

CHAPTER IV

SUMMARY AND CONCLUSIONS

The large variety of floor coverings manufactured in India includes different types of carpets, durries, nandas, gabbas, tapestry rugs etc. These have been appreciated not only for their aesthetic richness and ornamental value but also because of the functional purpose which they serve. These lend a soft, cheerful look to a room which emanates a feeling of warmth and comfort. Thus, the use of floor coverings becomes a necessity, especially in the cold climate of hills.

Weaving of shawls, blankets and different types of floor covering is a traditional craft in Himachal Pradesh. Plenty of raw wool is available in the state and people undertake spinning and weaving to pass long, lonesome winter months as well as to earn a living. The Tibetans who have settled in different parts of the state have also given an impetus to the manufacture of floor coverings. As a result carpets, kharchas, thobies, durries, nandas and borus are being produced in the state. A critical review of the available literature revealed that indepth information on the

characteristics of the manufacturing processes of these floor coverings was badly lacking.

It has been observed that coating and cross linking fibres with resin finishes has been helpful in enhancing certain end use properties of textiles. Though resin finishing of textiles has been actively studied, only a few attempts have been made to study the effect of acrylic finishes on carpet wear characteristics such as appearance retention, compressibility, recovery, resiliency and abrasion resistance.

The investigator undertook the present investigation in order to study technical processes, designs and colours combinations used for manufacturing different types of floor coverings in Himachal Pradesh. At the same time, an effort was also made to study the effect of acrylic finish on wear characteristics of carpets.

The specific objectives of the investigation were:

- 1) To study the socio-economic aspects of the manufacture of floor coverings in Himachal Pradesh.
- 2) To study the production processes and techniques used for the manufacture of these floor coverings.
- 3) To study the motifs, designs and colour combinations

used in the floor coverings and the symbolic significance of these.

- 4) To study the production and marketing channels adopted and the problems faced by the personnel engaged in the manufacture of floor coverings.
- 5) To study the effect of application of acrylic finish on the compressibility, recovery, resiliency, appearance retention and abrasion resistance of the carpets woven in the state.

Limitations of the Study

- 1) The study was limited only to ten districts of the state.
- 2) The effect of acrylic finish was studied on woven carpets only.

After critically evaluating the available literature and keeping in mind the specific objectives of the study, the investigator formulated theoretical framework of the research. In the light of this framework, a multi-method approach to the investigation was designed which included descriptive survey method to study the manufacture of floor coverings and an experimental

procedure to study the effect of acrylic finish on the wear characteristics of the carpets.

The tool used for collecting data for the descriptive survey was an interview schedule, and simple and participatory observation technique. To study the socio-economic aspects of all the personnel involved in the floor covering industry, three sets of questionnaires were developed, one each for the entrepreneurs, and the craftsmen and one for the designers and trimmers. Different aspects of manufacture such as the raw materials used, pre-weaving, weaving and post-weaving processes, colour combinations and designs used and production and marketing channels of the floor coverings along with the background information of the personnel/enterprises were included in the schedule. Before commencing with the actual data collection, the schedules were pre-tested on a non-sample group.

A multi-stage, purposive sampling procedure was adopted for selection of sample for data collection. A total of 219 respondents from ten districts of the state were selected for the purpose. To get an authentic and complete information on the subject, the investigator personally administered the interview schedules to

respondents to study the techniques used for making different floor coverings. This data was supplemented through simple and participatory observation.

To study the effect of acrylic finish on the wear characteristics of the carpets, pure wool carpet samples of .46x.46 m size were used. Ahuracryl TX 50, an acrylic emulsion was applied to these carpets with magnesium chloride acting as a catalyst. Two concentrations of the finish, 2 per cent and 4 per cent were used and one sample of each was prepared by dipping method as well as the brushing method. The samples were line dried and then cured at 150°C for 5 minutes. The effect of finish on compressibility, recovery, resiliency, appearance retention and abrasion resistance of the carpets was studied by using standard test methods.

The data obtained was statistically treated by using descriptive as well as relational statistics. From the results of the investigation the following conclusions were drawn:

6.1 In Himachal Pradesh the floor coverings were manufactured in organised as well as unorganised sector. Galichas, durries and nandas were made only in the organised sector while kharchas, thobies and borus were

manufactured exclusively in the unorganised sector.

