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## PRESERVATION OF LIBRARY MATERIALS: A CASE OF A PUBLIC LIBRARY WITHIN THE ACCRA METROPOLITAN AREA OF GHANA

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**PRESERVATION OF LIBRARY MATERIALS: A CASE OF A PUBLIC  
LIBRARY WITHIN THE ACCRA METROPOLITAN AREA OF  
GHANA**

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## **Abstract**

Preservation is an important component of the library as it is designed to prolong the lifespan of library collections in order to provide access to users. The study was achieved through different reviews on literature in relation to library preservation. Globally different kinds of literature have been reviewed on the preservation of library materials and specifically narrowed to Ghana. The purpose of the study was to review the literature on the prospects and challenges of library materials in Ghana. The study further sought to find out the benefits of preserving library materials and identification of the internal and external factors that affect the preservation of library materials in Ghana. Some of the benefits identified were cost effectiveness, promotion of scholarly work, protection of organisational memory and heritage. Other internal and external factors include; quality of materials in terms of manufacturing and putting measures in place to protect loyalty and access to documentary materials.

It was recommended that both user and staff training must be encouraged, the need for librarians to keep good housing practices and to be aware of the total library collections, proper shelving of library materials must be taught and unfavourable environmental conditions for biological agents must be enhanced.

**Keywords:** Preservation, Public Library, Library materials, Destructive agents, Urban Area, Deteriorating factors, Ultraviolet radiation, biological agents, Heritage, Environmental factors

## **1.0 Introduction**

Library as an institution is an acquisition of books and other materials made accessible to individuals for their study, reading for knowledge or serve as a reference to be consulted. There are many different kinds of materials in the library available for the user. Modern libraries acquire materials that include print materials such as books, newspapers, magazines, journals, manuscripts and also microfilms, maps, photographs, audio and video recording, computer software, electronic databases and other media (Issa, 2009). Patil and Pradhan (2014) agreed that libraries all over the world are considered as a place of treasures and where knowledge are stored, that is, why there are many reading material consisting of books, journals, films, images, manuscripts, audio visual materials and many more which has knowledge, recorded by eminent writers and personalities. This knowledge needs to be preserved and make it available to the users.

Also, in order to sustaining collections, modern libraries have telecommunication links that provide access to the information at wherever they are, by preventing being physically present in the library. Acquisition, organization, preservation, and provision of access of knowledge and information to the users are the fundamental mission of the library. In achieving this mission, the library preserves valuable record of culture so that it can last for a long period of time whilst ensuring access to the documentary materials from one generation to another. Libraries are important connection between the past, present and future. The library preserves both cultural records in print or electronic formats and makes it accessible to the user when needed. This means the library make the information accessible to the user to perform their work, learn and govern (Issa, 2009).

The important elements of libraries are documents, users and librarians. One of the main purposes of libraries is to pin-point, thorough and prompts information to users. In order to fulfil this purpose the library collect varieties of information in printed and electronic form and the personnel are employed to be proactive, that is, making the document available to the user before they even come and ask. This means the personnel act as an intermediaries between the users and the information embodied in a variety of documents. Information is in different formats, languages, channels and sources. No matter the formats and the channel accessible, it is very important for the librarian as to the materials are useful and available in meeting the user community. The user studies plays an important role in any type of library in planning, designing, bringing new information services as well as providing quality services, facilities and their satisfaction (Lakshmi, Chinnasamy & Venkatachalam, 2011).

Preservation is a branch of library, archives and information science which includes upholding access to documentary materials and records by reading, diagnosis, regulating and avoiding of damage to document (Akussah, 2013). According to Jordan (2003), the term preservation is an umbrella term for varieties of activities: methods, principles, and organizations in order to ensure the use of the materials, keeping the document for a long period of time and access to the recorded knowledge. Walker (2013) defined preservation as ‘all managerial, technical and financial considerations applied to retard deterioration and extend the useful life of (collection) materials to ensure their continued availability’. He continues that preventive measures prolong the life of documentary materials and less expensive than curative measures to control damage after deterioration has taken place. While the Institute of Museum and Library Services (IMLS) (2009) defines preservation as a process that effectively prolong the life of whether living or non-living materials, the items of the person including materials, building, structure or site by decreasing the rate of deterioration. Harrison (2002) indicated that “preservation includes all managerial and

financial considerations including storage and accommodation, provisions, staffing levels, policies, techniques and methods in preserving library and archival materials and the information contained in them". Now preservation according to Ngulube (2005) as a longevity and access to information but that information must be valuable. According to the definition he came out with two levels of access. These are physical and intellectual access. Physical access means ensuring that the information remain intact and are in good state that is, preventing damage to the document, curing the document when necessary and transfer it when necessary. In intellectual access means being able to use the content of the document or exploiting the information that is, being able to read the content to gain knowledge, having the available software to access it. It applies to the non-conventional documents that is, the type of document that can be accessed using equipment such as audio-visual (AV), microfilm and electronic format.

