activities on the materials. Ministry of Water and Environment registry still relied on outsourced contractual personnel to do conservatory work which was costly since these were hired on an hourly basis. Besides that, monitoring their performance was quite hard.

Limited space was one of the core challenge identified. It was noted that there was a growing number of archival collections in Ministry of Water and Environment registry and yet the space housing the collections was not enough and no extra space was set aside to cater for the growing space requirement.

**Acidity:** acidity is the quality of being acid, or ‘sour.’ Acidity is the opposite of alkalinity, which is the quality of being alkaline or, in effect, ‘sweet.’ Acids contain high levels of positively charged hydrogen ions that can cause damages if introduced to paper, make it fragile and prone to deterioration. These ions can be introduced during the paper manufacturing process, from writing inks used or because of poor storage. The level of acidity or alkalinity in something is measured on a pH scale, an arbitrary scale ranging from 0 to 14. Neutrality – a state neither too acid nor too alkaline is found at 7.0. All numbers above 7.0 represent increasing alkalinity; all numbers below 7.0 indicate increasing acidity. The scale is logarithmic, with each number representing a tenfold change in acidity or alkalinity. Thus a pH of 5 is 10 times more acidic than a pH of 6, and a pH of 4 is 100 times more acidic than a pH of 6. Both high acidity and high alkalinity are destructive to materials, but acid is considered the more damaging of the two in the archival environment. Many archival materials, particularly paper-based materials, are of inherently poor quality because they contain high quantities of acid, which can weaken and deteriorate the structure of the paper itself, causing it to degrade.

**Light:** light speeds up the oxidation of paper, causing materials to deteriorate faster. Oxidation: The combination of oxygen with another element promotes deterioration, such
as rusting of metal or disintegration of paper. Light also has a bleaching action, causing colored papers and inks to whiten or fade. At the same time, light can increase the chemical activity in paper, causing changes in color; consider the effect of sunlight on a newspaper. Light also generates heat and, as discussed above, heat can speed up the process of degradation of materials (Ogden 1992 and Feather 1991).

**Mould, insects and rodents can all damage records and archives**; their presence can be encouraged by high relative humidity, high temperatures, a complete absence of light and the availability of nutrients. Mould: A woolly or furry growth consisting of minute fungi that forms on substances found in moist, warm air. The spores or seeds that cause mould to grow are always present in the atmosphere and can never be eliminated completely from the environment. However, mould needs nutrients to grow, such as paper, leather, glues and adhesives, dust and moisture to enable it to absorb the nutrient. As access to the nutrients cannot be restricted, the growth must be inhibited by controlling the environment. Mould grows best in an environment with high relative humidity. When the relative humidity exceeds 70% and the temperature reaches 25 o C or more, mould growth speeds up considerably. Mould growth is exacerbated when the air is still; non-ventilated areas may be more susceptible than areas with ceiling fans or ventilators (Shuhaimi 1986).

**Dirt;** dust and other particles are also pollutants, and they can absorb gaseous pollutants, which then penetrate materials and promote chemical and physical deterioration. Pollutants can also come from paper products themselves, especially those made with poor quality materials, such as newspapers. As these types of materials age they generate dust particles that damage not only the items themselves but also any materials in the vicinity and these pollutants affect records and archives. Gases, exhaust, dirt, dust and other pollutants come in the form of particles that float in the air. They are acidic and abrasive, and when they come in contact with materials they can eat through the item causing it to deteriorate. Pollutants can cause metals to rust or wood products to chip.

**Air pollution;** air pollution can be a serious hazard to records and archives, particularly in urbanized or industrialized areas. Industrial gases, chemicals, car exhaust and other toxins generate pollution. Gaseous pollutants include sulphur dioxide, nitrogen dioxide and
hydrogen sulphide. Ozone also causes oxidation, which is damaging to materials by promoting their deterioration. Air pollution can also appear within a building from photocopiers, cleaning supplies, paints, untreated wood and certain plastics and adhesives all contain gases that can pollute. Pollution can also be found in water, such as tap water, or even sea water for areas close to the ocean. These pollutants can also damage equipment and materials. Pollutants can promote the deterioration of records and archives (feather, 1991)

**Relative humidity;** Feather (1991) defines relative humidity as the percentage of the quantity of water in a particular volume of air in relation to the maximum quantity that it can hold at its present temperature. The ratio of the amount of water vapor in the air to the amount that would be present at the same temperature was the atmosphere to be fully saturated. Relative humidity is expressed as a percentage. In an archival environment, changes in relative humidity can have a negative effect on records and archives. High relative humidity, particularly when coupled with high temperatures, accelerates the chemical deterioration of materials. High relative humidity can also cause some inks to feather: that is, to spread, sometimes well across the page, damaging the material. If relative humidity is too low, and the air is too dry, materials will become brittle and may crack or split. If the relative humidity is too high, materials can absorb the moisture and swell and warp. High relative humidity also promotes mould growth, which is highly dangerous to records and archives.

**Human factors;** apart from the physical and chemical factors, a serious cause of deterioration is often the casual attitude of the records staff as well as the information users towards these information materials. Information professionals are in charge of the documentary heritage, are responsible for the overall conservation and preservation of their collections, but they are not aware on how to handle, store and use records carefully to minimize damages and help in preservation. Improper storage, faulty repairmen, rough handling, deliberate abuse, mutilation, vandalism are all examples of deterioration of records by Human beings (Patkus, 2003).
Inadequate funding and increased costs of electronic gadgets have also contributed to the deterioration of records (Nansamba, 2013).

**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. The preservation and conservation departments do not have disaster control plans and the absence of such a plan means that in the event of a disaster, they will not be in a position to respond to the disaster with the urgency that is required (Wamukoya and Mutula, 2005).

**Changes in software and hard ware;** for those using computers in records management have created pressure on archival institutions because preservation of digital archive collections and their storage are facing storage media deterioration (Nansamba, 2013).

**Theft;** Some of the records were stolen by human beings or users due to selfish ambitions and kept away from the records centers. This was a big threat since it was something done by the human resource who were supposed to protect these records (Katundu, 2001).

2.5 Ways of improving preservation and conservation of archives

Environmental factors can be controlled at selection of the site where a records centre is to be constructed and also the soil on which the building will sit should be tested to prove and be assured of a good environment because these elements have got a greater impact on the environmental control inside the records centre. Growth of trees and other plants around the building should be avoided to because roots of such trees can damage the building. It is always better to construct the building away from the traffic to avoid too much dust and dirt.

