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PRESERVATION OF AUDIO-VISUAL ARCHIVES IN ZAMBIA

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Abstract

Audio-visual records and archives constitute a fundamental heritage that satisfies multiple needs, including education, training, research and entertainment. As such, there is a need to appropriately preserve and conserve them so they can be accessed for as long as they are needed. In spite of their significant role in safeguarding cultural heritage, audio-visual records and archives, are often neglected and accorded less attention than paper-based records, especially in developing countries. Hence, there is a risk of losing information held in audio-visual form. That is why this study looked at how the National Archives of Zambia (NAZ) and the Zambia National Broadcasting Corporation (ZNBC) preserve audio-visual materials to ensure long-term accessibility of the information. The study investigated the types of audio-visual collections held, the storage equipment used, measures put in place to ensure long-term accessibility of audio-visual materials, the disaster preparedness plans in place to safeguard audio-visual archives and the major challenges encountered in the preservation of audio-visual materials. The findings of the study revealed that films (microfilm and microfiche), photographs and manuscripts, and video (video tapes) and sound recordings (compact cassette) constitute the biggest audio-visual collection preserved. The equipment used to store audio-visual materials included open shelves, specialised cabinets, electronic database for digitised materials, aisle mobiles and cupboards. The measures taken to ensure the long-term accessibility of audio-visual collection included digitisation and migration of endangered records and archives; fumigation of storage areas; conservation of damaged materials and regulation of temperatures and humidity in the storage areas. The disaster preparedness plans in place mostly covered structure insurance; protection against fire and water by way of installing fire extinguishers; smoke sensors; fire detectors and construction of purpose-built structures. The major challenges faced were financial constraints; technological obsolescence; lack of playback equipment; limited training; lack of strong back-up systems and inadequate storage facilities.

Introduction

Audio-visual records and archives (AVR) are a national asset. They connect cultures, educate and unearth the history of people, and preserve the recorded history. Since time immemorial, they have been expressive of the artistic work of the nation and they serve as the tangible source outlining evidence that can be heard or seen as though the past is reconstructed. They are preserved for the purpose of posterity for future generations. The United States National Archives and Records Administration (2016) defines audio-visual records as collections that

include "motion picture film, still photographs, filmstrips, sound and video recordings, posters and other graphic works, and multimedia productions with related finding aids and production files." Additionally, Edmondson (2004:21) indicates that audio-visual heritage includes recorded sound, radio, film, television, video or other productions comprising moving images and/or recorded sounds.

Zinyengere (2008:37) avers that, "audio-visual records are vital elements of our collective memory, determining our achievements over the years, documenting our past, present and determining our future." The value of audio-visual records in society, and particularly in Africa where illiteracy levels are very high, cannot be overstated. The International Federation of Library Associations and Institutions (2004) affirms that, "audio-visual records are cultural heritage, carrying a huge amount of information that needs to be preserved for future use." They went further to state that, "audio-visual materials can reach different audiences where print materials would not have otherwise reached." Mnjama (2010) posits that audio-visual records are part of official programmes because they record many kinds of information beyond the written word and they serve as direct and powerful communication tools that can reach and inform wide audiences. According to Mnjama (2010), audio-visual information possesses a unique dimension the written word cannot replace. For instance, the US National Archives and Records Administration (2016) states that transcripts of speeches or meetings are hardly a substitute for recordings that show gestures and personality traits or tone of voice of persons who participated in the important events that have shaped our nation's history. According to Edmondson (2002), audio-visual records are part of the documentary heritage that charts the evolution of thought and is the inheritance of the world.

Accordingly, preservation of audio-visual records should be a dominant archival function in institutions entrusted with that responsibility. It is an activity that should not be ignored because the content carried in physical carriers is at the peril of deterioration, disappearing or becoming inaccessible (Casey 2015:14). Preservation is defined as "preventing the deterioration of archival material" (Ngulube 2003). In addition, Harris (2000:48) and Harvey (1993) state that preservation can be viewed as all deliberations involved in ensuring continual accessibility to the records and the information they contain. In this study, Wright's (2012:4) definition of preservation was adopted where he states that preservation is the totality of things necessary to ensure the permanent accessibility, with minimum loss of quality, of the visual or sonic content or other essential attributes of the work concerned. Therefore, it embraces things such as access; feedback; examination; conservation; repair; restoration; copying; surveillance; collection management systems; storage environments and methods.

Nevertheless, most institutions in the world neglect the preservation of audio-visual records and archives. According to Matangira (2010); Mnjama (2010) and Lihoma (2008), the neglect of audio-visual preservation in most institutions is due to a combination of several factors such as a lack of appropriate equipment needed to inspect and view such materials; a lack of qualified personnel to care for and maintain both materials and equipment; limited resources for engaging in audio-visual preservation and reformatting activities, and the absence of sufficient description of these materials. Audio-visual materials are much more difficult to preserve than paper records (Matangira 2010:224). Mnjama (2010) indicates that audio-visual records are managed inadequately because of the absence of proper preservation strategies, which also indicates that existing finding aids have not been updated for some time while audio-visual collections have continued to grow. This resulted in collections not being migrated to new formats, which leads to a risk of loss of information. The absence of

hardware, software, standards, policies, guidelines and trained staff may affect long-term preservation. However, this does not underscore the importance of audio-visual materials today. It is imperative that they are preserved for posterity.