Tibetan carpets and chugdans were produced in the organised as well as the unorganised sector. A look into the ownership and management of organised enterprises revealed that 42.10 per cent of the units were owned and run by government undertakings, 26.31 per cent were registered weavers societies run by the Tibetan government in exile and only 31.57 per cent of the enterprises were owned by private enterprenuers.

6.1.1. It was observed that manufacture of floor coverings in the state was not a capital intensive industry though three types of units namely, small, medium and large scale were present. Out of the sample taken up for the study, 36.84 per cent were small scale units, 26.32 per cent were medium scale and 36.84 per cent were large scale units. The capital investment of these enterprises varied from Rs.17000/- to Rs.583775/-. Out of this the working capital investment ranged between Rs.10000/- to Rs.450000/- and Rs.5000/- to Rs.108700/- had been incurred on the purchase of looms. Cost of accessories used was between Rs.2000/- to Rs.19075/-. In the unorganised sector capital investment required for establishing and running a unit was determined by the type of floor covering to be made and the size of the unit.

Units manufacturing floor coverings such as kharchas, thobies and borus were less capital intensive than the rest.

6.1.2 The personnel involved in the industry included administrative employees, technical employees, helpers and skilled labour i.e. weavers and trimmers. All the employees except the skilled labour were paid salaries in fixed scales. The wages of the craftsmen depended upon the pile density of the carpets and their work output in terms of meters or number of floor coverings made, while the trimmers were paid on the basis of their work output. According to the number of knots in 2.5 cms square of carpet, weavers of Tibetan carpets were paid Rs.11/- to Rs.17/-. Similarly galicha weavers were paid Rs.14/- per 30 cms square for weaving a galicha having 6x8 knots to a 2.50 cms square and Rs.800/- per 2.50 cms for making a 30 cms square of prayer rug having 36x36 knots per 2.50 cms square. Chugdan weavers were paid Rs.7/- to Rs.11/- per 2.50 cms square and the durrie weavers got Rs.11.95 to Rs.23.85 for weaving one durrie, the wages being determined by the design of the durrie. According to the size of the namda made, namda makers were paid either Rs.11/- or Rs.20/- for making one namda. The trimmers were paid

Rs.2.50 to Rs.2.80 for trimming and contouring a 30 cms square of carpet. In this manner the craftsmen working in the organised sector were able to earn Rs.101/- to Rs.150/- to more than Rs.500/- per month. When the mean income of craftsmen belonging to different categories were calculated, it was observed that the mean income of durrie weavers was the highest although the task of weaving pile carpets and rugs was much more difficult than that of flat woven ones. Depending on the number of looms used and the number of workers employed, the monthly income of the self-employed craftsmen working in unorganised sector varied from Rs.1200/- to Rs.10000/-.

The earnings of the weavers of Tibetan carpets and chugdang who had their own units were much more than those of the weavers who worked for enterprenuers. A very low wage rate of employed workers and high profit margins in the industry were thought to be the factors responsible for this.

6.1.3 There existed vast difference in the general establishment of the three types of enterprises i.e. Tibetan Societies, Government Undertakings and privately run units. A typical Tibetan establishment included Managing Director/President/Chairperson, Secretary, Accountant or Cashier and Store Keeper besides the

technical staff, skilled labour and helpers. Weaving Master, Peon and the Weavers were the personnel working in Carpet Production Centres run by the Himachal Pradesh Handloom and Handicraft Corporation Limited. Khadi Gram Udyog Mandal and Khadi Ashram units had a Manager, Salesmen, Field Workers, Production Incharge and Dyeing Masters. Only one private enterprise had employed a Weaving Master, the rest were being managed by the owners themselves.

6.1.4 Manufacturing of floor coverings was a labour intensive industry which generated employment for a number of men and women. Out of the total 799 persons employed by these enterprises, 67.70 per cent were women. No gender discrimination between the workers was observed. The wages paid to the women workers were same as the ones paid to men and besides weaving, they were assigned administrative and store-keeping work also. In all except one Carpet Production Centres as well as private units, only girls were employed as weavers while some of the weavers employed by Tibetan weaving centres were men.