Direct sunlight must be controlled and stopped from falling on papers and the electronic gadgets used in storing records (Nansambas, 2013). Since dampness, dark and dingy places in the records centers facilitate the growth of biological pests, good housekeeping and maintenance of optimum storage conditions are necessary to control propagation of insects. Provision of cross windows, ventilators and exhaust fans ensures good circulation of air at all times.
Disaster preparedness; Disasters are generally unexpected events with destructive consequences to records and other information resources. Therefore, it will be vital for any records center to take every possible precaution to prevent the occurrence of unavoidable disasters. A disaster and preparedness team is essential for preventive conservation and is responsible for identifying any external or internal threats to the records and measures to meet those threats. Without an existing disaster preparedness plan or crisis management plan, the information professionals will be unable to act quickly in case of a disaster; it should be a mandatory for every center to have a disaster and preparedness plan (Katia, 2006). Fire may be prevented by banning smoking in the library. Inflammable articles like kerosene, petrol, waste paper should be kept outside. Electric wiring must be enclosed in metal conducts to localize the effect of sparks due to short circuits. Control switches for lighting should be fixed outside the room and the mains switches should be off when the stack area is closed. A good method of limiting the fire is to partition the stack area into different portions with metal partitions which have metal doors and to isolate them from one another through shutting the doors in case of fire outbreak. This will check the spreading of fire and will help in its control. Sufficient number of fire extinguishers should be kept at strategic points in the library (Sunil and Kumar, 2009).

Inflammable materials and chemicals should not be kept in the information centers, besides the information centers should be provided with fire and smoke detection machines/systems and automatic fire extinguishing systems. Use of match stick and smoking should be prohibited in the house that has records, the electrical detects and faults should be set right (UNESCO, 2000)

Enough security; According to Ovowoh and Iwhiwhu (2010). Security control measures should be taken as a preservation and conservation measure to control theft of records and vandalism due to the selfish ambitions of users and staff. Machines that detects and cameras should be put in place and ensure no document or material moves out minus authorization. Users, with a stealing inclination, can be checked through preventive measures like spying and installing thief catching devices. The fundamental factor in minimizing unnecessary damage to the records materials also depends on the careful handling of the materials on the part of both staff and users.
Sensitization; Proper sensitization should be done for both staff and the records users on preservation and conservation and encourage proper handling of the equipments and the records themselves. Videotapes or slides regarding the handling of records should be shown to the new employees and the readers. They expressed those information materials like Books should never be pulled off the shelves by head caps. Care should be taken to reduce the possibility of dropping off of records (Ovowoh and Iwhiwhu, 2010).

2.5.1 The current trends of preservation

Things have changed a lot for records management in the last 20 years. A change in technology and the types of records that must be stored and managed has changed the way records managers must do their jobs. Perhaps there were no regulations on how to save and store instant messages, social media or video when you got into records management, but those regulations exist now. Any job that touches technology is going to be constantly reinvented and revised as technology advances, records management is no exception. Here are a couple of the trends that are shaping records management right now.

Information security will increase at all levels; hackers are attacking everyone from individual people to large corporations. Because digital technology has become so important, you cannot just get rid of your computers to protect your data from hackers, this would cause your business to lag far behind the competition. That is why there will be a massive push to enhance digital security in this year. Not only will tech experts be making sure that security capabilities improve, but companies will be seeking out the latest, greatest security features.

Digital archiving will be used more often; for a very long time, the best and only reliable way to archive a document was to lock it away in storage indefinitely. This inefficient, expensive approach to archiving is no longer used necessary. Digital archiving your records allows you to cheaply store your records without any hassle. Global digital archiving is a part of the plan for many companies this year.

Mobility will go mainstream; as mobile technology evolves, the features that were once novelties are becoming true utilitarian capabilities. For example, a mobile app was once
thought to be simple to handle any real enterprise-level records management. Because of facts like this, you can expect the use of mobile devices for records management to skyrocket this year.

Cloud-based records management services will be used more; A few years back, the idea of storing valuable documents on the web would seem like a big mistake. However, in order to keep up with the lightning fast digital world, cloud-based records management must be a consideration. In this year, this consideration will be taken much more seriously by many companies. This is for the following reasons:

- Increased reliability on mobile devices- modern devices are just as powerful as a computer.
- Enhanced cloud Security-Cloud-based storage solutions are often more secured than traditional storage.
- An increasing need for global document accessibility- Companies want to move faster and be more flexible; cloud management gives them this capability.

In order for your business to have maximum growth in this year, you must join this trend. You will be able to securely manage your digital documents from anywhere with an internet connection. In most cases, this access will be more secure than accessing your documents from a computer terminal at your facilities (Mike 2016).

2.5.2 Techniques of Preservation

Paper-based preservation techniques include preservation photocopying, preservation microfilming, preservation transfer microfilming. These techniques preserve the content of records but the artifactual and intrinsic value of the originals cannot be captured in the reproduction.

Phased preservation and preservation management look at the preservation needs of a body of materials as a whole, assessing both the physical condition and the value of materials to determine how to allocate resources to maximize the impact of preservation efforts.
Digital preservation techniques; digital preservation is the management of information that appeared in traditional and electronic formats. Due to technological obsolescence, there are several additional strategies that librarians and archivists may use to actively combat the loss of digital information Celoonan (2002). They include;

**Migration**: migration is the transferring of data to newer system environments. The purpose of migration is to keep on preserving the information in electronic formats and maintain the ability of users to keep on using them in the face of constantly changing technology. This may be conversion of resources from one file to another for example conversion of Microsoft word to pdf or open document, from one operating system to another for example conversion from windows to Linux, from one programme language to another for example conversion from C to Java, so that the resources will remain fully functional and accessible. One setback in this method is that resources that are migrated run the risk of losing some type of functionality because newer formats may not be capable of capturing all the functionality of the original format or the converter itself may not be able to interpret all the nuances of the original format.

**Refreshing**: this is the transfer of data between two types of the same storage medium so that there are no changes or alteration of data. It is a way of periodically moving files from physical medium to another in order to avoid obsolescence or degradation of the storage medium. For example, transferring census data from one old preservation device, such as CD to a new one.