The need for the preservation of audio-visual records stems from the fact that many of them are fragile, machine dependent and carry information on endangered media. There would be nothing left if the major risks of deterioration and obsolescence defeat the efforts of archivists to provide the utmost protection (Breen & Flam 2014). However, many agencies are unable to establish programmes that meet archival standards for the preservation of audio-visual records. For this reason, the study sought to assess how the National Archives of Zambia and the Zambia National Broadcasting Corporation preserve their audio-visual records to ensure long-term accessibility.

Background of National Archives and Zambia National Broadcasting Corporation

According to Mulauzi, Munsanje-Mwale, Mtanga and Hamooya (2014) and Hamooya, Mulauzi and Njobvu (2012), the National Archives of Zambia (NAZ) is a department under the Zambia Ministry of Home Affairs charged with the responsibility of providing efficient and effective records management systems and safe custody of public records, archives, and printed and non-printed publications in order to ensure lawful access to information by government institutions and the general public. These authors explain that the NAZ derives this mandate from the National Archives Act, chapter 175 of the Laws of Zambia, and the Printed Publications Act, chapter 161 of the Laws of Zambia.

A study by Mulauzi et al. (2014) revealed that the collection at the NAZ comprises books acquired by legal deposit and donations; records and archives such as District Notebooks (DNBs); maps; Government Gazettes; newspapers from all the newspaper companies dating back as far as the 1950's and journals. The NAZ holds documents relating to each of the provinces and districts for pre- and post-election periods for matters such as legal cases, political issues and civil engineering issues, to mention just a few. To do this efficiently, the NAZ has various sections. These include: the Library Management Section responsible for preparing local and international materials in book and periodical form before they are made available for publication and circulation; the Conservation Section, which aims to ensure long-term preservation of the library; the Archives Administration section responsible for the care and management of archival materials; and the Records Management Section responsible for the care, management and custody of semi-current records of all government institutions. All these sections play a part in the holistic description of the collection in accordance with the collection development policy (Hamooya et al. 2012).

On the other hand, the ZNBC is a Zambian state-owned television and radio station. It is the oldest, widest and largest radio and television service provider in Zambia. The ZNBC was established by an Act of Parliament in 1987, which was passed to transform the Zambia Broadcasting Services (ZBS) from being a government department under the Ministry of Information and Broadcasting Services into a statutory body called the Zambia National Broadcasting Corporation (Africa in Broadcasting Series 2010). Zambia, known as Northern Rhodesia before 1964, acquired a radio service during World War II. This followed the government Information Department's move in 1941 to install a 300 watt transmitter in Lusaka, the capital city. At that time, the radio service was built for the purpose of disseminating war-related information. From the outset, the Lusaka station addressed

programmes to Africans in their own languages, becoming the pioneer in the field of local vernacular broadcasting (Africa in Broadcasting Series 2010).

In 1945, Harry Franklin, Director of Information in the colonial government, proposed that Radio Lusaka concentrate on developing programming for Africans. Since Northern Rhodesia could not afford such a specialised service on its own, Harry Franklin persuaded the administrations of Southern Rhodesia and Nyasaland to share in the operating costs, while the British Government agreed to provide capital funds. Thus, the Central African Broadcasting Station (CABS) came into being (Africa in Broadcasting Series 2010).

In 1953, there was a Federation of Rhodesia and Nyasaland and, in 1958, a new broadcasting organisation, the Federal Broadcasting Corporation of Rhodesia and Nyasaland was founded, with its headquarters in Lusaka. This organisation continued to use African languages as well as English, but the spirit that had animated the original station had long since been drowned by the rising tide of animosity between the races. Eventually, in 1963, Northern Rhodesia and Nyasaland broke away from the Federation and became Zambia and Malawi, respectively. The station in Lusaka was then known as the Zambia Broadcasting Corporation until 1966, when it changed to ZBS after an Act of parliament was passed (Banda 2003). In Zambia, television was introduced in 1961 by a private firm called the London Rhodesia Company (LONRHO) that was based on the Copperbelt province in Kitwe. The station was owned by 'Tiny' Rowland and it was primarily set up to serve the interest of the large, white mining and commercial community in the province. However, in 1967, the television station was moved to the capital, Lusaka, to become part of the ZBS. Following this move, an Act of parliament was passed in 1987 to turn the ZBS into a body corporate to be called the Zambia National Broadcasting Corporation (ZNBC) (Africa in Broadcasting Series 2010).

