

A DESCRIPTIVE SURVEY STUDY ON CONSERVATION OF TEXTILE ARTIFACTS IN THE SELECTED MUSEUMS OF UTTAR PRADESH

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ABSTRACT: In the present study an attempt was made to analyse the variety of textile antiquities conserved, stored and displayed, techniques used for storage & and conservation in the museums of Uttar Pradesh. A total of four museums were selected as per the approachability of researcher. The data were collected through interview method and observation using questionnaire. From the study it was observed that in three museums exclusive textile antiquities i.e. Baluchari, Kantha, Brocades and Chikankari were conserved. Narasimhan Museum, Bareilly has a very good collection of dresses and Flags of world war-I and II. Showcasing was the most commonly used display technique used by all the museums followed by the use of rollers, hangers and dummies. Different precautionary procedures such as control of humidity & temperature, periodical cleaning and dusting, fumigation, use of dehumidifiers and 'Clove oil' & dried 'neem' leaves were mostly used by all the museums.

KEYWORDS: Antiquities, Artifacts, Conservation, Museums, Storage

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I. INTRODUCTION

Indian textiles artefacts have the glorious past which express our history of culture and tradition followed by the people of ancient times. During the times of yore, people used to own traditional textiles and costumes of their time so that they would be able to demonstrate their culture to the coming generations. This way the precious and exclusive wealth in form of traditional textiles and costumes remained hidden in the boundaries of four walls and limited to the access of particular family to which these artifacts belonged to and in many cases may have no or limited public accessibility.

However, with the instigation of government and non-government administrations, the efforts had been made to reserve and store the cultural heritage of our nation in various museums spread all over the India. According to **U.S. Museum Services Act (2014)** a museum is "a public or private non-profit agency or institution planned on a permanent basis for essentially educational or appealing purposes that uses a professional staff; possesses or utilizes, upkeeps and exhibits the palpable objects to the public on a regular basis. The term "museum" comprises of botanical gardens, art museums, children's museums, general museums, historic houses and sites, history museums, natural history and anthropology museums and specialized museums".

Each and every state of India has its own characteristic textiles and crafts indigenous to the specific area. Likewise, Uttar Pradesh had its own tradition due to that enriched with various antiquities. Thus, museums serve as a place where these antiquities can be conserved for future generations. So, Uttar Pradesh has a number of museums blessed with a most beautiful collection of display which signifies the history of this state such as costumes of its combatants, paintings, textiles, jewellery, coins, sculptures and various manuscripts which speaks the golden past of the state.

Museums are the only way to make the collected and inherited rare textile artifacts accessible to the people in order to understand about their culture, tradition, arts, history and crafts and various other remarkable features idiosyncratic to a region.

The present work is an attempt to study the variety of textile antiquities conserved, stored and displayed, techniques used for storage and conservation in various selected museums of Uttar Pradesh.

II. MATERIAL AND METHODS

Selection of Museums

Following four museums were selected from different cities of Uttar Pradesh for the study.

- Allahabad Museum, Allahabad
- State Museum, Lucknow
- Jnana Pravaha Kalamandapa, Varanasi
- Narasimhan Museum-Pre-Independence, Bareilly

Museums as per approachability of researcher were surveyed on the basis of availability of textiles. These museums were purposively selected for the study on the basis of the information obtained through primary and secondary sources. Each museums of Uttar Pradesh possessed a valuable collection of textiles which were a part of its anthology during the time of study but, may not be tomorrow with no or limited public accessibility.

Tool and Method Of Data Collection

Primary data was collected with the help of self-structured interview schedule and secondary data was collected from books, journals, magazines and internet. A well-structured interview schedule was developed for the collection of data. It consists of two sections covering general as well as specific information.

The general information includes historical background of museum like establishment year and background information of the curators such as name, designation, age, sex, education, trainings obtained and motivating factors to start this work.

Specific information include information regarding traditional textiles & costumes conserved in museums including the total number of textile articles present in respective museums, details about the various types of textile antiquities present in the museum collection, details of the documentation of their collection of textile articles, pre-treatments given to the textile materials before display, conservation methods used for textiles etc. Questionnaire consisted of both close ended and open-ended types of questions, to get the detailed information which helped to assess the existing status and conservation techniques followed in various selected museums.

Analysis of Data

The data were coded, tabulated and analysed using simple percentages as well as weighted scores.

III. RESULTS AND DISCUSSION

In the process of data collection following two points was observed.

1. All the respondents have not given all possible answer.
2. The interview schedule consisted some open-ended questions.

The results of the study are discussed under the following heads:

General Information About The Museums

The general information includes such as period of establishment of selected museums along with its managing agency were collected and are presented in Table 1. From the table it is clear that the oldest among the four selected museums was State Museum, Lucknow (1863) followed by Allahabad Museum (1931) and Narasimhan Museum-Pre-Independence, Bareilly (1995). Three museums were managed by government and only Narasimhan Museum was privately managed by Prof. Kamal Giri.