According to Akussah (2013), preservation of library materials is defined as activities including upholding and keeping materials away from deterioration, to prolong the lifespan or keeping the document for a long period of time either in the formal or original state or in such a way that is useful to the user. Jordan (2003) indicated the activities included in the preservation of library materials such as conservation (restoration of both general and special materials), reformatting (microfilming, digitization, photocopying, and photographing), selection for preservation, monitoring and controlling the environmental conditions, good handling procedures, disaster preparedness and recovery, setting standards to documentary materials, good practices, methods, binding and educating and training in preservation.

The history of preservation can be traced starting from evidence of early preservation including the documentary materials being used, before the middle ages, modern preservation and lastly preservation in the 21<sup>st</sup> century. In the beginning of preservation, there was no existence of paper

as a medium. People started using stone, metals, tree barks, clay tablets, palm leaves, leather, papyrus and parchment. Each of these media is having its own deteriorating agents. Early preservation, started with scrolls which were kept or preserve in cylindrical ivory to protect form moisture, insects and dust. Those who use papyrus use special oil such as cedar wood and citrus leave oil for protection. In Indian palm leaves were protected from atmospheric pollution and there were other insecticides that were being used. Before Middle Ages that is, where handmade paper came into existence, therefore; preservation did not constitute problem because of good material being used and there were limited document available. Modern preservation started with Cardinal Franz Ehrle, keeper of Vatican Library in 1898. During modern preservation, there were problems or causes of preservation which many international bodies, countries and institutions came in to solve. This was the era were machine made paper was available. This institution brought about three main things. These are:

- I. Standard settings and specifications.
- II. Looking at the efficiency of the materials.
- III. Deterioration and long lasting of the media were studied.

In this 21<sup>st</sup> century, preservation is in electronic form because of the development of information and communication technology (ICT). In the electronic preservation, it has brought about the life span of most media unknown and there are frequent changes in technology which has been headache of preservators. This has led to more research in digital and multimedia materials preservations (Akussah, 2013).

In preservation, we have to ensure that information in the documentary materials are accessible when needed and this can be possible by making sure that the physical object is taken care of.

Therefore, there is the need to reconcile an ideal or perfect environmental condition where both the librarians and patrons can feel comfortable to work with the books to attain their goals where the conditions at the library are technically achievable and feasible in terms of cost (Sunil & Kumar, 2009). Sawant (2014) indicated two principal methods for the preservation of library materials. The first is preservation in the original format such as good handling procedures combined with rigorous protective storage, low temperature for storage of materials, restoring treatment and mass deacidification when the materials get to that state. The second method of preservation is reformatting where there is complete transfer of materials from one format to another format which is stronger than the first. This includes digitization and microfilming. According to Chapman, Conway & Kenney (n.d.), hybrid approach can be used for preservation of library materials combining the importance of both methods at the same time. But according to Akussah (2013), there are three components of preservation, namely: preventive/direct, curative/restorative/direct and substitution/ transfer/ reformatting. According to him, there is the need for librarian to holistic notion about these approaches so that he/she can keep a practicable balance in order to attain both longevity and access to the documentary materials of value. He said, even though; you do that, you have to know that preventive preservation is preferred than curative preservation, because of the advantages it is having. These are:

- I. Preventive preservation is less expensive to run.
- II. It is easier to implement than the other methods.
- III. There is mass enjoyment, that is, all the document enjoy from preventive preservation such as the good environmental conditions.

- IV. Some document may be lost if you want to cure those document and even some document may die off, if you don't get the experienced person to do it for you.

According to Kemuma (2013), library materials get deteriorated within the shortest period of time when publisher's inferior materials of low quality such as when the paper changes colour due to wear of paper glue or exposed to inherent or external sources of light. This has increased in our local publications. Even though this materials will not last forever, but that does not mean that as a librarian you can't take good care of the document so that it can last for a long period of time. You can do that by making sure that the environmental conditions are favourable to the document that is, ensuring constant humidity and temperature, shelving well, maximum security and handling the document well so that the materials can last for future generations.