The ZNBC has various units, including technical services; finance; programmes; marketing sales; human resources; corporate affairs and the regional controller. The corporation operates diffusion services across three radio channels, namely Radio 1, Radio 2 and Radio 4; and three television channels, namely TV1, TV2 and TV3 with plans to introduce new channels. The ZNBC is mandated to deliver an unparalleled public value proposition of educating, informing and entertaining all Zambians by means of radio stations and television channels. The corporation is wholly owned by the government of the Republic of Zambia and was established on 1 April 1988 as a public service broadcaster, the precursor to the ZBS. The corporation's core responsibility is to provide radio and television broadcasts throughout the country. The corporation's other role is to provide signal distribution to other broadcasting stations (Africa in Broadcasting Series 2010).

The institution's mission is to provide quality radio and television services throughout Zambia in order to stimulate the cultural, social and economic development while generating commercial value and attaining financial viability for the corporation (Makungu 2004). Over its three radio channels and three television channels, the ZNBC plans to introduce new channels. Currently it offers programmes on news, public affairs, light entertainment, sports, religion, education, business, political interviews, discussion programs and documentaries (Africa in Broadcasting Series 2010).

Statement of the problem

One of the fundamental roles of audio-visual records is to maintain cultural heritage. However, audio-visual records are often neglected and generally accorded less attention than

paper-based records, especially in developing countries. A dearth of literature exists on how audio-visual records are preserved for posterity in Zambia, particularly at the NAZ, which is entrusted to ensure safe custody of all public records, and the ZNBC whose records are mainly in audio-visual form. This study, therefore, looked at how the different types of audio-visual records at the NAZ and the ZNBC are preserved to ensure long-term accessibility.

Research objectives

The general research objective was to assess the preservation of audio-visual records and archives at the NAZ and the ZNBC. The specific objectives included the following:
1. To find out which types of audio-visual records and archives were kept by the NAZ and the ZNBC.
2. To find out which equipment was used in the storage of audio-visual records and archives at the NAZ and the ZNBC.
3. To establish the measures put in place to ensure long-term accessibility of audio-visual records and archives at the NAZ and the ZNBC.
4. To ascertain the disaster preparedness plans employed to safeguard audio-visual records and archives at the NAZ and the ZNBC.
5. To determine the challenges encountered by the institutions in the preservation of audio-visual records and archives at the NAZ and the ZNBC.

Significance of the study

The results of this study will raise awareness about the importance of putting in place proper preservation measures of audio-visual records for future reference. It is also hoped that the findings of the study will help implore decision- and policy-makers to formulate and implement training and development programmes aimed at advancing skills and techniques to safeguard audio-visual records in Zambia. The findings will also be of benefit to decision-makers to develop more interest in developing strategic measures that would prolong the life of audio-visual records. Above all, the study adds knowledge to audio-visual records and archives to the existing body of literature.

Literature review

Nature of audio-visual record

Lukileni-Iipinge and Mnjama (2017) carried out a research at the National Archives of Namibia on the preservation of audio-visual records, which revealed that the National Archives of Zambia holds records of original footage and finished productions of VHS, Betacam and DVDs. Their findings further revealed that the National Archives also holds records such as the music on tapes, videotapes, audiocassettes, gramophone, news tapes, projector films, compact discs, photographs, microfiche and microfilms.

Another study done by Ncala (2017) at the National Film Video and Sound Archives on the preservation of, and access to, audio-visual records in South Africa discovered the diverse, mixed and multimedia collection in the National Film Video and Sound Archives holdings such as film, video, sound recordings, photographs, manuscripts and miscellaneous. The researcher revealed that the National Film Video and Sound Archives has old collections which date back to between 1850 and 1899; therefore, the collection has aged but it still has historical, heritage and research value. Similarly, Mensah, Adjei and Adams (2017)

conducted a research at the University of Ghana, specifically at JH Kwabena Nketia Archives, on the preservation of audio-visual archives in Ghana and revealed that the archives consist of collections of the Institute of African Studies and that of the International Centre for Music and Dance (ICMD) collected between the 1950s and 1970s. Further, the archives were expanded to include paper document types since 2014, and presently contain a collection of audios, videos or CD-ROMs, photographs, manuscripts and paper holdings totalling approximately 12,700.

Equipment used in the storage of audio-visual records

Abankwah (2008) conducted a study at the Botswana National Archives and Records Service (BNARS) and reported that there is a 'purpose-built' building that is equipped with sliding racks, adjustable shelving, film cans and acid-free archival boxes modern facilities for audio-visual materials. Similarly, the study that Lukileni-Iipinge and Mnjama (2017) carried out at the National Archives of Namibia on the preservation of audio-visual records discovered that the building was purpose built to ensure that audio-visual records are exposed to suitable storage conditions to avoid deterioration. According to Mwangwera (2003), audio-visual materials kept in improvised buildings are normally exposed to harsh conditions due to a lack of suitable accommodation. In terms of storage facilities available for the storage of audio-visual records and archive, Lukileni-Iipinge and Mnjama (2017) found that at the National Archives of Namibia, cabinets and open shelves were the main storage facilities for keeping photographs, negatives, videocassettes, U-Matic tapes, audiocassette and CDs. Further, it was discovered that maps were placed in vertical cabinets. Unfortunately, the maps were vulnerable to falling as they were held in the cabinets by tapes which, when exposed to heat, came loose and fall off. Kemoni (1996) recommends special equipment for such kinds of materials, including but not limited to universal shelves that are suitable for large maps and posters and large shelves on rollers and tubes.