Specific Information

This section reveals the information regarding types of textile articles conserved, range of temperature and humidity maintained, props used for display of textile articles and labelling methods used for the displayed

articles. The information was also collected regarding covering materials used for antiquities, various display techniques used, pre-treatments and curative methods given to textile artifacts in selected museums of Uttar Pradesh.

1. Types of Textile Articles Conserved

During the survey, it was observed by the researcher that various types of textiles are conserved in the museums were mostly from different regions of India namely, Phulkari, Kantha, Baluchari Saree, Kurta, Carpet, Lehnga, Shawl, Asawali saree, Candova, Moon shawl, Coga, Jamdani dupatta, Jamdani angrakha, Kalamkari and Pahari rumal with scenes, Mashru, Banarasi dupatta, Painting on cloth, Cotton print, Paithani saree, Tribal veil cloth, Chakla, Patola saree, Toran, Book cover, Shawl, Rumal, Banner, Brocade saree, Jackets, Odhani, Lehnga, Phulkari, Chikankari kurta, Caps. Bareilly museum collection constitutes the cotton and silk uniforms and flags which are woven of World War I and II (Table 2).

2. Range of Temperature and Humidity Maintained in Various Museums

Museum curators of all four museums revealed that they had installed relative humidity measuring instruments in their display areas to measure the macro climate of the museum building though none monitored the micro climate (climate inside the showcases or closed display space) nor practiced any method to control the same which is a threat to the physical integrity of the organic artefacts. All museums had made arrangements to control the macro climatic conditions (temperature and relative humidity) with various methods. According to the curators, all the stated methods assisted as preventive measures to control climatic fluctuations which were the greatest threat to textile materials in the tropical countries like India. One of them opined that much effort to control humidity was not required in their case as the museum had favourable geological location whereas, one of the respondent of Allahabad Museum also expressed that due to financial and other constraints they could not opt for air-conditioners despite of it being the best method. The respondent of the Jnana Pravaha Museum said that air conditioners were not suitable for preservation because it increases the humidity due to which the textiles will get damp therefore, they were using dehumidifiers to control the level of humidity. Conservators in selected museums (under study) control temperature and humidity in the respective range i.e. 20-25°C, 45-60%.

Corgneti, S.P (2009) also suggested that the variation or fluctuation of temperature and relative humidity in the vicinity or near environment of the rare textile artifacts is the most significant reason of weakening of textile fibres. Sudden changes in both these factors will bring about stress to various textile articles, due to this it creates increasing and irretrievable alterations in the physical and chemical properties of textiles which would resultantly speed up the weakening process.

3. Air Circulation Facilities in the Museums

In State museum, Lucknow exhaust fans and Air Conditioners were used for air circulation. According to the respondents their building was fully closed with glasses therefore air conditioners were used by them to maintain the temperature and humidity and to protect their textiles from deterioration. In Jnana Pravaha Kalamandapa, Varanasi exhaust fan, ceiling fans, and air coolers were used for air circulation. In Allahabad Museum only exhaust fans and ceiling fans were used due to the lack of funds they could not afford air conditioners as reported by respondents. Some respondents said that there is no need of any other air circulation facility because the museum conservators conserve their textiles collection very well with only exhaust fans and ceiling fans. In Bareilly museums apart from exhaust fans and ceiling fans, air conditioners were also installed for air circulation, the respondents in these museums said that adequate funds were coming from charity therefore they are increasing their wings and facilities in the museums.

It is clear from Table 3 that all museums had installed exhaust fans (100%) and three museums had fans (75%) and two had air conditioners (50%). Only one out of four museums had installed air cooler (25%).

4. Acquisition of Textile Antiquities

The textile collections in the museum was mainly acquired through purchases and donation/gifts (100%) followed by explorations (25%) and exchange from other regions (25%).

5. Methods Used For Protection of Windows/Ventilators From Sunlight and Dust

In Jnana Pravaha Kalamandapa museum cloth curtains, blinds, reflectors and UV light filters were used. In State museum, Lucknow cloth curtains and thermolux glass were used. In Allahabad museum cloth curtains, dust

proofs and screens were used. In Bareilly museums cloth curtains, dust proofs, screens and UV light filters were used for protection of displayed articles from sunlight and dust.

It was found that all (100%) the museums are using cloth curtains followed by dust proofs (75%) and UV light filters (50%).

6. Labelling Methods Used For The Displayed Articles

It is found that pasting on wall method was practiced by all the museums frequently. Metal pins are not used by any of the museum. In Jnana Pravaha Kalamandapa, Varanasi stitching on the textile's method were used occasionally. In Lucknow museum, Allahabad museum and Bareilly museum pasting on showcases method was used frequently.

Table 4 clearly reveals that the most preferred labelling method used for the displayed articles was laminated frame on wall and pasting on showcases and got first rank (s=11) followed by kept near antiquity which got second rank (s=10) and stitching on the textiles which got third rank (s=7).