6.1.5 The weavers were either given work on carry home basis or they made floor coverings in the premises of

the units. Only two units gave work on carry home basis. Depending on the performance of the weavers they were given raw materials for 3 to 5 carpets or chugdang or 10 to 40 durries to take home for weaving. When ready, the floor coverings were brought back to the unit premises and were weighed again. In other units also the weavers were given a weighed quantity of yarn for weaving carpets and rugs and the ready floor coverings were again weighed.

6.2 A larger percentage (66.66 per cent) of the craftsmen were employed in the organised sector. Majority of the craftsmen were engaged in weaving of Tibetan carpets (45.12 per cent) and only two namda makers were there. Kharchas and thobies were made only by 9.32 per cent and 11.28 per cent of the respondents while 5.12 per cent of them were boru makers. Durries were made by 12.32 per cent, 8.20 per cent were chugdan weavers and 7.60 per cent manufactured galichas. From the annual work pattern of the respondents it was seen that 41.02 per cent of the craftsmen manufactured floor coverings throughout the year. The rest of them took up some other occupation, usually farming or petty trading in the plains during the winter months.

6.2.1 Demographic features of the craftsmen revealed that a major part of the respondents comprised of girls and women who made Tibetan carpets, galichas, chugdang and borus. A few women were also engaged in durrie weaving but manufacture of felt for namdag and the weaving of kharchas and thobies was undertaken only by men. Agewise distribution of the craftsmen revealed that one-fourth of the respondents were of 20 to 25 years of age though the age of the respondents ranged from 20 years to 65 years. The manufacture of namdag, thobies and kharchas was taken up by older people. Maximum number of craftsmen were Buddhists followed by Hindus and Muslims, belonging to farmer, nomad, shepherd, Brahmin, lohar, kumhar and harijan castes. It was seen that 50.25 per cent of the craftsmen were illiterate and only 5.64 per cent of them had studied till matriculation. Weavers of Tibetan carpets, galicha, chugdan and boru makers, belonging to the younger age group, were more educated than the rest of the craftsmen. Majority of the respondents hailed from joint families having 4 to 13 members. The monthly income of the families was between Rs.500/- to more than Rs.2500/- and the number of earning members in the family varied from 1 to 4.

6.2.2 The results showed that 54.87 per cent of the craftsmen had their own weaving units, majority of which were self established. Only a few of the Tibetan carpet and chugdan weaving units were owned by the weavers. All the craftsmen who manufactured kharchag, thobies, durries and borus had their own weaving units. The rest of the respondents worked for different enterprenuers.

6.2.3 It was seen that the craftsmen and trimmers working in the Tibetan weaving centres were provided maximum facilities. They were given free residence, free electric and water supply, free medical aid, free education for their children and three months annual leave in winter. The Himachal Pradesh Handloom and Handicraft Corporation gave provident fund and leave facilities to its craftsmen but the rest of them were not given any facility by their employers.

6.2.4 The respondents had learnt their respective crafts at government institutions, Tibetan weaving centres, private weaving centres or from their neighbours and family members. Depending upon the type of floor covering and the place of training, the craftsmen learnt the craft in 2 months to 1 year. Trimmers had learnt the

skill at Tibetan weaving centres. One of the designers had learnt painting at a Tibetan monastery while the other was a fine arts graduate. The experience of the respondents varied from a minimum of 1 year to a maximum of 51 years. It was seen that the experience of craftsmen engaged in making kharchas, thobies and Tibetan carpets was greater than the rest. Induction of weavers to these crafts at a very young age could be the reason for this as these were indigenous floor coverings for certain social groups among the craftsmen.

6.3 The warp and weft yarns of the carpets and the chugdang were mill spun cotton. Mill spun and mill dyed wool yarn was used for making the pile of the carpets. Prayer rugs were made only in silk, Kharchas and thobies were made from local wool which was hand or machine carded and hand spun. Local wool and cotton fibres purchased from other states were the materials used for the manufacture of the namdag. The base material for borus was jute, on which embroidery was done with wool yarn. Cotton yarn used for making Tibetan carpets, galichas and chugdang was of 4 or 6 ply and their count was 20s to 30s. Wool yarn used for pile was of 2 ply or 3 ply, the count of the yarn being 20s to 60s. Prayer rugs were made of 4 to 8 ply silk yarn. The yarn used