Ncala (2017) conducted a study on the preservation of and access to audio-visual records at the National Film, Video and Sound Archives of South Africa (NFVSA). The findings showed that with regard to storage conditions of audio-visual materials, the collection was at risk and not in very good condition. He revealed that film was the most contaminated collection, followed by sound, then video. Notably, dust and fungi were found on all media, water on film and sound, and oil and insect droppings on film. The study also revealed that the NFVSA was not purpose built, which made it possible for audio-visual materials to be exposed to deteriorating agents. Further, the researcher's observation in the same study revealed that the other major concern at the NFVSA was the water pipes that were so close to the vaults that posed a threat to audio-visual records. If a flood or water leakage was to occur or a pipe was to burst, there would be a loss of all the valuable collections. In Swaziland, Maseko (2010) observed that although videotapes at the Swaziland Television Authority (STVA) were systematically arranged according to subject titles, some of the videotapes were stacked up in cardboard boxes without any meaningful arrangement, thereby making the retrieval process slow and cumbersome.

Measures to safeguard audio-visual

A study done by Mutiti (2002) on the management and preservation of audio-visual materials at BNARS revealed that there were searching systems to ensure long-term accessibility and making the collection available to the public. The researcher revealed that BNARS used a printed guide and computer catalogue accessible in-house. Searchable descriptions of all

audio-visual records were processed so that all the users could access them at all times. This is important because the purpose of archival preservation is to ensure that records remain accessible over time as authentic and reliable evidence in future.

Another study that is the one carried out by Komba, Nawe and Manda (2017) on the preservation and accessibility of audio-visual records at the National Archives of Tanzania and Tanzania Television Broadcasting Companies. It was found out that in the modern world, access was steadily becoming more of an online experience than a mere visit to a monolithic brick and mortar edifice at the two institutions. The researcher revealed that Tanzania's television broadcasting companies were moving away from the analogue contents that were accessed with the use of readable machines to the migrated digital medium, which aimed at enhancing both accessibility and preservation. The study further revealed that the institution underwent reformatting processes that involved copying, digitisation, microfilming, migration, emulation, and photocopying to ensure long-term accessibility through carrier readers (DVD, video and film readers) and electronic means. According to Duryee (2014), accessing such materials can range from the technology used, adequate viewing/listening room, useable playback machines, screens, playing tables, computers, headsets and copying machines. The actual access is the listening to or viewing of the contents that takes place because of well-preserved audio-visual materials in its original form or in a reformatted version.

A study by Lukileni-Iipinge and Mnjama (2017) at the national archives further revealed that there was order in the reading room in the way the records were arranged and retrieved. The results also showed that there were manual finding aids and an electronic database that were available for use by researchers and staff members to locate and retrieve audio-visual records. Similarly, Ncala's (2017) study at the NFVSA reported that the institution had various finding aids available to locate descriptions of audio-visual collections. The findings revealed further that word-processed registers/inventories and the NFVSA website were used, followed by card catalogues and indexes; thereafter the printed guides and computer catalogues were accessed remotely. The author established that it was possible to search online through the websites and online catalogues without having to travel to the NFVSA. Those who were onsite mostly preferred registers/inventories and indexes. The IASA Technical Committee (2014) conducted a study on the handling and storage of audio and video carriers and established that "long-term preservation of AV materials can be achieved by converting contents into digital files and by maintaining these files like any other computer data". The study done by Setshwane (2005) revealed that phonographic recordings were assigned numerical sequential numbers to facilitate the retrieval process while magnetic recordings were appropriately stored vertically, and compact discs were assigned numbers before they were placed on wooden shelves for the purpose of accessibility and retrieval.

In a study by Abankwah (2008), it was discovered that national archives in Eastern and Southern African Branch of the Internal Council on Archives (EASRBICA) used both provenance and original order to arrange audio-visual materials. In agreement with this finding, Hamooya (2003) disclosed in his paper presentation on the National Archives of Zambia's audio-visual collection that the archival principal of provenance applied in the arrangement audio-visual materials because it was easier to determine as the National Archives of Zambia dealt with only three media organisations in enhancing accessibility to the public. Weir (1988) conducted a study on managing archives and archival institutions in London and emphasised the need for computer services to accession, preserve and provide a reference service on machine-readable records. The researcher disclosed that the tools used to

access audio-visual materials included accession registers and series description. Abankwah (2008) conducted a study on the management of audio-visual materials in the member states of the East and Southern Africa Regional Branch of the International Council on Archives (ESARBICA) in which he discovered that, to a large extent, national archives in the region used accession registers to document information on audio-visual materials. He further revealed that information included was acknowledgement date; information content; records quality and acquisition file number, and, to a lesser extent, the information contained in the accessions registers included donor or previous custodian, location of material, description of material, originating office and date of arrival to facilitate accessibility and retrieval.