## **2.1 Benefits of preservation of library materials**

According to Akussah (2013), information resources of every organization are very important this is because they are very necessary to the day to day running and very vital for the survival of the organization. This information resources need to be protected from all form of deterioration so that they can last for a long period of time. The benefits of preservation are as follows:

- I. It promotes scholarly work, that is, very information resources are written by scholars in those fields. This means this scholar written must be taken care of so as to ensure that they continue to survive.
- II. It saves cost, that is, these information resources are very expensive when the library is buying it. The resources needed to be taken care of since the money allocated to libraries is very small. There by saving them from high cost as there is a saying that it is only finish librarian who tends following or keep buying new collection rather than take good care of

the old ones. This means the materials must remain intact and well taken good care of rather than chasing new collections.

- III. It ensures efficiency that is, ensuring that very important materials will survive. Efficiency refers to the fastest and quickest way of getting access to the documents.
- IV. It protects corporate or organizational memory, that is, memory where information can be stored. This information resources have been documented so the organization can refer on it anything the organization is doing something.
- V. It protects heritage. Heritage refers to something that we hold onto, that is, our tradition, languages or culture that tells us about our past and still of importance.

Varlamoff (2005) indicated that in preserving library materials, there is the need to give considerations for preservation measures otherwise preserving it are of no value and allowing access is of waste because it will lead to the document becoming unavailable for future generations. This means the benefits of preservation is to ensure information accessibility and also ensuring final survival of the document. According to Mnjama (2010), indicated that the documentary materials help us to understand, explain and enjoy both visible and invisible world. Access to these library materials help us to know the past, understand the present and informs the future. In terms of preserving our past information, we are also preserving the future generation collective memory. This means the library material will be available to the generation to come. The benefits of preserving library materials, according to Clooman (2001) can be summarized as “that preservation allows for the continuity of the past with the present and the future”. The increase of knowledge and experience contained in both libraries and archives are exceptional. However, it would be a waste of resources if an institution placed large amount of money in

collecting and processing library materials and this important resources unavailable to users. Therefore, preservation measures must be put in place to ensure that users are able to access it National Preservation Office, (NPO, 2001).

Popoola (2003) indicated the benefits of preservation of library materials as:

- I. Documents are collected and preserved (such as paper and other information carriers) in order to learn from them;
- II. Acquisition, processing and organization of library materials of library materials are expensive for use rather than allowing them to deteriorate;
- III. Less money are allocated in the annual budget for libraries;
- IV. In all educational institutions, library materials are important components of teaching and learning;
- V. The library materials are valuable and useful for development of a country;
- VI. They are stock in trade and assets of libraries and archives.

He also indicated that preservation and conservation programmes must be embark by library management that will protect their materials from partial and total deterioration in order to meet the information needs of the users. The legal and social responsibilities of libraries international make it comparative for them to preserving their information resources.

## **2.2 Factors that affect the preservation of library materials in Ghana**

Deterioration is the change that is made in the original state of documentary material between the entity and the factors of destruction. It is a degradation of the quality of documentary materials or

simply the activity that results in the decrease in the quality of documentary materials. Deterioration can also be defined as the act or process of the entity becoming worse (Akussah, 2013; Merriam-Webster, 2015).