for making kharchas and thobies was of two ply but it was much more thick than the one used for other floor coverings. In durries 2 to 8 ply cotton yarn was used. The amount of yarn consumed by enterprises engaged in the manufacture of Tibetan carpets was 6 to 100 kgs of cotton and 30 to 400 kgs of wool. The consumption in galichas making units varied from 14.5 to 40 kgs of cotton and 64 to 150 kgs of wool in one month. In prayer rugs about six kilograms of silk were used in a month while the consumption of cotton yarn, used as extra weft was 400 to 500 grams per month. For making durries about 750 kilograms of cotton yarn was used in one month while 10 kilograms of cotton and 70 to 90 kilograms of wool were consumed in the namda manufacturing units. Wool and cotton yarns for making Tibetan carpets, galichas and chugdang were purchased from Amritsar, Panipat, Ludhiana, Beed or Manali at the rate of Rs.60/- to Rs.150/- per kilogram. For weaving durries cotton was purchased from Ludhiana and Ganganagar at the rate of Rs.6/- to Rs.16/- per kilogram. Cotton fibre for namdas was bought at the rate of Rs.18/- per kilogram from Ambala, while wool was purchased from Shimla, Lahul Spiti and Kinnaur at the rate of Rs.30/- to Rs.37/- per kilogram. Since most of the kharcha and thobi weavers

reared their own sheep they used home wool for making these rugs. If required they purchased wool from the village itself at the rate of Rs.20/- to Rs.25/- per kilogram. Dyes and chemicals were purchased from the local market. Inspite of Himachal being a wool producing region, local wool was not used for making pile carpets. This could be attributed to unsuitability of local wool as carpet wool.

6.3.1 An inquiry into the amount of yarn consumed by the craftsmen revealed that the carpet weavers consumed 3 to 5 kgs of cotton yarn and 8 to 10 kgs of wool yarn in one month. For prayer rugs 20 to 40 grams of cotton and 150 to 225 grams of silk yarns were used in one month. Monthly consumption of durrie weavers varied from 35 to 200 kgs while the namda makers used about 10 kgs of cotton and 70 to 90 kgs of wool. The amount of wool consumed by kharcha and thobi weavers was 6 to 25 kgs and 15 to 35 kgs in a year respectively.

6.3.2 Medium to superfine quality carpets and rugs having a minimum of 48 to a maximum of 1296 knots per 2.50 cms square were manufactured in Himachal Pradesh. Their sizes ranged from .46x.46 to 6.68x6.68 and weighed less than 1 to 150 kgs. Pile height of the carpets

Table 31 Outstanding features of floor coverings manufactured in Himachal Pradesh

