CHAPTER – IV

RESULTS AND DISCUSSIONS

The results and interpretations of the study have been discussed under the following heads:

4.1 Pilot Study

4.2 Preservation and Conservation Practices adopted by Museums and Individuals

4.2.1 Preservation and conservation practices adopted by museums

4.2.2 Preservation and conservation practices adopted by individuals

4.3 Analysis of the Documented Textiles in terms of Classification, Origin and Fiber Content

4.4 Analysis of the Documented Textiles in terms of Category, Type of Damage and Condition of the Textile Artifact

4.5 Development of Database

4.6 Application of Conservation Treatment on Selected Textile Artifact

4.7 Outcome of the Workshops on Preventive Conservation of Textiles at Household Level

4.1 Pilot Study

The investigator attended a workshop on "Conservation of Thanka Painting" organized by Baroda Museum and Picture Gallery, Vadodara from 28th Feb. to 4th March, 2005 to gain an insight and develop a wider perspective on textile preservation and conservation. One of the eminent conservator along with his

team from National Museum, New Delhi was invited to conserve a rare and degraded 7th century Thanka Painting of Baroda Museum and Picture Gallery, Vadodara.

Tibetian Thankas, scroll paintings of Buddha done on a cotton fabric framed with silk brocade borders on all four sides are complex objects with intricate iconography, technical construction and lot of religious and cultural significance, a challenge to the conservators.

The workshop commenced with the preparation of a condition report of the painting to plan its conservation treatment strategy which included a brief summary on its present condition as follows.

On assessment, the present condition of the painting was declared as "poor" with the subsequent items of concern.

- Dirt and dust was found throughout the painting.
- The base cotton fabric had areas of losses forming large number of holes due to the attack of silver fish that were found in the displayed show case.
- The paint layers had got faded and flaked off at several places due to the fluctuations in the climatic conditions.

On observation the sequential treatment planned for the conservation of the artifact was as under:

The treatment work started with separation of the hand stitched brocade borders and the central painting of the Thanka followed by wet cleaning. The painting was carefully soaked flat in filtered water mixed with few drops of glycerin for

10 minutes, aided with gentle sponging on both sides for better cleaning. Finally rinsed in plain water, laid flat on the blotting paper for complete drying.

Next day, the painting was set aside for stabilization. It was placed flat on the table for realignment of the yarns in the damaged areas. Based on the conservation treatment plan, the damaged areas were sandwiched between fine nylon net with manual darning stitches to minimize the movement of fibres and prevent from further loss.

The selection of backing fabric was done on the principle of like with like. Cotton fabric was selected to support the painting and silk for the borders which was similar in content, weave structure, colour and weight. The cotton fabric support was attached to the painting with a paste of white refined flour and sodium chloride (used as a preservative) with nap pasting method at specific points to avoid mechanical stress of needle and thread to the entire weak area of the painting. Later, the brocade silk border was also lined with silk fabric using fine darning stitches as it was in sturdy condition.

Finally, the whole painting was assembled in the same manner as the original piece by hand stitching the borders to the central painting and was displayed in the showcase for public viewing. The complete process was carried out with the emphasis on reversibility of the treatment and avoidance of foreign matter that disturbs the authenticity of any historical item, a must for all working in the field of conservation sciences.

4.2 Preservation and Conservation Practices adopted by Museums and Individuals

4.2.1 Preservation and conservation practices adopted by museums

The investigator personally interviewed six museum curators and conservators to obtain first-hand information as well as gain in depth knowledge regarding the standard preservation and conservation practices followed by the museums in India.

Professionals in all the museums were aware of preservation, conservation practices and the detrimental effect of environment threats, pests and inappropriate display, storage and handling on the artifacts.

All the respondents had written guidelines (museum handbook) for the staff to follow preventive care but, the practices adopted were to the best of their knowledge within the available resources and constraints.

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 one of the museums switched on the lights only when visitors entered the display area. This indicated that the museum personnel were aware of the perilous effect of light (both natural and artificial) on the exhibited textiles.

All museum curators revealed that they had installed RH 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 artifacts.

The investigator observed that all museums had made arrangements to control the macro climatic conditions (temperature and relative humidity) with various methods. Only one out of six museums had air-conditioner installed whereas three had ceiling fans and two had installed exhaust fans. 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 favorable geological location whereas , one of the respondents also expressed that due to financial and other constraints they could not opt for air-conditions despite of it being the best method.

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. Avoid naphthalene balls to preserve brocades and silk sarees since it releases noxious gas, instead dried neem leaves are suggested by Singh (2011), senior conservator of the India Council of Conservation Institutes (ICCI).

Three museums were observed placing small fabric bags in their showcases. On probing respondents revealed the content of the bags as equal mixture of neem and tobacco leaves whereas, one used crushed extracts of commonly available

plants such as fenugreek, custard apple and bitter gourd seeds with mango leaves placed next to the artifact to prevent fungal attack. Fumigation chambers were used in two museums 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.

Since Indian climatic conditions are favorable for pests to nurture and thrive, more precautionary measures were required.

Of the total museums visited, regular i.e. daily cleaning of the display, storage area and showcases was observed by only four. During a visit to an exhibition gallery of two renowned museums, lot of dirt and dust was noticed inside the showcases. When expressed concern regarding the same to the curators, it was informed that the prevailing situation was owing to the shortage of staff for housekeeping.

One of the museums had also limited 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."

Inspection of each and every artifact was done on a regular basis i.e. every three months to check the condition of the textiles. All conservators opined that vacuuming was carried out as a treatment for surface cleaning being the safest method for aged textiles .Wet cleaning was carried out only in situations when textiles had got so badly soiled that if not wet cleaned its preservation would be difficult.

On observation, results pertaining to the display methods practiced by all the museum curators revealed that small fragile artifacts were laid flat in the show cases whereas, sturdy artifacts (garments like *jama, sherwanis*) were hanged on padded hangers. Sarees were rolled and displayed along the walls depending

upon the condition while in one of the museums, large sized artifacts were mounted between pixel glass frames for better preservation.

Each displayed artifacts were supported with brief informative labels by all museum personnel. When inquired about the descriptive and photographic documentation, only two museums shared that they have carried out while others were reluctant to speak anything on the same.

On analysis of the data about their preference for preservation over conservation revealed that cent per cent preferred preventive conservation (preservation) over conservation. Two of the museums were noted to practice basic mending techniques for holes, tears, splits and provide backing fabric to the damaged textiles by trained darners on contrary others outsourced the services from reputed conservation centers. On probing it was found that darning stitch was used for mending with chosen polyester, cotton or wool threads corresponding to the damaged textiles to be stabilized.

Curative conservation on textiles was not recommended by the conservators. They believed in non-interference with the state of the textiles until it was unavoidable due to the fragile condition and becomes mandatory to save our heritage.

Curative conservation was practiced inhouse by only one museum while others expressed lack of equipment facilities thereby seeking help from professional conservation centers.

Therefore, the information attained from the museum personnel on the adopted preservation and conservation practices revealed that preventive conservation can be practiced with the limited available resources by all, be it a museum or personal textile collector.

4.1.2 Preservation and conservation practices adopted by individuals

The investigator personally visited nine individuals and conducted exhaustive documentation of their rare textile collection. During the course of casual probing on methods of preservation and conservation practices adopted by them, eight i.e. majority of the respondents revealed that they were aware of the two terms as they had read about it in the newspapers and heard from their friends and relatives but, were lacking clarity of meaning of two terms, preservation and conservation.

The responses regarding the threats and the common agents responsible for deterioration to their textile collections varied from dust, dirt, temperature, light, relative humidity and pests. Dust was considered as the greatest threat for them followed by insects, microorganisms, light, temperature and relative humidity. Surprisingly only one respondent knew that the fluctuating climatic conditions i.e. temperature and relative humidity was the major risk factor for deterioration of the textiles artifacts.

The data pertaining to the preservation and conservation practices adopted by individuals revealed that 11 per cent had the knowledge about the correct preservation practices and 89 per cent of them adopted methods learnt from their antecedents as follows:

The keepsakes were stored in metal trunks by two individuals ignorant of the fact that with passage of time it would stain the textiles with rust marks, seven used wooden wardrobes of which only two individuals had treated them against termite attack.

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

The trunks and wardrobes were placed in the basements of their houses by six of the respondents asserting space as constraints for their large collection, unaware of the information that the impact of environmental conditions would be maximum in such areas due to minimum air circulation and light. Only three had placed their wardrobes in well-ventilated space sharing that they were aware of the fact that textiles also need to breathe.

The investigator observed during the process of documentation that seven of the nine respondents wrapped their valuables in white bleached mulmul fabric uninformed of the detrimental effect of emitted acid on the stored textiles. The remaining two stored them in non-recommended plastic saree covers which were equally harmful as there would be no air circulation encouraging moisture to build up. (70)

Similarly, it was found that eight of the total respondents stored the garments such as *sherwanis, achkans etc.* on plain hangers without considering its condition to take up the stress and strain whereas one folded and placed it flat on the shelf. Eight of them folded their textiles like sarees, blouses, *ghagra-cholis, kurti-kanchlis*, yardages etc. with minimum four to maximum six folds and piled them one on top of other. Only one had to his credit very degraded pieces, some of which were stored either with no or minimum folds (as the piece was larger in size), flat on the horizontal shelf of the wardrobe. None of them stored their zari artifacts separately. The damaged artifacts were not given any special treatment and were stored along with the ones in the good condition.