**Emulation**: the purpose of emulation is for older datasets to be allowed to run on modern computers. Unlike migration, emulation focuses on application software instead of the files containing data. It seeks to develop new tools that will create conditions under which the original data were created.

**Replication**: this involves creating duplicate copies of one or more systems. Data that exist as a single copy in one location is highly vulnerable to software or hardware failure, intentional or accidental alteration, and environmental catastrophes. For preservation and conservation, data is more likely to survive if it is replicated to several locations. However,
replicated data may create difficulties in refreshing, migration, versioning and access since they are located in multiple places.

2.5.3 Strength and weaknesses of the above techniques of preservation

Digital preservation techniques have the following strength;

- The performance model breaks down the concept of a digital record into components that help explain their fundamental nature.

- As a result, each viewing of a record is a new original copy of itself where two people can view the same record on their computers at the same time and will experience equivalent performances of that record.

- The importance placed on originality, in relation to paper records, does not apply to digital records, where many users can access equivalent copies.

- Risks of data loss are minimized because content and contextual information are kept together.

The weaknesses include;

- Digital records are mediated by technology, which means that to access digital records a person must have the right combination of hardware and software.

- **Formats and styles**: computer technology facilitates creating an increasing diversity of recorded information forms. Like traditional forms for example books, maps, photographs, and sound recordings continue to be produced in digital formats. New formats have emerged, such as hypertext, dynamic pages multimedia, geographical information systems and interactive video and each format poses distinct challenges for digital preservation.

- **Context**: We must use basic research to help develop an understanding of the contextual circumstances to define, develop and evaluate techniques to preserve the content, formats and styles and context of digital information across information
technology generations, develop criteria and methods for assessing and demonstrating the preserved information’s authenticity and articulate methods of assessing the long-term value of digital information.

- Technology cycles are short; therefore, product lifetimes also tend to be short. The implication of this largely market-driven instability is two-fold: rapid decay and technological obsolescence. Storage media, such as disks, tapes and cartridges, decay relatively rapidly compared to other media because they are not designed for long term use and are therefore extremely susceptible to short and medium term decay.

Paper-based preservation techniques have the following strength;

- It does not involve the use of hardware and software to access information.
- It is not prone to computer viruses since computers are not used in preserving information.
- Cost, the cost of acquisition is low.

The weaknesses include;

- Paper records can only be accessed at one place at a time.
- Requires constant attention.
- It occupies a lot of office space.

2.6 Research Gap

Having clearly studied the above literature by different scholars, specific ideas of preservation and conservation of archives, it was inferred that few studies were available on the assessment of archives preservation and conservation in public organizations.
CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter described the research design and methods for this study. It specifically identified processes and techniques of gathering, analysing and interpretation of data that was used in the study. The chapter began with the research design, which was the description of the research approach. It further attempted to describe the population of the study. It also looked at data collection tools that were used in the course of the research. It also presented the data collection instruments that were used to maintain the validity of research instrument at the Ministry of Water and Environment Registry.

3.2 Research design

Burns and Grove (2003) define a research design as “a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings”.

Kombo and Tromp (2006) define research design as a scheme outline or plan that is used to generate answers to research problems. They further emphasize that a research design can be thought as the structure of research.

Bell (1997) observes that the research design outlines the basis for making interpretation of data and establishes the format for detailed steps to follow when conducting this study. Bell (1997) further contends that the ‘research universe’ is guided by two major research design paradigms; that is quantitative research and qualitative research paradigms. Each of these paradigms is further conducted using relevant data collection and analysis approaches as the need may arise (Enon, 1998).

Graziano and Raulin (2010) noted that research plan is complex and if they are not constructed properly, all the work of collecting and analyzing data will be wasted. This study was conducted using a qualitative research paradigm. Easter by-Smith et al (1991) noted that qualitative researchers use words and meanings from studies as opposed to the use of number and quantifiable units to draw meanings, which is the focus of quantitative
research. In adopting the qualitative research paradigm, the case study design was used as a method of data collection, which emphasized non-numeric approach. The method was used for the following reasons; the method emphasizes data which do not break into variables, it seeks to discover what is hidden, uses more of questions to collect data, the researcher will interact with the participants, data will be collected from its true setting or from the Registry of the Ministry of Water and Environment.

3.3 Area of the Study

Katamba and Nsubuga (2014) describe the area of study as the description of the geographical area where the research is to be carried out. This study was carried out at the Registry of Ministry of Water and Environment and it focused on assessment of archives preservation and conservation.

3.4 Population of the Study

Kombo and Tromp (2006) define population as a group of individual objects or items from which samples are taken for measurement. For the purpose of this study, the population included the records staff of the registry of the Ministry of Water and Environment. These were selected because of their roles in the preservation and conservation of archives at the Registry department of Ministry of Water and Environment. The size of the population in the study was consistent with the application of qualitative research design.

3.5 Sampling Techniques.

Sampling refers to the means of how researcher gathers information about the target population. Sampling techniques refers to the process of collecting samples. The researcher used purposive sampling technique to collect the depth of information about the problem that was studied and the gaps bridged. Purposive sampling was used in this study because Parahoo (1997) describes purposive sampling as “a method of sampling where the researcher will deliberately choose who to include in the study based on their ability to provide necessary data about the archives preservation and conservation at the Ministry of Water and Environment.
3.5.1 Sample size

Using the purposive sampling technique, a sample of twelve (12) respondents were selected to take part in the study in order to get the relevant information on the study and these were the (01) senior records manager, (01) records manager, (03) records clerk, (05) records assistant and (02) others.

3.6 Data Collection Methods

According to Kombo (2005) data collection in research is the term used to refer to the gathering of specific information aimed at providing or refuting some facts. Therefore, the researcher used various methods to collect data depending on the type of information needed for the respondents and how flexible this method was to the researcher in obtaining or getting necessary information from the respondents.

3.6.1 Interviews

Kothari (2004) defines interview as a method that involves presentation of oral- verbal stimuli and reply in terms of oral- verbal responses. He also puts it that interviewing is a conversation between the interviewer and the respondent. It also involves asking questions in person. Interview can be in two types; structured and unstructured interview. The researcher used face-to-face interviews with the different staff members of the registry department for example. Senior Records officer and the Assistant Records officers available therein. Respondents were informed early about their involvement in the study; this gave them enough time to get ready for the researcher. The researcher in the course of the interview for proper documentation and analysis recorded answers from the respondents down after the interview.