Features of Floor Coverings	Tibetan Carpets	Gulicha	Chugdan	Durris	Sharoha	Thobi	Handa	Boru
Type	Woven pile	Woven pile	Woven pile	Flat-woven, warp faced, plain weave	Flat-woven, plain weave	Flat-woven, warp faced, plain weave	Flat, embroidered felt	Flat, embroidered felt
Yarns used	Warp: Cotton and Yarn Weft: Pile-Wool Yarn	Warp: Cotton and Yarn Weft: Pile-Wool Yarn	Warp: Cotton and Yarn Weft: Pile-Wool Yarn	Warp: Cotton and Yarn Weft: Yarn	Warp: Wool and Yarn Weft: Yarn	Warp: Wool and Yarn Weft: Yarn	Wool and Cotton fibres	Jute and Wool yarn
Looms used	Vertical Loom	Vertical Loom	Vertical and Horizontal Loom	Horizontal Pitloom	Vertical Frame Loom	Horizontal Loom	-	-
Pile Density (knots/250 cms square)	6 x 8 and 8 x 10	6 x 8 to 36 x 36	4 x 6	-	-	-	-	-
Size	.46x.46 to .68x.68m	.46x.61 to .57x.74m	.61x.52 to .92x.74m	1.10x2.20 to 1.20x2.35m	.46x.52 to 1.52x2.43m	1.00x2.43 to 1.22x2.43m	1.22x1.82 to 1.82x2.74m	.46x.61 to .61x.92m
Thickness	9 to 15 mm	6 to 12 mm	12 to 16 mm	5 to 6 mm	6 to 9 mm	5 to 6 mm	6 to 9 mm	5 to 6 mm
Weight	Less than 1 to 150 kgs	Less than 1 to 125 kgs	5 to 7 kgs	2,200 to 2,350 kgs	4 to 7 kgs	6 to 8 kgs	2 and 6 kgs	Less than 1 kg
Technique used	Senna knot	Senna knot	Sousak (Looping)	Dovetail Tapestry & Overshot Weave	Plain weave	Warp faced plain weave	Felting and Chalk-stitch embroidery	Cross stitch embroidery
Designs used	Gocha Pema Khomun, Duk Goh, Ja-thang Pema, Sang-bo, Ton-di-Leti, Changi Bulue, Chadok, Tashi-tu-gye	Bukhara, Shah-Abbasi, Tabriz, Kashan, Tree of Life	Geometrical motifs, Pyramid and Chess-board design	Pattidar, Guddadar, Tussary, Gulchaman and Jaldar	Plain, Bordered	Thick and thin lines alternating with horizontal bars	Designs made from geometrical, bird and floral motifs	Designs made from geometrical, bird and floral motifs
Colour combinations	Blue, yellow, white, green, red, black, pink and brown colours on ivory, blue or maroon background	Yellow, red, black, white, blue and maroon colours on ivory, maroon, brown or navy blue background	Multi-coloured yarns of left-over wool	Blue, green, yellow, red and white	Undyed wool of cream, brown, black and grey colours	Undyed wool of cream, brown, black and grey colours	Pink, yellow, turquoise, red and green	Pink, red, maroon, yellow, green and white
Selling Price	Rs.75/- to Rs.100/- per 30 cms square	Rs.175/- to Rs.500/- per 30 cms sq. or Rs.800/- to Rs.1000/- per piece	Rs.45/- to Rs.55/- per 30 cms square	Rs.75/- to Rs.115/- per piece	Rs.250/- to Rs.350/- per piece	Rs.250/- to Rs.500/- per piece	Rs.90/- to Rs.300/- per piece	Rs.75, Rs.80/- per piece
Area	All over the State	Solan, Kangra and Hamirpur district	All over the State	Sirmour district	Kulu, Chamba and Shimla districts	Lahul Spiti and Chamba districts	Kulu and Shimla	Areas of Chamba, Kangra dist., Jhansi and Punjab
Market	Sold all over the State, outside State and exported	Sold all over the State and exported	Sold all over the State	Sold all over the State	Local market	Local market	Sold all over the State	Local market

was 3 to 15 mms. Chugdang were made in .61x1.52 to .92x2.74 m sizes and these had 12 to 18 mms pile. Their weight was between 5 to 7 kgs. The size of the durries varied from 1.10x2.20 to 1.20x2.35 m and their weight was between 2.200 to 2.350 kgs. Namdag measured 1.22x1.82 m and 1.82x2.74 m and weighed 2 and 6 kgs. Kharchas were made in .46x1.52 m to 1.52x2.13 m sizes. The size of the thobies was 1.00x2.43 to 1.22x2.43 m. The weight of these rugs was 4 to 6 kgs and 6 to 8 kgs respectively. Borus were made in .46x.61 and .61x.92 m sizes and weighed less than one kilogram.

6.4 The enterprenuers as well as the craftsmen produced the floor coverings to cater to the orders of the buyers and selling agents but majority of the carpets and rugs were made in anticipation of demand. Marketing was done directly as well as through selling agents. Almost all the production was directed towards domestic market, mainly in the state of itself. This might be due to lack of awareness of proper marketing channels outside state, remoteness of the area and lack of communication facilities. Only 3 to 6 per cent of the production from the organised sector was exported and just one weaving centre. had engaged an agent for dealing with the export market. The rest of the enterprenuers exported carpets

and rugs directly to the buyers. Main buyers of carpets and prayer rugs produced in Himachal Pradesh were West Germany, United States of America, The United Kingdom and Austria. Durries and namdas were sold only in the state, through the retail outlets of Khadi Ashram and Khadi Gram Udyog Mandal. Kharchas, thobies and borus were either sold in the local market or were marketed during the Lavi fair.

6.4.1 Annual production of the Tibetan carpets in the organised sector varied from 332.30 to 2326.33 square meters while that of galichas was 2.32 to 322.58 square meters. About 338 square meters of chugdang were manufactured in these units in one year and 30116.12 square meters of durries were made annually. The production of namdas varied from 1858 to 2972.90 square meters per year.