Heathcote (2002) said that labels should be placed to the lower right of the object on the supporting wall, pedestal with a fixed sight line. On a dark background, a lot of white labels can dominate the objects therefore it should be avoided. Labels should not be printed with the same colour as the background because this can create a problem of visibility to the viewers.

7. Covering Materials Used for Displayed Articles

The information on covering materials used for the displayed articles were collected and the results are reported in Table 5.

Covering displayed articles with glass cases is the most frequently used method for textiles in all the museums because this is the safest method for textiles which protect them from dust and other impurities from outer environment. Protective transparent sheets are used by some museums. According to the respondent of Jnana Pravaha museum large paintings like tree of life, Kalamkari is very big in that museum so they use to mount that painting on hardboard covered with protective transparent sheets. Lamination method is very limited used in museums only for any hand embroidery article like in Allahabad museum. Table clearly reveals that the most preferred covering material for displayed textile articles was with glass cases which got first rank (s=12) followed by protective transparent sheets which got second rank (s=9) and lamination (s=8).

8. Display Techniques Used for the Textile Antiquities

The information on display techniques used were collected and the results are reported in Table 6

The showcasing and tables display technique was mainly practiced by all the museums as showcasing and tables are the most safest method, which protect textile articles from dust, light, touch of the visitors and other environmental factors. As reported by most of the respondents in Bareilly museum only dummies and mannequins and hangers were used frequently for display of uniforms. In Allahabad museum most of the articles were displayed in the showcases and the rest of the articles were on dummies and mannequins and hangers which were padded so that it will not affect the displayed article and would not create any kind of strain on the fragile articles. In Lucknow museum only one or two articles were displayed on dummies and mannequins. In Jnana Pravaha Kalamandapa, Varanasi most of the textiles were displayed on rollers and the rest in showcases.

Table 6 clearly reveals that showcasing and tables were the most frequently preferred display technique used for textile antiquities which got first rank (S=11), the next most preferred display technique was hangers (S=10) followed by rollers (S=9), dummies & mannequins (S=8) and wire models (S=4) which got third, fourth and fifth rank respectively.

9. Storage Equipment's Used in Various Museums

The keepsakes were stored in metal trunks by two museums ignorant of the fact that with passage of time it would stain the textiles with rust marks. All four museums used wooden boxes of which only two museums had treated them against termite attack. In three museums, storage chambers of wood were used and only of metal, two museums storing their textiles in wooden cupboards and one in metal cupboards. Three museums had lined

their storage space with newspapers before arranging the textiles being oblivious of the fact that it attracts insects like silver fish.

National Park Service (2012) also suggested that museum storage equipment's should be made of metal. Wood should not be used even when painted, as it can off gas harmful acids.

10. Lighting System in Various Museums

The information elicited by the curators on practices monitored for control of natural and artificial light revealed that all the museums had closed buildings structures with no windows to prevent from direct day light. None of them had instruments to measure the intensity of light yet, all adhered to proper light arrangements (within tolerable limits) for public viewing whereas Jnana Pravaha Kalamandapa museum, switch on the lights for a very short time and specially when the visitors entered the galleries of the museum.

This clearly indicates that the museum staff were cognizant about the hazardous consequences of light (natural as well as artificial) on the displayed artefacts. All of them were well aware of the airing of the textiles but, maximum (three) did not practice due to time limitations while others (one) exposed their artefacts under the sunlight, specifically after monsoons, for increase their longevity.

It can be found that diffused lighting system was mainly preferred by all the museums (100 percent) followed by diffused sunlight (75 percent) and direct artificial light (25 percent).

Francis, et al. (2017) opined that exposure of museum textiles to light can fade the dyes, discolour the fabrics & yarns and embrittlement & loss of strength in fibres which are not susceptible to this type of damage such as silk and nylon therefore to monitor light levels "Light meters" are used.

11. Different Types of Artificial Lights Used in Various Museums

Jnana Pravaha Kalamandapa museum had limit the entry of the visitors in order to preserve their heritage for a longer duration being well aware of the fact that dirt and dust pose direct threat to the physical state of the artifacts. They believed in the philosophy of "prevention is better than cure", In Jnana Pravaha Kalamandapa museum, the gallery attendants switch on the lights only when the visitors visit the galleries of the museum. This indicates that they are well aware of the perilous effects of the lights.

The type of artificial lights mostly used in the museums are incandescent bulbs (100%) with value 70 Lux followed by tungsten bulbs (25%). The results are also in accordance with **Hunt, G. E, 2009** that Incandescent lamps are usually used for ambient and accent lighting with track luminaires. In museums, the most common light sources are incandescent, fiber optic and HID.

12. Pretreatments Given to Textile Antiquities and Display Boards

In Allahabad museum it was observed that the conservators used to place small fabric bags in their showcases. On probing respondents revealed the content of the bags was paradichlorobenze whereas, Jnana Pravaha Kalamandapa, Varanasi used crushed extracts of neem leaves placed next to the artifact to prevent fungal attack. Fumigation chambers were used in State Museum, Lucknow as it is an effective, quick and safe method of treatment to treat pest menace while others did not state the reason for not having one. Two museums use insecticides for display equipments.