Similarly, Madanha (1996) carried out a study on appraisal practice and the experience of the National Archives of Zimbabwe and established that securing an archival building structure and installing the necessary equipment are the beginning of preservation where the desired result is the long-term use of audio-visual materials. The researcher also revealed that the requirements of environmental, chemical, biological, physical and pest controls are important in minimising the speed of deterioration and the promotion of the physical integrity of the collection with emphasis on maintaining normal temperature and relative humidity. The findings of Laas's (2011) study in Iceland made similar observations that audio-visual collections are rare and fragile, but their lifespan can be prolonged through completely keeping agents of deterioration in check. According to the IASA Technical Committee (2014), institutions that preserve audio-visual records should ensure physical carriers such as audio and video cassettes, microfilms, microfiche, compact discs and DVDs are taken care of by ensuring that there are conducive storage facilities, normal temperature and humidity, and that they are packed in proper containers and are properly shelved to achieve longevity.

Disaster preparedness plans for audio-visual records and archives

Ncala (2017) also covered an aspect of disaster preparedness in his study at the NFVSA and established that the NFVSA covered disaster preparedness plan aspects of safe evacuation of people, emergency procedures and disaster response, fire extinguishers and inspections that were done only on instruction. This finding is quite worrying because should a disaster happen, staff might not be able to rescue the audio-visual collection, and more harm to the audio-visual materials can result. The study also revealed that there were fire detectors in place and fire extinguishers that were inspected on a regular basis. However, no training on the use of fire extinguishers had been given to the staff. This situation poses risks. According to Akussah (2006), who conducted a study at the National Archives of Ghana on the state of document deterioration argued that, in order to protect their assets, including records and archives, the national archive developed a disaster and emergency plan system. He further discovered that the disaster and emergency plan covered people, equipment and supplies, and its critical information sources and established procedures to follow when a disaster occurs to protect those assets from damage or deterioration.

Challenges in preserving audio-visual records and archives

Derges (1992) carried out a study at the Film Institute on the acquisition and preservation of audio-visual archives in the ESARBICA region and discovered that the audio-visual materials were largely unidentified due to improper cataloguing. He further argued that even the manual systems did not reflect data fields such as predefined rights, copyright, number of showings, photo rights, territory rights, re-use rights and footage rights, and this posed a challenge in terms of accessibility and even proper care. Meanwhile, Abankwah's (2007)

study revealed the challenge of inadequate funding for the management of audio-visual materials. According to Matangira (2003), as well as Ngoasheng, Ngoepe and Marutha (2021) access to audio-visual materials is denied when the materials are not catalogued. In relation to Abankwah's finding, Matangira (2003) avers that viewing or listening equipment and a change to new formats due to technological obsolescence cannot take place in the absence of adequate resources.

Mensah et al. (2017) in Ghana revealed a number of challenges faced with audio-visual records preservation. These challenges included poor environmental conditions, obsolete media, a lack of expertise, unavailability of obsolete machines, inadequate facilities, poor internet connectivity and poor storage, which were all affected by financial constraints. Mnjama (2010) argues that limited technical expertise in the restoration of audio-visual materials led to staff not being able to repair damaged materials. In the survey of audio-visual collections in 34 countries in Europe conducted by Klijn and de Lusenet (2008) on tracking the reel world of audio-visual collections, it was established that there was a lack of qualified staff with expertise and professional training working with audio-visual records and archives.

Another study carried out by Lukileni-Iipinge and Mnjama (2017) established that the constant change in technology was seen as a major challenge to the preservation of audio-visual records, as it demanded migration from one system to another. The findings also revealed that records were stored separately under the original file number, resulting in differences in organising the collections intellectually. These findings concur with those of Zinyengere (2008) who drew a conclusion that audio-visual recordings in many African countries are endangered because of various factors, including but not limited to, political and economic factors; legal statutes towards audio-visual materials; staffing, a lack of training and funding; perception of society towards archives; climatic issues; technological awareness and the preservation and access of recordings.

Research methodology

A case study design was employed to assess the preservation of audio-visual records at the NAZ and the ZNBC. According to Runyon and Haber (1980), a case study research refers to an in-depth study of an individual or small group of individuals. As such, the study was typically qualitative in nature, resulting in a narrative description of behaviour or experience. Case study research is not used to determine cause and effect, nor is it used to discover generalisable truths or make predictions. Rather, the emphasis in case study research is on exploration and description of a phenomenon. The main characteristics of case study research are that it is narrowly focused, provides a high level of details, and is able to combine both objective and subjective data to achieve an in-depth understanding. Case studies are used to answer questions of how or why. They are commonly used to collect in-depth data in a natural setting where the researcher has little or no control over the events and there is a real-life context (Runyon & Haber 1980).

