

## CHAPTER V

RESULTS AND DISCUSSION

In the present study, production processes, techniques, designs and wear characteristics of floor coverings manufactured in Himachal Pradesh have been studied. The production and manufacture of the floor coverings was studied through descriptive survey method and an experimental technique was used to study the wear characteristics of carpets. The data for the survey was collected from 37 villages and towns of 10 districts of the state. Respondents were the enterprenuers, craftsmen, trimmers and manufacturers of floor coverings in Himachal Pradesh. The results of the survey and the experimental technique have been discussed in this chapter. Keeping the specific objectives of the investigation in mind, the results have been divided into following sections :

- I Profile of the Industry
- II Manufacturing Techniques of Floor Coverings
- III Designs Used for Floor Coverings
- IV Wear Characteristics of Carpets,

## Section I

### PROFILE OF THE INDUSTRY

To get an insight into the production and manufacture of floor coverings, the investigator interviewed different personnel associated with the industry. These included enterprenuers, craftsmen, trimmers and designers. To facilitate the ensuing discussion, this section has been further divided into following sub-sections:

#### 5.1 The Enterprenuers

#### 5.2 The Craftsmen

#### 5.3 The Trimmers and the Designers.

#### 5.1 The Enterprenuers

In order to study the enterprenueral aspects of the manufacture of floor coverings, the investigator interviewed 19 enterprenuers from 9 districts of the state. Various enterprises engaged in the manufacture of Tibetan carpets, galichas, chugdang, durries and nandas from Shimla, Lahul Spiti, Chamba, Kangra, Mandi, Hamirpur, Kulu, Solan, and Sirmaur districts were taken for the study. Details of the enterprises visited by the investigator have been given in Table 1.

Table 1 List of enterprises selected for the study

Name of the Enterprise				Year of establish- ment
<b><u>Tibetan Carpet Manufacturers</u></b>				
1	Sharma Carpets, Beed	..	..	1987
2	C P C Old Kangra	..	..	1981
3	Tibetan Handicrafts Production-cum-Sale Co-operative Industrial Society Ltd, Dharamshala	..	..	1963
4	Vidya Carpet Industries, Sarahan	..	..	1981
5	Satya Kaleen Industries, Sarahan	..	..	1986
6	Tibetan Refugee Self Help Handicraft Society, Shimla	..	..	1967
7	C P C Jahalman	..	..	1980
8	C P C Ladruin	..	..	1987
9	J S Carpets, Bakloh	..	..	1984
10	Tibetan Refugee Handicraft Centre, Dalhousie	..	..	1962
11	Khum Kathok Society, Satuan	..	..	1967
12	Bhuppur Tibetan Society, Bhuppur	..	..	1967
<b><u>Galicha Manufacturers</u></b>				
13	Rana Carpets, Bod	..	..	1978
14	Kapoor Carpets, Old Knagra	..	..	1984
15	C P C Sujjanpura Tira..	..	..	1978
16	C P C Kuthar	..	..	1982
<b><u>Durrie Manufacturers</u></b>				
17	Khadi Ashram, Majra	..	..	1982
<b><u>Namda Manufacturers</u></b>				
18	Khadi Gram Udyog Mandal, Shimla..	..	..	1956
19	Khadi Gram Udyog Mandal, Kulu	..	..	1960

From Shimla district, four enterprenuers were interviewed. Two of them had been engaged in the manufacture of both, the Tibetan carpets and the chugdang and one each in Tibetan carpets and namdag. From Lahul Spiti district, one enterprenuer manufacturing Tibetan carpets and chugdang was interviewed. Two manufacturers of Tibetan carpet were interviewed from Chamba district. The investigator interviewed five enterprenuers from Kangra district, out of which two produced Tibetan carpets and three were galicha and prayer rug manufacturers. Hamirpur district had only one carpet manufacturing unit where galichas were manufactured. From Solan district one enterprise manufacturing galichas was taken while the sole enterprenuer from Kulu was engaged in namda manufacture. Three enterprenuers from Sirmaur district were interviewed, two of them produced Tibetan carpets and one was engaged in durrie manufacture.

#### 5.1.1 Ownership and Management Details of the Enterprises

It was observed that maximum number of units were owned by government undertakings. The data showed that 42.10 per cent of the enterprises selected for the study were owned by the government undertakings namely, The Himachal Pradesh Handloom and Handicraft Corporation

FIG.5 DETAILS OF ENTERPRISES VISITED BY THE INVESTIGATOR



Limited, The Himachal Khadi Gram Udyog Mandal and the Khadi Ashram. Handloom and Handicraft Corporation worked through its Carpet Training Centres (CTC) and Carpet Production Centres (CPC) in the state. The Khadi Udyog Mandal and Khadi Ashram had production centres throughout the state. Percentage of self-established enterprises was 31.57 while the rest 26.31 per cent were owned by registered societies run by the Tibetan Government in exile (Figure 6).

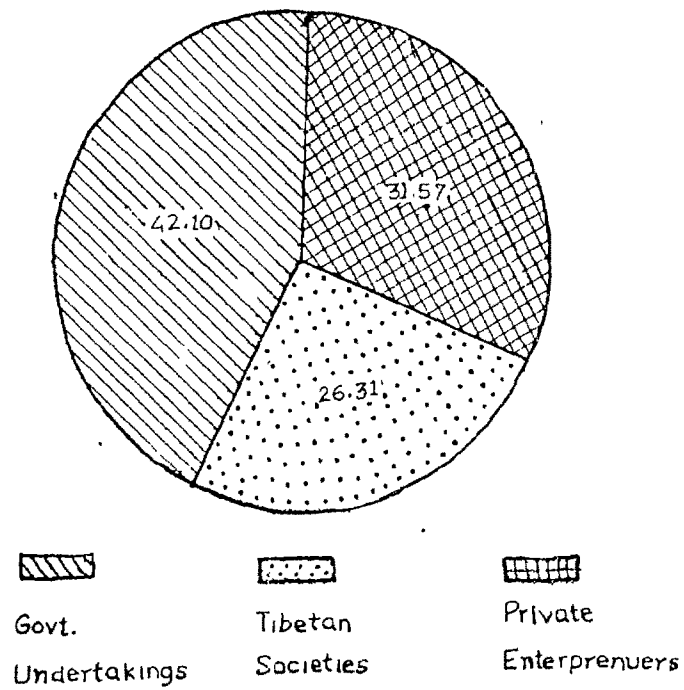
The age of these units varied from ~~five~~ to thirty four years. The year of establishment of each unit has been mentioned in Table 1.

#### 5.1.2 Details of Capital Investment

On the basis of working capital the enterprises were divided into three categories - small scale, medium scale and large scale units. Small scale units were the ones that had the working capital of Rs.50000/- or below. The units with working capital of more than Rs.50000/- to Rs.100000/- were categorised as medium scale units whereas large scale units were the ones which had an investment of more than Rs.100000/- as working capital.

Going by the above mentioned classification

FIG.6 DISTRIBUTION OF ENTERPRENUERS ACCORDING  
TO TYPE OF OWNERSHIP (%)



36.84 per cent of the units visited by the investigator were categorised as small scale units. There was an equal number of large scale units. Only 26.82 per cent enterprises fell under the medium scale category (Table 2).

It was further elucidated that all but one small scale units were owned by the proprietors themselves. Carpet Production Centre, Old Kangra was run by the Handloom and Handicraft Corporation. Working capital investment of these units ranged between Rs.10000/- to Rs.47000/- and their fixed capital investment was Rs.7000/- to Rs.17100/- only. Out of the fixed capital Rs.5000/- to Rs.15000/- had been spent on looms (Table 2) while the investment on accessories ranged between Rs.2000/- to Rs.5000/-. Overhead charges of these units were from Rs.500/- to Rs.1000/- though Sharma Carpets, Beed, did not incur any overhead charges. Details of the capital investment of different units has been presented in Table 2.