3.6.2 Observation

Kothari (2004) defines observation as the most commonly used method especially in studies relating to behavioural sciences. He puts it that under observation method, the information is sought by way of investigator’s own direct observation without asking from respondent. Observation is one of the most classical methods of collecting data in scientific studies. It is also defined as the way of gathering data by way of watching behaviour,
events, activities and taking note of characteristics of whatever is being observed in its original and natural setting. Observation can be direct or indirect. This is the modification of diary method for example in observation; it involves sampling techniques where they are used for selection of the study.

## 3.6.3 Document reviews

This exercise involved revisiting of written books and manuals to overlap the problem. The researcher read several books and organisation manuals and policies to establish relevant information for the study. These included books like records management hand books, organisational structure, e- journals, e- books and many more for the purposes of understanding.

## 3.7. Data Collection Instruments

According to Kakinda (2000), data collection is a systematic process in which the researcher collects relevant data or information to achieve the research objectives. The instruments to use for data collection depended on the research design. In this study, data was collected using interview guide and observation guide to make the research easy and quick in problem solving.

### 3.7.1 Interview guide

An interview guide is a set of topics or questions about which the interview is conducted (Kombo 2006). The researcher asked questions face to face from the respondents and this was very important because the researcher was able to clarify on what information was required.

### 3.7.2 Observation guide

Adzobu (2003) says that the method studies events as they occur and so what people the subjects do rather than what they say they do. The researcher critically observed how all the records staff handle the records management systems, files and equipment that were used and practices in place for management of records. This guide included a number of observational data that was relevant to obtain at different levels and stages of assessing the
records management practices in order to make comparison with respondents’ feedback using other methods.

3.8 Data analysis

This is the process where the researcher made sense out of the data collected from the field. Basing on the research objectives, data was gathered and critically analyzed qualitatively using percentages of responses to examine the magnitude of preservation and conservation of archives in the Registry of Ministry of water and environment.

3.9 Data presentation

The researcher used tables, charts and graphs to present the data. The choice of the method of data presentation depended on the preference of the researcher and the assumption behind the choice.

3.10 Data Quality Control

Quality control entails ensuring acceptable levels of validity and reliability of instrument. Onen (2008) defines validity as the degree to which the instrument measures what it is meant to measure. To ensure data quality control, the researcher made that the research instruments used, were accurate, correct, fair, appropriate and relevant for the study. The researcher strictly observed time allocated for interview and observation. There was also quick judgement of situation in its natural setting.

3.11 Ethical Considerations

According to Katamba and Nsubuga, (2014) ethical issues refer to the moral justification of the investigation or intervention as regards to the minimal abuse, disregard, safety, social and psychological wellbeing of the person and the community. The researcher adhered to the following ethical issues

The researcher maintained confidentiality by making sure that all the information obtained from the respondents was kept secret.

The researcher maintained honesty by saying what he meant and meaning what he said. Being truthful to respondents at all stages of the research and avoiding any form of
manipulation.

The researcher maintained due respect to the whole population and equal treatment was accorded to the population irrespective of rank. This built rapport between the researcher and the respondents and information was easily acquired. Acknowledgement of the authors and all published information was done to appreciate the contributors’ works and honor the copyright laws.

The researcher ensured punctuality; she was very punctual on every appointment that was scheduled. This was done through liaising with the respondents on when to meet.

3.12 Limitations of the Study

In carrying out research, the following hindrances were encountered.

Failure of respondents to fill and return the questionnaires; some respondents provided inadequate/incomplete information. The researcher tried to mitigate that by assuring the respondents of the confidentiality on the information provided as a motivation to provide sufficient information. Phone call reminders to those who were taking long to fill in the questionnaires were made while at the same time issuing out new questionnaires to those who purported to have lost the original copies.

Time factor; there was a challenge of limited time on both the researcher and respondents’ side. This was overcome by scheduling appointments with the designated respondents as opposed to ambushing them. For those who did not honor earlier made appointments, new ones were made at a time of their convenience. The researcher also tried to make use of non-official hours like at tea breaks and lunch time so as not to interfere greatly with the smooth operations of the respondents during official working hours.

Financial problems; research has always been an expensive undertaking to accomplish. It involved use of lots of stationery to print, involved lots of movements and other expenses arising from communication. The researcher tried to be as frugal as possible to ensure that he covers as much as possible on a limited budget. For instance, he preferred making phone calls during off-peak hours to enjoy some subsidy, delegating to friends some duties to be
done at no cost and printing a few materials and topping up the required number by photocopying. All these tactics helped the researcher to minimize costs.
CHAPTER FOUR
PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.0 Introduction

This chapter presents findings that were collected from the field and interpretation of data collected about preservation and conservation of archives at the Ministry of Water and Environment in relation to the study objectives. These findings are presented in accordance to the objectives of the study as presented in chapter one and these include;

5. To identify the kinds of archival collections and associated threats at Ministry of Water and Environment.
6. To assess the methods used in preserving and conserving archives at the Ministry of Water and Environment.
7. To find out the challenges faced in preserving and conserving archives at the Ministry of Water and Environment.
8. To suggest ways to improve preservation and conservation of archives at Ministry of Water and Environment.

a. Demographic chapter of respondent

The study population revealed that 84% of the respondents were male and 16% of the respondents were female as illustrated in the table and the pie chart below.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>9</td>
<td>75</td>
</tr>
<tr>
<td>Female</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1: Demographic information (Source: Field data 2018)
**A Pie chart showing demographic information of respondents**

![Pie chart](image)

**Figure 1: Demographic information (Source: field data 2018)**

**Description of the respondents**

The interview guide required general information about the different respondents who were involved in the study.

Basing on research findings, the Registry has a number of staff and support staff who carry out the archives management activities and it is from this that the researcher was able to get population of eight people that included; a senior records manager (01), records assistants (03) three records clerks and one senior administrator who is the Head of the Registry.

The study involved Senior Records Manager, Records Manager, Records Assitant, Records clerk and other users (clients) that were selected for the accomplishment of the study as illustrated in the table and the pie chart below.
<table>
<thead>
<tr>
<th>Profession</th>
<th>Research target population</th>
<th>Actual respondents</th>
<th>Response percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Records Manager</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Records Manager</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Records Assistant</td>
<td>5</td>
<td>4</td>
<td>33</td>
</tr>
<tr>
<td>Records Clerk</td>
<td>3</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>9</td>
<td>73</td>
</tr>
</tbody>
</table>

Table 2 Study population (Source: field data 2018)

A Pie Chart Showing the Description of the Respondents

Figure 2 Study population of the study (Source: field data 2018)

The Senior Records Officer.

