NATURE AND EXTENT OF DEGRADATION AND CAUSES OF DETERIORATION OF INFORMATION RESOURCES

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This examination explored the different strategies utilized in the conservation and preservation of library resources in select libraries. The authors analysed the beginning and type of degradation, weakening, arrangements and various techniques utilized in their curb, presence of conservation and preservation strategies and imperatives restricting viable conservation and preservation. Conclusion uncoveres that conservation and preservation methods, however, employed in the institutions were not adequately being used. The study settled that there are in reality rates of decay, the maximum noticeable outcomes being books getting damaged and splitting and rasping of non – print materials.

Keywords: Conservation, Preservation, Library Materials, Deterioration Factors, Information Resources.

INTRODUCTION

The library resources are the priceless heritage of mankind as they preserve ideas, facts, thoughts and evidences of human development in multi areas, ages and directions. The past records constitute natural resources and are useful for the present generation to come. Any loss of such resources or materials is not replaceable. That's why preservation and conservation of these highly useful library resources, cultural heritage becomes the moral responsibility of the libraries / information scientists, who are in charge of these repositories.

Library materials contain a great diversity of substances, most by far of which are organic and in this manner subject to deterioration. In an actual sense, deterioration means a decrease in the ability of a material to fulfill its considered function. Library materials transmit information to a user. In this way, deterioration can be any activity Physical, Chemical or Biological and Human factors that interfere with that transfer. Degradation, an irreversible procedure, must not be permitted to progress beyond the point where the intellectual content cannot be reformatted, or change to a different medium, when suitable. Most of the libraries have paper based materials in the form of books, manuscripts, paintings, periodicals, drawings, charts, maps etc. The basic materials and constituents of the

physical entity of these library resources are organic in nature, which are very soft, susceptible to natural decay and deterioration. All these library resources are nutrition to some living organisms. So the library materials need protection from factors of deterioration. In this paper the authors find the different aspects of degradation of information resources.

REVIEWOF LITERATURE

This section highlights the changing library milieu and analyses the conservation and preservation nature and cause of degradation of library resources. Schito (2019) discusses the correct preservation of old and rare books in libraries needs suitable values of temperature and relative humidity. The data presented in the article is related to the research article entitled "A procedure for identifying chemical and biological risks for books in historic libraries based on microclimate analysis". Goswami (2018) analysed the deterioration of environmental factors and the preservation of library documents. Kant (2017) highlights importance of preservation and conservation of library resources for future generations. Mahmood (2013) discusses that the amount of damage that occurs can be reduced by proper handling. Wilful acts that damage library materials, such as underlining and cutting pages out of books, are inexcusable and must not be done. Abiodun (2013) takes a brief look at the causes of deterioration of library materials and calls for collective responsibilities in order to rescue the library materials. Bankole (2010) discusses the biological deterioration of papers which is the main information carrier in libraries. It provides very useful and practical suggestions that libraries in the tropics could adopt to tackle the menace of biological agents. Generally deterioration can be classified into physical, chemical, biological and environmental factors. Madu and Adeniran (2015) opine that different materials have been used as writing surfaces through ages with the exception of stones and metals and all these are susceptible to deteriorating factors. Everything in library collections is deteriorating today, was deteriorating yesterday and will continue to deteriorate tomorrow although wrought to retard the process.

Alegbeleye (1993) and Walker (2013) analyse on the reasons for decay of library materials uncovered that basic causes incorporate high sharpness, over the top light, air contamination, poor book racking, relative dampness, dampness, oxidation among others. Outside reasons for decay of assortments incorporate poor handling or capacity, robbery or vandalism, fire and flood, bugs, contamination, light and high temperature and relative mugginess. Residue and particulate issue are the best reasons for weakening while dampness and air contamination are the least causes. Harvey (1993) discusses that a clean, well-ventilated and climate-controlled environment goes a long way toward preventing infestation by any of these pests.