In the medium scale category, working capital investment was between Rs.60000/- to Rs.100000/-. All except two of these units had invested Rs.23500/- to Rs.103150/- as fixed capital out of which Rs.17500/- to Rs.40000/- had been spent on looms. Since Carpet

Table 2 Details of the capital investment made by entrepreneurs

Name of the Enterprise	Total Capital Investment (Rs.)	Fixed Capital		Working Capital (Rs.)	Overhead Charges (Rs.)
		Looms (Rs.)	Accessories (Rs.)		
<b>Small Scale Enterprises</b> (36-84 per cent)					
1 Sharma Carpets, Beed	17000	5000	2000	10000	-
2 Rana Carpets, Bod	18500	6000	1500	10000	1000
3 Kapoor Carpets, Old Kangra	33000	5000	2500	25000	500
4 Vidya Carpet Industries, Sarahan	42100	9000	2000	30000	1100
5 C P C, Old Kangra	53100	15000	2100	35000	1000
6 J S Carpets, Bakloh	47900	10200	2200	35000	500
7 Satya Kaleen Industries, Sarahan	65000	12000	5000	47000	1000
<b>Medium Scale Enterprises</b> (26-31 per cent)					
8 C P C, Jahalman	61100	-	600	60000	500
9 C P C, Sujjanpur Tira	112000	40000	4000	65000	3000
10 C P C, Ladruin	99500	17500	600	75000	1000
11 C P C, Kuthar	179500	73000	3500	100000	3000
12 Khadi Gram Udyog Mandal, Kulu	106800	-	800	100000	6000
					98
					98

Table 2 contd..

Name of the Enterprise	Total Capital Investment (Rs.)	Fixed Capital		Working Capital (Rs.)	Overhead Charges (Rs.)
		Looms (Rs.)	Accessories (Rs.)		
<b>Large Scale Enterprises</b> (36-84 per cent)					
13 Bhuppur Tibetan Society, Bhuppur	180000	20000	5000	150000	5000
14 Khadi Ashram, Majra	172000	-	13000	150000	9000
15 Khadi Gram Udyog Mandal, Shimla	158000	-	1000	150000	7000
16 Kham Kathok Society, Satuan	427500	63000	9500	350000	5000
17 Tibetan Refugee Self Help Handicraft Society, Shimla	479000	60000	9000	400000	10000
18 Tibetan Handicrafts Production-cum-Sale Industrial Society Ltd, Dharamshala	522000	35000	30000	450000	7000
19 Tibetan Refugee Handicraft Centre, Dalhousie	583775	108700	19075	450000	6000

Production Centre, Jahalman distributed work to weavers on carry home basis, and namdas were made in Khadi Gram Udyog Mandal; Kulu, the two enterprises did not incur any expenses on carpet looms. In the medium scale units Rs.600/- to Rs.4000/- were spent on accessories while their overhead charges ranged from Rs.500/- to Rs.6000/- (Table 2).

Working capital investment of the large scale units was Rs.150000/- to Rs.450000/-. The amount spent on the purchase of looms varied from Rs.20000/- to Rs.108700/-. Khadi Ashram, Majra and Khadi Gram Udyog Mandal, Shimla did not make any investment on looms as the former worked on carry home basis while the latter was engaged in the production of namdas.

The data revealed that only Tibetan weaving societies had their own buildings valued at Rs.100000/- to Rs.500000/-. The private enterprenuers either worked at home or had rented the premises and all the enterprises run by government undertakings were housed in rented accommodation.

It was inferred that the manufacture of floor coverings in Himachal Pradesh was not a capital intensive industry. Both, the fixed and the working capital

investment made in the state was much less than that made by manufacturers and exporters of Bhadohi (50).

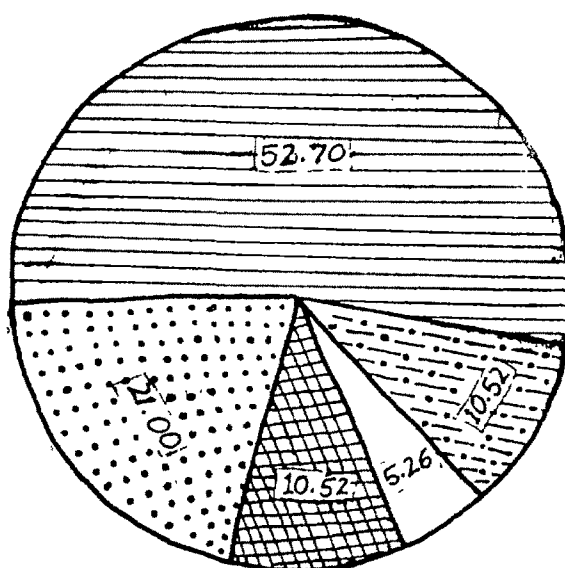
### 5.1.3 Construction Details of Floor Coverings

#### 5.1.3.1 Pile density and thickness:

The data elicited that different floor coverings manufactured in the units visited by the investigator were Tibetan carpets, galichas, chugdans, durries and namdas. Out of these 53.20 per cent were engaged in the manufacture of Tibetan carpets. Galichas and prayer rugs were manufactured by 21 per cent, another 10.52 per cent produced namdas while durries were made by 5.62 per cent (one unit) only. It was observed that 10.52 per cent of the enterprises manufacturing Tibetan carpets produced chugdans as well (Figure 7).

The quality of the carpets produced in Himachal Pradesh ranged from medium (6 x 8 and 8 x 10 knots/2.50 cms square), fine (10 x 10, 12 x 12 and 13 x 13 knots/2.50 cms square) and superfine (16 x 16 and 36 x 36 knots/2.50 cms square). All the enterprises engaged in the manufacture of Tibetan carpets, with the exception of one unit, made medium quality carpets. The knot density of these carpets was 6 x 8 knots to 2.50 cms square. Fine Tibetan carpets having 8 x 10 knots per

FIG.7 DISTRIBUTION OF ENTERPRENUERS ACCORDING TO  
THE TYPE OF FLOOR COVERING MANUFACTURED(%)



  
Tibetan Carpets

  
Galicha

  
Durries

  
Namda

  
Tibetan Carpets & Chugdans

2.50 cms square were woven only at Vidya Carpet Industries, Sarahan. Knot densities of galichas made in Himachal Pradesh was 6 x 8 to 36 x 36 knots to a 2.50 cms square. Medium and fine quality galichas were made at Carpet Production Centre, Kuthar, while Kapoor Carpets of Old Kangra manufactured prayer rugs of superfine quality which had 36 x 36 knots to a 2.50 cms square (Table 3). Pile densities of the chugdangs produced at Shimla and Vidya Carpet Industries, Sarahan was 4 x 6 loops/knots per 2.50 cms.

Pile height of the floor coverings was between 3 to 18 mm. Tibetan carpets manufactured by these units had a pile height of 9 to 15 mm, whereas the galichas had 6 to 9 mm high pile. Prayer rugs had 3 mm high pile tufts. Pile of chugdangs was 15 to 18 mm high. Thickness of durries and namdas manufactured in these enterprises was about 6 mm and 3 mm respectively (Table 3).

#### 5.1.3.2 Size and weight of floor coverings:

The weight of floor covering depended on the knot density, pile height and its size. Weight of a Tibetan carpet of .92 x 1.82 m having 6 x 8 knots/2.50 cms square was about 6 to 7½ kgs while those having 8 x 10 knots/2.50 cms square weighed about 10 kgs (Table 3). A galicha of the same size having 8 x 8 knots/

10/4  
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Table 3 Details of the floor coverings made at different enterprises

Name of the Enterprise	Details of the Floor Coverings			
	Size (meters)	Weight (kg)	Thick- ness (mm)	No. of knots/ 2.5 cm
<u>Tibetan Carpets</u>				
1 Sharma Carpets, Beed	.92x1.82	6½	12-15	6x8
2 C P C, Old Kangra	.92x1.82	6½-7	12-15	6x8
3 Tibetan Handicraft Production-cum-Sale Co-operative Industrial Society Ltd, Dharamshala	.46x.46	2½	9-12	6x8
	.92x1.82	6½	9-12	6x8
	1.22x1.82	8	9-12	6x8
	1.84x2.74	17-18	9-12	6x8
	6.68x6.68**	150	9-12	6x8
4 Vidya Carpet Industries, Sarahan	.76x1.52*	5	15-18	4x6*
	.46x.46	3.2	9-15	8x10
	.92x1.82	10	9-15	8x10
5 Satya Kaleen Industries, Sarahan	.46x.46	2	12-15	6x8
	.92x1.82	6½	12-15	6x8
6 Tibetan Refugee Self- Help Handicraft Society, Shimla	.46x.46	2-2½	9-12	6x8
	.76x1.82*	5	15-18	4x6*
	.92x1.82	6	9-12	6x8
	1.22x1.82	8	9-12	6x8
	1.82x2.74	16	9-12	6x8
	2.74x3.64	28	9-12	6x8
7 C T C, Jahalman	.76x1.82*	4½	15-18	4x6*
	.62x1.82	6	12-15	6x8
	.62x2.74	7	12-15	6x8
8 C P C, Ladruin	.92x1.82	6½	12-15	6x8
	1.22x2.13	10	12-15	6x8
	1.82x2.74	19½	12-15	6x8

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Table 3 contd..