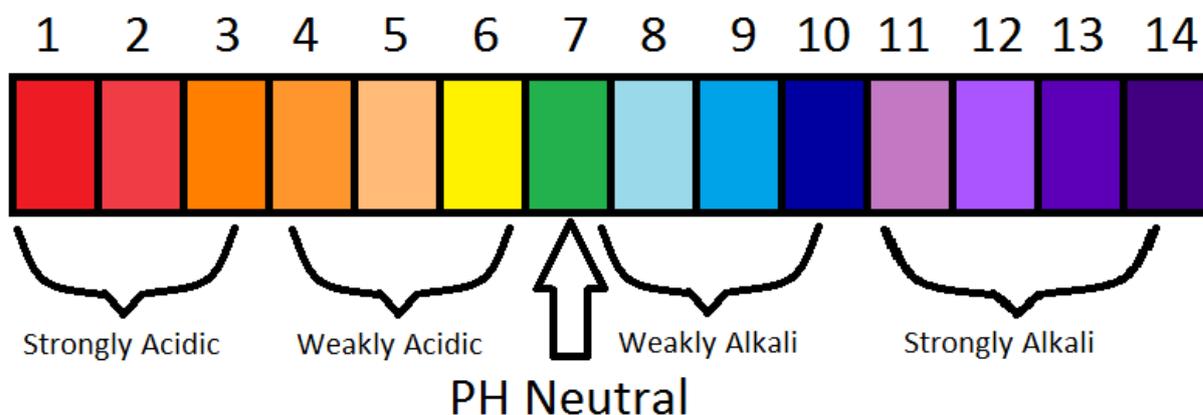
### **2.2.1 Internal factors**

Intrinsic or inherent factors refer to the components used in the manufacture of library materials (raw materials) and also the manufacturing process. In case of paper these raw materials are of low quality material (such as wood grind into pulp), chemicals used for manufacturing the pulp (some do not add any chemical which is called mechanical wood pulp), sizing (using deteriorative agents such as rosin and alum) and loading processes involved in the manufacturing of paper (Ogunmodede & Ebijuwa, 2013). These include acidity and basicity.

#### **2.2.1.1 Acidity and basicity**

One of the major internal factors of deterioration is by the use of library materials especially print materials that is highly use of acidic paper during the middle of the last century. Manuscripts in most of the eighteenth century were brittle and not used. This is because the library materials were highly acidic rather than the material being out of date and the pH values ranging from 3.0 to 3.5 while on the contrary, there were other library materials that were good because it had low acid content or some have basic with potential of hydrogen (PH) values of 6.0 or above. These documents deteriorate because of the contents of the acidic elements of paper-based library materials (Oluwaniyi, 2015). The acidity and basicity are measured on a pH scale.

This is illustrated below:



Source: <https://www.google.com.gh/search?q=pH+scale+draw&biw>

From the above pH scale, it can be realised that the pH ranges from 1 to 14. The pH from 1- 3.5 is more acidic, 3.5 getting to 7.0 is weakly acidic while 7.0 is the point of neutrality, from 7-10.5 is weakly alkali whiles from 10.5 to 14 is strongly alkali. The property of acid is that it makes the paper brittle and brownish whilst that of the alkali makes the paper fluffy (absorbs water) and makes it difficult to use. The interval between each is 10 times, that is, pH 3 and 4 is 10 times acidic whiles pH of 3 and 6 is 1000 times more acidic. Both are not good but alkali is better than acidic.

### 2.2.2 External factors

According to Oluwaniyi (2015), the main components of external deterioration are temperature, relative humidity, handling procedures, light, atmospheric pollution, biological agents such as fungi, insects, rodents and bacteria, natural disaster such as fire, flood, earthquake, and man such as storage, improper handling and theft.

### **2.2.2.1 Temperature and relative humidity**

Relative humidity is a ratio of the amount of moisture in a given volume of air as compared to the maximum amount of moisture that air can hold at the same temperature and pressure expressed as a percentage. Temperature and humidity moves together because they depend on each other, that is, the higher the temperature, the higher the moisture the air can hold. When the air is cooled (that is relative humidity about 100%), relative humidity rises because it can hold very low water. An unacceptable level accelerates greatly to the breakdown of documentary materials; therefore critical steps must be taken to control the temperature and relative humidity. At every 10% decrease in temperature, it is estimated that the chemical reaction of the paper is doubled and for every 10% increase in temperature, the life of materials are reduced by half. When relative humidity is high, it provides water vapour accelerates harmful chemical reactions in documentary materials and in combination with high temperature, encourages fungi and insects manifestation. Desiccation and embrittlement of library materials occur when there is low relative humidity which mostly occurs in heated buildings or dry climates (Walker, 2013).

Always constant temperature being kept in the storage area is the best than the fluctuations in temperature and relative humidity which are very damaging to documentary materials. Library materials absorb and discharge water vapour and respond to the daily and seasonal changes in temperature and relative humidity reducing and expanding in size. Changes or fluctuations in temperature and relative humidity hasten deterioration and lead to visible damage such as change covers of books, crack mixture of photograph and cockling paper (Walker, 2013).

#### **2.2.2.1.1 Joint effect of temperature and Humidity**

To predict how an item might deteriorate, one must know the type of collection, its composition, how it decays and how it is stored or displayed. No single environment is ideal for all objects.

Temperature and relative humidity affect three decay processes: chemical, biological and mechanical.