From the Research findings, the Registry has got a senior records officer whose position is the head of archives department reporting to the senior administrator that is the head of the Registry. The officer has a professional experience of four years in archives management.
He is directly involved in the monitoring and supervision of all archives management activities and subordinate records personnel in the Registry, records management regulations, procedures and policy development which help in the effective management of archives.

**Record Assistants**

The Registry has also got records assistants who are with a qualification of at least a diploma in records management. Their role is to carry out the daily archives management activities such as retrieving, shelving, filing, sorting and many others. These assistant have got office space where they operate the registry activities and they report directly to the senior records officer.

**Records Clerks**

These are mainly stationed in the registry and they carry out all support staff activities as directed or delegated by the assistant records officers, they also carry out housekeeping activities in the registry and they report directly to the assistant records officers. They are also involved in the collection and compilation of the different records and information resources in the Registry.

**4.1 Qualifications of Respondents**

The study population revealed that most of the respondents had different levels of qualification which included; Records Assistants and Records clerks were diploma holders, Records Manager had a bachelor’s degree and the Senior Records Manager with a master’s degree as seen in the bar graph below.
Figure 3: A bar graph showing the qualifications of respondents (source: field data 2018)

4.2 Kinds of archival collections at Ministry of Water and Environment

From the interview and observation used, the researcher identified the kinds of archival collections at Ministry of Water and Environment. The collections were identified according to the following criteria; by physical form and by subject.

4.2.1 Physical form

On the basis of their form, collections were described on the basis of the material on which the information is contained. The collections at Ministry of Water and Environment was classified into the following classes; Collections on paper material, Collections on microform and microfilms, Collections in electronic format and Cartographic materials.

Collections on paper material. As a material for archival management, paper is still by far the most used physical material in the world today especially in Sub-Saharan Africa. Britannica further defines paper material as a matted or felted sheet, usually made of cellulose fibers, formed on a wire screen from water suspension. In Ministry of Water and
Environment Registry, paper also formed the largest part of the collection since records in Uganda have largely been managed on paper. These papers however vary in physical form basing on the way they were manufactured. It was very evident that the Ministry of Water and Environment Registry does not have control over the records that come to the archive during their active stage. Therefore, all sorts of paper types are used and just presented to the Registry department after the appraisal stage of the lifecycle. All this implied that different paper materials had different kinds basing on how they were manufactured. Therefore, preservation and conservation of such a myriad of forms, sizes, textures and quality required careful examination and execution.

**Collections on microform and microfilm.** Such collections involve information captured on microform material. Encyclopedia Britannica (2010) describes microform and microfilm as materials that emanate from any process, photographic or electronic, which involves reproducing printed matter or other graphic material in a much reduced size, which can be enlarged by an optical apparatus for reading or reproduction. In general, such systems provide durable, extremely compact and easily accessible file records.

In Ministry of Water and Environment Registry these are in form of condensed periodicals and newspaper back issues, manuscripts, theses and dissertations captured on reduced scales. They are also frequently used for storage of past photos of historical significance. It should be noted that in addition to being more durable in preserving records and archival materials, this kind of media occupies relatively less storage space. For all these benefits however, it is used on a very minimal level at Ministry of Water and Environment. It should be noted that unlike paper, microform and microfiche are affected by different kind of physical strains and in varying degrees and such they require special care and handling.

**Collections in electronic formats.** Ministry of Water and Environment has been gradually embracing information and communication technologies. One of the key pillars of this revolution was the registry which is transforming its collection into electronic formats. Though still in small quantities, it was noted that there are some archives which are being transformed into electronic files. It was evident that the digitization process was more of preservation strategy whereas the electronic archives are more of the backups of the
originals. Though they are more of backups, electronic archives also represent a unique physical form of archival collections. Most of these types of records are kept on computer discs, Disc versatile Discs, computer hard discs and flashes.

**Cartographic materials.** Merriam-Webster online dictionary (2010) defines cartography as a science of making maps. This term can also be referred to as map making and it involves the practice of making maps or globes. Therefore, cartographic materials include all materials in form of maps. Such materials in Ministry of Water and Environment Registry were categorized into general maps that were constructed for a general audience and thus contain a variety of features. These maps exhibited many reference and location systems which were produced in series.

4.2.2 Subject

Subject in this case refers to the themes or topics contained in the archival collections. The content of the collections were described on the foundation by which the records were created. It is on the basis of this categorization (subject) that the archival collections at Ministry of Water and Environment are organized, identified and retrieved. According to the Ministry of Water and Environment archival list, the archival collection is significant to both for research and is the primary depository of Ugandan history. It contains papers, letters, notes, reports, diaries of events, travel, church memorandum, and registers which are important to the Ugandan colonial and early Independence Day’s legacy. The department also holds important historical documents referring to Kenya and Tanzania during the early years of colonization. The section also prides itself to hold a collection of materials mostly of non-government nature consisting of the minutes of the Uganda chamber of commerce from its beginning and there are also church missionary files within these holdings. All the above collected works exist in a variety of media. These include; paper based material, sound recordings on magnetic tapes, cassettes and Audio visual recordings on video tapes.

Such collection shows variety in prominence yet there is one thing in common; that all these are special collections to Uganda’s legacy and as such ought to be preserved and
conserved for future generations. They are exceptional and should be treated with such reverence.

4.3 Threats to Archival Collections

Using observation and interview, the researcher was able to find out the threats to archival collections at Ministry of Water and Environment Registry. The following were mostly talked as the serious threats to archival deterioration at Ministry of Water and Environment.

**Dirt and dust;** through observation, the researcher found out that dirt and dust was the major cause of archives deterioration at Ministry of Water and Environment. It is located near a busy area where too many vehicles pass by. This therefore means that the records in the registry are exposed to car exhaust, dirt and dust. Dirt and dust form particles that float in the air. Such particles are sometimes acidic and abrasive and they can penetrate through the items when they come into contact with materials thus causing them to deteriorate.

**Air pollution;** from the interview and observation made by the researcher, air pollution was another serious hazard to archives at Ministry of Water and Environment. Through observation, the researcher observed that Ministry of Water and Environment is located in an industrialized area that experience air pollution like gaseous air, chemicals, car exhaust and other toxins that generate pollution. These can damage the archival materials hence causing them to deteriorate.