Name of the Enterprise	Details of the Floor Coverings			
	Size (meters)	Weight (kg)	Thick- ness (mm)	No. of knots/ 2.5 cm <sup>2</sup>
9 J S Carpets, Bakloh	.46x.46	1½-2	9-12	6x8
	.92x1.82	6-7	9-12	6x8
	1.82x2.74	19	9-12	6x8
10 Tibetan Refugee Handi- craft Centre, Dalhousie	.46x.46	2-2½	9-12	6x8
	.92x1.82	6-6½	9-12	6x8
	1.22x1.82	8	9-12	6x8
	1.82x2.74	17-18	9-12	6x8
	6.68x6.68**	150	9-12	6x8
11 Khum Khathok Society, Satuan	.46x.46	1½-2	12-15	6x8
	.92x1.82	6-6½	12-15	6x8
	1.22x2.13	8	12-15	6x8
	1.82x2.13**	13	12-15	6x8
	2.13x2.74**	16	12-15	6x8
	2.74x3.04**	25	12-15	6x8
12 Bhuppur Tibetan Society, Bhuppur	.46x.46	2½-2½	12-15	6x8
	.92x1.82	6½	12-15	6x8
	1.22x1.82	7-7½	12-15	6x8
	1.82x2.74	16	12-15	6x8
<u>Galicha</u>				
13 Rana Carpets, Bod	.92x1.52	21	7-9	13x13, 16x16
	1.22x1.82	25-26	7-9	"-
	1.52x1.85	28	7-9	"-
	1.82x2.74	32-33	7-9	"-
14 Kapoor Carpets, Old Kangra	.46x.61	1	3	36x36
	.61x.92	1.8	3	36x36

Table 3 contd..

Name of the Enterprise	Details of the Floor Coverings			
	Size (meters)	Weight (kg)	Thick- ness (mm)	No. of knots/ 2.5 cm
15 C P C, Sujjanpur Tira	.92x1.82	8	7-9	8x8, 10x10
	1.82x2.74	22	7-9	"-
	2.74x3.64	45	7-9	"-
	5.47x4.56	92	7-9	"-
	5.47x5.47	125	7-9	"-
16 C P C, Kuthar	1.82x2.74	22-26	7-9	6x8, 10x10
	2.74x3.64	45	7-9	"-

Durrie

17 Khadi Ashram, Majra	1.10x2.20	2.200-	6	-
	1.20x2.35	2.350		

Namda

18 Khadi Gram Udyog Mandal, Shimla	1.22x1.82	2½	3	-
	1.82x2.74	6	3	-
19 Khadi Gram Udyog Mandal, Kulu	1.22x1.82	2	3	-

\* - Chugdan

\*\* - Made on order only

2.50 cms square weighed approximately 8 kgs but the weight of a .92 x 1.52 m galicha having 13 x 13 to 16 x 16 knots/2.50 cms square ranged from 18 to 21 kgs.

Similarly a Tibetan carpet of 1.82 x 2.74 m weighed 17 to 18 kgs but the weight of a galicha made in same size was 32 to 35 kgs. Weights of galichas of different sizes and varying pile densities have been given in Table 3. Though the knot density of the prayer rugs was much higher than that of carpets, their weight was much less as these were made from a different fibre, namely silk. A .46 x .92 m prayer rug weighed only 1 kg and the weight of .46 x .92 m rug was about 1.8 kg (Table 3).

The sizes of the durrles woven in the state were 1.10 x 2.20 to 1.20 x 1.35 m and their weight ranged between 2.200 to 2.350 kgs (Table 3).

The weight of a 1.22 x 1.82 m namda was between 2 to 2½ kgs while a 1.82 x 2.74 m namda weighed about 6 kgs (Table 3).

Besides the above mentioned floor coverings saddle carpets were also manufactured in the Tibetan Weaving Centre at Dharamshala. These were made only on order.

#### 5.1.4 Processes Carried Out on the Premises

The enterprenuers reported that mill spun and mill dyed yarn was used for making carpets in all the units, hence weaving, trimming and fringing were the only processes which were carried out on premises. Only in one unit, namely, Tibetan Refugee Self Help Handicraft Society, Shimla, dyeing was carried out on the premises but only left-over yarns, meant for chugdan weaving were dyed there. At Carpet Production Centre, Jahalman, only trimming was done on the premises as the weavers did weaving on carry home basis. In two enterprises, namely Rana Carpets, Bod and Kapoor Carpets, Old Kangra the only process carried out on the premises was weaving of carpets and prayer rugs.

In the units engaged in the manufacture of durries, machine carding was the only process which was carried out on the premises. Processes of spinning, weaving and finishing were carried out by the spinners and weavers who worked on carry home basis.

Enterprenuers engaged in the manufacture of namdas reported that the processes of carding, felting and dyeing were executed on the premises. Embroidery of namdas was assigned to contractors.

The studies done on the floor coverings of Kashmir (76) and Punjab (75) revealed that dyeing, weaving, trimming, chemical washing etc were carried out on the premises whereas in Himachal Pradesh only weaving, trimming and fringing of carpets was done on the unit premises. The practice followed in the state differed from the one used in Bhadohi (50) also where weaving was leased out to loom owners and weavers and only pre-weaving and post-weaving processes were carried out on the premises.

#### 5.1.5 Purchase and Consumption Pattern of Yarns

The yarn used for making Tibetan carpets, chugdane and galichas was purchased from Amritsar and Panipat. Only one enterprenuer from Beed purchased the yarn from the local market. The consumption of cotton yarn by enterprises engaged in the manufacture of Tibetan carpets ranged from 7½ to 100 kgs per month and 30 to 400 kgs of wool yarn were utilised in the same period (Table 4). In galicha manufacturing units .4 to 21 kgs of cotton yarn were consumed and the consumption of wool yarn was 64 to 160 kgs per month. Only 6 kgs of silk yarn were utilised per month in weaving of prayer rugs.

Cotton yarn was purchased at the rate of Rs.30/- to Rs.40/- per kilogram. The price of wool yarn ranged

Table 4 Purchase and consumption pattern of yarns used for floor coverings

Name of the Enterprise	Cotton			Wool			Silk		
	Consump- -tion (kgs/ month)	Price (Rs./ kg)	Place of Pur- chase	Consump- -tion (kgs/ month)	Price (Rs./ kg)	Place of Pur- chase	Consump- -tion (kgs/ month)	Price (Rs./ kg)	Place of pur- chase
1 Sharma Carpets, Beed	7½	35	Beed	30	105	Beed	-	-	-
2 C P C, Old Kangra	6	30	Panipat	35	100	Panipat	-	-	-
3 Tibetan Handicrafts Production-cum-Sale Co-operative Industrial Society Ltd, Dharamshala	50	35	Panipat	650-700	105	Panipat	-	-	-
4 Vidya Carpet Industries, Sarahan	7	30	Amrit- sar	40	100	Amrit- sar	-	-	-
5 Satya Kaleen Industries, Sarahan	36-40	35	Panipat	108	150	Panipat	-	-	-
6 Tibetan Refugee Self Help Handi- craft Society, Shimla	52	45	Amrit- sar, Panipat	300	118	Panipat	-	-	-
7 C P C, Jahalman	10	38	Panipat	60	106	Panipat	-	-	-
8 C P C, Ladruin	29	38	Panipat	110	100-120	Panipat	-	-	-
9 J S Carpets, Bakloh	12	35	Panipat	40	105	Panipat	-	-	-

Table 4 contd..