As learnt from their grandmothers, all respondents were conscious of the most common tear damage, set folds that usually occurred along the folds of the textiles that could be evaded by changing the folds regularly. But only five were able to manage while four expressed their inconvenience in following the practice as they had relocated and time was the constraint factor for them.

All of them were well aware of the airing of the textiles but, maximum (six) did not practice due to time limitations while others (three) exposed their artifacts under the sun post monsoons to preserve them in a better condition for longevity.

Common household insecticides and repellants to obviate the attack of insects and microorganisms like naphthalene balls, cloves, neem leaves, tobacco leaves, *kala jeera*, etc. were kept in and around the storage space by all the respondents. Cloves were directly placed by two respondents without wrapping them in cloth which led to permanent brown stains on their textiles.

Natural fumigants like '*gugal*' or '*dhup*' was also burnt as incense to drive away the insect pests by two respondents.

The data on good housekeeping practices revealed that cent per cent respondents kept the storage area clean and tidy as dust was the major threat to their collections. Vacuuming for cleaning of individual artifacts was practiced by none owing to their ignorance regarding the same, might cause further damage to the artifacts. They also did not seek any professional guidance to maintain them free of dirt and dust.

Majority (seven) of them did not carry regular inspection of their textile collection whereas, two followed once a year at the time of airing. The literature

reviewed states that it should be done every six months in order to stabilize the present condition ensuring longer life to the textiles.

It was further observed by the investigator that none of the documented artifacts had been mended or repaired, in fact no attempt was ever made to even darn or repair any of the minor damages found in the textiles.

The respondents when oriented regarding the damages which had occurred on their textiles during documentation reflected keen interest to learn the preventive conservation practices at household level that would aid to save their inheritance for years to come.

4.3 Analysis of the Documented Textiles in terms of Classification, Origin and Fibre Content

The documented textiles were classified on the basis of their manufacturing techniques namely weaving, embroidery, resist dyeing and printing. The data on classification of the documented textiles have been presented in Table 4.1.

Table 4.1: Analysis of documented textile artifacts in terms of Classification

Classification	N-95 Documented Textile Artifacts	
	f	%
Woven Textiles	47	50
Embroidered Textiles	40	42
Resist dyed Textiles	5	5
Printed Textiles	3	3
Total	95	100

The results in terms of classification of the documented textile artifacts revealed that of the total 95 textiles, maximum i.e. 47 were classified under woven category followed by 40 embroidered, five resist dyed and three printed textiles.

The data pertaining to origin of the documented textiles has been illustrated in the Table No.4.2.

Table 4.2: Analysis of documented textile artifacts in terms of Origin

Origin	Documented Textile Artifacts N-95	
	f	%
Kashmir	9	10
Rajasthan	11	12
Gujarat	40	42
Maharashtra	3	3
Andhra Pradesh	1	1
West Bengal	2	2
Uttar Pradesh	28	29
Madhya Pradesh	1	1
Total	95	100

It was elucidated from the above table that 42 per cent of artifacts were from the state of Gujarat attributing to the fact that all the respondents under study hailed from the same state, therefore possessed most of the textiles of Gujarat origin.

Similarly, 28 opulent textiles had their origin to the state of Uttar Pradesh, accredited to the respondents' association with the affluent strata of the society as well as the princely states of Gujarat hence their abundance was reflected through their rich textile collection.

Few textiles i. e. eleven belonged to Rajasthan since small section of the respondents belonged to Rajput community, thereby had acquisition of their traditional textiles.

Only one silk and eight woolen artifacts originated from Kashmir as the most beautiful and exquisite woolen pieces were made in that region only.

Other three were from Maharashtra, two from West Bengal, one each from Andhra Pradesh and Madhya Pradesh which were gifted to them by their friends and relatives on festivals and occasions as stated by the respondents.

The data on composition of the textile artifacts under study revealed that all were made of silk, wool and cotton fibres belonging to the group of natural source as shown in Table 4.3.

Table 4.3: Fibre content of the documented textile artifacts

Fibre Content	Woven Textiles	Embroidered Textiles	Resist dyed Textiles	Printed Textiles	N-95 Total
Silk	44	28	4	1	77
Wool	2	5	-	-	7
Cotton	1	7	-	2	10
Combination	-	-	1	-	1
Total	47	40	5	3	95

Results pertaining to the fibre composition of the total 95 artifacts stated that 77 were silk based, 10 had cotton, seven had wool base whereas one was union fabric composed of silk and cotton.

Of the 47 woven artifacts, the major constituent of 44 was silk since majority of the documented woven artifacts were brocades from the state of Gujarat and Uttar Pradesh whereas a shawl and a rug from Kashmir were woven from wool and only one cotton *khes* was found in their collection.

Similarly, in embroidered category (40), silk fabric was used as the base for 28 artifacts embellished with gota, zardozi, kutch and kasida embroidery. Wool was found only in five elaborate Kashmir embroidered textiles while the raw material of other seven pieces was cotton.

Elegant resist dyed textiles consisting of four silk patolas and one mashru (union fabric i.e. silk and cotton) from Gujarat were found in the collection of only one respondent.

Out of the three printed textiles two were composed of cotton and one of silk.

4.4 Analysis in terms of Damage Category, Type and Condition of the Textile Artifacts

The detailed study of the damages from primary and secondary sources had enabled the investigator to report, evaluate and interpret the damages to the best of the knowledge.

Results of the investigation of the documented textiles in terms of category and type of damage have been reported in Table 4.4.

Table 4.4: Analysis of the documented textiles in terms of category and type of damage

Category of Damage	Type of Damage	Numerical number of Affected Artifacts	N-68 Catalogue Number of Artifacts
Physical Damage	Permanent Creases	-	-
	Permanent Folds	19	WN6, WN8, WN11, WN15, WN20, WN21, WN23, WN25 WN26, WN27, WN28, WN29, WN33, WN39, WN46, ED7,ED8, E22, ED26
	Raveling or fraying of yarns	-	-
	Tears at folds	2	WN37, WN41
	Abraded areas	3	WN45, ED12, ED17
	Breakage of yarns	6	ED34, ED35, ED36, ED37, ED38, ED39
	Multiple Damages	7	WN9, WN12, WN34, WN47, ED23, ED24 ,ED30
	Total	**37**	
Chemical damage	Colour fading	-	-
	Yellowing	-	-
	Zari tarnish	3	WN18, ED5, ED21
	Holes due to ageing	3	RD2,RD3,RD4
	Total	**6**	
Biological damage	Insect holes	7	WN13, ED1, ED2 , ED4, ED15, ED16, ED33
	Brown stains	-	-
	Total	**7**	
Multiple Damages	Physical & Chemical	12	WN1, WN2, WN3, WN4, WN7, ED3, ED6, ED25, ED27, ED28, ED29, ED40
	Physical & Biological	4	WN5, WN10, WN40, P3
	Biological& Chemical	1	ED31
	Physical, Biological& Chemical	1	ED32
	Total	**18**	-
Total		**68**	-

On analysis of the data pertaining to the category and type of damage reflected that 68 of the 95 had various types of damages categorized under physical, chemical and biological.

Physical damages were the most immediately apparent, frequent and avoidable of all the three categories of damages occurred on 37 textiles as shown in Plate 4.1. The threats leading to the above analyzed damages have been discussed as follows:

Folds were observed in 19 artifacts respectively owing to inadequate storage space, incorrect storage method followed by too many folds of the artifacts kept for long ignoring the necessity of changing the folds.

Raveling or fraying of yarns with other damages was identified in two resulting unintentionally due to general wear and tear and poor handling of the artifact.

Tear or split, a very common damage was identified at the fold lines in two artifacts at the place where they had been folded and kept in the same condition for quite a long period without rotating as stated by the respondents. Hence it was inferred that faulty storage practices with adverse climatic condition i.e. temperature, relative humidity, dirt and dust led to tear or split damage.

The damage as abraded areas had occurred in three of them due to inappropriate use, excessive usage, abrasion of one artifact against the other during storage and unsuitable environmental conditions.

Multiple physical damage was noticed in seven artifacts specifically creases, cuts, tears on folds, breakage of yarns and abraded areas attributed to various

reasons; unstable climatic conditions, inadequate storage space, incorrect method of storage and faulty human interventions.

Chemical damages as evident in Plate 4.2 were an outcome of intrinsic qualities of the material, at times unstable and inherently harmful triggered by the impact of external factors such as inappropriate environmental conditions and atmospheric pollutants.

Yellowing, an indication of unanticipated chemical degradation was spotted in two textiles attributing to their long term exposure to excessive heat and presence of atmospheric pollutants namely nitrogen oxide and sulphur dioxide inside the storage area. The possessor of both these artifacts confirmed that their storage area got intensely heated up during the summers that enabled the investigator to derive at the correct interpretation as supported by relevant review. (70)

The liberation of anxious gases such as nitrogen oxide and sulphur dioxide within the storage space had led to tarnishing of majority of gold and silver zari textile artifacts. It was witnessed during the field survey that none of the respondents stored their zari artifacts separately neither followed preventive measures; hence the emissions from the surrounding sources had degraded the textiles.