**Photocopying;** the respondent revealed that another threat to Archival collections was photocopying. Records in the Registry at Ministry of Water and Environment are photocopied in many copies to avoid frequent use of the original and therefore this exposes the records to intense light and heat that can highly affect the archival materials. The physical damage caused by repeatedly handling of materials and flattening them onto the photocopying glass was severe especially where a particular archival item was requested frequently.

**Insects and Rodents;** the respondent revealed that insects like cockroaches and rodents like rats are dangerous to archival collections at Ministry of Water and Environment. The researcher through observation found out that insects are also attracted to dump, dark and
dirty places in the storage area which destroys the records by eating them and even making them dirty with their droppings. Through interview, the researcher found out that insects are attracted to the nutrients found in paper-based products particularly adhesives and starches which may require extermination of records. The researcher through interview still found out that insects such as rats and mice eat archival materials as they use papers to build their nests. Rodents are attracted to storage areas by warm or dark environments and they also gain access if there are passage ways to the outside such as cracks or holes in walls.

**Acidity in papers;** the respondents revealed that acidity in papers is also another threat to archival collections which cause records deterioration at Ministry of Water and Environment Registry. Through interview with the Senior Records Manager, Records Manager, Records Clerk, Records Assistants and others, the researcher found out that papers used to draft guidelines and policies, appointment letter and leave form are made from wood pulp that deteriorate faster because they are highly acidic.

**Temperature and humidity;** the findings revealed that temperature and humidity also cause threats to archives at Ministry of Water and Environment Registry. Through interview and observation, the researcher found out that archives in the Registry experiences very high temperatures which speeds up the chemical reactions that causes records deterioration and high relative humidity which promotes the growth of moulds which are dangerous to records therefore the archives are highly affected by the fluctuation in temperature and relative humidity than consistently high or consistently low levels.

**The nature of records itself;** the respondent answered that the nature of records itself also causes records deterioration at the Ministry of Water and Environment Registry. Through interview and observation, archives are mostly in papers form whereby some papers are of poor quality containing a lot of acids which are dangerous to records.

**Misuse and poor handling of files;** from the interview and observation made by the researcher, misuse and poor handling of files is another threat to the archival collections at the Ministry of Water and Environment. Through observation, the researcher observed that records users and records managers are threats to the archival materials and it is made
through a number of ways that is; poor retrieval and filing practices by the records managers causing the materials to tear and wear, photocopying practices by the users as they come requesting for information which they take to make copies exposing it to excessive light thus causing such a record to deteriorate, excessive use of the records also quickens their deterioration hence leading to loss of valuable information.

4.4 Preservation methods used at the Ministry of Water and Environment Registry

The researcher inquired about the preservation methods used at the Ministry of Water and Environment Registry, all the respondents answered that the following preservation methods were used in the Registry at Ministry of Water and Environment.

**Dusting:** the respondents answered that dusting was one of the preservation method used in the Registry at Ministry of Water and Environment. Through using interview, the researcher found out that dusting is done every morning to remove dust dirt that may stain the papers and photographic records. Therefore, dusting reduces the rate of records deterioration.

**Shelving:** from the researcher’s observation at Ministry of Water and Environment Registry, the researcher found out that shelving was another preservation method used in the Registry, this ensures safe storage of the archival materials. The researcher also observed that all the shelves at the Ministry of Water and Environment Registry were coded and labeled. Shelving prevents records from being mixed up in the storage area and coding and labeling of shelves makes it easier to retrieve and replace records.

**Proper handling:** through interview, the respondent answered that proper handling was one of the preservation methods used at Ministry of Water and Environment Registry. The records staffs were advised not to wet the corners of the papers when opening them and users of records were also encouraged not to fold file folders. In case of need of certain files from the Registry, records assistants were also supposed to know the arrangement of files on shelves and in cabinets in order to ensure easy retrieval and proper records handling. Through interview with the senior records manager, the researcher found out that proper handling is highly considered at the Ministry of Water and Environment Registry.

**Cabinets:** through observation, the researcher found out that Ministry of Water and Environment Registry puts its documents in cabinets. This ensures that records are safe thus preventing records from deteriorating.
**Boxing**; through observation, the researcher observed that Ministry of Water and Environment Registry preserves their archives in plastic boxes which are acid free. This method protects records from light and heat.

**Security**; through observation, the researcher found out that security was highly observed in the Registry at the Ministry of Water and Environment through preventing unauthorized access to records. According to the access to information act (2005), security is an important factor in preserving records.

The preservation methods used were illustrated in both table and pie chart showing their frequency and percentage as seen below.

<table>
<thead>
<tr>
<th>Methods used</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabinets</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Dusting</td>
<td>16</td>
<td>30</td>
</tr>
<tr>
<td>Shelving</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Proper handling</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>Security</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Boxing</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>54</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*Table 3: Preservation methods used (Source: field data, 2018)*

**A Pie Chart Showing the Preservation Methods Used**
4.4.1 Conservation methods used at the Ministry of Water and Environment Registry

The researcher inquired about the conservation methods used at the Ministry of Water and Environment Registry, all the respondents answered that the following conservation methods were used in the Registry at Ministry of Water and Environment.

**Photocopying:** through an interview with the senior records manager, the researcher found out that photocopying was also used as a conservation method at Ministry of Water and Environment Registry. Photocopying different copies from the original this helps the original document stay in its original format as the duplicates are in use and also it acts as backup when the duplicate is lost.

**Digitization:** from an interview with the Registry staff, the researcher found out that digitization was another conservation method used at the Ministry of Water and Environment Registry. Digitization was done by experts and they use document image processing systems for the conversion of materials from paper to electronic form or machine readable form. Digitization change of paper based records from paper format to digital by use of scanners.
**Binding**: the respondent answered that binding was one of the conservation methods used in the Registry at the Ministry of Water and Environment. Binding helps in the safety and security of records such as newspapers.

**Lamination**: through interview, the respondent answered that lamination was another method of conserving records. Lamination applies to the whole document where by the original copy is laminated to avoid threats like water, tear and sometimes even pastes.