Name of the Enterprise	Cotton			Wool			Silk		
	Consump- -tion (kgs/ month)	Price (Rs./ kg)	Place of Pur- chase	Consump- -tion (kgs/ month)	Price (Rs./ kg)	Place of Pur- chase	Consump- -tion (kgs/ month)	Price (Rs./ kg)	Place of Pur- chase
10 Tibetan Refugee Handicraft Centre, Dalhousie	100	35	Panipat	400	120	Panipat	-	-	-
11 Khum Khathok Society, Satuan	45	35	Panipat	280	110	Panipat	-	-	-
12 Bhuppur Tibetan Society, Bhuppur	30	35	Panipat	115	120-135	Panipat	-	-	-
13 Rana Carpets, Bod	40-50	30-40	Amrit-sar	150-160	85-90	Amrit-sar	-	-	-
14 Kapoor Carpets, Old Kangra	.4-.5	60	Amrit-sar	-	-	-	6	800	Sri-nagar
15 C P C, Sujjanpur Tira	14½	40	Panipat	64	105	Panipat	-	-	-
16 C P C, Kuthar	20-21	35	Panipat	80	105	Panipat	-	-	-
17 Khadi Ashram,	750	6-7-16	Ludhi-ana Ganga-nagar	-	-	-	-	-	-
18 Khadi Gram Udyog Mandal, Shimla	-	-	-	80-90	35	Shimla, Kinnuar	-	-	-
19 Khadi Gram Udyog Mandal, Kulu	10	18	Ambala	70	37	Lahul Spiti	-	-	-

between Rs.85/- to Rs.150/- per kilogram. For making prayer rugs silk yarn was used which was purchased from Srinagar at the rate of Rs.800/- per kilogram. Cotton yarn for the same was bought from Amritsar at the rate of Rs.60/- per kilogram.

For making Tibetan carpets and chugdang 4 to 6 ply cotton yarn of 10s or 20s was used for the warp as well as weft and one to three strands of yarn were used for the weft. The pile of these carpets was made of 20s or 30s yarn and 2 or 3 strands of yarn were used together. The warp and weft yarns of galichas were of 4 and 6 ply cotton yarn of 20s or 30s and the pile was made of 2 ply wool yarn of 30s, 45s or 60s. The prayer rugs were made of 6 or 8 ply silk warp and 4 ply weft and extra weft yarn.

Almost all the carpet weaving centres used Indian wool. Only three enterprises making Tibetan carpets and one galicha manufacturing unit used a blend of Indian and imported carpet wool. The reasons for using Indian wool were its easy availability and low price while blended wool was used for maintaining the high standard of carpets and because the manufacturers provided it to galicha weaving unit.

For durrie making 750 kgs of cotton fibres were used per month. Cotton fibres was purchased at the rate of Rs.6/- to Rs.7/- per kilogram from Ludhiana or at the rate of Rs.16/- per kilogram from Ganganagar. Durries were made from 2 and 3 ply warp and 4 to 8 ply weft yarns. The price of cotton purchased from Ludhiana was less because the fibres used were left-overs from the hosiery industry.

Cotton fibres for making namdaz were purchased from Ambala at the rate of Rs.18/- per kilogram. Wool fibres were bought from Lahul Spiti, Shimla and Kinnaur at the rate of Rs.35/- to Rs.37/- per kilogram. The amount of cotton consumed in one month was 10 kgs and that of wool varied from 70 and 90 kgs.

Chugdang were made in Tibetan carpet weaving units. Left-over wool was used for making these rugs.

The units which carried out dyeing on the premises purchased dyes and chemicals from the local markets i.e. from Kulu and Shimla.

#### 5.1.6 Looms and Accessories

##### 5.1.6.1 The looms used:

Tibetan carpets were woven on vertical loom. Most

of these looms did not have a harness, instead, a heddle stick sufficed for it. Looms having harnesses were used only in Tibetan weaving societies. Here too, only some of the looms were provided with harnesses. Sizes of the looms varied from 1.22 x 1.82 m to 6.68 x 6.68 m but 1.52 x 2.13 and 1.82 x 2.74 m were the most popular sizes (Table 5). The price of each loom depended upon its size, type of material used for fabricating it and its place of manufacture. These were purchased at the rate of Rs.500/- to Rs.3500/- per loom (Table 5). Most of the looms were fabricated locally. Looms used at the Carpet Production Centre, Ladruin and Kuthar had been purchased from Palampur. Similarly at Satuan and Bhuppur weaving centres, these looms had been supplied by Tibetan Handicraft Centre, Dehradun. Tibetan Refugee Self Help Society, Shimla had horizontal looms for weaving chugdang but at Vidya Carpet Industries, Sarahan chugdang were woven on the looms which were used for making Tibetan carpets. The price of each horizontal loom was Rs.600/- (Table 5).

Galichas too were made on the vertical looms but these looms were slightly different from the ones used for Tibetan carpets. All these were fixed looms and except for the ones used for weaving prayer rugs, the

Table 5 Details of the looms used at different enterprises

Name of the Enterprise	Size of the loom (Meters)	Price (Rs./Loom)	No. of Looms Possessed	Place of Purchase	Type of Loom	
					Vertical	Horizontal
1 Sharma Carpets, Beed	1.22x1.82	600	5	Made Locally	/	-
	1.52x1.82	900	1	"	/	-
2 C P C, Old Kangra	1.52x2.13	1000	9	"	/	-
	1.82x2.74	3000	2	"	/	-
3 Tibetan Handicrafts Production-cum-Sale Industrial Society Ltd, Dharamshala	1.22x1.82	500	25	"	/	-
	1.52x1.52	800	5	"	/	-
	1.52x2.13	1000	6	"	/	-
	1.82x2.74	1500	6	"	/	-
	3.04x5.17	2000	2	"	/	-
4 Vidya Carpet Industries, Sarahan	1.52x2.13	700	7	"	/	-
5 Satya Kaleen Industries, Sarahan	1.52x1.52	900	12	"	/	-
6 Tibetan Refugee Self Help Handicraft Society, Shimla	1.22x2.13	1200	3	"	/	-
	1.52x1.52	1200	22	"	/	-
	1.52x2.13	1500	7	"	/	-
	1.82x2.74	3000	4	"	/	-
	2.74x3.64	3000	2	"	/	-
	.36	600	2	"	/	-
					115	
					115:	

Table 5 contd..

Name of the Enterprise	Size of the loom (Meters)	Price (Rs./loom)	No. of Looms Possessed	Place of Purchase	Type of Loom	
					Vertical	Horizontal
7 C P C, Jahalman	-	-	-	-	-	-
8 C P C, Ladruin	1.52x1.82	800	9	Made Locally	/	-
	1.82x2.74	3000	1	"	/	-
9 J S Carpets, Bakloh	1.52x1.52	800	15	"	/	-
	1.82x2.13	1100	3	"	/	-
	1.82x2.74	2200	1	"	/	-
10 Tibetan Refugee Handi-craft Centre, Dalhousie	1.22x1.82	800	2	"	/	-
	1.22x2.13	800	71	"	/	-
	1.82x2.74	1000	12	"	/	-
	2.74x3.64	2500	3	"	/	-
	5.47x3.64	3000	4	"	/	-
	6.68x6.68	3500	4	"	/	-
11 Khum Khathok Society, Satuah	1.52x1.82	1200	35	"	/	-
	1.82x2.74	3000	7	Dehradun	/	-
12 Bhuppur Tibetan Society, Bhuppur	1.52x2.13	800	23	"	/	-
	2.74x3.64	2000	1	"	/	-
13 Rana Carpets, Bod	1.22x1.82	600	5	Made Locally	/	-
	1.52x1.82	900	1	"	/	-
					116	

Table 5 contd..