In terms of the population, the study targeted the records and conservation officers in charge of audio-visual materials. The purposive sampling technique was used by the researchers to select respondents from the ZNBC and the NAZ. The two public institutions are the major institutions that acquire and preserve audio-visual records in Zambia. Four respondents were purposively selected to participate in the study and they included one records manager and three conservators. It is important to note that in qualitative research, what really matters is wealth of the gathered information and not necessarily the number of participants. The data

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collection instruments that were used in this study were the interview guide and observation method. Thematic analysis was used to analyse the data collected.

Presentation and discussion of the findings

Demographic information of the respondents

To find out about the background information of the respondents, a total number of four staff members were interviewed. The study revealed that all the respondents from both the NAZ and the ZNBC were female. In terms of the qualifications, two of the respondents were degree holders while the other two were diploma holders in information communication technologies and records management programmes. It is clear from the findings that none of the respondents were specifically trained in conservation and preservation of audio-visual records and archives. However, the findings revealed that their training covered conservation and preservation of records, although from the general perspective. Somehow, this finding supports Webb's (2004) assertion that there is a lack of professional personnel in audio-visual archiving, especially in Africa. This is attributed to the fact that there are few, if any, institutions in Africa that offer certificates or degree qualifications in the conservation and preservation of audio-visual materials. Ngulube (2003) made a profound statement that, "preservation of records irrespective of their format and media they are captured on hinges on staff with necessary skills and knowledge to deal with records at every stage of their use by society". According to Mnjama (2010), this is very appropriate because the handling of audio-visual materials requires trained personnel who are skilled and have some form of education in archives or library studies.

Types of audio-visual records and archives institutions keep

The research study sought to find out which types of audio-visual records were kept by the NAZ and the ZNBC. When asked about what kind of audio-visual records and archives their institution keeps, this is what a respondent from institution A had to say:
"…mmm we have films but we do not have much of the needed equipment to read them. We have videos and the equipment to read them such as DVD recorder. We also have sound recordings …; for example, traditional ceremonies are held on DVDs and we also have sound recordings like cassettes on the history of Zambia. We have photographs and in fact, they are the majority."

A respondent from institutional B reported as follows:
"We have films which is the earliest format in different sizes and they are in video form. Our audio content sits on reel-to-reel tapes. It is also the earliest. Most of our archival content sits on reel-to-reel which is durable, and the sound quality is very good. We have breakable and compact cassettes… for video, we had the film and then we moved to Beta cam U-matic to DV cam and now digital."

Similarly, from the researcher's observations, the institutions under study had a variety of audio-visual records, which included films (microfilm and microfiche), videos, sound recordings, photographs and manuscripts. Most records in this collection (films, photographs and manuscripts) dated as far back as 1895, while video (video tapes) and sound recordings (compact cassette) that were collected around 1960 to 2000 still exist. Most of these materials were still accessible. These findings are similar to those of Lukileni-Iipinge and Mnjama (2017) whose research discovered that records of original footage and finished productions of

VHS, Betacam and DVDs, music tapes, videotapes, audiocassettes, gramophone, news tapes, projector films, compact discs, photographs, microfiche and microfilms were some of the audio-visual collection kept in the Namibian National Archives. Similar findings by Ncala (2017) at the National Film Video and Sound Archives discovered the diverse, mixed and multimedia collection holdings such as film, video, sound recordings, photographs, manuscripts and miscellaneous. The study of Mensah et al. (2017) in Ghana revealed that audio-visual collection like audios, videos or CD-ROMs, photographs and manuscripts were the holdings mostly kept.

Equipment used in the storage of audio-visual records

In finding out the equipment used in the storage of audio-visual records, respondents were asked to state the kind of storage equipment that was used for audio-visual materials in their institution. A respondent from one of the institutions explained as follows:
"We use open shelves for storage of some of our materials. These have proved to be useful for shelving video tapes and manuscripts. Of course, cabinets are also used though they occupy a lot of space but minimize exposure of materials to dust."

A respondent from institution B had this to say:
"We have migrated most of our audio-visual materials. Some of them like photographs have been digitised. For digitised materials, a database is in place from which records needed can be retrieved."

Similarly, a respondent from institution A said:
"We have digitised a number of our audio-visual archives and set up an electronic database. Researchers can access these materials on the computer terminals."

It was indicated by a respondent from institution A that:
"To maximise on space in our repository, we acquired aisle mobiles where we keep some of the audio-visual materials like video. The aisle mobile make it easy for us to locate audio-visual records as they provide passages for people."

Another respondent from institution A added as follows:
"We have specialised cabinets where we store maps, charts and some CDs. Most of our video tapes are kept in lockable cupboards."