On observation three silk artifacts were found in shattered condition. They possessed major damage in terms of large holes due to the presence of metallic salts usually containing tin and iron used during the late nineteenth and early twentieth centuries, to give them a heavier and more luxurious feel. However, as

these fabrics aged, the metals in the fibres accelerated their decay that caused them to become extremely brittle leading to the damage. So, it could be concluded that many a times the inherent vice of the material itself lead to its deterioration.

Biological damages as observed in Plate 4.3 frequently occur on organic materials as the content itself is supportive to insects and microorganisms attack. The conducive environmental conditions of the Indian tropical country permit it to further thrive, resultant to visible damages such as holes and stains.

Of the total seven cotton, silk and wool artifacts were attacked by silver fish and cloth moths that fed on the cellulose and protein substances of the material to form small irregular holes all over the textiles. As observed by the investigator storage in dark, undisturbed areas such as basements with poor air circulation encouraged the presence of the same. Further, the unfavorable climate of such places and the respondents' irregular inspection encouraged their growth.

Plate 4.4 reflects the multiple damages in terms of physical & chemical, physical & biological damage, biological & chemical and physical, biological & chemical in combination, analyzed in 18 artifacts.

Plate: 4.1a
Item Name: Cradle Cloth (*Khoyu*)
Catalogue No. WN6
Type of Damage: Permanent folds found.

Plate: 4.1b
Item Name: Textile Fragment
Catalogue No. WN34
Type of Damage: Permanent folds & raveling of yarns found at edges

Plate: 4.1c
Item Name: *Kamarbandh*
Catalogue No. WN37
Type of Damage: Tears found on folds

Plate: 4.1d
Item Name: Cushion cover
Catalogue No. ED29
Type of Damage: Zari turned black & centre got abraded

Contd...

Plate: 4.1e
Item Name: Shawl
Catalogue No.: WN9
Type of Damage: Creases, breakage of yarns, tears & abraded areas found all over

Plate: 4.1f
Item Name: Shawl
Catalogue No. ED30
Type of Damage: Permanent folds & cuts found at few places

Plate: 4.1g
Item Name: Textile Yardage
Catalogue No.: WN23
Type of Damage: Permanent folds found

Plate: 4.1h
Item Name: Shawl
Catalogue No. ED17
Type of Damage: Abraded areas found at few places

Plate 4.1: Category of Damage: Physical damage

Plate: 4.2a
Item Name: Textile Fragment
Catalogue No. RD2
Type of Damage: Holes found at several places

Plate: 4.2b
Item Name: Jacket
Catalogue No. ED25
Type of Damage: Zari turned black &edges worn out

Plate: 4.2c
Item Name: Shirt (*Baby Kurta)*
Catalogue No. WN2
Type of Damage: Yellowing & folds found at several places

Plate: 4.2d
Item Name: Skirt (*Ghagra)*
Catalogue No. ED21
Type of Damage: Zari turned black

Plate 4.2: Category of Damage: Chemical damage

Plate: 4.3a
Item Name: Dhoti (*Abotiyu*)
Catalogue No. WN5
Type of Damage: Several small & large holes found in the field

Plate: 4.3b
Item Name: Shawl
Catalogue No. ED2
Type of Damage: Several small holes found all over

Plate : 4.3c
Item Name: Cushion cover
Catalogue No. ED33
Type of Damage: Badly eaten at the edges

Plate : 4.3d
Item Name: Cape
Catalogue No. WN13
Type of Damage: Small & large holes found at several places

Plate 4.3: Category of Damage: Biological damage

Plate: 4.4a
Item Name: Dhoti (*Abotiyu*)
Catalogue No. WN3
Type of Damage: Permanent folds & small holes found at few places

Plate : 4.4b
Item Name: Carpet
Catalogue No. ED6
Type of Damage: Abraded areas found all over & zari turned black.

Plate: 4.4c
Item Name: Cushion cover
Catalogue No. ED28
Type of Damage: Zari turned black & edges worn out

Plate: 4.4d
Item Name: Cushion cover
Catalogue No. ED32
Type of Damage: Zari turned black, centre worn out & holes found at the back.

Plate 4.4: Category of Damage: Multiple damages

The condition of an object was an assessment to judge the occurrence of damage if any in the object. The analysis of the category and type of damages assisted the investigator to ascribe condition rating code to each documented textile artifact on the basis of their degree of damage as presented in Table 4.5

Table 4.5: Analysis of the documented textiles in terms of condition of the textiles

Condition Rating	Numerical number of Artifacts	N-95 Catalogue Number of Artifacts
Excellent: EX	**27**	WN14,WN16, WN17, WN19, WN22, WN24, WN30, WN31, WN32, WN35, WN36, WN38, WN42, WN43, WN44, ED9, ED10, ED11, ED13, ED14, ED18, ED19, ED20, RD1, RD5, P1, P2
Good: GD	**32**	WN2, WN6, WN8, WN11, WN15, WN18, WN20, WN21, WN23, WN25, WN26, WN27, WN28, WN29, WN33, WN39, WN46, ED5, ED7,ED8,ED12, ED21, ED22 , ED23, ED24, ED26 , ED34, ED35, ED36, ED37, ED38, ED39
Fair: FR	**25**	WN1, WN3, WN4, WN10, WN13, WN34, WN37, WN40, WN41, WN45, WN47, ED1, ED2, ED4, ED15, ED16, ED17, ED25, ED27, ED28, ED29, ED30, ED31, ED32, ED40
Poor: PR	**11**	WN5, WN7, WN9, WN12, ED3, ED6, ED33, RD2, RD3, RD4, P3
Total	**95**	

The interpretation of the above data reflected that 32 textile artifacts were in Good, 27 in Excellent, 25 in Fair and 11 in Poor condition.

Hence, the treatment priority of the artifacts in Excellent (Plate 4.4) to Good condition (Plate 4.5) was found to be Low which indicated that majority of the textile artifacts needed only preventive conservation treatment to stabilize them in its present condition.

Some with minor damages such as holes, tears etc. being in Fair condition (Plate 4.6) called for medium treatment that could be repaired to maintain its individuality and preclude further damage whereas , 11 amongst the total sample selected were in Poor condition as shown in Plate 4.7 with high treatment priority demanding curative conservation to save them for posterity.

From the above analysis and discussion on category, type of damages and condition of the artifacts, the investigator inferred that majority of the damages in textiles had ensued due to respondents misconceptions, unawareness , lack of knowledge on the correct basic storage practices to preserve the particular textile heritage. So, this could be prevented by abiding to the right preventive conservation practices.

Hence, it called for a need to sensitize women at household level to practice an appropriate storage environment that would prevent physical and biological damage as well as slow down the chemical deterioration increasing the life span of traditional textile artifacts.

Plate: 4.5a
Item Name: Blouse
Catalogue No.: WN20
Category of Damage: Nil
Type of Damage: Nil

Plate: 4.5b
Item Name: Jacket (*Sadaria*)
Catalogue No.: WN21
Category of Damage: Nil
Type of Damage: Nil

Plate: 4.5c
Item Name: Shawl
Catalogue No. : RD1
Category of Damage: Nil
Type of Damage: Nil

Plate: 4.5d
Item Name: Kurti
Catalogue No.: ED14
Category of Damage: Nil
Type of Damage: Nil

Plate 4.5: Documented textiles in Excellent condition (EX)

Plate: 4.6a
Item Name: Textile Fragment
Catalogue No.: WN25
Category of Damage: Physical
Type of Damage: Permanent folds found

Plate: 4.6b
Item Name: Textile Yardage
Catalogue No.: WN26
Category of Damage: Physical
Type of Damage: Permanent folds found

Plate: 4.6c
Item Name: *Thal cover*
Catalogue No.: ED30
Category of Damage: Physical
Type of Damage: Permanent folds & creases found all over

Plate: 4.6d
Item Name: Cape
Catalogue No.: ED5
Category of Damage: Chemical
Type of Damage: Zari turned black

Plate 4.6: Documented textiles in Good condition (GD)

Plate: 4.7a
Item Name: Skirt (*Ghaghra*)
Catalogue No.: WN13
Category of Damage: Physical & Biological
Type of Damage: Badly torn at edges & holes found at few places

Plate: 4.7b
Item Name: Shoulder Cloth (*Khes*)
Catalogue No.: WN4
Category of Damage: Physical & Chemical
Type of Damage: Yellowing at several places & permanent folds

Plate: 4.7c
Item Name: Jacket
Catalogue No.: WN1
Category of Damage: Physical & Chemical
Type of Damage: Zari turned black, fraying of yarns & permanent folds.

Plate: 4.7d
Item Name: Cushion cover
Catalogue No.: ED39
Category of Damage: Chemical & biological
Type of Damage: Zari turned black & holes found at the back

Plate 4.7: Documented textiles in Fair condition (FR)

Plate: 4.8a
Item Name: *Ghoda ni Gaddi*
Catalogue No.: WN12
Category of Damage: Physical
Type of Damage: Tears, breakage of yarns & abraded areas found all over

Plate: 4.8b
Item Name: Shawl
Catalogue No.: WN9
Category of Damage: Physical
Type of Damage: Creases, breakage of yarns, tears & abraded areas found all over

Plate: 4.8c
Item Name Small Purse
Catalogue No.: RD3
Category of Damage: Chemical
Type of Damage: Holes found at several places

Plate: 4.8d
Item Name: Blouse
Catalogue No.: ED3
Category of Damage: Physical & Chemical
Type of Damage: Badly worn out at the underarms areas & water stains found on the front

Plate 4.8: Documented textiles in Poor condition (PR)

4.5 Development of Database

A database is a collection of data grouped together in an organized manner for a specific purpose that enables people to easily sort, browse and find related information. The main aim of any documentation work is to ensure long-term access to the information resource beyond any geographical borders.