6.4.2 The selling price of Tibetan carpets was Rs.75/- to Rs.100/- per 30 cms square, galichas were sold at the rate of Rs.175/- to Rs.500/- per 30 cms square. Wide variation in the price of carpets can be attributed to differences in raw materials used and the number of knots per 2.50 cms square. Selling price of the prayer rugs varied from Rs.8000/- to Rs.10000/- per piece while

the chugdang were priced at Rs.45/- to Rs.55/- per 30 cms square. The price of durries was between Rs.75/- to Rs.115/- per piece, namdag were sold at the rate of Rs.90/- to Rs.300/- per piece and the kharchag at Rs.250/- to Rs.350/- per piece. Thobies and borus were sold for Rs.250/- to Rs.500/- and Rs.75/- to Rs.80/- per piece respectively.

6.4.3 Some of the problems faced by the personnel involved in the manufacture of floor coverings in Himachal Pradesh were irregular supply of yarn, poor quality of yarn, lack of marketing facilities, designs and trained weavers, delayed payment of wages and difficulty in getting financial aid. It was suggested to check the rising price of wool, open control priced yarn supply depots, improve marketing facilities so that the above mentioned difficulties could be overcome.

6.5 Carpets and prayer rugs were woven on vertical looms. The size of these looms ranged from 1.22x1.82 to 6.68x6.68 m and their price was between Rs.500/- to Rs.3500/-. These were either fabricated locally or were purchased from Palampur, Dehradun or Amritsar. Chugdang were woven on vertical as well as horizontal looms. The vertical looms used were the same as the ones used

for making Tibetan carpets. The width of the horizontal loom was 35 to 40 cms and these were installed at the cost of Rs.600/-. Axis rod, gauge rod, shed stick, heddle stick, harness, shuttles, mallet, comb beater, knife, knife and pin, wooden plank, scissors, measuring tape, reeling frames, flat shears, iron comb and carpet brush were some of the accessories used with these looms. These were either made locally or were purchased from Amritsar, Panipat, Shimla, Rampur Bushahar, Re Kang Pio and Manali. A horizontal pitloom was used for making durries. The width of this loom varied from 1.20 to 1.35 m. This loom was installed at a cost of Rs.400/- to Rs.800/-. Boat shuttle, bobbins, measuring tape, and a wooden plank were the accessories used for making durries. These were purchased from Ambala, Nahan, Paonta Sahib and Saharanpur or were fabricated locally. For weaving kharchas and thobies a home made loom was used, which was vertical in case of kharchas and horizontal in case of thobies. The width of the loom used for manufacturing thobies was 35 to 40 cms while the size of the kharcha loom depended upon the size of the rug to be woven. The cost of these looms varied from Rs.50/- to Rs.100/- and these were fabricated by the respondents themselves. Shed stick, stick shuttle, heddle stick, batten, fork, beater, measuring tape and

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a pair of scissors alongwith a hand card, drop spindle and a winder were the accessories need^{ed} for weaving these. The respondents either made these themselves or bought these from Chamba, Rampur Bushahar, Manali, Keylong and Shimla. A mat, stick and a fork were the only equipment required for the manufacture of namdag. These were provided by the enterprenuers. Trimmers and designers were also provided the raw supplies and the equipment required, by their employers. For making borus only a hand needle was needed which the respondents purchased from the local market. The looms and the accessories used for the manufacture of indigenous floor coverings i.e. kharchas and thobies were primitive in nature. The reasons for this might be lack of exposure of the craftsmen to new developments in the field due to remoteness of the area and financial constraints as the market for floor coverings was limited.

6.5.1 The results showed that depending on the type of floor covering, the pre-weaving/manufacturing and post-weaving/manufacturing processes carried out were - grading, carding, spinning, plying, dyeing, warping, trimming, contouring, stitching, finishing of warp ends and finishing of raw edges. Pre-weaving processes of kharchas and thobies required about 18 days to two

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months. While a minimum of four to 5 days were needed for carrying out the pre-weaving processes of durries. Warping of all the floor coverings was accomplished in one day only. The craftsmen took the help of other family members or their colleagues for conducting pre-weaving processes. More time was required for pre-weaving operations of kharchas, durries and thobies as the yarn for these was hand spun and home dyed.