The conservation methods used were illustrated in both table and pie chart showing their frequency and percentage as seen below

<table>
<thead>
<tr>
<th>Methods used</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photocopying</td>
<td>7</td>
<td>41</td>
</tr>
<tr>
<td>Lamination</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Digitization</td>
<td>5</td>
<td>29</td>
</tr>
<tr>
<td>Binding</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*Table 4: Conservation methods used (Source: field data, 2018)*

**A PIE CHART SHOWING CONSERVATION METHODS USED**

*Figure 5: Conservation methods used (source: field data, 2018)*
4.5 Challenges associated with preservation and conservation at Ministry of Water and Environment Registry

The findings which were both from the observation and interview guide revealed that the Registry faces a number of challenges during preservation and conservation of archives at the Ministry of Water and Environment. These include the following below;

Inadequate storage space; the study findings revealed that the Registry is small and cannot accommodate the number of records that are stored within them. This inconveniences the records staff in the course of conducting their duties and activities. In the end files are misplaced and misfiled hence making the retrieval of records difficult when needed.

Under staffing; the study findings revealed that the Registry has fewer staff that work in there yet records accumulate on a daily basis and therefore there are a lot of activities that have to be performed and thus this makes the Registry staff to overwork.

Inadequate records storage equipments such as cabinets, boxes and binders. It was observed that, the storage facilities were not enough to accommodate all the records being generated on a daily basis and as a result records are stored on tables, chairs and floor thus records getting torn due to the nature of storage.

Dust, basing on the research findings, one of the respondents noted that dust is one of the major causes of records deterioration because when dust particles settle on an item, they can leave permanent stains on them thus causing damage. Since the registry is near the road and the road which produces a lot of dust which goes straight to the records since they are not fully covered in shelves and dust also sometimes comes from raising dust during the sweeping of the floor and due to lack of dust masks

Lack of a well trained staff in the field of records management, the research findings further revealed that most of the staff knows very little about records management because they were trained in other fields thus affecting service delivery and poor decision making in the organization most of them trained as cartographers but are in the registry managing records
Inadequate backup, the study also revealed that most of the records were maintained using manual system and this was a serious problem because in case of any disaster such as water and fire outbreak, records will be totally lost without any recovery.

Lack of enough security for records; the research findings revealed that files are stored on tables, floor and most of the cabinets are not locked which means records can be accessed by unauthorized users thus leading to loss of confidentiality and integrity of records.

Lack of a disaster management plan; one of the key respondents mentioned that, the department lacks fire extinguishers, water alarms to be used during the emergency of the disaster and this puts records at the risk of total loss and damage.

Darkness in the Registry when electricity goes off; this is a major challenge because when lights are off the whole room is very dark and nothing can be done until electricity is back which delay the daily activities.

Inadequate electronic equipments; the study findings revealed that the electronic equipments used are not enough for example photocopying machines, scanners and printers where by most of these machines are shared by different departments causing congestion and misplacement of records.

Wear and tear of some records; the study findings revealed that as a result of over utilization and handling of paper records by action officers, records wear and tear rapidly. The findings also revealed that some paper records are returned to the Registry when they have been destroyed.

Inadequate funds; the findings revealed that the most outstanding challenge in the Registry at the Ministry of Water and Environment faced during preservation and conservation of archives is limited funding. Through interview, the researcher found out that all the funding to the Registry is from the government and yet it allocates little funds towards the activities of preservation and conservation of archives like hiring qualified experts, buying preservation and conservation equipments such as modern photocopiers, digital cameras, dusting machine and scanners.
Misplacement of files; the study findings revealed that the action officers pick files from the Registry for use and end up losing them in that process. This is because most action officers do not want to return the files after they have finished using them.

Internet challenges; the study findings show that the internet is slow with a lot of users online, this makes sharing of electronic records very slow and dependable. Furthermore, records that have been sent electronically are hard to be accessed because of slow internet.

4.6 Possible solutions to challenges faced in preservation and conservation of the archives at Ministry of Water and Environment Registry

From the interview and observation used by the researcher, the researcher found out the possible solutions to the challenges faced in preservation and conservation at the Ministry of Water and Environment Registry. The solutions that were suggested by the respondents include the following:

First of all, more funds should be allocated to the archives management section. The planning committee of the District should allocate enough funds to records section to enable the Head of records management acquire equipments, supplies and facilities which are key in total management of records.

The organization should train staff, all seminars and workshops organized should incorporate a module on records storage to enable officers at all levels to appreciate the importance of storing records in an organization.

There is also need to automate the record storage and retrieval system due to the fact that the volume of records in the department is ever increasing and this will help to create the storage space for the new incoming records.

Besides that, records should be properly filed by ensuring that right documents are in right files and reviewing, updating the filing systems for efficient management and retrieval of information.
A disaster management plan should be in place and up-to-date disaster preparedness and recovery programme must be in place for all storage areas and facilities. Staff must ensure that a disaster preparedness and recovery programme for records within storage areas and storage facilities is developed and implemented.

Regular cleaning and spraying should be done in an area where archives are stored to kill insects and prevent records against damage and deterioration. Air conditioners should also be used under moderate temperature and relative humidity.

**4.7 Conclusion**

Chapter four has presented the findings of the study basing on the objectives of the study and chapter five will present the summary, conclusions and recommendations to the study.
CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter provides the summary of the major findings, conclusion and recommendations of the study. The recommendations were based on the findings of the study given by the respondents and also to what was observed by the researcher during the study.

5.1 Summary of the Findings

The study was conducted in the Registry at the Ministry of Water and Environment and it focused on assessment of archives preservation and conservation. This section provides a summary of the research findings based on the objectives of the study which included the following;

1. To identify the kinds of archival collections and associated threats at Ministry of Water and Environment.
2. To assess the methods used in preserving and conserving archives at the Ministry of Water and Environment.
3. To find out the challenges faced in preserving and conserving archives at the Ministry of Water and Environment.
4. To suggest ways to improve preservation and conservation of archives at Ministry of Water and Environment.

According to the study findings, there are different kinds of archival collections that are held in the Registry at the Ministry of Water and Environment. These include; Collections on paper material, Collections on microform and microfilm, Collections in electronic formats, and Cartographic materials.

The study findings also revealed that the kinds of archival collections were identified according to subject and Subject in this case referred to the themes or topics contained in the archival collections. The content of the collections were described on the foundation by which the records were created. It was on the basis of this categorization (subject) that the archival collections at Ministry of Water and Environment were organized, identified
and retrieved. According to the Ministry of Water and Environment archival list, the archival collection is significant to both for research and is the primary depository of Ugandan history.