In the present study, the investigator has developed a digital database where each artifact was accessioned with thorough documentation, including a coloured photograph, descriptive information and in depth analysis on the category, type and degree of damage with the treatment priority of each artifact. As stated by Nair (2011), Secretary General of the India Chapter of ICOM, "Digitization has changed the entire face of subjects like documentation which is vital to the study of heritage and conservation."

Further, the document containing exhaustive information on each of the artifact with which the collection was concerned has been produced using the suitable software. Then all the digitized collections were put onto a CD-ROM consisting of folders representing a particular classification of traditional textiles for ease of access. (Enclosed CD-1)

Digitized templates of the database under the category of woven, embroidered, resist dyed and printed textiles have been shown in Plate 4.9-4.28.

WOVEN TEXTILES

Item Name	Saddle Cloth (*Ghoda ni Gaddi*)
Catalogue No.	WN12
Date of acquisition	1900
Place of Origin	Gujarat, India
Material	Silk, Zari (pure gold), Resham
Technique	Plain & Jacquard weave
Dimensions	112cm x 68cm

Description

Bright pink brocade was woven with overall floral design encompassed in geometrical compartments. The fabric used for construction of saddle cloth for horses by the royals was bordered on all four sides with a beige plain silk fabric. It was stuffed with cotton to provide comfort to the rider

Credit	Ms. Gyaneshwari Devi Rana
Category of Damage	Physical
Type of Damage	Tears, breakage of yarns and abraded areas found all over.
Condition	PR
Treatment Priority	High

Plate 4.9: Digitized template of Woven Textile : WN12

Item Name	Jacket (*Sadaria*)
Catalogue No.	WN17
Date of acquisition	1800
Place of Origin	Gujarat, India
Material	Silk, Zari (pure gold) & Resham
Technique	Plain & Jacquard weave
Dimensions	65cm x 100cm (chest girth)

Description

The jacket was constructed from a brocade yardage that had a gold zari base with all over pattern in green, cream, magenta and red known as *badrum ka jaal.* The design was inlaid into the fabric with extra weft and outlined with another colour i.e. black called as *minakar*i. The prominent style features of the jacket were mandarin collar, round yoke, extended front placket and edging with white silk pipin.

Credit	Ranisahib Sugan Kunwar
Category of Damage	Nil
Type of Damage	Nil
Condition	EX
Treatment Priority	Low

Plate 4.10: Digitized template of Woven Textile : WN17

Item Name	Jacket (*Sadaria*)
Catalogue No.	WN18
Date of acquisition	1810
Place of Origin	Uttar Pradesh, India
Material	Silk, Cotton & Zari (pure gold)
Technique	Plain & Jacquard weave
Dimensions	65cm x 100cm (chest girth)

Description

Sleeveless, mandarin collar, round yoke jacket with extended front placket was constructed from a stunning piece of Varanasi brocade. The piece had design in gold on a red base woven in an uninterrupted diamond pattern with a leaf *butti* inside. The jacket was finished with a contrasting green pipin and lined with a red cotton fabric.

Credit	Ranisahib Sugan Kunwar
Category of Damage	Chemical
Type of Damage	Zari turned black
Condition	GD
Treatment Priority	Medium

Plate 4.11: Digitized template of Woven Textile : WN18

Item Name	Textile Fragment (2)
Catalogue No.	WN22
Date of acquisition	1720
Place of Origin	Uttar Pradesh, India
Material	Silk & Resham
Technique	Jacquard weave
Dimensions	18cm x 17.5cm (1^{st}) 40cm x 42cm (2^{nd})

Description

Rare piece of the Moghul era in fushia pink with a heavy border of *phoolwar* design edged with *jhalar* of leaf *buttis* on either sides worked with resham. Falcon, elephant, horse with rider and floral motifs decorated the field of the artifact.

Credit	Ranisahib Sugan Kunwar
Category of Damage	Nil
Type of Damage	Nil
Condition	EX
Treatment Priority	Low

Plate 4.12: Digitized template of Woven Textile : WN22

Item Name	Saree
Catalogue No.	WN29
Date of acquisition	1910
Place of Origin	Gujarat, India
Material	Silk, Zari (pure gold) & Resham
Technique	Jacquard weave
Dimensions	537cm x119 cm

Description

Orange coloured Ashavali saree was ornamented with overall pattern of roundels in the field with pure zari and the *kunai kalga* motif. The ground of the pallav was worked with rich golden thread in twill with multi coloured flowering shrubs and a heavy gold border.

Credit	Ms. Mandakini Devi Chauhan
Category of Damage	Physical
Type of Damage	Permanent folds found.
Condition	GD
Treatment Priority	Low

Plate 4.13: Digitized template of Woven Textile : WN29

Item Name	Saree
Catalogue No.	WN33
Date of acquisition	1920
Place of Origin	Uttar Pradesh, India
Material	Silk, Zari (pure gold) & Resham
Technique	Jacquard weave
Dimensions	537cm x 119cm

Description

Brown colour Organza saree in plain weave with circular floral *buttis* in sky blue, green, pink and purple colours were patterned in a definite diagonal line in the field using extra weft technique. The centre of the pallav was worked with heavy gold thread in twill weave forming diamond pattern followed by few horizontal rows of flame motif *jhalar* and floral *butti* bands on the outer as well as the upper edge of the pallav had *jhalar* of *keris*.

Credit	Ms. Mandakini Devi Chauhan
Category of Damage	Physical
Type of Damage	Permanent folds found.
Condition	GD
Treatment Priority	Low

Plate 4.14: Digitized template of Woven Textile : WN33

Item Name	Waist Cloth (*Kamarbandh)*
Catalogue No.	WN37
Date of acquisition	1910
Place of Origin	Uttar Pradesh, India
Material	Silk & Zari (pure gold)
Technique	Jacquard weave
Dimensions	200cm x 115cm

Description

The field of magenta self-striped woven silk waist cloth was arranged with rows of gold floral *buttis* and *kunia keri butta* with foliage on four corners. The side borders had narrow bands of chevron bound by *mothra* stripes in black and gold edged with a straight row of *keri buttis*. The horizontal ends had a gold brocade central panel of uninterrupted diaper of diamonds enclosed by two chevron *mothra* guard bands in gold and black edged with similar row of *keri buttis* as in the border on the upper edge.

Credit	Ms. Mandakini Devi Chauhan
Category of Damage	Physical
Type of Damage	Tears found on folds
Condition	FR
Treatment Priority	Medium

Plate 4.15: Digitized template of Woven Textile : WN37

Item Name	*Odhana*
Catalogue No.	WN40
Date of acquisition	1920
Place of Origin	Gujarat, India
Material	Silk & Zari (pure gold)
Technique	Jacquard weave
Dimensions	250cm x 115cm

Description

Pure silk violet coloured *odhana* ornamented with broad border of flower & leaf scrolls on all four sides in gold zari with an added narrow edging of *keri* motifs and *kunai kalga* motif. The intricately central floral *butta* in gold enhances the overall look of the *odhana*.

Credit	Ms. Mandakini Devi Chauhan
Category of Damage	Physical & Biological
Type of Damage	Permanent folds &small holes found in the field.
Condition	FR
Treatment Priority	Medium

Plate 4.16: Digitized template of Woven Textile : WN40

EMBROIDERED TEXTILES

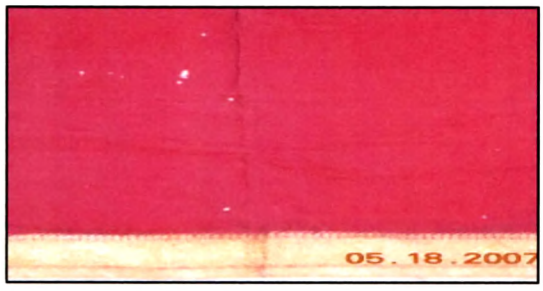
Item Name	Cap (*Topi*)
Catalogue No.	ED1
Date of acquisition	1940
Place of Origin	Kashmir, India
Material	Cotton & Untwisted silk floss
Technique	Plain weave
Dimensions	23cm x 8cm

Description

An exquisite *Sozni* embroidered cap origin of Kashmir worked with stem, cretan, fly and darning stitches in mauve, blue, orange & golden yellow colours. The floral and leaf motif well placed on the top centre and all round the edge beautifully outlined in black.

Credit	Ms. Namrata Parikh
Category of Damage	Biological
Type of Damage	Several small holes & brown stains found.
Condition	FR
Treatment Priority	Medium

Plate 4.17: Digitized template of Embroidered Textile : ED1



Item Name	Shawl
Catalogue No.	ED4
Date of acquisition	1921
Place of Origin	Kashmir, India
Material	Wool & Zari (pure gold)
Technique	Plain weave
Dimensions	260cm x 133cm

Description

The magenta coloured pashmina shawl had a plain field with elaborately zari embroidered end pallu, stylized corner *kalka botehs* and vertical and horizontal *hashias*. Pallu at the edge were intricately embroidered with loop and spiral stitches depicting overlapping pair of *kalka botehs* filled with pine motif and smaller *butties*. An additional border illustrated a row of *kalka boteh* ; the crescent and flower motifs between the corner and pallu. Finally the shawl was finished with a fine narrow brocade border on the vertical edge.