Nwokedi and Nedosa (1999) explain that the more acidic a paper was, the more probable it would disintegrate quickly. In this manner, nearly, papers that have less acidic substance stay in perfect condition for a more drawn out time before they breakdown. Mahapatra (2003) explains that much avoidable damage is done to books by well- meaning but uniformed librarians through the use of pressure sensitive tapes, indeterminate use of polyvinyl acetate and other

synthetic adhesives use of highly acidic paper for protective wrappers, use of wood backing in print, picture and map frames, amateur lamination and improper storage. Natural aging of paper since the major constituents are of organic nature. Such inevitable deterioration can be minimized to a large extent by proper housekeeping. Alegbeleye (2007) found that majority of the microfilm strips examined had not only deteriorated but had also suffered from vinegar syndrome. Where there is a condensation or moisture due to high humidity, there is consistently the nearness of natural development.

OBJECTIVES OF THE STUDY

The purpose of the study is to find the answers to the following questions:

1. To know the nature and extent of degradation of print information resources.
2. To know the nature and extent of degradation of non-print information resources.
3. To know the causes and extent of degradation of print information resources.
4. To know the causes and extent of degradation of non-print information resources.

SCOPE OF THE STUDY

The study is focused on the nature, causes and extent of degradation of both print and non-print information resources in libraries. This data is collected from the respective libraries of Indira Gandhi National Centre of Arts (IGNCA), National Archives of India (NAI), The Nehru Memorial Museum and Library (NMML), Central Archaeological Library (CAL), National Museum Library (NML) and Zakir Hussain Library (ZHL). The main reason for selecting the following libraries is the vast collection that they have like manuscripts, art and culture, photography, books, periodicals, charts, reports, projects, databases etc.

RESEARCH METHODOLOGY

The survey method was adopted with the help of structured questionnaire keeping in mind the objectives of the study. The data is collected from the Indian libraries to identify the different forms, nature, causes & extent of degradation of Print and Non-print Information Resources. The questionnaires were distributed and collected personally from the Head of Institutions/ Libraries. The collected data was analyzed with the help of simple statistics, presented tables and comparative analysis of the data is done.

ANALYSIS AND INTERPRETATION OF DATA

Nature and Extent of Degradation of Print Information Resources

The print library materials face degradation in ways like mutilation, vandalization, brittleness, breaking, tearing, etc. The table 1 clearly indicates that the library materials in IGNCA had undergone little extent of degradation in all forms mentioned above whereas, in NAI, some resources had undergone a moderate degree of deterioration in several forms like mutilation, brittleness and breaking. In NMML, the breaking and tearing of library materials had gone till moderate level and a little extent of degradation has occurred in various other forms. In CAL, the degradation of library resources in brittleness, breaking and tearing has reached to a little extent. At the same time, there is no degradation of library materials in the form of mutilation and vandalization. In

ZHL, the deterioration of the resource varies widely for different ways, i.e. from no degradation to moderate degradation while in NML only minor degradation can be seen among the library materials in all forms.

Among all the library resources degradation of different forms, some has degraded to zero or no extent, some to little extent and some to moderate and even great extent. There are total 30 degradation forms for the six libraries out of which 3 (10%) had undergone degradation to zero extent, 21 (70%) to little extent 6 (20%) to moderate extent and 0 to a great extent.

Table 1: Nature and Extent of Degradation of Print Information Resources

Libraries	Extents	Mutilation	Vandalization	Brittle	Broken	Torn
IGNCA	0	×	×	×	×	×
	1	✓	✓	✓	✓	✓
	2	×	×	×	×	×
	3	×	×	×	×	×
NAI	0	×	×	×	×	×
	1	×	✓	×	×	✓
	2	✓	×	✓	✓	×
	3	×	×	×	×	×
NMML	0	×	×	×	×	×
	1	✓	✓	✓	×	×
	2	×	×	×	✓	✓
	3	×	×	×	×	×
CAL	0	✓	✓	×	×	×
	1	×	×	✓	✓	✓
	2	×	×	×	×	×
	3	×	×	×	×	×
ZHL	0	✓	×	×	×	×
	1	×	✓	✓	✓	×
	2	×	×	×	×	✓
	3	×	×	×	×	×
NML	0	×	×	×	×	×
	1	✓	✓	✓	✓	✓
	2	×	×	×	×	×
	3	×	×	×	×	×