According to Akussah (2013); Wang (2012), the following are the joint effort of both temperature and relative humidity:

- I. Paper is strongly affected by the environment. It is easily damaged by high humidity and temperatures, which hastens its chemical deterioration. Ground wood pulp paper deteriorates especially rapidly because of the chemicals it contains, i.e. principally additives and lignin and soon becomes brittle. Ground wood paper contains high acidity and when catalyzed by lignin, results in weak fibers and embrittlement. Chemical deterioration, is when a chemical reaction occurs, causing damage to an object. Chemical deterioration includes metal corrosion, increased fading and glass decomposition from high relative humidity levels. Plastics and organic materials have inherent and spontaneous deterioration reactions whose rate is determined by temperature and relative humidity. Increases in either temperature or relative humidity speed the deterioration. For example, paper is strongly affected by the environment.
- II. It is easily damaged by high humidity and temperatures, which hasten its chemical deterioration.
- III. Biological deterioration is damage caused by living organisms such as insects, bacteria and mold. Relative humidity and temperature levels determine whether these organisms flourish or exist at all.
- IV. Mechanical deterioration is related to either the amount of water absorbed by organic materials, or thermal expansion in inorganic materials, especially metals. The item

changes size and shape, leading to cracking, splitting and warping. Stress or the application of different materials will affect the susceptibility of a piece to mechanical deterioration when the environment fluctuates.

- V. Chemical reaction rates increase with higher temperature, increased concentration of reactants and increased pressure. Water is a reactant in many decay processes. Increased relative humidity increases the concentration of water. The Image Permanence Institute (IPI) has researched the chemical decay of archival materials, especially film and photographs. Not everything lasts the same amount of time. Each material has a unique decay rate. For example, among papers, rag paper is slow and newspaper is fast, but both decay rates increase with higher temperature and relative humidity.
  
- VI. Paper possesses the property of absorbing and giving off moisture until the moisture in the paper and the moisture in the atmosphere are in equilibrium. The behavior of paper under given atmospheric conditions is, therefore, dependent on the relative amounts of water present in the atmosphere and in the paper. Heat, together with high relative humidity, encourages mold growth and creates an environment conducive to pests and insects. Heat, coupled with low relative humidity, will eventually lead to desiccation and embrittlement of certain materials e.g. leather, parchment/vellum, paper, adhesives, the adhesive binders on audio and video cassettes, etc.

#### **2.2.2.2 Light**

Light is defined as energy that makes vision possible. Library materials such as books and other paper-based information resources are light sensitive. Madu and Adeniran (2002) indicated that ultraviolet radiation and visible light cause fading, discoloration and embrittlement to library documentary materials. Incandescent light is damaging to document because it produces heat

which increases the temperature of materials and takes a little longer to destroy documentary materials. Sunlight deterioration is decreased by lowering the quality of light falling library materials. The better way to reduce daylight is to wedge all windows and used artificial which is not always helpful.

Light is the most common cause of damage to documentary materials because it can fade most of the materials. Most materials are subtle to light such as leather, paper, photographs, cloth and media (inks, dyes). Apart from fading of document, they may also be deteriorated to the physical and chemical structure of materials. There are two components of light, namely: ultra-violet radiation (UV) and the infra-red radiation (IR). These accelerate the chemical reactions that lead to deterioration of the library materials. High concentration and exposure to light many times can lead to fading of in dyes and colorants. The Ultra-violet radiation causes bond to bond weakening, bleaching, and paper becoming yellow. All these are having impact on the access to information, affect the beauty of the work and reduce readability. The damage cause by light is not reversible because even if you take faded photograph down and store in the dark place, it will still remain in its original faded state (<https://www.nedcc.org/free-resources/preservation-leaflets/2.-the-environment/2.4-protection-from-light-damage>).

According to Muhammad (2006), a lot of heat is being generated from the incandescent light leading to high temperature which must be kept away from the documentary materials. Shades and shutters wedge light from the sun thereby helping in the controlling of temperature by reducing the generated heat from the sun during the day. Filters made of special plastics help control Ultra violet (UV) radiation, and the use of special low UV florescent tubes is very important. It is difficult not to expose documentary materials to light but the rate of exposure

must be reduced and also complete dark and humid environment is a propensity to moulds, insects and rodents manifestation.