Credit	Ms. Gyaneshwari Devi Rana
Category of Damage	Biological
Type of Damage	Small holes found all over.
Condition	FR
Treatment Priority	Medium

Plate 4.18: Digitized template of Embroidered Textile : ED4

Item Name	Carpet
Catalogue No.	ED6
Date of acquisition	1905
Place of Origin	Uttar Pradesh, India
Material	Silk, Cotton & Zari (pure gold)
Technique	Plain & Pile weave
Dimensions	112cm x 68cm

Description

Brown velvet zardozi carpet (known as *Masnads*) intricately worked with *karchob* embroidery of Varanasi. The embossed corner motif of Lord Krishna playing a flute enclosed with floral-leaf border, worked with gold & silver gilt wires or spangles stitched to the base with running, couching, satin and stem. The either side of the border had one inch gotta patti. The border toward the field was edged with a narrow three petal floral zardozi strip. The four sides of the carpet were finished with beautiful crochet fringe. The piece was stuffed with cotton and lined with jute.

Credit	Ms. Gyaneshwari Devi Rana
Category of Damage	Physical & Chemical
Type of Damage	Abraded areas found all over & zari turned black.
Condition	PR
Treatment Priority	High

Plate 4.19: Digitized template of Embroidered Textile : ED6

Item Name	Blouse
Catalogue No.	ED12
Date of acquisition	1870
Place of Origin	Rajasthan, India
Material	Silk & Zari (pure gold)
Technique	Plain weave
Dimensions	52cm x 86cm (chest girth)

Description

Plain yellow silk blouse with mandarin collar, kurta placket and three fourth cuffed sleeves beautifully ornamented with zardozi embroidery using *salma, sitara,* twisted gold and silver wires.

Credit	Ranisahib Sugan Kunwar
Category of Damage	Physical
Type of Damage	Abraded areas found at few places.
Condition	GD
Treatment Priority	Low

Plate 4.20: Digitized template of Embroidered Textile : ED12

Item Name	Jacket (*Achakan)*
Catalogue No.	ED13
Date of acquisition	1810
Place of Origin	Rajasthan, India
Material	Silk & Zari (pure gold)
Technique	Jacquard weave
Dimensions	66cm x 92cm(chest girth)

Description

The fushia pink *achakan* had been ornamented with a beautiful floral gota border at the front opening, neckline, slits and hems of the sleeves as well as the garment. The corners were decorated with *kairi buttas*, some scattered *jaliwala phool* in the field and heart shaped floral *butta* on the centre back and sleeves. The neckline, slits and hems were finished with green broad *lehru* gota to complement to the overall design.

Credit	Ranisahib Sugan Kunwar
Category of Damage	Nil
Type of Damage	Nil
Condition	EX
Treatment Priority	Low

Plate 4.21: Digitized template of Embroidered Textile : ED13

Item Name	Border
Catalogue No.	ED19
Date of acquisition	1910
Place of Origin	Gujarat, India
Material	Silk & Untwisted silk floss
Technique	Plain weave
Dimensions	900cm x 14cm

Description

The exquisite blue saree border depicted the imaginative art of *Aari* embroiders of Kutch region. The centre was artistically embroidered with leaf and floral motifs of rose and hibiscus in multi colour shades. The ribbon border on its either sides were worked with four petalled flowers. The upper edge had flowers interspersed with leaves to enhance the beauty of the artifact. All worked in chain stitch with untwisted silk floss using *ari.*

Credit	Ms. Mandakini Devi Chauhan
Category of Damage	Nil
Type of Damage	Nil
Condition	EX
Treatment Priority	Low

Plate 4.22: Digitized template of Embroidered Textile : ED19

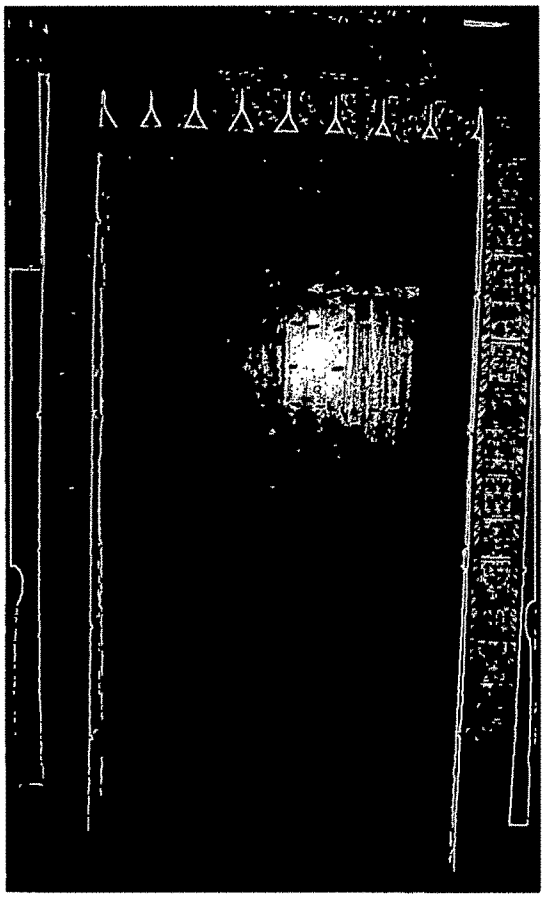
Item Name	Cushion cover
Catalogue No.	ED33
Date of acquisition	1910
Place of Origin	Gujarat, India
Material	Silk, Cotton & Resham
Technique	Plain weave
Dimensions	30cm (diameter)

Description

Circular cushion cover with an orange base had intricately embroidered floral& leaf scroll border in shades of pink, purple, green and mustard done using chain stitch. The centre medallion was enhanced with a single floral design with concentric borders in same colours.

Credit	Ms. Mandakini Devi Chauhan
Category of Damage	Biological
Type of Damage	Badly torn at the edges.
Condition	PR
Treatment Priority	High

Plate 4.23: Digitized template of Embroidered Textile : ED33



Item Name	Door Hanging (*Sakhiya)*
Catalogue No.	ED39
Date of acquisition	1910
Place of Origin	Gujarat, India
Material	Glass beads & Cotton threads
Technique	Mono bead technique
Dimensions	132 cm x 65 cm x 29 cm

Description

Sakhiya were vertical striped decorations for the door, fine specimen of the bead work. The entire base was made up of white beads attached to a plain weave, red coarse cotton cloth. It had a border running all around divided into sections enclosing motifs of tiger, horse, elephant, human figures & small flowering plants in each section with red, green, orange, yellow and blue colours.

Credit	Ms. Alaukika Devi Khachar
Category of Damage	Physical
Type of Damage	Breakage of yarns found at few places.
Condition	GD
Treatment Priority	Low

Plate 4.24: Digitized template of Embroidered Textile : ED39

RESIST DYED TEXTILES

Item Name	Shawl
Catalogue No.	RD1
Date of acquisition	1938
Place of Origin	Gujarat, India
Material	Silk & Cotton
Technique	Ikat & Satin weave
Dimensions	195cm x 102cm

Description

Mashru shawl was woven with silk warp and cotton weft yarns in satin weave especially for the use of Muslim men as they were forbidden to wear silk next to skin.

The pattern showed vibrant multi coloured stripes of pink, purple, white and golden yellow. The stripes had an arrow head design which was achieved by sectional tying and dyeing of warp yarns prior to weaving.

Credit	Mr. Kanubhai Salvi
Category of Damage	Nil
Type of Damage	Nil
Condition	EX
Treatment Priority	Low

Plate 4.25: Digitized template of Resist Dyed Textile : RD1

Item Name	Textile Fragment
Catalogue No.	RD2
Date of acquisition	1900
Place of Origin	Gujarat, India
Material	Silk
Technique	Double Ikat & Plain weave
Dimensions	40cm x 45cm

Description

The fragment of patola saree was an exquisite piece of double ikat from the Salvi weavers of Gujarat region. The silk warp and weft yarns had been tie dyed as per a predefined pattern and then woven together. It has *pan* (leaf), *tara* (star) and round ball designs in maroon, white and orange worn by the Vora Muslim during the marriage ceremony.

Credit	Mr. Kanubhai Salvi
Category of Damage	Chemical
Type of Damage	Large holes found at several places.
Condition	PR
Treatment Priority	High

Plate 4.26: Digitized template of Resist Dyed Textile : RD2

PRINTED TEXTILES

Item Name	*Odhana*
Catalogue No.	P1
Date of acquisition	1920
Place of Origin	Rajasthan, India
Material	Silk
Technique	Plain weave
Dimensions	250cm x 115cm

Description

Georgette magenta *odhana* known as *Phamri* was printed with pure gold khadi worn by Rajasthani brides. The field had well placed *keri buttis* in definite rows. The horizontal ends of the *odhana* were decorated with borders of *keri buttas* placed in geometrical format edged with golden fringes.

Credit	Ranisahib Sugan Kunwar
Category of Damage	Nil
Type of Damage	Nil
Condition	EX
Treatment Priority	Low

Plate 4.27: Digitized template of Printed Textile : P1

Item Name	Jacket
Catalogue No.	P3
Date of acquisition	1880
Place of Origin	Rajasthan, India
Material	Cotton & Silk
Technique	Plain weave
Dimensions	65cm x 102cm (chest girth)

Description

Quilted jacket known as *Atam Sukh* was constructed from beige and red dots printed fabric of Rajasthan. The jacket had multiple vertical quilting lines, stand collar, short sleeves, side slits, all edged with a narrow band of same colour silk fabric.