Key: 0 = No Extent, 1 = Little Extent, 2 = Moderate Extent, 3 = Great Extent ✓=presence, ×= absence

Table 1 (A): Results of Chi- Square Statistics and its Significance

Grand Total	%	2 Statistic	d.f.	P-value	Remarks
27	90%	7.78	5.00	0.169	Insignificant

**Significant at 5% level (p<0.05) and d.f- degree of freedom for the chi- square*

(Note: Chi-square Test cannot be performed as there is an assumption that for performing Chi-square Test, no cell frequency should be less than 5. Therefore, when cell frequencies are less than 5, contingency table is performed).

The table 1 (A) shows the Chi-square test is conducted to test the claim; nature and extent of degradation of print library materials is not significantly different in the selected libraries. Since the p-value is greater than 0.05. It is confirmed that there is no significantdifference in the nature and extent of degradation of print library materials in the selected libraries.

Nature and Extent of Degradation of Non-Print Information Resources

The table 2 shows the non-print library materials face degradation in several ways such as color change, surface blemish, disc deformation, fungi, cracks, poor playback, distortion, loss of data, etc. The non-print library materials in IGNCA had gone through these degradations up to a little extent in some of the forms and no degradation in others. In NAI, there is no degradation in the non-print materials in the entire library. While in NMML, the materials had undergone degradation to a little and in some cases, no extent. The CAL does not have any non-print resources in its store. The resources in ZHL had not undergone any serious degradation except a small degree of surface blemishing in some materials. But in NML, the resources had undergone degradation to a little extent in various forms like color change, surface blemishing, fungi and distortions.

Table 2: Nature and Extent of Degradation of Non- Print Information Resources

Libraries	Extents	Color Change	Surface Blemish	Disc De-form-ation	Fungi	Cracking	Poor Play-back	Disto-rtion	Data Loss
IGNCA	0	×	✓	✓	✓	✓	✓	×	✓
	1	✓	×	×	×	×	×	✓	×
	2	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×
NAI	0	✓	✓	✓	✓	✓	✓	✓	✓
	1	×	×	×	×	×	×	×	×
	2	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×
NMML	0	×	×	✓	✓	✓	×	×	×
	1	✓	✓	×	×	×	✓	✓	✓
	2	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×
CAL	0	×	×	×	×	×	×	×	×
	1	×	×	×	×	×	×	×	×
	2	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×
ZHL	0	✓	×	✓	✓	✓	✓	✓	✓
	1	×	✓	×	×	×	×	×	×
	2	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×
NML	0	×	×	✓	×	✓	✓	×	✓
	1	✓	✓	×	✓	×	×	✓	×
	2	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×

Key: 0 = No Extent, 1 = Little Extent, 2 = Moderate Extent, 3 = Great Extent ✓=presence, ×= absence

Table 2 (A): Results of Chi- Square Statistics and its Significance

Grand Total	%	2 Statistic	d.f.	P-value	Remarks
12	25.0%	0.00	5.00	1.00	Insignificant

**Significant at 5% level (p<0.05)*

Among all the library resources degradation in different forms, some hadn't degraded at all, some had degraded to a little extent and some to moderate and even a great extent. Since the CAL does not have any non-print library resources so there are total 40 degradation forms for the remaining five libraries out of which 28 (i.e. 70%) had undergone degradation to zero extent, 12 (i.e. 30%) to little extent, 0 (i.e. 0%) to moderate extent and 0 (i.e. 0%) to a great extent.

The table 2 (A) shows the Chi-square test is conducted to test the claim; nature and extent of degradation of non-print library materials is significantly different in the selected libraries. Since the p-value is less than 0.05, it is confirmed that there is a significant difference in the nature and extent of degradation of non-print library materials in the selected libraries.