#### **2.2.2.2.1 Effects of light on materials**

- I. Light causes information materials to bleach, and others yellow and darken
- II. It also causes some materials to fade or change colour, change the legibility or appearance.
- III. It generates heat which speeds up the rate of breakdown of library materials.

#### **2.2.2.3 Atmospheric pollution**

According to Akussah (2013); Singh (2004); Sharma, S. B., Jain, S., Khirwadkar, P., & Kulkarni, S. (2013) gave comprehensive talks on atmospheric pollution. Atmospheric pollution refers to impurities either in gaseous form or in form of particles found in the atmosphere which are dangerous to documentary materials. These impurities can accelerate the rate of damage to documentary materials. These are toxic gases present in the atmosphere which readily hasten chemical deterioration of documents under favourable conditions in the presence of moisture and high temperatures. Some gaseous pollutants include Sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), hydrogen sulphide (H<sub>2</sub>S) and carbon monoxide (CO). The major source of these gases is the burning of fossil fuel. Fossil fuel refers to fuel generated from fossilized organic matter, which includes decayed: plants, trees, human remains. Fossil fuel includes coal, petroleum, kerosene, and diesel. 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. Ground level ozone is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen and volatile organic compounds in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust,

gasoline vapors, and chemical solvents are some of the major sources of NO<sub>2</sub> and H<sub>2</sub>S. CO is a colorless, odorless gas emitted from combustion processes. Nationally and, particularly in urban areas, the majority of CO emissions to ambient air come from mobile sources.

#### **2.2.2.3.1 Effects of Gaseous Pollutants on Documents**

These gasses are not harmful on their own but become harmful when they come into contact with water, that is, they turn into acids (moisture is the mother of all deterioration). These acids are corrosive and can deteriorate library materials. They turn paper brownish and make them frail resulting in a final loss.

Sulphur Dioxide + Water = Sulphuric acid

Nitrogen Dioxide + Water = Nitric acid

Hydrogen Sulphide + Water = Sulphuric acid

Carbon Monoxide + Water = Carbonic acid

Particulate pollutants are impurities in the atmosphere that are solid particles. These impurities absorb water vapour hence they become sites for harmful chemical reactions. These may include dust, smoke, soot and other solid particles that could also cause deterioration to library materials.

In Ghana, particulate pollutants pose the following threats to documentary materials:

- I. Dust, dirt and other particles can absorb gaseous pollutants thereby penetrating materials causing chemical deterioration.
- II. Dust can reduce the sensitive of materials such as the heads of reading drives
- III. It cause scratches, and occupy space on the film material.

- IV. They often contain traces of metal such as iron, which may facilitate or increase the rate of degradation on the materials
- V. The particles may become imbedded in paper fibres causing these papers to wane over some time.

There is high concentration of gaseous pollutants in urban areas than rural areas vice versa there is high concentration of particulate pollutants in rural areas than in urban areas.

### **Urban areas in Ghana**

The factors contributing to the high concentration of gaseous pollutants in the urban areas in Ghana are due to the following reasons:

- a. Vehicular traffic is high in the urban areas
- b. More industries are found in the urban areas
- c. Use of liquefied petroleum gas (LPG) is high in the urban areas

### **Rural areas in Ghana**

The factors contributing to the high concentration of gaseous pollutants in the urban areas in Ghana are due to the following reasons:

- a. Loosen of earth soil due to high rate and rampant farming activities
- b. Excessive grassing by domestic animals such as cattle in the rural areas
- c. Roads in the rural communities are mostly not tarred
- d. The extended use of fire wood and burning of charcoal results in high concentration of

smoke, and then soot.

The basis of the difference is the level of concentration of either gaseous or particulate pollutants. Both gaseous and particulate pollutants can be found at both areas. Again due to air inversion air moves from a higher level of concentration to a lower level of concentration. This makes it possible for gaseous material to get to rural areas. Therefore air pollution cannot be stopped as long as air continues to blow (Akussah, 2003).

#### **2.2.2.4 Biological deterioration**

According to Kademani, Kalyane & Kumar (2003), biological agents increase in the library due to the organic matter they found there. They can also spread due to the high temperature and relative humidity, darkness and absence of ventilation. There are two types of biological agents, namely: micro-organisms and micro-organisms.

- I. Micro-organisms include fungi forms including mold, mould
- II. Macro organisms include: insects (including silverfish, booklice, Bookworm, Cockroaches, Mud wasps and termites/white ants) and rodents (including rats, mice and squirrels).