Credit	Ms. Gyaneshwari Devi Rana
Category of Damage	Physical & Chemical
Type of Damage	Tears and holes found at several places.
Condition	PR
Treatment Priority	Low

Plate 4.28: Digitized template of Printed Textile : P3

4.6 Application of conservation treatment on selected textile artifact

The artifact was a rare piece of early 20th century made in pure silk and zari from the state of Gujarat, India. It was an exquisite piece, very dear and treasured by one generation to the next .The Paithanis are woven today in a contemporary version losing its original form. Hence, a woven Paithani saree of Gujarat acquired from a personal collection was selected as a sample for the case study. The general condition of the saree was considered "Poor."

The results pertaining to the conservation of the selected artifact have been presented as under in the following sections:

4.6.1 Investigations prior to treatment

4.6.1.1 Condition Assessment

Condition assessment report of the selected artifact under study was prepared in detail to facilitate an appropriate treatment strategy. The report encompassed the following details.

Item Name	Saree
Catalogue No.	WN7
Date of acquisition	1900
Place of Origin	Gujarat, India
Material	Silk & Zari (pure gold and silver)
Technique	Jacquard weave
Dimensions	250cm x 90cm
Credit	Ms. Kalpana Bhatt
Category of Damage	Physical & Chemical
Type of Damage	Breakage of yarns, holes and tears found all over the field
Condition	PR
Treatment Priority	Urgent
Present storage system	Folded and stored flat in a cotton saree cover

The silk saree was assessed visually and the results established that it was in Poor condition. It had become fragile and stiff which might be a consequence of improper storage in too fluctuating atmospheric conditions.

There were holes and tears found all over the field of the saree but the pallav was in good condition. The piece exhibited many areas of losses and there was evidence of natural ageing due to the inherent vice of the material itself as shown in Plate 4.21. Otherwise, it was possible to handle the object under study.

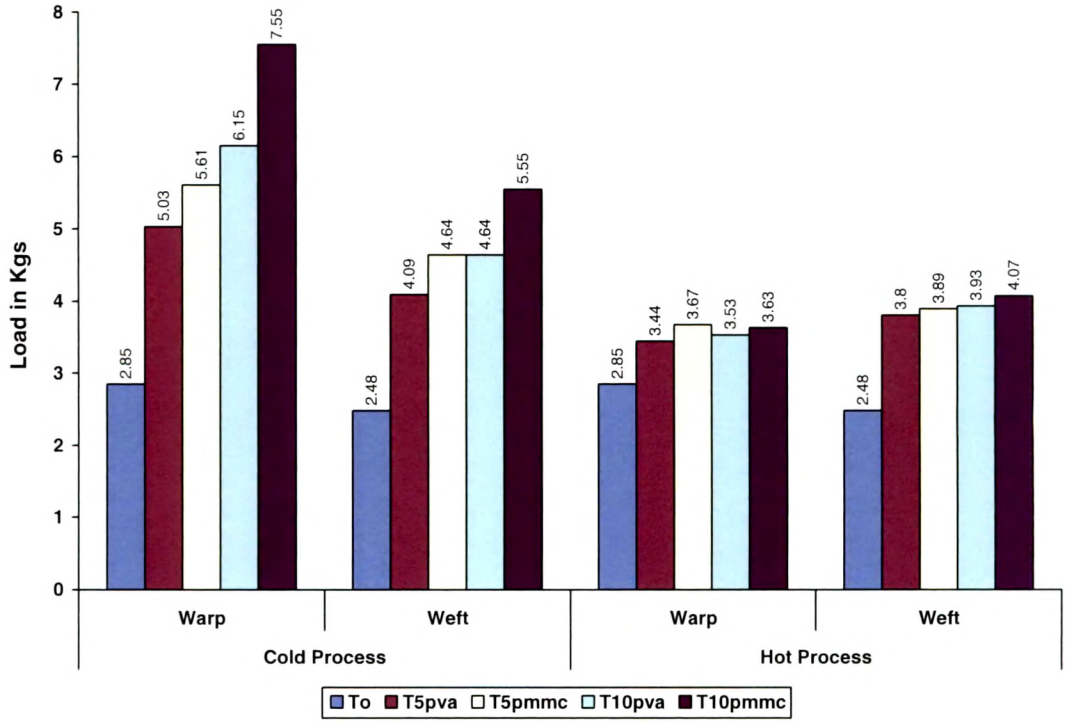
Plate 4.29: Parts of saree with damages such as holes, tears and breakage of yarns

4.6.1.2 Assessment of untreated and treated samples for Tensile Strength, Stiffness and Transparency Properties

The selected support fabric was treated with two adhesives i.e. Polyvinyl Acetate (PVA) and Polymethyl Methacrylate (PMMC) consolidated to the silk fabric with cold process (CP) and hot sealing process (HP). The lined silk samples were then subjected to standard test methods such as Tensile Strength, Stiffness and Transparency to determine the most preserving and secure method of adhesive lining for the object under study.

4.6.1.2.a Assessment of untreated and treated silk samples for Tensile Strength

The experimental data on tensile strength measurements in Graph 4.1 revealed that there was a marked increase in the strength of both the adhesive treated samples in comparison to untreated one with increase in concentrations irrespective of the methods of adhesion.



Graph 4.1: Tensile strength measurements of untreated and treated silk samples

Key:

To	:	Untreated sample
T5pva cp	:	Treated with 5% PVA and cold process
T5pva hp	:	Treated with 5% PVA and hot process
T5pmmc cp	:	Treated with 5% PMMC and cold process
T5pmmc hp	:	Treated with 5% PMMC and hot process
T10pva cp	:	Treated with 10% PVA and cold process
T10pva hp	:	Treated with 10% PVA and hot process
T10pmmc cp	:	Treated with 10% PMMC and cold process
T10pmmc hp	:	Treated with 10% PMMC and hot process

On comparison of the data between the consolidation methods, the treated samples at same concentration showed lower strength with the hot sealing process than to the cold process regardless of the adhesive used. This was attributed to the reason that application of heat decreases the bonding strength of the adhesives and hence showed reduction in tensile strength with the hot sealing process.

4.6.1.2.b Assessment of untreated and treated silk samples for Bending length

The data on bending length measurements as indicated in Table No.4.6 showed a noticeable increase in stiffness of the samples treated with the two adhesives Polyvinyl Acetate (PVA) and Polymethyl Methacrylate (PMMC) when compared to the control sample.

The increase in concentration of both the adhesives indicated marginal rise in the bending length but the stiffness of samples adhered with cold process were less than with hot sealing process.

Samples treated with PMMC were found to be stiffer than the ones treated with PVA irrespective of the concentrations and method of reinforcement which led the samples to lose its flexibility which was not the true representation of the object under investigation.

Table 4.6: Bending length measurements of untreated and treated silk samples

Sample	Warp		Weft	
	F-F (cm)	B-B (cm)	F-F (cm)	B-B (cm)
To	2.1	2.0	1.8	1.6
T5pva cp	6.5	7.5	6.7	7.2
T5pva hp	9.7	9.4	9.3	7.7
T5pmmc cp	7.0	9.6	7.0	9.5
T5pmmc hp	10.7	9.7	10.0	8.7
T10pva cp	7.3	8.0	7.7	8.0
T10pva hp	10.7	9.5	9.7	8.1
T10pmmc cp	13.0	11.0	13.2	11.1
T10pmmc hp	14.0	11.5	13.0	10.5

Key:

To : Untreated sample
T5pva cp : Treated with 5% PVA and cold process
T5pva hp : Treated with 5% PVA and hot process
T5pmmc cp : Treated with 5% PMMC and cold process
T5pmmc hp : Treated with 5% PMMC and hot process
T10pva cp : Treated with 10% PVA and cold process
T10pva hp : Treated with 10% PVA and hot process
T10pmmc cp : Treated with 10% PMMC and cold process
T10pmmc hp : Treated with 10% PMMC and hot process

4.6.1.2.c Assessment of untreated and treated silk samples for Transparency

Consolidated samples were visually evaluated for transparency to retain the object in its original form as well as enable the future study of design details of a particular artifact.

Results of comparative objective evaluation established that both concentrations of PVA treated samples performed better than PMMC ones as the latter gave a hazy appearance to the samples.

Similarly on comparisons between the processes of PVA treated samples, it was found that cold process gave the best results in terms of transparency, smoothness and visually satisfying appearance that mimic the original piece in both concentrations.

Hence the assessment of tensile strength, stiffness and transparency properties of untreated and treated samples confirmed that 10 per cent Polyvinyl Acetate (PVA) with cold adhesion process was the most suitable treatment for chemical consolidation of the aged silk textile under study as it preserved and retained the authentic properties of the silk artifact.

4.6.2 Treatment of the object

To achieve stabilization of the object, the treatment included reinforcement of the prepared support fabric to the original object with chemical and mechanical consolidation methods.

The nylon net support fabric was treated with the selected adhesive i.e. Polyvinyl Acetate at 10 per cent concentration and attached to the object under study with cold adhesion process.