The study findings also revealed the associated threats which include; light, wear and tear, human activity, environmental factor, oxidation and infestation.

Basing on the study findings, respondents noted the different methods of preservation and conservation used in the Registry at Ministry of Water and Environment which include; digital preservation, lamination, leaf-casting, encapsulation and restoration.

According to the findings of the study, it was found out that, there exist different challenges associated with archives preservation and conservation in the Registry at the Ministry of Water and Environment and they include limited storage space and storage equipments, inadequate funds, missing files, few staff, record insecurity and lack of a disaster management plan misplacement of Files.

From the interviews conducted by the researcher, the following solutions were suggested and these include regular cleaning, an up to date disaster management plan, and automation of paper based records, ensure proper filing, division of work, train staff and allocate more funds.

5.2 The Conclusions of the Study

Success in preservation and conservation of archives can only be achieved depending on the determined attempt of the staff and support by management to provide appropriate technology and qualified personnel deployment. It is encouraging that the Registry staff pays attention to archives preservation and conservation especially for paper records. Even though the study findings revealed that the Registry is faced with challenges in the preservation and conservation of archives, there is hope that the Ministry is beginning to undertake measures on these challenges through the purchase of closed metallic shelves to ensure that there is protection against disasters like fire water leakages and others.
To succeed, the Registry needs not only to lay a firm foundation by investing more resources in modern technologies but also taking the necessary measures in terms of deploying relevant skilled human resource, investing in staff training and development, acquiring appropriate storage devices and paying attention to records management policy related issues.

The study also revealed that, preservation and conservation of archives plays an important role in management of records because it helped in supporting legitimacy, accountability and transparency in the Registry. However, from the observations and interviews carried out from the different categories of respondents, it was found out that, there were many challenges encountered in preservation and conservation of archives, the records management department is not yet taken as a priority yet every one runs to it. Hence the recommendations below could help the records management unit to solve the challenges of records management in the Registry and the Ministry at large.

5.3 Recommendation

The research study was carried out in relation to the objectives as the driving force. The conclusions were based on the objectives in the study findings and from the findings, the researcher sought to make recommendations that would provide the suggestions to enhance proper preservation and conservation of archives in the Registry. It is up to other research institutes to adopt and implement any of these recommendations if it finds them relevant to its work. The recommendations were as follows;

Management and Security of Records

It is important to conduct a risk analysis in order to discover and evaluate potential hazards and therefore to take protective measures. Risk analysis and evaluation will lead to identification of records and documents that are most at risk from threats such as loss, destruction, misplacement, document removal and malicious alterations. Files and documents that are judged to be vulnerable to such threats will merit a higher level of protective measures including security classification to restrict access and their storage in a secret or confidential record management unit.
Develop preservation policy

In order to address some of the weakness discussed in this study, there is need to develop preservation policy for the Ministry of Water and Environment archives. Preservation is the use of preventive maintenance, treatment to improve the conditions of the records and reduce the rate of deterioration; this can help to easily identify the requirements for preservation and the purchase of preservation equipments.

Offsite storage centre

Offsite storage centre should be established to store all vital records of the Ministry. This will help to reduce congestion of paper records in the storage area and this also acts as a backup for the vital records.

Funding

Sufficient funding should be allocated to the record management department to facilitate the purchase of equipments and material in the department and also enable cater for seminar training of the staff and be able to match with the rapidly advancing technology in the field of records management

Automation

The management should strive to automate the already existing preservation and conservation systems and embrace the new technology in creation of records, that is, create electronic records to reduce the congestion of the records in the Registry, this comes to support the Ministry efforts to go electronic and increase access to information in the country.

Users’ orientation

There is need to fully orient users before they are admitted to start using the records in the Registry. This can be achieved through putting notices at the counter. This will fully equip users as well as creating positive attitude in the users to minimize the rate of mishandling of records. The ministry should adopt the use of suggestion boxes where users will give their views on the type of services they require
5.4 Areas for further Research

The researcher further noted that the following areas should be handled by other researchers who are going to improve the services in the organization.

1. Records management systems and practices
2. Storage and retrieval of Archives
REFERENCES


Kothari, C.R. (2004). *Research Methodology Methods and techniques (2nd ed.)*. New Delhi:

New Age International.


Dear respondent,

I am Biyinzika Justine, a student at Makerere University pursuing a bachelor’s degree in Records and Archives Management. As part of the program, I am conducting a research study on the topic “assessment of archives preservation and conservation at Ministry of Water and Environment”. I therefore humbly request to respond honestly to this interview guide so as to enable the researcher to collect the right information and help her to acquire knowledge.

Thank you.

The interview guide is divided into sections to help the researcher collect information in major themes

**Section A: Demographic information**

1. What is your position in the Registry department?
2. What is your role in the Registry department?
3. Level of education?
4. Do you appreciate archives preservation and conservation concept?

**Section B: Different kinds of archival collection at Ministry of Water and Environment Registry**

1. What are kinds of archival collections at Ministry of Water and Environment Registry?
2. What are the common threats to these archival collections at Ministry of Water and Environment Registry?
3. Which media are these archives created?

**Section C: Methods of archives preservation and conservation at Ministry of Water and Environment Registry**

1. How are archival collections preserved and conserved at Ministry of Water and Environment Registry?
2. What is done to conserve archival collections that are damaged at Ministry of Water and Environment Registry?

3. How effective are the methods of preserving and conserving archives at Ministry of Water and Environment Registry?

Section D: Challenges and solutions of archives preservation and conservation at Ministry of Water and Environment Registry

1. What Challenges are associated with archives preservation and conservation at the Ministry of Water and Environment Registry?

2. What are some of the possible solutions that would help to improve archives preservation and conservation at Ministry of Water and Environment Registry?

“Thank you for participating in the interview”
Appendix B: Observation Guide.

The guide was useful especially for activities that could not be measured; for example, the time the users spent when accessing archives, the number of users, the time the records manager spent in searching for records, the condition of the archives storage equipments. The observation guide was used to observe the following:

1. Kinds of archival collections
2. Threats to archival collections
3. Availability of preservation and conservation equipments
4. The condition of archives
5. Observe how archives are preserved and conserved
6. Access and use of archives by users
7. Media used for preservation and conservation of archives
8. Methods in preservation and conservation of archives
9. The rooms where archives are stored