Insecticides were mainly used for wooden display equipments in only two museums. Strengthening was carried out for cotton, wool and silk textile objects in 100 percent of museums. While in 75 percent of museums naphthalene balls and dried neem leaves were used for cotton textiles. **Merritt and Reilly (2010)** also stated that Naphthalene is a repellent which is commonly used in museums because it can be simply procured from the local market.

National Museum of the American Indian (2017) reported that Naphthalene and paradichlorobenzene were applied as a solid and sublimate, acting as a fumigant. The fumes from these materials destroy insects and work best in tightly closed spaces. The pesticide residue is estimated to evaporate over time.

13. Protective Measures Followed in Museums during Storage

In Jnana Pravaha Kalamandapa Museum dust proof covered almirah were used to store textiles. They used to place camphor and dried neem leaves in the stored textiles to protect from insect attack and dehumidifier was used to protect the textiles from dampness. In State Museum, Lucknow periodical cleaning and dusting were carried out to protect the stored textiles against dust. Silica gel crystals and acid free blotting paper were used as a protective measure against dampness. Stored textiles were fumigated and naphthalene bricks and paradichlorobenzene was used to treat against insect attack.

UV films were used to protect the textiles from sunlight. In Allahabad Museum windows were closed and periodical cleaning and dusting was carried out to protect the stored textiles against dust. Silica gel crystals were used as a protective measure against dampness in both Allahabad Museum and Bareilly Museums and paradichlorobenzene was used to treat textiles against insect attack.

The results are also supported with the study by **Arenstein, P.R (2019)** that Silica gel beads have a massive network of inner pores generating a lot of surface area. The silica gel crystals are so efficacious as a desiccant for the reason that it adsorbs moistness upto 40% of its weight (in some cases) into its pores.

14. Preventive Methods Used in Various Museums

The information on preventive methods was collected and the results are reported in Table 7.

Table clearly explains the preventive methods used in the museums of Uttar Pradesh. Proper cleaning and proper lighting arrangement were done in all the museums frequently. Humidity is maintained in all the museums. Periodical fumigation is done in most of the museums occasionally except Bareilly museum and Jnana Pravaha Kalamandapa, Varanasi.

Table 7 clearly reveals that preventive methods used in the museums the most frequently preferred methods were proper cleaning and lighting arrangement which got first rank (s=12), the next most preferred method was Control of humidity & temperature which got second rank (s=7) followed by fumigation which got third rank (s=6).

Genoways and Ireland (2003) also supported the study by mentioning that the upkeep of a clean workplace is a part of the complete environmental necessities for the preservation of the textile antiquities as well as for the over-all health and wellbeing of the people using the space of museum.

15. Common Pests Encountered In Museum Textiles

The information on common pests encountered in museum textiles was collected and the results are reported in Table number 8.

Since Indian climatic conditions are favourable for pests to nurture and thrive, more precautionary measures were required. Silver fish is most frequently encountered pest in textile museums.

Table clearly that in common pests encountered in museum textiles the most frequently pests encountered was silver fish which got first rank (S=11), the next pest encountered was rats which got second rank (S=8) followed by cockroach and clothes moth which got third rank (S=7). **Harvey and Mahard (2020)** also stated that silverfish and booklice prerequisite moist conditions to prosper and aid as initial pointers of environmental problems.

16. Repellents Used Against Insect Rodents

Table 9 clearly shows that naphthalene is used frequently by State museum, Allahabad and Bareilly museums. Paradichlorobenzene was used to treat the textiles most frequently by State museum, Allahabad and Bareilly museums. Neem leaves were used frequently only by two museums and others are using neem leaves occasionally. Only two museums are using "Kapoor" frequently. Jnana Pravaha Kalamandapa do not have their own textile laboratory. They are only using natural repellents against insect rodents for storing their textiles. Interviews and observation revealed that to ward off insects and microorganisms, two museums adhered to the usage of naphthalene balls, placed beside the displayed artifacts. The method practiced was considered highly uncommendable.

Table 9 clearly reveals that the most frequently preferred repellent were naphthalene and neem which got first rank (s=9), the next most preferred was Paradichlorobenzene which got second rank (s=7), followed by Camphor

which got third rank (s=6). **Rushworth et al. (2014)** also opined that Naphthalene is a most common volatile insecticide deposit found in museum collections.

17. Different Methods Used For Strengthening Textiles

While interviewing the conservator of State museum it has revealed that netting was done on the weaker areas of the fragile textile to stabilize it temporarily. Netting increases the study life of the textile and also improves the strength to withstand the tension during display. They use nylon net for netting because it had many advantages over protein and cellulosic fibres such as cost effectiveness, edges do not fray and less visible. Stitching, darning, patch work, lining, backing was practiced by all the museums.