Causes and Extent of Deterioration of Print Information Resources

There are several causes for deterioration of information resources in the library depending on their respective types of material. Some of the causes for deterioration of print library materials are acidity, wear & tear, pollution, temperature, humidity, excessive light, dust, biological agents, bad shelving, human factors, etc. In IGNCA, the library resources had undergone deterioration from zero to a little extent, while in NAI a majority of resources didn't face any deterioration but for a few had deteriorated to a little extent. In NMML, CAL, ZHL and NML, the maximum extent of deterioration has reached to level 2 i.e. to a little extent.

The table 3 shows that among all the library resource deterioration of different types, some had not deteriorated at all while others had deteriorated to a little extent. No resources were found that had reached moderate or high level of deterioration. There are a total of 60 deterioration ways out of which 32 (53%) had undergone deterioration to zero extent, 26 (i.e. 30%) to little extent, 2 (4%) to moderate extent and 0 (0%) to great extents.

The table 3(A) shows the Chi-square test is conducted to test the claim; nature and extent of degradation of print library materials is not significantly different in the selected libraries. Since the p-value is greater than 0.05, it is confirmed that there is no significant difference in cause and extent of degradation of print information resourcesin the selected libraries.

Causes and Extent of Deterioration of Non-Print of Information Resources

The table 4 shows the non-print library materials face degradation in various ways like oxidation, magnetism, heat, moisture, dust, biological agents, pollutants, excessive light, etc. In libraries like IGNCA, NAI and NML, no resource deterioration was found in any of the non-print library resources. There were no non-print resources available in CAL, so only a little extent of deterioration of information resources was found in NMML and ZHL. Among all

Table 3: Causes and Extent of Deterioration of Print Information Resources

Libraries	Extents	Acidity	Wear & Tear	Pollution	Temp.	Humidity	Excessive Light	Dust	Biolo-gical Agents	Bad Shelving	Human Factors
IGNCA	0	×	×	✓	✓	✓	✓	×	×	×	×
	1	✓	✓	×	×	×	×	✓	✓	✓	✓
	2	×	×	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×	×	×
NAI	0	×	✓	✓	✓	✓	✓	×	✓	✓	✓
	1	✓	×	×	×	×	×	✓	×	×	×
	2	×	×	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×	×	×
NMML	0	✓	×	✓	✓	✓	✓	×	×	✓	×
	1	×	✓	×	×	×	×	✓	✓	×	✓
	2	×	×	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×	×	×
CAL	0	✓	×	✓	✓	✓	×	×	✓	✓	✓
	1	×	✓	×	×	×	✓	✓	×	×	×
	2	×	×	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×	×	×
ZHL	0	×	×	×	×	×	✓	✓	✓	✓	✓
	1	✓	×	✓	✓	×	×	×	×	×	×
	2	×	✓	×	×	✓	×	×	×	×	×
	3	×	×	×	×	×	×	×	×	×	×
NML	0	×	×	×	×	×	×	×	✓	✓	×
	1	✓	✓	✓	✓	✓	✓	✓	×	×	✓
	2	×	×	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×	×	×

Key: 0 = No Extent, 1 = Little Extent, 2 = Moderate Extent, 3 = Great Extent, ✓=presence, ×= absence

Table 3 (A): Results of Chi- Square Statistics and its Significance

Grand Total	%	2 Statistic	d.f.	P-value	Remarks
28	46.7%	9.38	5.00	0.095	Insignificant

**Significant at 5% level ($p<0.05$) and d.f- degree of freedom for the chi- square*

different types of library resource deterioration, some had not deteriorated at all while others had deteriorated to a little extent. No resources were found that had reached moderate or high level of deterioration. There were a total of 40 deterioration ways out of which 37 (93%) had undergone deterioration to zero extent and 3 (7%) to little extent. No resources had deteriorated to moderate or great extents.