6.5.2 The manufacturing technique of the floor coverings varied according to their type. Tibetan carpets and galichas were woven in plain weave and pile of these carpets was made by using Turkish knot. The technique of making the Turkish knot differed in these. Two techniques were used for weaving chugdang. One was the Indian technique which was same as the one used for weaving Tibetan carpets. In the second technique, the pile of chugdang was looped around the warps instead of knotting. This was the traditional method of making chugdang which was being used only by the Tibetan chugdan weavers. Durries were weft-faced, flat-woven rugs in which the designs were either made by employing dovetail tapestry technique or through overshot weaving. Kharchas were woven in plain weave. Thobies were also made in plain weave but these were warp-faced. Felt for

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nandas was made by moistening and pressing a web of fibres. Later these were either dyed or were embroidered with chain stitch and applique work. Cross stitch embroidery was done on borus. Depending on the floor covering, its pile density, size and number of craftsmen working on a loom it took less than 5 days to 8 months to manufacture one floor coverings.

6.5.3 Depending on the type of floor covering, 1 to 8 days were needed for carrying out the post-weaving/manufacturing processes. The trimmers took 1 to 7 days to trim and contour one carpet, the time taken for it being dependent on the size of the carpet and the number of workers working on it. These processes were either carried out by the weavers themselves, their family members or by other workers in case of Tibetan weaving centres. More time was needed for post-weaving operations of Tibetan carpets because contouring was a very slow process in which the trimmers painstakingly trimmed the outline of each motif to give relief to the design.

6.6 Some of the popular designs used on Tibetan carpets were Duk Goh, Gocha Khorsum, Ja-Thang-Pema and Tashi-Tu-Gya in which lotus, roses, sage flowers, dragons, ducks, swastika, shou, rocks, mountains and water wave motifs were used. The carpets were made

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mainly in maroon, blue and ivory colours with the designs worked out in different shades of blue, yellow, white, green, red, black, pink and brown colours. Highly symbolic in nature, the motifs were usually manifestations of Lamaistic/Buddhist iconography. An inquiry into the symbolism of these designs and colours revealed that only Buddhist weavers were aware of the semiotics of the work. Indo-Persian designs such as Herati, Tabriz, Kashan, Tree of Life etc. were used on galichas. These comprised of rosettes, palmettes, iris flowers, leaves and tendrils worked out in medallion, cartouche or trellised designs. White, black, yellow, red, navy blue and maroon were the popular colours used on a maroon, navy blue, brown or ivory background. The weavers worked out these carpet designs by referring to old carpets or design graphs. Borders, multi-coloured stripes, lozenges and chessboard designs in red, blue, black, white and green colours were woven in chugdang. Stripes and overshot designs such as Gulchaman and Jaldar were made in durries. Red, blue, yellow, white and green were the popular colours used. Kharchas were either plain or had borders and stripes made with undyed wool of brown or grey colours. Since most of the designs used in chugdang, durries and kharchas were repetitive in nature the weavers worked these out

without any illustrated help. Thobies were woven in white and grey or brown colours and the designs consisted of thick and thin stripes with horizontal bars running between these. Stylised sparrows, flowers and lozenages were the motifs embroidered on namdas. The colours used for embroidery were yellow, green, turquoise, red and shocking pink. Cross stitch embroidery in borus was done in red, pink, green, white, blue and yellow colours. The motifs used were roses, rose buds, peacocks and floral baskets which were copied down from old embroidered textiles, design books or carpet designs. It was observed that a larger variety of colour combinations and designs was used in commercial floor coverings i.e. carpets and durries, while the indigenous floor coverings lacked these.

6.7 Effect of acrylic finish on the wear characteristics of carpets were studied by treating .46x.46 m carpet samples with 2 per cent and 4 per cent concentration of Ahuracryl TX 50 for compressibility, recovery, resiliency, appearance retention and abrasion resistance of these.

6.7.1 Treatment with 2 per cent concentration of the finish was helpful in improving the compressibility and

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recovery of the treated carpets. The percentage of compressibility and recovery for samples T_1 and T_2 , treated with this concentration of the finish were 38.0 and 90.0 and 40.0 and 90.2 per cent respectively against 37.0 and 88.4 per cent of the control sample. This concentration of finish was helpful in improving the resiliency of the carpets as well.