The dormant micro-organisms or spores remain dormant or latent in their dry state but they begin propagation when environmental conditions become favourable. Favourable conditions that encourage mould growth include warm humid conditions, darkness, and little air circulation. Mould can also grow at low temperatures with elevated relative humidity as commonly seen in home refrigerators. When temperature and relative humidity levels exceed 24 degrees Celsius and 65% respectively, mould growth is encouraged. Again, probability of fungus infestation is higher in an environment where there had been an earlier infestation which was not well treated

(Akussah, 2013). According to Muller and Schmit (2007), moulds are adaptable microorganisms which can be located everywhere and have over one million species. These moulds grow abundantly by being propagated by spores, thus making them to be visible as blackish, greenish, bluish, etc. on the surfaces of damage materials depending on the colour of the asexual fruiting structures (spores).

Fungi can cause several damages to documentary materials:

- I. They are living organisms which survive by feeding on the nutrients in the documents. They are actively responsible for the decomposition of cellulose, which is a basic component of most paper. These fungi feed on cellulose, starchy components of the document, adhesives (bonding agent) used to hold the documents together, and the sizing components, resulting in the weakening and ultimate breakdown of the documentary materials.
- II. They can stain documents permanently or temporarily. Permanent stains known as foxing include rust-brown measles-like spots that are frequently found on paper, and in older books and prints. Foxing is evidence that fungi have been at work, but are no longer active. Foxing stains can only be removed by bleaching, a hazardous operation which can easily damage the entire book if it is not expertly done. Foxing is therefore an unpleasantness best ignored.

## **The Harm caused by Insects**

Insects can cause great harm to documentary materials leading to great losses.

The losses they cause include the following:

- I. A total loss of collection. This is where infestation is so high and there is no timely intervention to eradicate them.
- II. Financial loss due to cost of repairs. One needs funds to forestall the damage to documentary materials. This can be very expensive and great financial loss to the information Centre.
- III. Health hazards and psychological revulsion. The invasion of insects can result in sickness/diseases to staff of the information centre. This can happen directly but unknown to staff in a situation where some insects find their way into the food meant for consumption by staff. Another issue is that some people react negatively at the sight of a host of insects. Funds will be spent treating staff in the event of any sickness/diseases (Akussah, 2013).

The rodents including rats, mice and squirrels eat the documentary materials thereby destroying binding materials, adhesives and other library materials. These rodents are engrossed in humid, dark places, basement and cause much damage to documentary materials which sometimes can only be noticed late. The rodents could utilize library materials as food or they can soil and permanently disfigure the collections by urinating and defecating on them. Mice and rats also usually shred and chew paper materials to make nests. It is also pertinent to note that rodents' invasion of library materials could expose users to diseases (Kemuma, 2013).

Walker (2013) also identified the external causes of deterioration of library materials as:

- I. Poor handling or storage
- II. Theft or vandalism
- III. Fire and flood
- IV. Pests
- V. Pollution
- VI. Light
- VII. Incorrect temperature and relative humidity.

### **3.0 Conclusion**

The purpose of the study was to reviewed literature on the prospects and challenges of preservation of library materials in Ghana. The literature review has addressed all the themes in the study, what emerge is that there are few articles written on benefits and challenges preservation of library materials in Ghana but many has been done globally. The study also saw that there are many factors affecting the deterioration of documentary materials. These include both internal, that is, the quality of the materials in terms of the manufacturing process which the librarian has no control. But in terms of the external factors, the librarian has control over it and therefore there is the need for him to put various measures so as to protect the longevity and access to the documentary materials. Also, as a librarian there is the need for you to be responsible in your custody so that the document will last for a long period of time and thereby making the users enjoying the benefits accrue to the documentary materials.

#### **4.0 Recommendations**

The researchers suggested the following measures:

- I. Since the biological agents come to the library when environmental condition are favourable for them, there is the need for the librarian to make condition unfavourable for them such as avoiding humid and dark places.
- II. There is the need for the librarian to keep good housekeeping system since some of the biological agents are attracted by the debris.
- III. Staff must be trained to always be aware of some of the control and preventive measure.
- IV. Both staff and users must be trained on how to handle document well.
- V. The use of air conditioner or good ventilation must be ensured.
- VI. Librarians must be made aware of the total amount of library collections so that they will be mindful and know the amount of money invested. This will stimulate the librarian to take very good care of the document.
- VII. The librarian must be taught how to shelve document.

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