The work surface was cleaned and prepared in the same manner as stated in the methodology. The required size of non-sticky plastic was taken to prevent

sticking of the object to the surface. It was held tightly on all the sides with the cello tape (Plate 4.30a).

The support fabric i.e. nylon net of same size and colour was placed uniformly on it without stretching as shown in Plate 4.30 b .Tested adhesive i.e. Polyvinyl Acetate of 10 per cent concentration was applied thrice evenly on it (wet on dry) to form a uniform film (Plate 4.30c-d).

As shown in Plate 4. 30e, the back side of object under study was placed against the face side of the of the dried support fabric, smoothly as flat as possible without any wrinkles. Then the two surfaces were adhered to each other by brushing the acetone solution completely on it and leaving to dry for 24 hours (Plate 4. 30h).

Later, the pallav of the saree was strengthened with the use of needle technique. Loose support stitches were taken with the matching polyester thread at regular intervals to hold the support fabric. The method followed was single strand, no knots, minimum tension and passing the thread between and not through the yarns as cited in the relevant reviews of conservation studies.

Finally, the reinforced artifact (Plate 4.30i) was ready to be laid for rolled storage.

Plate 4.30 a: Non-sticky film laid on the wooden table

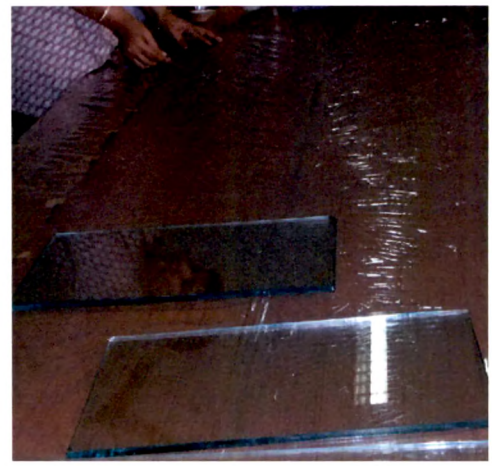


Plate 4.30 b: Smooth placement of nylon net on the film

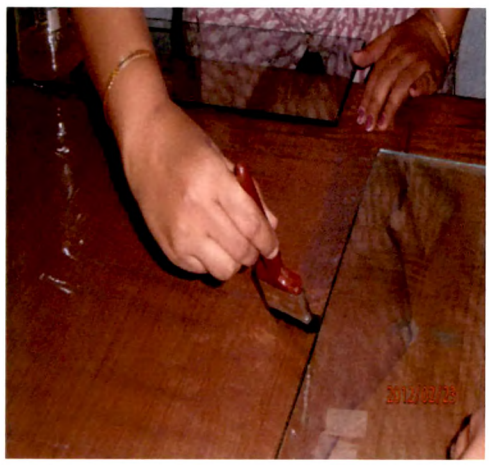


Plate 4.30 c: Even coating of PVA done on the nylon net

Plate 4.30d: Evenly coated support fabric (nylon net)

Contd.....

Plate 4.30e : Placement of original artifact over the support fabric

Plate 4.30f: Positioning of tears at the right place

Plate 4.30g: Alignment of yarns at areas of damage

Plate 4.30h: Even coating of acetone on the object for consolidation to the support fabric

Plate 4.30i: Paithani saree ready for rolled storage

Plate 4.30: Stabilization Process of the object under study

4.7 Outcome of the Workshop

The investigator organized two workshops entitled "Preserving Our Heirlooms" to sensitize individuals about preventive conservation practices that could be adopted at household level to preserve ones traditional textile collection. Questionnaires were administered to selected respondents to elicit their feedback regarding the workshop.

Table 4.7: Demographic Profile of the respondents

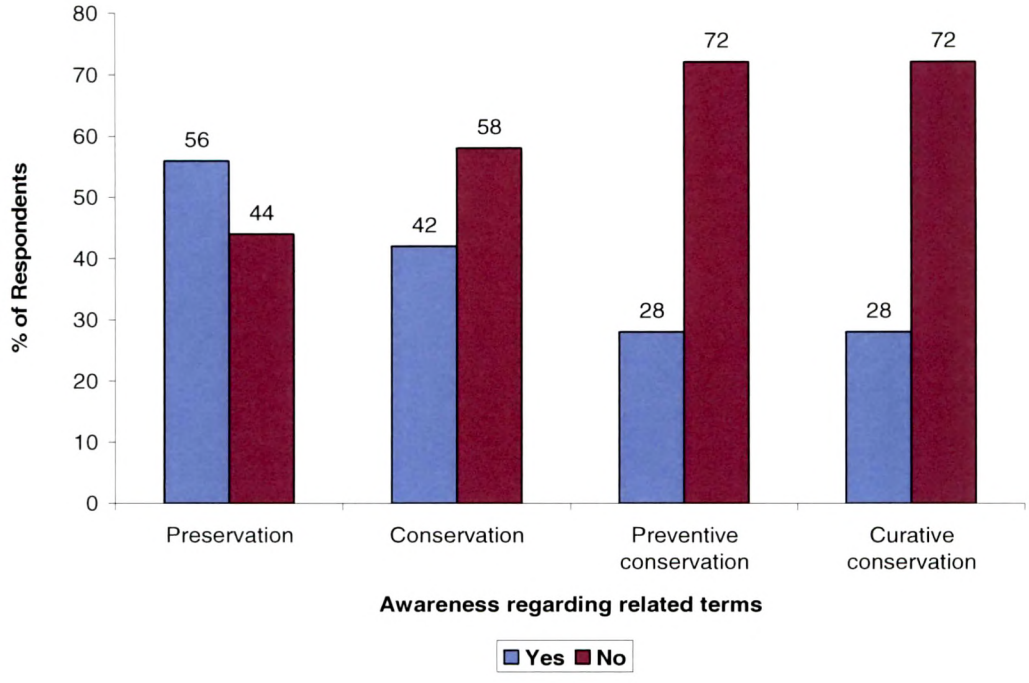
Demographic Details		**N-36 Number of respondents**
Age (in years)	21-30	3
	31-40	16
	41 & above	17
	Total	**36**
Educational Qualification	Graduate	26
	Post Graduate	8
	Ph.D.	2
	Any other	-
	Total	**36**
Occupational Status	Home maker	20
	Professional	9
	Entrepreneur	3
	Social worker	4
	Total	**36**

The demographic profile of the respondents indicated that out of a sample of 36 respondents, nine per cent belonged to the age group of 21-30 years, 44 per cent fell in the age group of 31-40 years and 47 per cent were from the age group of 41 years and above. Hence it was observed that there was an equivalent participation from the age groups of 31-40 years and 41 years and above whereas few belonging to the age group of 21-30 years also attended the workshop. The said trend could be interpreted as the urge for art, design and textiles grows intensely with age and therefore maximum participation was from the age groups of 31-40 years and 41 years and above.

The data pertaining to educational qualification of the respondents revealed that 72 per cent had attained graduation, 22 per cent were post graduates and only six per cent achieved a doctoral degree. Graduation being the minimum qualification was based upon the rationality that educated respondents would have some awareness as regards to preservation and conservation leading to improved understanding during the workshop.

Majority of the respondents i.e. 56 per cent were proud homemakers, 25 per cent of the total were entrepreneurs managing one's own textile gallery, organizing training workshops on leadership and skill development in the area of capacity building, eight per cent were professionals working as textile researcher, museum curator, consultant to NGOs, teachers etc. and 11 per cent were social workers in field of mentally challenged children, handicap people, rehabilitation centers and NGOs.

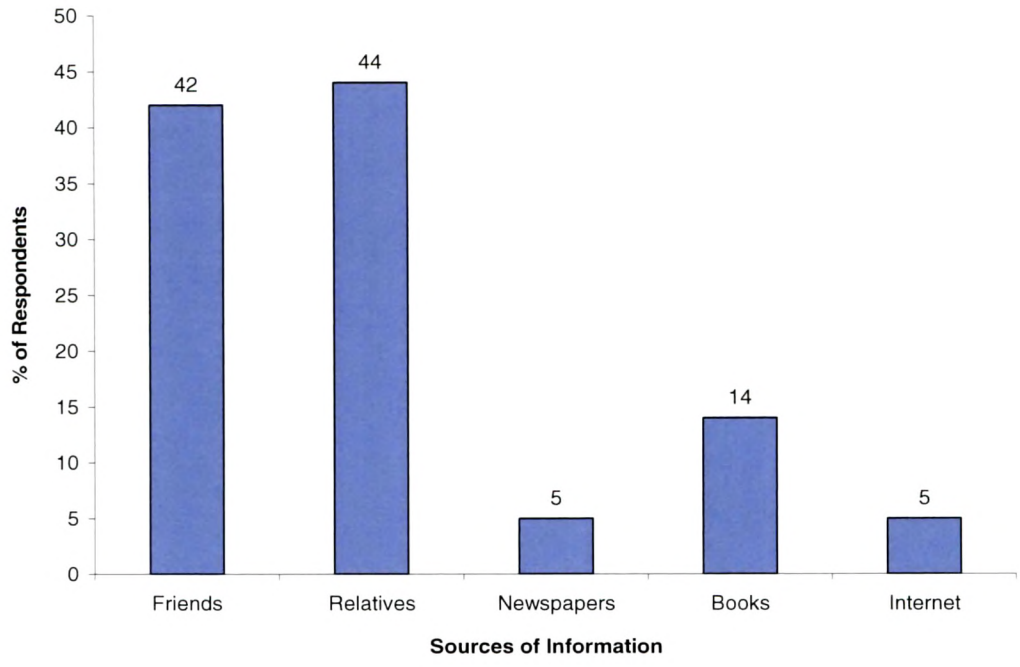
The data on occupational status revealed that it was a mixed bag still they shared a common interest and passion towards textiles irrespective of their different contributory roles to the society. This was attributed to the fact that textiles and women are interwoven with each other and hence they are inseparable.