6.7.2 The thickness retention of the samples treated with Ahuracryl TX 50 was higher than the control. Maximum improvement in thickness was observed with 2 per cent finish applied by dipping method.

6.7.3 When the compressibility and recovery of the carpets was studied after subjecting the samples to Dynamic Loading it was observed that internal deposition of acrylic finish on the fibre helped in improving these properties.

6.7.4 A study of the abrasion resistance of the carpets revealed that the finishing treatments led to decrease in the abrasion resistance of all except one sample T_2 which had been finished with 2 per cent concentration of the finish.

The improvement in compressibility, recovery and resiliency of the carpets treated with acrylic finish

Table 3a Effect of acrylic finish on wear characteristics of carpets

Sample Code	Compressi- bility	Recovery	Resiliency	Thickness retained after 1000 Dynamic Loading Impacts (%)	After Dynamic Loading Impacts		Weight Retention After 4000 Abrasion Cycles
					1000	Recovery	
	(%)	(%)	(%)	(%)	Compressi- bility	(%)	(%)
T ₀	37.02	88.48	35.16	82.7	30.7	89.7	96.1
T ₁	38.05	90.09	41.35	85.8	32.0	91.4	95.8
T ₂	40.08	90.20	36.16	91.7	31.6	92.8	97.0
T ₃	32.26	93.64	33.61	85.5	29.1	91.8	95.2
T ₄	30.34	97.54	30.30	87.5	30.2	93.7	88.6

was attributed to improvement in the sleazy and limp tufts of the carpets which enabled these to withstand forces of compression better than the untreated sample. Decrease in abrasion resistance of the samples treated with acrylic finish can be explained by the close packing of the fibres which occurred due to application of resin finishes. This packing was responsible for an increase in inter-fibre friction in the yarn which led to a decrease in abrasion resistance of the carpets treated with acrylic finish. Hence application of soft acrylic polymer on the carpets was helpful in improving some of the wear related properties of carpets but the effectiveness of the finish was determined by its concentration and the method of application.

Implications of the Study

- 1) The study gives information about the manufacturing techniques, designs and colour combinations employed for making different floor coverings. Besides these, it also provides information regarding their organisational set up and working conditions of the craftsmen, trimmers and designers.
- 2) The work can be helpful in creating awareness among manufacturers, exporters and selling agents from other

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states regarding the untapped and unexplored potential which is present in this state. At the time when the carpet industry is going through a severe crisis of skilled labour, the skills of the craftsmen working in the unorganised sector can be aptly utilised by them. This can be mutually beneficial to both the parties.

3) As work has also highlighted the problems and grievances of the manufacturers and craftsmen, policy makers and agencies such as the Himachal Pradesh Handloom and Handicraft Corporation can modify the existing policies or frame new policies directed towards overcoming these. Some of the suggestions are -

i) Provision of a design cell which may supply designs to craftsmen either free of cost or at a marginal rate so that the weavers working in unorganised sector and the small scale enterprenuers can benefit.

ii) A liason should be established between the self-employed craftsmen, the small scale enterprenuers and the manufacturers, exporters and selling agents belonging to other states so that the two may interact.

iii) As reported by the thobi weavers and kharcha weavers they have sufficient raw materials (wool) but do not make use of it due to lack of demand for these

floor coverings. Same wool can be utilised to make woollen durries which may find ready acceptance among consumers. Economically such a scheme can be much more rewarding than the manufacture of kharchas and thobies.

iv) At present the emphasis in the state is on the production of Tibetan carpets but some of the entrepreneurs are willing to shift to the manufacture of superfine galichas if they are provided with the designs and are assured a market for these. This may not only provide better income but also have more export potential.

v) Alongwith providing training in carpet weaving, the agencies such as the Handloom and Handicraft Corporation and the Department of Industries should also sensitize the trainees towards different funding agencies which can give loans to them and guide them regarding the procedures to be adopted for the same.

Recommendations

- 1) A similar study can be conducted on floor coverings and textile crafts of other states.
- 2) Effectiveness of other resin finishes in improving the wear characteristics of carpets can be studied.