It is also investigated in the study conducted by **Nilsson (2015)** that how different three methods, using dissimilar stitching techniques and supporting layers, support the extreme force at disruption of silk samples. The results illustrate that subsequently after conservation, laid couching made both surrogates with tear and with abrasion the strongest though brick couching made surrogates with tear almost as strong.

18. Common Problems Encountered In Various Museums

Inadequate staff for the conservation of artefacts, lack of storage space and lack of special equipment for conservation were not available in the Allahabad Museum. In Jnana Pravaha Kalamandapa, Varanasi no conservation lab, no trained staff for the conservation of artifacts were the problems faced in this museum. In State Museum, Lucknow common problems faced were lack of staff for curative conservation, lack of funds and special equipment's for conservation. In Narasimhan Museum-Pre-Independence, Bareilly the problems faced was no conservation lab and no technical staff.

IV. CONCLUSION

From the study it is concluded that in selected museums of Uttar Pradesh exclusive textile antiquities of different places of India including Baluchari (West Bengal), Kantha (West Bengal), Phulkari (Punjab), Brocades (Banaras), Jamdani (West Bengal), Paithani (Maharashtra), Kalamkari, Chikankari (Lucknow) and embroidered articles were conserved. Most of the museums control temperature (20-25°C) and humidity (45-60%).

It was found that all (100%) the museums were using cloth curtains followed by dust proofs (75%) and UV light filters (50%) to protect the windows/ventilators from sunlight and dust because this can increase the amount of heat in museum and accumulation of dust on textile articles. Various preventive measures including control of humidity and temperature, periodical cleaning and dusting, fumigation, use of dehumidifiers to control the level of humidity, "kapoor" and dried "neem" leaves were mostly used by the conservators of selected museums. However, naphthalene balls, paradichlorobenzene were used as curative measures and Silica gel crystals were used as a protective measure against dampness in both Allahabad Museum and Bareilly Museums.

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VI. REFERENCES

- [1] Arenstein, P.R. (2019). Demystifying Silica Gel for Effective Microclimates. A.M. Art Conservation.
- [2] Corgnati, S.P. (2009). A methodology for microclimatic quality evaluation in museums: Application to a temporary exhibit. 44(6). 1254-1260pp
- [3] Chang, Y.S., and W.H. Jue. "The Assessment Factors for Museum Digital Guide System Design—From User Experience and Perception." *International Journal of Communication and Media Studies* 6.2 (2016): 7-24.
- [4] Das, Abhijit, et al. "Occurrence Of trematode Artyfechinostomosis in pig of Lakhimpur District of Assam." *Int J Agri Sci Res* 11 (2017): 53-58.

- [5] Francis, K et al. 2017. Environmental Concerns for Textiles - Section C. Light. Retrieved on 24 Sep 2017
- [6] http://www.conservationwiki.com/wiki/TSG_Chapter_III_Environmental_Concerns_for_Textiles_-_Section_C_Light
- [7] Genoways, H.H and Ireland, M.L. Revised by Conn, D. (2003). Museum Administration- An Introduction. A Division of Rowman & Littlefield Publishers, Inc. Walnut Creek, Lanham, New York, Toronto, Oxford.
- [8] Harvey, R and Mahard, R. M. (2020). The Preservation Management Handbook- A 21st Century Guide For Libraries, Archives and Museums, Second Edition. Rowman & Littlefield Publishers, Inc. Lanham, Boulder, New York, London.
- [9] Heathcote, C. (2002). Exhibition and display basics. Australia: MAP-Admin-Mus Resources – Helpsheets, 1-4p. Retrieved on 19 Dec 2017
- [10] https://mavic.asn.au/assets/Info_Sheet_11_Display_Basics.pdf
- [11] Hunt, G.E. Study of Museum Lighting and Design- *Published Master's Thesis*. Texas State University-San Marcos. May, 2009.
- [12] Khamitova, Marvan. "Problems the Studying of the Historical-Cultural Heritage." *International Journal of History and Research (IJHR)* 5.2 (2015): 1-6.
- [13] National Museum of the American Indian. 2017. Pesticides. Retrieved on 24 Sep 2017
- [14] <http://nmai.si.edu/explore/collections/conservation/pesticides/>
- [15] National Park Service, Museum Handbook, Part I (2006). Museum Collection Storage. Retrieved on 24 Sep 2017
- [16] <https://www.nps.gov/museum/publications/MHI/CHAP7.pdf>
- [17] Nilsson, Johanna. (2015). Evaluation of Stitched Support Methods for the Remedial Conservation of Historical Silk Costumes. *e-conservation Journal*. 10.18236/econs3.201506.
- [18] Merritt, J and Reilly, A.J. (2010). Preventive Conservation for Historic House *Museums*. Rowman & Littlefield Publishers, Inc. Lanham, New York, Toronto, Plymouth, UK.
- [19] Rushworth, I.D., Higgitt, C., Smith, M. and Gibson, L.T. (2014). Non-invasive multiresidue screening methods for the determination of pesticides in heritage collections. *herit sci* 2, 3. <https://doi.org/10.1186/2050-7445-2-3>
- [20] Tomar, Shrutisingh, and Madhu Sharan. "A Glance at an Extinct Craft OF Cotton Loin Cloth Production and Zari Border Weaving at Mandvi, Surat." *International Journal of Textile and Fashion Technology (IJTFT)* 6. 6, Dec 2016, 37-44
- [21] U.S. Museum Services Act (2014), Infrastructure Needs Study of Alaska Museums and Planning Guide. Retrieved on 5 Oct 2017