It is clear from the findings that a number of types of storage equipment are used to store audio-visual materials in the institutions under study. These included open shelves, specialised cabinets, computer or electronic databases for digitised materials, aisle mobiles and cupboards. Lukileni-Iipinge and Mnjama (2017) also found that cabinets and open shelves were the main storage facilities for keeping photographs, negatives, videocassettes, U-Matic tapes, audiocassettes and CDs at the National Archives of Namibia. Additionally, specialized vertical cabinets were used for storage of maps. Meanwhile, Kemoni (1996) recommends special equipment such as universal shelves, which are suitable for large maps and posters, and large shelves on rollers and tubes. Contrary to these findings, Maseko's (2010) study in Swaziland at the Swaziland Television Authority (STVA) established that some of the videotapes were stacked in cardboard boxes without any meaningful arrangement, thereby making the retrieval process slow and cumbersome.

Measures put in place to ensure long-term accessibility of audio-visual records

The study further sought to establish the measures that were put in place in the institutions under study to ensure long-term accessibility of the audio-visual materials. Thus, the following was reported by one of the respondents from institution B:
"We have digitized most of our endangered audio-visual materials to reach different audiences where print materials would not have otherwise reached and to prolong their lifespan. The institution has bought the new converter equipment which runs on a software called Media Asset Management (MAM) system to digitize the audio-visual records and then the digitized content is ingested by Media Rainbow News software which is eventually preserved by the system software called Media Rainbow Archive."

In addition to the above, another respondent from the same institution indicated this:
"The institution was unable to read most of the analogue content items due to technological obsolescence and found it difficult to repair damaged items. This posed a high risk to audio-visual records in that most of them developed sound and (or) image problems, play-start problems and dust effects. The problem was exacerbated by improper storage at the time when they were rehabilitating this structure where we house these materials. As a way to safeguard them, we have transferred most of the information held on this physical content to digital media through digitisation and migration … we recently bought new machines for migration of analogue content to digital through the system we call 'MAM which is media asset management'. Our machine has different equipment in it for converting analogue content form Beta cam, U-matic, DV cam and other content carriers. The only back up system we have is that which we record …"

As a way of preserving audio-visual materials that were under attack of termites, one of the respondents from institution A pointed out the following:
"…if the material has been found with any traces of termites, we put them in the fridge because termites cannot survive the temperature in the fridge. For those materials that come into contact with water, blowers are used to dry them before further treatment. In addition, once in a year, we strive to fumigate the storage areas."

The purpose of digitisation as reported in the current study is mainly to prolong the lifespan of the materials, especially the endangered ones. These findings are supported by Abankwah (2007) and Schüller (2008) who posit that it affords institutions the opportunity to protect the original copies from further deterioration. The findings are also in agreement with Edmondson (2004) who argues that digitisation is a vital aspect of collection care in audio-visual archives. It comes with much importance, as Abankwah (2007) postulates that it protects historical collections and analogue records from further deterioration. It also salvages endangered collections and prevents deterioration that accompanies repetitive handing (Bruce-Cathline 2013).

Observations made by the researchers revealed that institutions had purpose-built storage structures for audio-visual records. What was more interesting to note was that the structure at institution A, among other rooms, had a laboratory and theatre for treating damaged materials and the structure had windows at the top of the walls to prevent dust and direct sunlight from damaging the materials. At institution B, the structure was equipped with air conditioners. The building also had what is known as a 'dark room' meant for viewing

content such as videos and films. As Rhys-Lewis (2000) states, the starting point in developing a preservation strategy that maintains material from being affected by its surroundings is to ensure that the building and the materials housed meet the basic requirements for the storage of such archival materials.

Disaster preparedness plans employed to safeguard audio-visual records

Moreover, the study sought to find out what the disaster preparedness of institutions was regarding the audio-visual records and archives in their buildings should a calamity occur. The findings revealed that the buildings at both institutions that were under study were insured, had smoke sensors and fire extinguishers as a way of compensation, detection and putting out fire, respectively, in case of a fire breaking out. This is evident from the responses given by the respondents. For instance, one of the respondents from institution B revealed the following:
"We have fire extinguishers and smoke sensors in place to ensure that our materials are protected from any possible fire emergency."

Similarly, a respondent from institution A indicated:
"Of course, we have insured our buildings in case of any disaster. We also have fire extinguishers that we can use to put out fire in case of its outbreak … However, we have no emergency exits in our audio-visual storage rooms which does not only expose audio-visual records to high risk of destruction but also endanger the lives of people who operate from there in case of fire outbreak… one may die or suffocate."

Another respondent from institution A added the following:
"We have fire detectors in place and fire extinguishers, which are inspected on a regular basis. However, no training on the use of fire extinguishers has been given to the staff. This situation poses risks not only to the materials but also us who are in charge of these materials."

At institution B, a respondent stated this:
"We have standby generators with auto-starting mechanism which act as power back-up for electricity supply for air conditions to continue maintaining the storage conditions at required temperature, especially those under a certain temperature to avoid deterioration of records."