Graph 4.2: Respondents' awareness regarding related terms

The data as shown in Graph 4.2 on awareness regarding the above terms indicated that 56 per cent and 42 per cent of the respondents gave positive responses for the terms Preservation and Conservation as these are most frequently talked about in respect to paintings, sculptures and architectural buildings whereas remaining were completely unaware about them.

The terms Preventive conservation and Curative conservation were known to few i.e. only 28 per cent of the total whereas majority i.e. 72 per cent were ignorant towards these terms.

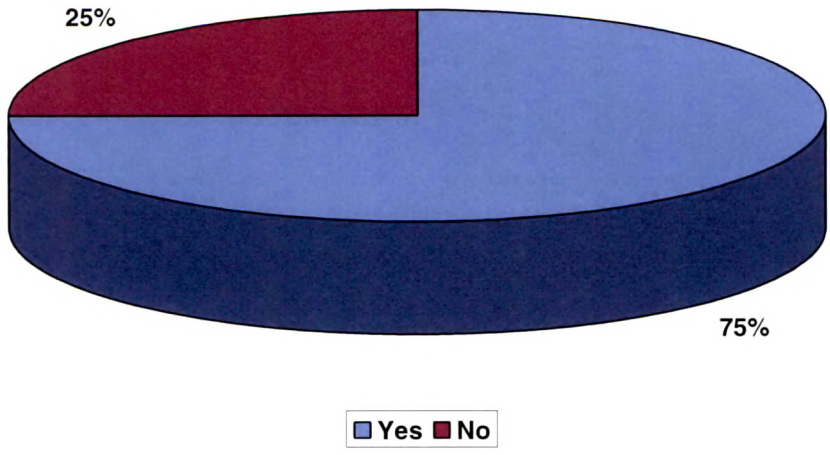


Graph 4.3: Distribution of respondents in terms of sources of information

The data as shown above in Graph 4.3 pertinent to the sources of information reflected that friends and relatives recorded almost equivalent percentage i.e. 42 per cent and 44 per cent respectively to acquaint the respondents to the terms confirming to the fact that information spreads faster with the word of mouth.

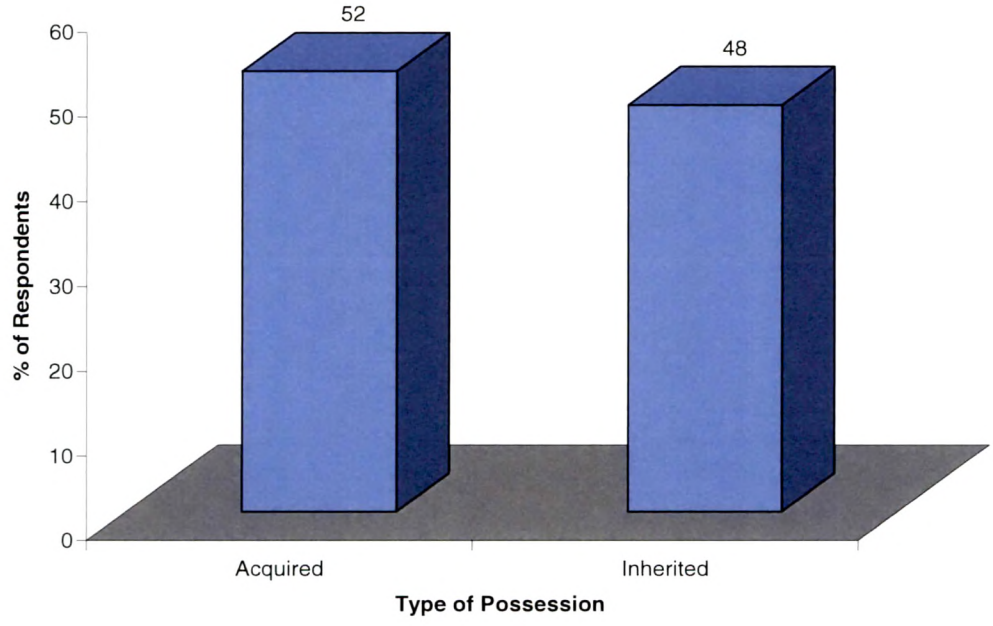
It was surprising to note that newspapers, books and internet exhibited low percentages in spite of being the most used and fastest media of communication Majority being home makers might not have an access to the above sources.

One of the respondents stated travelling abroad enabled her to familiarize with these terms.



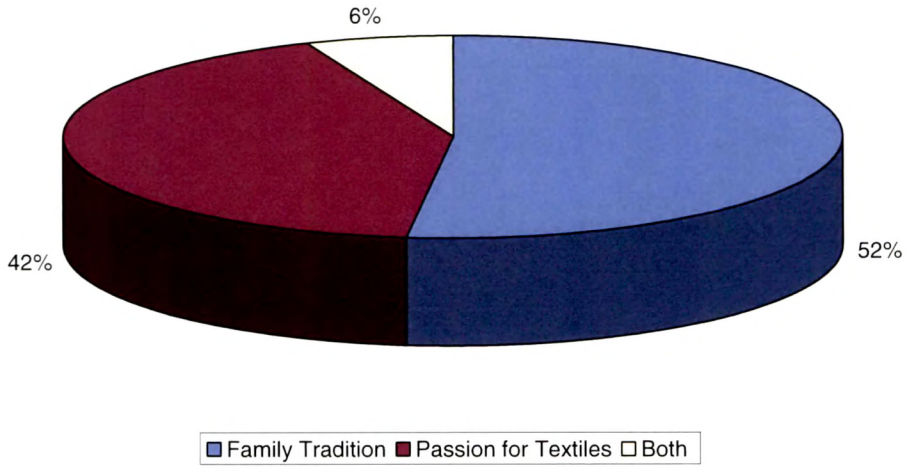
Graph 4.4: Distribution of the respondents towards possession of traditional textiles

As inferred from the above Graph 4.4, it was found that 75 per cent of the respondents possessed traditional textiles whereas only 25 per cent i.e. one quarter of the total showed their inability to have one. This could be attributed to their age as well as their priorities in life.



Graph 4.5: Distribution of the respondents for type of possession of traditional textiles

On probing about their possession of these precious textile artifacts, 52 per cent of the respondents conveyed that they purchased traditional textiles for their personal collection because of their interest and appreciation for the same while 48 per cent had inherited them from their mothers, grandmothers and in laws.



Graph 4.6: Distribution of the respondents in terms of reason for preservation of textile collection

Maximum number of respondents i.e. 52 per cent stated that the reason for preservation of their heirlooms was to carry forward their family tradition, 42 per cent were passionate towards their textile heritage while few i.e. six per cent opined that both reasons were valid for preservation of their valuables as illustrated in Graph 4.6.

Responses regarding the present storage system for their two dimensional textile artifacts like sarees reflected that 60 per cent of the respondents used thin white cotton cloth or dupattas whereas 36 per cent used plastic saree covers readily available in the local market being unaware of the degrading effect of plastic on

the textiles. Finally all the respondents placed them flat either in cupboards, trunks or suitcases.

One of the respondents who worked with the museum shared that large pieces like carpets were rolled on drums and stored vertically and not horizontally as space was a constraint.

Similarly for storage of three dimensional textiles, majority of the respondents preferred hangers for coats, suits, *sherwanis* while blouse covers were used for blouses and *cholis*.

All the respondents conveyed that none out of the total 36 had attended or heard about any such workshop on preservation and conservation of textiles. It was first of its kind.

All the respondents strongly opined and stated that the workshop had benefitted them and was of great relevance to their day to day life.

Affirmative responses were received from all the respondents when posed a question on the willingness to implement the methods demonstrated during the workshop on preservation of one's textile collection.

General comments regarding the workshop revealed that 72 per cent opined that the use of power point presentation and demonstration method (Plate 4.31a-b) led to better understanding of the workshop content reaching even to the layman whereas five per cent urged to get written instructions for storage methods as they might miss on any of the intermediate step unknowingly, causing damage to the textiles.

The respondents (85 per cent) felt that the workshop was very informative and interactive as they experienced hands on skills (Plate 4.32a-b) after the demonstration of storage techniques.

The respondents also felt that such workshops should be frequently conducted as they contribute not only to the individual, society but to the nation at large. Such workshops have a lot of social relevance.

The prepared technical manual (Enclosed CD 2) was circulated amongst the respondents during the workshop to elicit their opinions regarding the same. The respondents found it as a user friendly package. They also expressed that the presentation of the content was apt in simple language supported with relevant pictures comprehending even to a layman.

Hence, it was concluded from the above responses that there was necessity to bring awareness amongst women at household level to practice preventive care methods to maintain their heirlooms in best possible conditions.

Plate 4.31a: Demonstration on preventive conservation methods

Plate 4.31b: Demonstration on preventive conservation methods

Plate 4.32a: Participants' hands on skills and interactive session

Plate 4.32b: Participants' hands on skills and interactive session