VII.APPENDIX

Table 1: General Information about the Museums

S. No	Museums	Period of establishment	Managing Agency	Address	Contact number and Email I.D
1.	Allahabad Museum, Allahabad	1931	Department of culture, New Delhi	Chandrashekhar Azad Park, Kamla Nehru Road, Allahabad, Uttar Pradesh.	0532-2407409 allahabadmuseum@rediffmail.com .
2.	State Museum, Lucknow	1863	Department of culture, Uttar Pradesh	Prince of Wales Zoological Gardens, Lucknow	098072 94411 upstdc@up-tourism.com
3.	Jnana Pravaha Kalamandapa, Varanasi	1997	Private	Centre for Cultural Studies & Research South of Samne Ghat	91-542-2366326 jnanapravaha.vns@gmail.com
4.	Narasimhan Museum-Pre-	1995	Army	Jat Regiment Centre, Cantt,	91 94121 11111

Independence, Bareilly			Bareilly	
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Table 2: Types of Textile Antiquities Preserved in Various Museums

Museum	Textiles	Fiber content	Technique of manufacture	Period
Allahabad Museum	Coat, Kurta (Sumitranandan Pant)	Cotton	Woven, embroidered	19 th century
	Kurta and Pyjama (Maulvi Liaqat Ali)	Cotton	Woven	1857
	Phulkari, Chadar	Cotton	Woven,embroidered	20 th century A.D
	Frame of Tarakashi	Cotton, Zari	Woven,embroidered	20 th century A.D
	Baluchar saree	Cotton, Silk	Woven, embroidered	20 th century A.D
	Lahnga	Cotton, Zari	Woven,embroidered	19 th century A.D
	Embroidered picture	Cotton, Silk	Woven,embroidered	19 th century
	Shoulder bag, Skirt, Table cloth, Saree, Loin cloth	Cotton	Handwoven, dyed	19 th century
	Chogha/kurta, Jacket	Silk	Woven,embroidered	19 th century
	Shawl	Wool	Woven,embroidered	19 th century
Cap	Cotton	Woven,embroidered	19 th century	
State Museum, Lucknow	Jacket (Achkan), Lehnga/ghagra	Cotton, Silk	Woven,embroidered	19 th century
	Odhani	Silk	Woven, tie-dye	20 th century
	Lehnga	Silk	Woven,embroidered	20 th century
	Blouse/Choli jacket, Kameez	Cotton	Woven,embroidered	19 th century
	Shawl/odhani	Cotton	Woven, dyed	19 th century
	Pichhwai	Cotton	Woven, painted	19 th century
	Brocade saree	Silk, Zari	Woven,embroidered	19 th century
	Table cloth	Cotton, Zari	Woven,embroidered	18 th century
	Chikankari kurta	Cotton	Woven,embroidered	20 th century
	Cap	Cotton	Woven	18 th century
	Chikan handkerchief	Cotton	Woven	19 th century
	Thangka Paintings	Silk	Woven, painted	19 th century
Jnana Pravaha Kalamandapa Museum, Varanasi	Phulkari	Cotton	Woven, embroidered	19 th century
	Kanthas	Cotton	Woven, embroidered	Early 20 th century
	Baluchari Saree	Silk	Woven	20 th century
	Kurta, Shawl/Odhani,Lehnga/Ghagra	Cotton, Silk	Woven	17 th century
	Painting on cloth	Cotton	Woven and painted	19 th century
	Asawali Saree	Silk and metal thread	Woven	Early 19 th century
	Candova (canopy)	Silk and metal thread	Woven	Early 20 th century
	Moon shawl	Pashmina wool	Woven	Late 18 th century
	Coga	Pashmina and other Wool	Woven, embroidered	Second half of the 19 th century
	Jamdani dupatta	Cotton and Zari	Woven, embroidered	Late 19 th century
	Jamdani angrakha	Cotton	Woven	C.1850
	Kalamkari border of a Pichavai	Cotton, painted and stamped mordants	Woven, painted	C1800-75
Pahari rumal with scenes from the Ramayana	Cotton, Silk	Woven, embroidered	Early 19 th century	
Narasimhan Museum-Pre-	Uniforms, Flags	Cotton, Silk	Woven	World war I and II

Independence, Bareilly				
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Table 3: Air Circulation Facilities in the Various Museums

Museum	Air circulation facilities			
	Air conditioner	Exhaust fans	Air coolers	Ceiling fans
1	-	+	-	+
2	-	+	+	+
3	+	+	-	-
4	+	+	-	+