Name of the Enterprise	Size of the loom (Meters)	Price (Rs./loom)	No. of Looms Possessed	Place of Purchase	Type of Loom	
					Vertical	Horizontal
14 Kapoor Carpets, Old Kangra	1.37x1.52	2500	20	Amritsar	/	-
15 C P C, Sujjanpur Tira	1.22x1.82	1200	5	Hamirpur	/	-
	1.82x2.74	1500	20	-#-	/	-
	2.74x3.64	3000	1	-#-	/	-
16 C P C, Kuthar	1.22x1.82	2000	3	Palampur	/	-
	1.82x2.74	2500	12	-#-	/	-
	2.74x3.64	3000	3	-#-	/	-
17 Khadi Ashram, Majra	-	-	-	-	-	-
18 Khadi Gram Udyog Mandal, Shimla	-	-	-	-	-	-
19 Khadi Gram Udyog Mandal, Kulu	-	-	-	-	-	-

rest had a harness to manoeuvre the weaving operations. The size of the loom used was 1.37 x 1.52 m for making prayer rugs and these had been brought to Old Kangra from Amritsar. Cost of these was Rs.1500/- per loom. Galichas were woven on looms of 1.22 x 1.84 to 2.74 x 3.64 m size or those having bigger sizes. Cost of these looms varied from Rs.1000/- to Rs.3000/-. These were either fabricated locally or purchased from Palampur.

Durrie manufacturers did not purchase any looms. Here yarn was supplied to weavers who carried out weaving at home, using a pitloom.

Since namdag were non-woven floor coverings no looms were required for making these.

#### 5.1.6.2 The accessories used:

The accessories used for making Tibetan carpets and galichas were axis rod, gauge rod, shed stick, harness, heddle stick, shuttles, mallet, comb beater, knife, knife and pin, pins, wooden planks, scissors, flat scissors, iron comb, measuring tape, reeling frame (spindles), carpet brush, mat, fork etc. Structural and functional features of each accessory have been individually dealt with in Section II of this chapter.

Weaving Master, Carpenter and Driver who were paid Rs.500/-, Rs.450/- to Rs.500/- and Rs.250/- respectively. Designers, weavers and trimmers were the skilled workers employed by Tibetan weaving centres. Designers were paid a salary of Rs.380/- to Rs.600/- while the weavers got Rs.14/- to Rs.17/- for weaving a 30 cms square of carpet. The trimmers were paid Rs.2.50 to Rs.2.80 for trimming 30 cms square of carpet. Unskilled helpers and peons got a fixed salary of Rs.200/- and Rs.350/- to Rs.450/- respectively.

The general establishment of Carpet Production Centres was very different from that of the Tibetan weaving centres. In these only three types of employees were engaged. These were the Weaving Master, who was paid a salary of Rs.1300/- to Rs.1800/- per month, a peon who got about Rs.800/- per month and the weavers who were paid wages at the rate of Rs.11/- to Rs.50/- per 30 cms square. The basis of making payment to the weavers was the pile density of the carpets, i.e. higher the number of knots in 2.50 cms square, higher were the wages paid.

The personnel employed by the Khadi Ashram and Khadi Gram Udyog Mandal were the Manager, Salesmen, Field Worker, Production Incharge and Dyeing Master.

They were paid a salary of Rs.800/- to Rs.1500/- per month. Durrie weavers were paid wages according to the design of the durries and the wages of the namda maker depended upon the size of the namda. The wages of the former were between Rs.11.95 to Rs.23.05 per durrie while the latter got Rs.11/- to Rs.20/- for making one namda.

Most of the private enterprises did not have any administrative and technical employees. Only one unit, Kapoor Carpets, Old Kangra, had employed a Weaving Master who was paid a salary of Rs.1500/- per month. The weavers in private enterprises were paid wages at the rate of Rs.11/- to Rs.14/- per 30 cms square. Galicha weaver got Rs.36/- to Rs.800/- per 30 cms square.

Working hours of the Tibetan weaving centres were nine hours per day but those of the government undertakings were eight hours daily. Weavers in private units worked for seven to eight hours per day.

The results of a study by Nayyar (50) showed that different types of administrative, skilled and unskilled workers were employed in private sector in the carpet industry of Bhadohi but in Himachal Pradesh, the private sector mostly employed weavers only.

#### 5.1.7.2 Details of women worker's employed:

Manufacture of carpets was a labour intensive industry which generated employment for a number of men and women. The number of workers employed by a unit was determined by its size.

In the Tibetan weaving centres, 27 to 137 persons had been employed. The Kham Khathok Society of Satuan was the smallest society while the largest Tibetan weaving centre was Tibetan Handicraft Production-cum-Sale Industrial Society Ltd., Dharamshala. In these two centres 77.77 per cent and 67.15 per cent of the employees were women. The largest percentage of women workers were employed at Satuan (77.77 per cent) and the smallest were employed at Shimla (63.54 per cent) (Table 6). Most of the women workers were weavers though they were assigned other duties such as store keeping and administration also (Table 6). Even the Chairperson of the Dalhousie weaving centre was a woman. Depending upon the type of work done, they were paid a salary of Rs.135/- to Rs.1000/- per month.

In the Carpet Production Centres the minimum number of workers were employed in Ladruin centre where 12 workers, all women, had been employed. The maximum number of 86 workers was employed at the Jahalman centre

Table 6 Details of the women workers employed by the  
enterpreneurs and the type of work taken from them

Name of the Enterprise	Total workers	<u>Women workers</u>		Type of work taken
		N	%	
1 Sharma Carpet, Beed	6	6	100.00	Weaving
2 C P C, Old Kangra	16	14	87.50	Weaving and Trimming
3 Tibetan Handicraft Production-cum-Sale Co-operative Industrial Society Ltd, Dharamshala	137	92	67.15	Weaving and Store Keeping
4 Vidya Carpet Industries, Sarahan	12	12	100.00	Weaving
5 Satya Kaleen Industries, Sarahan	24	24	100.00	Weaving
6 Tibetan Refugee Self Help Handicraft Society, Shimla	74	47	63.51	Weaving, Store Keeping
7 C P C, Jahalman	86	80	93.02	Weaving, Trimming
8 C P C, Ladruin	12	10	83.33	Weaving, Trimming
9 J S Carpets, Bakloh	30	30	100.00	Weaving, Trimming
10 Tibetan Refugee Handicraft Centre, Dalhousie	112	82	73.21	Weaving, Administra- tion
11 Khum Khathok Society, Satuan	27	21	77.77	Weaving
12 Bhuppur Tibetan Society, Bhuppur	42	35	83.33	Weaving

Table 6 contd..

Name of the Enterprise	Total workers	Women workers		Type of work taken
		N	%	
13 Rana Carpets, Bod	10	10	100.00	Weaving
14 Kapoor Carpets, Old Kangra	20	20	100.00	Weaving
15 C P C, Sujjanpur Tira	24	22	91.66	Weaving
16 C P C, Kuthar	27	24	88.88	Weaving
17 Khadi Ashram, Majra	93	10	10.75	Weaving
18 Khadi Gram Udyog Mandal, Shimla	20	3	15.00	Weaving
19 Khadi Gram Udyog Mandal, Kulu	28	7	25.00	Binding

out of which 93.02 per cent were women. Depending on their weaving output they earned a monthly salary of Rs.150/- to Rs.300/-.

In Khadi Ashram, Majra and Khadi Udyog Mandal, Kulu, 10.5 per cent and 25 per cent of the workers were women respectively. In Majra the women worked as weavers but in Kulu they were assigned the jobs of binders for finishing the goods. According to their output they were paid Rs.150/- to Rs.800/-.

It was elucidated from the data that compared to the Khadi Ashram and Khadi Gram Udyog Mandal, Tibetan weaving centres and the Carpet Production Centres employed a larger number of women workers, who worked as skilled labour or were given administrative jobs. Furthermore, the number of women workers employed in the state was much higher than that of men. It was also revealed that there was no disparity between the wages of male and female workers.

Elsewhere in India (50, 75, 76) most of the carpet weavers were men though a small number of women weavers was also there. Again children, both boys and girls, were engaged in carpet weaving in Bhadohi and Kashmir but such a practice was absent in Himachal Pradesh.