As noted by the IASA Technical Committee (2014), in an archival landscape, fire prevention and extinguishing must be given utmost importance because burning AVR carriers produce highly toxic fumes, which are of a considerable risk to health, and may cause irreplaceable losses of holdings. Fire detection at an early stage is essential to activate systems and procedures to counter loss. Furthermore, special attention must be given to staff training. According to Ngulube (2005), disaster management should not only be useful for protection of records and archival materials from natural disasters, but also for protection of people caring for these records.

Challenges encountered by the institutions in the preservation of audio- visual records

With regard to the challenges that institutions faced in the preservation of audio-visual materials, some sentiments made by the respondents were as follows:

"Finances are always a challenge. For example, we have not completed digitising audio-visual records due to limited funds. Training in management of audio-visual collection in Zambia is limited… it's only covered as a topic in most institutions of learning."

"Lack of a strong back-up system for our audio-visual materials. The weakness with the current back-up system is that it is porous because we don't seem to have any other place where we can archive this particular content. At some point, we lost all the content because we never had a strong back-up system."

"It is the support in terms of political will generally that we lack in this profession. As such, people consider us the least in the organisation even when we have something reasonable to share, it is the least thing they consider… there is little motivation."

"We face play-back challenges, which affect the sound and video content. As an institution, we still rely on videotapes, compact discs and DVDs to view their content but they are unable to read the content of films due to lack of equipment."

"We do not have sufficient space and so we don't have a room designated as a workstation. I wish we had a workstation within so that our researchers can search for the content they need either for academic or professional aspects."

"We have the video player and the DVD player. However, our researchers are unable to access information in microfilm and microfiche due to lack of a microfilm reader. There was an issue were a researcher wanted to consult land records that exist in microfilm because of some wrangles somewhere over a piece of land. Up to now, we cannot provide the needed information to the researcher due to lack of a microfilm-reader."

"Lack of financial muscle and this has made us fail to acquire equipment that we can use to migrate analogue content to digital so that people can access the information. We have old technology which can no longer be used to access the information."

In terms of the challenges encountered by the institutions, the study revealed that both institutions faced financial constraints, obsolescence of equipment, limited training, a lack of strong back-up systems and a lack of political will. This finding agrees with those of Matangira (2010), Mnjama (2010) and Lihoma (2008) that the neglect of audio-visual preservation in most institutions is due to a combination of several factors such as a lack of appropriate equipment needed to inspect and view such materials, a lack of qualified personnel to care for and maintain both materials and equipment, limited resources for engaging in audio-visual preservation and reformatting activities, and the absence of sufficient description of these materials. Thurston (1996) also points out that failure to ensure sustainable preservation of archival materials in sub-Saharan Africa is not only caused by finance issues, but also by the poor format of archival documents, frequent careless handling, use and exposure to harsh environmental conditions.

Conclusion and recommendations

The findings of the study revealed that staff in charge of the audio-visual collection had the relevant skills and knowledge to manage the collection. However, none of them had specifically trained in the conservation and preservation of audio-visual records and archives.

Films (microfilm and microfiche), photographs and manuscripts, video (video tapes) and sound recordings (compact cassette) were the types of audio-visual records and archives kept. In terms of equipment used to store audio-visual materials, the findings showed that open shelves, specialised cabinets, an electronic database for digitised materials, aisle mobiles and cupboards are used to store audio-visual materials. On measures taken to prolong the lifespan of materials, the findings revealed that the institutions had digitised and migrated particularly the endangered records and archives. It was also reported on the same that fumigation of storage areas and conservation of damaged materials were important activities undertaken to protect the materials from damage. Temperatures were also regulated in the storage areas to maintain normal temperature and relative humidity.

The study also revealed that both institutions had disaster preparedness plans that stated actions to be taken when an emergency occur. The disaster preparedness plans mostly covered structure insurance, fire and water. The institutions had installed fire extinguishers, smoke sensors and fire detectors in case of fire in the buildings. Additionally, findings revealed that both institutions had insured their buildings. The temperature and humidity are regulated in the storage facilities by use of air conditions. Finally, the study also revealed that the challenges that were prominent in both institutions were the financial constraints, technological obsolescence, lack of playback equipment, limited training, lack of strong back-up systems and inadequate storage facilities. The study recommends that:

1. The government should adequately fund the NAZ and the ZNBC for them to effectively and efficiently manage the much-needed information in audio-visual format.
2. There is an urgent need at both institutions to acquire the equipment needed to read content held on microfilm/microfiche and reel-to-reel, because most of them contain endangered and much-needed information by the government itself and the general public at large.
3. Both institutions should endeavour to migrate information from obsolete to modern technology and, where possible, repair the dysfunctional equipment to avoid loss of information.
4. Both the NAZ and the ZNBC should have a strong back-up system that would enable retrieval of information in case of a disaster.

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