1.Allahabad Museum 2. State Museum, Lucknow 3. Jnana Pravaha Kalamandapa, Varanasi 4. Narasimhan Museum-Pre-Independence, Bareilly

Table 4: Labelling Methods Used for the Displayed Articles

Labelling methods	Museums												f	%	O	%	N	%	W.S	Rank
	1			2			3			4										
	F	O	N	F	O	N	F	O	N	F	O	N								
Stitching on the textiles	-	-	+	-	-	+	-	-	+	-	+	-	0	0	1	25	3	75	7	3
Using metal pins	-	-	+	-	-	+	-	-	+	-	-	-	0	0	0	0	4	100	4	4
Laminated frame on wall	+	-	-	+	-	-	+	-	-	-	+	-	3	75	1	25	0	0	11	1
Pasting on showcases	-	+	-	+	-	-	+	-	-	+	-	-	3	75	1	25	0	0	11	1
Kept near antiquity	-	+	-	+	-	-	-	+	-	+	-	-	2	50	2	50	0	0	10	2

1.Allahabad Museum, Allahabad 2. State Museum, Lucknow 3. Jnana Pravaha Kalamandapa, Varanasi 4. Narasimhan Museum, Bareilly
 F= Frequently, O= Occasionally, N= Never, f= frequency, %= Percentage, W.S= Weighted Score

Table 5: Distribution of Museums According to the Use of Covering Materials for Displayed Articles

Covering Materials	Museums												f	%	O	%	N	%	W.S	Rank
	1			2			3			4										
	F	O	N	F	O	N	F	O	N	F	O	N								
Glass cases	+	-	-	+	-	-	+	-	-	+	-	-	4	100	0	0	0	0	12	1
Protective transparent sheets	-	+	-	+	-	-	+	-	-	-	-	+	2	50	1	25	1	25	9	2
Lamination	+	-	-	-	-	+	-	+	-	-	+	-	1	25	2	50	1	25	8	3

1.Allahabad Museum, Allahabad 2. State Museum, Lucknow 3. Jnana Pravaha Kalamandapa, Varanasi 4. Narasimhan Museum, Bareilly
 F= Frequently, O= Occasionally, N= Never, f= frequency, %= Percentage, W.S= Weighted Score

Table 6: Distribution of Museums According to the Display Techniques Used

Display Techniques	Museums												f	%	O	%	N	%	W.S	Rank
	1			2			3			4										
	F	O	N	F	O	N	F	O	N	F	O	N								
Showcasing	+	-	-	+	-	-	+	-	-	-	+	-	3	75	1	25	0	0	11	1
Wire Models	-	-	+	-	-	+	-	-	+	-	-	+	0	0	0	0	4	100	4	5
Rollers	-	+	-	-	+	-	+	-	-	-	+	-	1	25	3	75	0	0	9	3
Hangers	-	+	-	+	-	-	-	+	-	+	-	-	2	50	2	50	0	0	10	2
Dummies and Mannequin	-	+	-	-	+	-	-	-	+	+	-	-	1	25	2	50	1	25	8	4
Tables	+	-	-	+	-	-	+	-	-	-	+	-	3	75	1	25	0	0	11	1

1.Allahabad Museum, Allahabad 2. State Museum, Lucknow 3. Jnana Pravaha Kalamandapa, Varanasi 4. Narasimhan Museum, Bareilly

F= Frequently, O= Occasionally, N= Never, f= frequency, %= Percentage, W.S= Weighted Score

Table 7: Distribution of Museums According to the Preventive Methods Used in Various Museums

Preventive method	Museums												f	%	O	%	N	%	W.S	Rank
	1			2			3			4										
	F	O	N	F	O	N	F	O	N	F	O	N								
Proper cleaning	+	-	-	+	-	-	+	-	-	+	-	-	4	100	0	0	0	0	12	1
Proper lighting arrangement	+	-	-	+	-	-	+	-	-	+	-	-	4	100	0	0	0	0	12	1
Control of humidity and temperature	-	+	-	-	+	-	-	+	-	-	-	+	0	0	3	75	1	25	7	2
Periodical Fumigation	-	+	-	-	+	-	-	-	+	-	-	+	0	0	2	50	2	50	6	3

Table 8: Distribution of Museums According to the Pests Encountered in Museum Textiles

Display Techniques	Museums												f	%	O	%	N	%	W.S	Rank
	1			2			3			4										
	F	O	N	F	O	N	F	O	N	F	O	N								
Anthrenus species	-	-	+	-	-	+	-	-	+	-	-	+	0	0	0	0	4	100	4	6
Cockroach	-	+	-	-	+	-	-	-	+	-	+	-	0	0	3	75	1	25	7	3
Clothes moth	-	+	-	-	+	-	-	+	-	-	-	+	0	0	3	75	1	25	7	3
Dermstid beetles	-	+	-	-	-	+	-	-	+	-	-	+	0	0	1	25	3	75	5	5
Moulds	-	+	-	-	+	-	-	-	+	-	-	+	0	0	2	50	2	50	6	4
Rats	-	+	-	-	+	-	-	+	-	-	+	-	0	0	4	100	0	0	8	2
Silver fish	+	-	-	-	+	-	+	-	-	+	-	-	3	75	1	25	0	0	11	1
Wood boring beetles	-	-	+	-	-	+	-	-	+	-	-	+	0	0	0	0	4	100	4	6