In Bhadohi, Kashmir and Punjab, men engaged in carpet weaving were paid higher wages than the women weavers but in Himachal Pradesh the wages of women weavers were equal to those of men.

A survey of durrie weaving of Ludhiana (Punjab) had revealed that durrie weaving was done by women who made these for self use as well as for commercial purpose (43). The results of a study conducted by Virk (75), had shown that durrie weaving in Punjab was done by men as well as women. A similar pattern was observed in Himachal Pradesh also.

#### 5.1.7.3 Pattern of work:

In all the enterprises visited by the investigator, all except two units, weaving was done on the premises itself. In Carpet Production Centre, Jahalman and Khadi Ashram, Majra, work was given to weavers on carry home basis. A specific amount of yarn was given to the weavers who in turn brought back woven floor coverings when ready. In Jahalman a weaver was given yarn for 3 to 5 carpets or chugdang at a given time but in Majra, yarn for as many as 10 to 40 durries was given to the craftsmen. The amount of yarn supplied depended upon the previous performance of the weavers. To avoid any discrepancy in the yarn consumption, the woven

floor coverings were again weighed. In Jahalman besides weaving, the weavers were also paid for making balls and for trimming and contouring the carpets. In the rest of the units where weaving was done on the premises, a weighed amount of yarn was given to weavers and the finished carpets and rugs were weighed again.

#### 5.1.8 Production and Marketing of Floor Coverings

##### 5.1.8.1 The production details:

It was reported by the manufacturers of Tibetan carpets that their annual production varied from 251 to 4800 square meters (Table 7). Carpet Production Centre, Jahalman had the minimum production of 251 square meters per year while the maximum output was that of the Tibetan weaving centre, Dharamshala. The reason for less production at Jahalman was the lack of supply of required amount of carpet yarn. Furthermore, the average size of the carpets woven there was .61 x 1.82 m which was smaller than the average size woven at other carpet weaving centres. The data also revealed that the the exception of Jahalman, the production of small scale units was less than that of the medium and the large scale units (Table 7). Though Jahalman was a medium scale unit its production was the minimum.

Table 7 Annual production of floor coverings

Name of the Enterprise				Annual Production (Sq.Meters)
<u>Tibetan Carpets</u>				
1	Sharma Carpets, Beed	..	..	332.30
2	C P C, Old Kangra	..	..	369.20
3	Tibetan Handicraft Production-cum-Sale Co-operative Industrial Society Ltd, Dharamshala			4800
4	Vidya Carpet Industries, Sarahan	..	..	347.60*
5	Satya Kaleen Industries, Sarahan	..	..	679.38
6	Tibetan Refugee Self Help Handicraft Society, Shimla			2326,338*
7	C P C, Jahalman	..	..	251,30*
8	C P C, Ladruin	..	..	1129.84
9	J S Carpets, Bakloh	..	..	406.15
10	Tibetan Refugee Handicraft Centre, Dalhousie			3692.30
11	Khum Khathok Society, Satuan	..	..	1383.61
12	Bhuppur Tibetan Society, Bhuppur	..	..	2215.38
<u>Galicha</u>				
13	Rana Carpets, Bod	..	..	166.15
14	Kapoor Carpets, Old Kangra	..	..	2.32
15	C P C, Sujjanpur Tira	..	..	322.58
16	C P C, Kuthar	..	..	209.00
<u>Durrie</u>				
17	Khadi Ashram, Majra	..	..	30116.12
<u>Namda</u>				
18	Khadi Gram Udyog Mandal, Shimla	..	..	2972.90
19	Khadi Gram Udyog Mandal, Kulu	..	..	1858.00

\* Chugdan

It was observed that the maximum output of galichas was that from the Carpet Production Centre, Sujjanpur Tira while Rana Carpets, Bod produced the minimum number of carpets. Its production being 166.15 square meters per annum. The annual turnover of prayer rugs was only 2.32 square meters. This was attributed to very fine quality of rugs.

Annual production of chugdans was 30 to 338 square meters. Turnover of the Carpet Production Centre, Jahalman was the lowest while that of the Tibetan Refugee Self Help Handicraft Society, Shimla was the highest (Table 7).

The yearly output of durries was 30116.12 square meters and 1858 and 2972.90 square meters of namdas were produced annually (Table 7).

#### 5.1.8.2 Pattern of production:

The enterprenuers reported that the sources of receiving orders for the manufacture of different floor coverings were the selling agents, government agencies and the buyers themselves.

In Tibetan weaving centres 6 to 55 per cent of the production was aimed at catering to the orders of the

buyers. In Bhuppur, Satuan and Dalhousie 35 per cent, 50 per cent and 55 per cent of the total carpet production was meant for selling agents. Rest of the carpets were manufactured in anticipation of demand.

In Carpet Production Centres, only 3 to 5 per cent of the production was meant for catering to orders placed by government agencies. The remaining production was carried out in anticipation of demand.

All the private enterprenuers with the exception of two, manufactured 5 to 8 per cent of the carpets to meet the demand of the orders from the buyers. Larger percentage of carpets was manufactured in anticipation of demand. This was contradictory to the practice followed in Bhadohi where most of the carpet production was carried out on orders from selling agents and buyers (50). Two enterprenuers, Kapoor Carpets of Old Kangra and Rana Carpets of Bod worked only on contract basis with exporters from Amritsar.

Durries and namdas were manufactured with an expectation of future markets. A similar trend was observed by Virk (75) and Wani (76) in Punjab and Kashmir respectively.

#### 5.1.8.3 Marketing pattern:

Weaving centres run by Tibetans marketed carpets through their own showrooms, through wholesalers and by selling directly to the buyers. Centres situated at popular hill stations such as Shimla and Dalhousie sold most of their carpets through their own retail outlets but most of the production of Bhuppur, Satuan and Dharamshala was marketed through selling agents, while 6 to 10 per cent of the total production was sold directly to the buyers. In Shimla, Dalhousie and Dharamshala floor coverings made by government undertakings were sold through their own showrooms i.e. the Handloom Emporia and the retail outlets of Khadi Gram Udyog Mandal and Khadi Ashram.

Most of the carpets made by private enterprenuers were sold directly to buyers. Only two enterprenuers, Satya Kaleen Industries, Sarahan and J.S. Carpets, Bakloh supplied 15 to 20 per cent of their products to wholesalers from Panipat and rest were sold to the buyers directly. Vidya Carpet Industries and Satya Kaleen Industries, Sarahan put up their stalls during Lavi fair at Rampur Bushahar. This was done in collaboration with Himachal Pradesh Handloom and Handicraft Corporation and the Department of Industries,

Himachal Pradesh. A large number of the buyers for these carpets were Tibetan and Lahuli traders who resold these outside the state. Tourists coming to hill stations and army officers were other main buyers of Tibetan carpets produced in the state.

Durries and namdas were sold at the retail outlets within the state itself.

The clientele of the carpets made in Himachal Pradesh was very different from that of the carpets made in Bhadohi (50), Kashmir (76) and Punjab (75) where the carpet industry was mainly export oriented. Durries in Punjab (75) were manufactured for domestic as well as export market while the ones produced in Himachal Pradesh catered to the domestic market only. Similarly, namdas manufactured in the state were meant only for the home market while the ones produced in Kashmir were exported as well.

#### 5.1.8.4 Export market:

Export market of the carpets produced in the state was very small. Tibetan weaving centres at Dalhousie, Dharamshala and Shimla exported 3 to 6 per cent of their products. Floor coverings from Dalhousie and Dharamshala were exported directly to the buyers, who were usually

foreign tourists. Shimla centre exported carpets through an agent. These were exported to West Germany, Switzerland, United States of America, Japan, United Kingdom and Austria.

Rana Carpets, Bod and Kapoor Carpets of Old Kangra worked on contract basis for exporter from Amritsar who exported these carpets and rugs to West Germany, United States of America and the United Kingdom. The production of these was totally export oriented.

#### 5.1.8.4 Selling price:

The selling price of Tibetan Carpets ranged from Rs.73/- to Rs.100/- per 30 cms square. Weaving centres at Bhuppur and Satuan sold these carpets at the rate of Rs.73/- per 30 cms square while at Sarahan centres these carpets were sold for Rs.100/- per 30 cms square.