Table 4: Causes and Extent of Deterioration of Non-Print Information Resources

Libraries	Extents	Oxid-ation	Magnetism	Heat	Moist-ure	Dust	Biological Agents	Pollutants	Excessive Light
IGNCA	0	✓	✓	✓	✓	✓	✓	✓	✓
	1	×	×	×	×	×	×	×	×
	2	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×
NAI	0	✓	✓	✓	✓	✓	✓	✓	✓
	1	×	×	×	×	×	×	×	×
	2	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×
NMML	0	✓	✓	×	✓	✓	✓	✓	✓
	1	×	×	✓	×	×	×	×	×
	2	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×
CAL	0	×	×	×	×	×	×	×	×
	1	×	×	×	×	×	×	×	×
	2	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×
ZHL	0	✓	✓	✓	✓	×	✓	×	✓
	1	×	×	×	×	✓	×	✓	×
	2	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×
NML	0	✓	✓	✓	✓	✓	✓	✓	✓
	1	×	×	×	×	×	×	×	×
	2	×	×	×	×	×	×	×	×
	3	×	×	×	×	×	×	×	×

Table 4 (A): Results of Chi- Square Statistics and its Significance

Grand Total	%	2 Statistic	d.f.	P-value	Remarks
3	6.3%	7.47	5.00	0.188	Insignificant

**Significant at 5% level ($p<0.05$) and d.f- degree of freedom for the chi- square*

The Chi-square test is conducted to test the claim; nature and extent of degradation of print library materials is not significantly different in the selected libraries. Since the p-value is greater than 0.05, it is confirmed that there is no significant difference in cause and extent of degradation of non- print information resourcesin the selected libraries.

Comparative Analysis of Nature, Cause and Extent of information resources

The research in this section is divided in 4 parts viz.

- ❖ Nature and extent of degradation of print information resources
- ❖ Nature and extent of degradation of non-print information resources
- ❖ Cause and extent of deterioration of print information resources
- ❖ Cause and extent of deterioration of non-print information resources

After analyses of data in this section, a comparative analysis has been done to understand the present conditions of our esteemed heritage value and to present this in better way, it has been divided in scale ranging from I to IV which consists of all the 31 points of above mentioned four parts.

Table 5: The Scale Distribution

Divide the graph into four Segments	I	II	III	IV
Distribution of ``Points	0-7	8-14	15-21	22-31

This comparative analysis is graphically shown in the pictures shown in fig.1. In this study, the authors make a triangular graph to understand the situation better in selected libraries. The authors divide the graph into four segments (1 to 2, 3 to 4). These segments show how much are these preservation and conservation techniques adopted by the library and each segment is on three vertexes (often, occasionally and never). By combining and understanding of data, the authors make libraries different graph of each preservation and conservation to understand the better picture.

SIGNIFICANCE OF THE STUDY

The present study helps the librarians / introduction scientists to study and find out the various factors of deterioration of information resources like environment factors, biological factors, chemical factors, human factors etc. with the nature and extent and cause of deterioration of these information resources available in the select libraries and after that find out how these information resources can be conserved and preserved with the help of various conservation and preservation techniques for the future generations to come.

DISCUSSION AND CONCLUSION

The deterioration of library resources is the basic problem of all the libraries and due to this problem we need conservation and preservation techniques. However, no library material is infinite. Due to their very nature they easily get deteriorate, hence preserving and conserving them become very important library resources acquired by the library should be conserved and preserved in a usable condition for generation of users. Though damage to library resources is sometimes unavailable, but with careful preventive measures, deterioration of the library resources may be prevented as the old adage says “prevention is better than cure”.