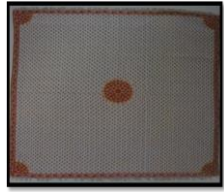









Table 9: Repellents Used against Insect Rodents in Various Museums

Repellents	Museums												f	%	O	%	N	%	W.S	Rank
	1			2			3			4										
	F	O	N	F	O	N	F	O	N	F	O	N								
Naphthalene	-	+	-	+	-	-	-	-	+	+	-	-	2	50	1	25	1	25	9	1
Paradichlorobenzene	+	-	-	-	+	-	-	-	+	-	-	+	1	25	1	25	2	50	7	2
Neem Leaves	-	+	-	-	+	-	+	-	-	-	+	-	1	25	3	75	0	0	9	1
Kapoor	-	+	-	-	-	+	-	+	-	-	-	+	0	0	2	50	2	50	6	3
Benzene+Creosote	-	+	-	-	-	+	-	-	+	-	-	+	0	0	1	25	3	75	5	4
Chloroform	-	-	+	-	-	+	-	-	+	-	-	+	0	0	0	0	4	100	4	5
Creosote and Naphthalene	-	-	+	-	+	-	-	-	+	-	-	+	0	0	1	25	3	75	5	4

1.Allahabad Museum, Allahabad 2. State Museum, Lucknow 3. Jnana Pravaha Kalamandapa Museum, Varanasi 4. Narasimhan Museum, Bareilly

F= Frequently, O= Occasionally, N= Never, f= frequency, %= Percentage, W.S= Weighted Score

			
<p>Figure 1:- Dress of Sumitranandan Pant in Allahabad Museum</p>	<p>Figure 2:- Artifacts displayed in Upright showcases with proper ventilation from windows and Ceiling fans, Allahabad Museum</p>	<p>Figure 3:- Lehanga of Zari work, 19th Century A.D displayed flat on Table Showcase, Allahabad Museum</p>	<p>Figure 4:- Clear View of Zari work Lehanga, 19th Century A.D, Allahabad Museum</p>
			
<p>Figure 5:- Embroidered picture presented to Pandit Nehru in Vietnam displayed on wall in laminated wooden frame, Allahabad Museum</p>	<p>Figure 6:- Baluchar Saree, Murshidabad, 20th Century A.D. displayed in upright showcase, Allahabad Museum</p>	<p>Figure 7:- Frame of Tarakashi with inlaid work of Jari, 20th Century A.D., Allahabad Museum</p>	<p>Figure 8:- Coat of Sumitranandan Pant, Allahabad Museum</p>
			
<p>Figure 9:- Baluchar Saree, West Bengal, 19th Century, Silk, Jnana Pravaha Kalamandapa Museum, Varanasi</p>	<p>Figure 10:- Candova (Canopy) Banaras, Early 20th Century, Silk and metal thread, Jnana Pravaha Kalamandapa Museum, Varanasi</p>	<p>Figure 11:- Zaridar (Gold-Embellished) Jamdani, Caukora, Banaras, c.1880, Jnana Pravaha Kalamandapa Museum, Varanasi</p>	<p>Figure 12:- Pahari Rumal with the wedding of Krishna and Rukmini, Himachal Pradesh, Probably Kangra, Early 19th Century, Cotton, Embroidered with floss silk and metal strips, Double darning stitch, Jnana Pravaha Kalamandapa Museum, Varanasi</p>

				
<p>Figure 13:- Shawl, Early 19th Century, Pashmina wool, Jnana Pravaha Kalamandapa Museum, Varanasi</p>	<p>Figure 14:- Asavali Saree, Early 19th Century, Gujarat, Silk and metal thread, Jnana Pravaha Kalamandapa Museum, Varanasi</p>		<p>Figure 15:- Moon Shawl, Kashmir, Late 18th Century, Pashmina wool, Jnana Pravaha Kalamandapa Museum</p>	
				
<p>Figures 16, 17, 18, 19, 20:- Officers dresses of 1903-1923 vintage displayed in glass showcases, dummies and hangers in Narasimhan Museum-Pre Independence, Bareilly</p>				
				
<p>Figure 21:- Officers dresses of 1903-1923 vintage, Narasimhan Museum, Bareilly</p>	<p>Figure 22:- Chikankari Handkerchief laid flat in State Museum, Lucknow</p>	<p>Figure 23:- Jamdani Angarakha in State Museum, Lucknow</p>	<p>Figure 24:- Cap in State Museum, Lucknow</p>	