The enterprenuers reported that the price of galichas was determined by the knot density. A carpet having 10 x 10 knots per 2.50 cms square was sold at the rate of Rs.175/- per 30 cms square while those having 16 x 16 knots to a 2.50 cms square fetched the price of Rs.400/- to Rs.500/- per 30 cms square. The prayer rugs were sold at the rate of Rs.8000/- to Rs.10000/- per piece.

The selling price of chugdang varied from Rs.45/- to Rs.55/- per 30 cms square.

The price of durries depended upon their designs. According to the design these were sold at the rate of Rs.75/- to Rs.115/- per piece.

Nandas were priced according to their size, colour and the type of surface ornamentation rendered. A 1.22 x 1.82 m plain namda was sold for Rs.90/- to Rs.120/- and the price of a 1.82 x 2.74 m plain namda was Rs.250/- to Rs.300/-. An embroidered namda of the same size fetched Rs.192/- per piece.

#### 5.1.9 Quality Control Measures

To maintain a specific standard of production of floor coverings all the enterprenuers adopted certain quality control measures.

The data revealed that carpets were inspected for quality control at the weaving stage and after these had been finished. These were checked for number of knots per square cms., shade variation, evenness of pile, weaving defects, evenness of size, colour combinations and design features. All the Tibetan centres and the private enterprenuers maintained a very strict

vigil on the quality of the carpets. The factors looked into by the Carpet Production Centres were only the shade variation, evenness of pile and number of knots per square inch.

In durries weight of the durrie and level dyeing were the factors looked into by the enterprenuers.

Nandas were checked for evenness of the felt and level dyeing.

## 5.2 The Craftsmen

In order to study the socio-economic conditions of the craftsmen, the techniques and the designs used for making the floor coverings, the investigator visited 37 villages and towns in nine districts of the state and interviewed 195 craftsmen engaged in the manufacture of carpets and rugs. The districts visited by the investigator were Shimla, Kinnaur, Lahul Spiti, Chamba, Kangra, Mandi, Kulu, Solan and Sirmuar (Figure 5). The respondents were selected to represent both the organised as well as the unorganised sector.

The analysis of data revealed that 56.66 per cent of the respondents were craftsmen employed in the organised sector (Figure 8a), the rest of them worked

in the unorganised sector. It was also elicited that namdas, galichas, and durries were manufactured only in the organised sector and the production of thobies, kharchas and borus was restricted to the unorganised sector only (Figure 8 ). A large part of the craftsmen, 45.12 per cent was engaged in weaving Tibetan carpets and 7.69 per cent manufactured galichas. Chugdang were made by 8.20 per cent of the respondents, 12.30 per cent were durrie weavers while another 9.33 per cent were engaged in producing kharchas. The craft of thobi weaving was practised by 11.28 per cent of the weavers and only 1.02 per cent were namda makers. Boru embroidery was carried out by 5.12 per cent of the sample.

### 5.2.1 Background Information of the Craftsmen

#### 5.2.1.1 Occupation of the craftsmen

A study of the annual work pattern of the respondents showed that only 41.02 per cent of the craftsmen worked throughout the year (Figure 9). The rest of them were seasonal workers who took up manufacture of floor coverings only during a specific season. All the respondents belonging to this category had adopted a secondary occupation, usually farming or petty trading.

Break up of the data according to different floor coverings showed that 21.53 per cent of the respondents engaged in weaving of Tibetan carpets were whole time workers while 23.58 per cent of them carried out carpet weaving from February to November or September to April. During extreme winters these respondents migrated plains where they acted as petty traders. In Lahul Spiti the respondents did farming during the summer season i.e. from May to August. All the galicha weavers, 7.69 per cent, were whole time weavers. Percentage of full time durrie weavers was 10.76 per cent and all the namda makers worked throughout the year (Figure 9).

Chugdan, kharcha, and thobi weaving was carried out during a few months only. Tibetans engaged in chugdan weaving did not work during winter months and took to small time trading in plains during these months. Durrie weavers who had some land holding tended to farming operations alongwith weaving, which remained their major occupation. All the kharcha and thobi makers were seasonal weavers who were primarily farmers or shepherds and made these floor coverings on the onset of summer or during late winter. Boru embroidery was undertaken by girls as it was customary but it was not adopted as a primary occupation.

FIG. 8 SECTORWISE DISTRIBUTION OF CRAFTSMEN (%)

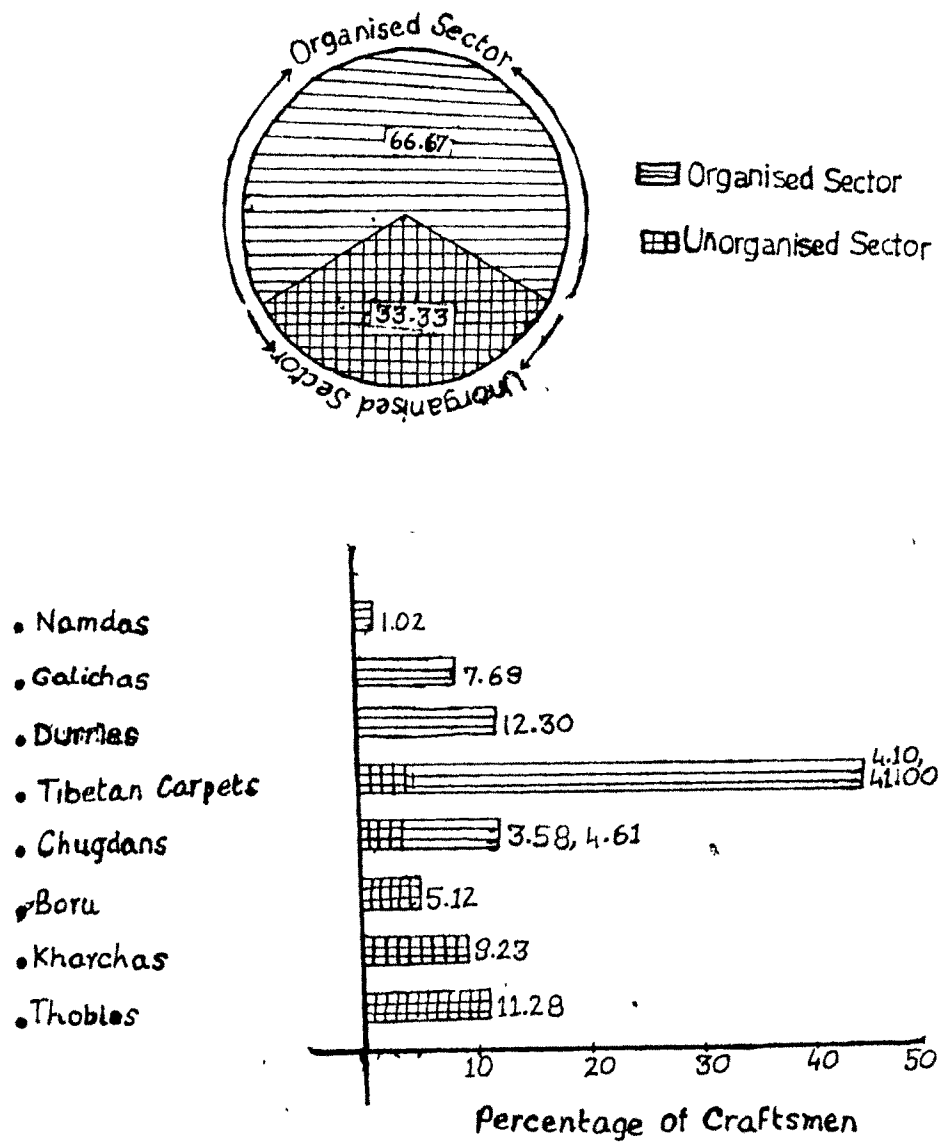
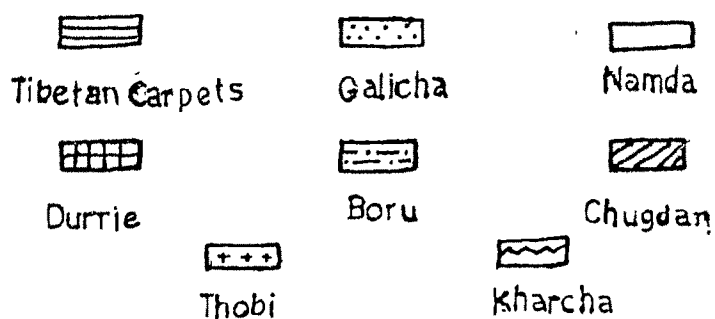
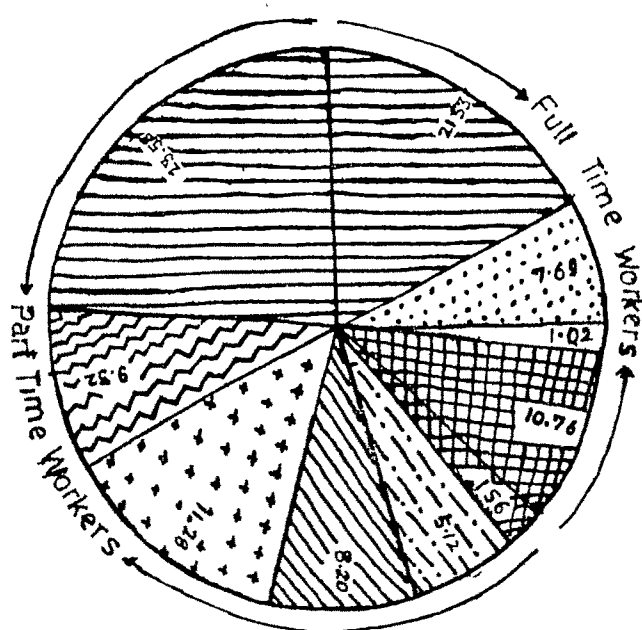