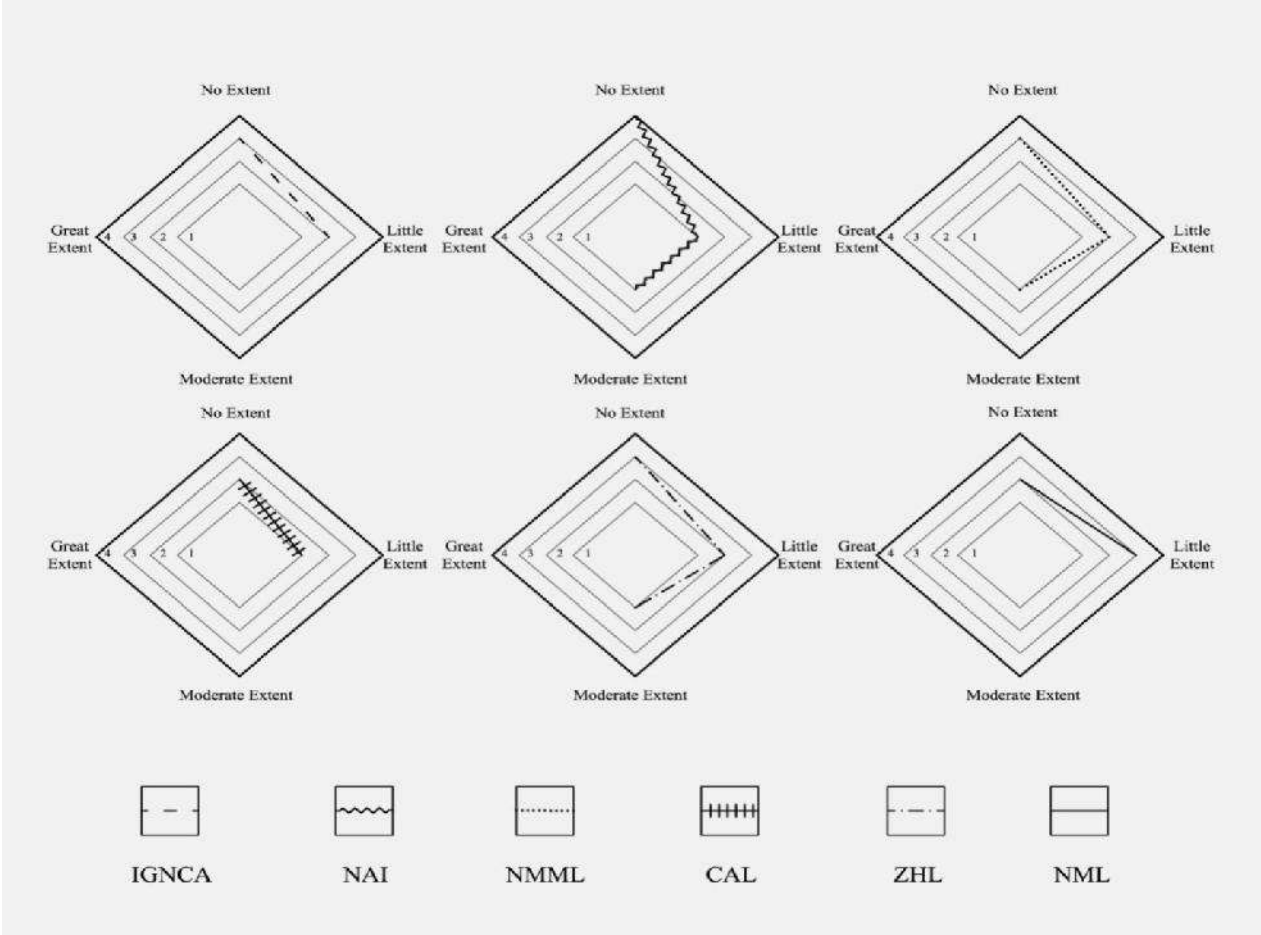

Figure 1: Nature and Extent and Cause of Deterioration of Print and Non- Print Information Resources

Libraries down the ages have been tailored towards teaching, learning, scholarly work and research activities with a view to achieving the mission and vision of the libraries / institutions. The investigation finds that because of the absence of appropriate protection and preservation rehearses in the establishments are the reasons for data assets weakening. Fragile, broken and torn issue was seen as the best reason for data assets' disintegration. Likewise, relative dust, mileage, high corrosiveness level and natural factor level have huge impact on the library materials in libraries / establishments. In this manner, the investigation recommended that libraries ought to apply current protection and preservation systems, for example, mechanically empowered ICT gadgets which will help satisfactory stockpiling and improve the sturdiness and life span of data materials in the libraries.

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