FIG.9 ANNUAL WORK PATTERN OF CRAFTSMEN(%)



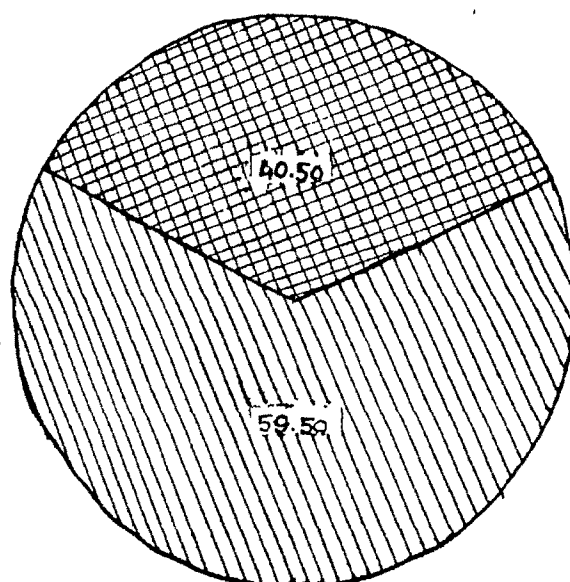
Carpet weaving in Bhadohi (50), Kashmir (76) and Punjab (75) was usually adopted as a full time occupation. As has been observed in Himachal Pradesh most of the durrie weavers in Punjab had taken up weaving as a whole time occupation (75) but weavers of Punja durries in Ludhiana district were mostly seasonal weavers (43).

#### 5.2.1.2 Sex and age of the craftsmen

The data elucidated that both men as well as women were engaged in the task of manufacturing floor coverings. Some of the floor coverings such as thobi, kharcha and the felt for nandas were made by men whereas the embroidery of borus was a women's domain. Chugdans were seldom made by men and only a few women were engaged in durrie weaving.

As shown in Figure 10, 59.49 per cent of the craftsmen were women while the men comprised only 40.5 per cent of the respondents. Out of the women craftsmen, 62.06 per cent were weavers of Tibetan carpets, 12.93 per cent manufactured galichas, 12.06 per cent were chugdan weavers, 4.31 per cent were engaged in durrie weaving and 8.62 per cent practised boru embroidery. As regards to the male craftsmen,

FIG.10 DISTRIBUTION OF CRAFTSMEN ACCORDING  
TO SEX (%)



Male



Female

20.25 per cent of them were employed in the manufacture of Tibetan carpets, 24.84 per cent were durrie weavers, 22.78 per cent made kharchas while 27.84 per cent were thobi weavers. Only 2.53 per cent of the men were engaged in namda making. None of the galicha and boru makers was male.

Agewise distribution of the respondents revealed that around one-fourth of the respondents (24.60 per cent) were between 20 to 25 years of age. Major part of this comprised of girls and women engaged in the manufacture of Tibetan carpets, galichas, chugdan and borus (Table 8). Only 1.02 per cent of the craftsmen falling under this category were male. Next largest group was the 26 to 30 year old age group in which 10.25 per cent of the female craftsmen fell and only 3.07 per cent of men were there. The female population was made up of weavers of Tibetan carpets and durries while the menfolk belonging to this age group were weavers of Tibetan carpets, durries and kharchas. Only a small percentage of craftsmen fell into the youngest and the oldest age group (1.02 per cent each, Table 8).

It was also seen that men and women, both young and old were engaged in weaving Tibetan carpets but galichas were produced only by young girls (Table 8).

### Table 8 Distribution of craftsmen according to age and sex

[illegible]

Maximum number of durrie weavers (8.20 per cent of the total) were between 30 to 50 years of age. Kharchas and thobies were mostly woven by middle aged and old men of 45 to 65 years, though some younger men also practised the craft (Table 8).

#### 5.2.1.3 Religion and caste of the craftsmen

To study the symbolic significance of the motifs, designs and colours used in the floor coverings, it became pertinent to distribute the craftsmen according to their religion and caste.

From Figure 11, it can be observed that the maximum number of craftsmen, 49.23 per cent, were Buddhists, followed by Hindus (38.46 per cent) and Muslims (12.31 per cent). Buddhist respondents were the ones engaged in the manufacture of Tibetan carpets - 33.84 per cent, chugdang - 7.17 per cent and thobies - 6.16 per cent. All the durrie weavers (12.30 per cent) were Muslims and the rest of the respondents were Hindu craftsmen. It was observed that Buddhism was followed by Tibetans and the craftsmen belonging to higher reaches of Kinnaur and Lahul Spiti districts. All the Muslim respondents were from Sirmuar district.

Distribution of respondents according to caste

FIG.11 DISTRIBUTION OF CRAFTSMEN ACCORDING TO RELIGION (%).

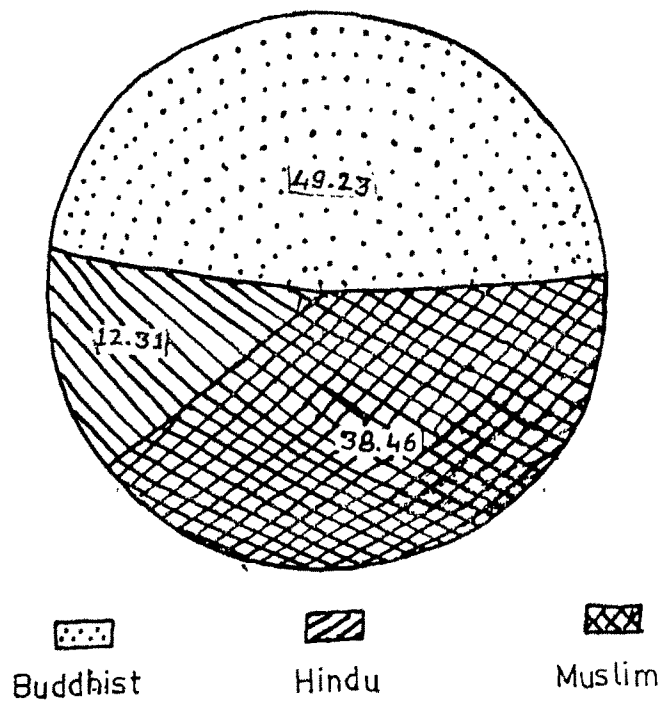
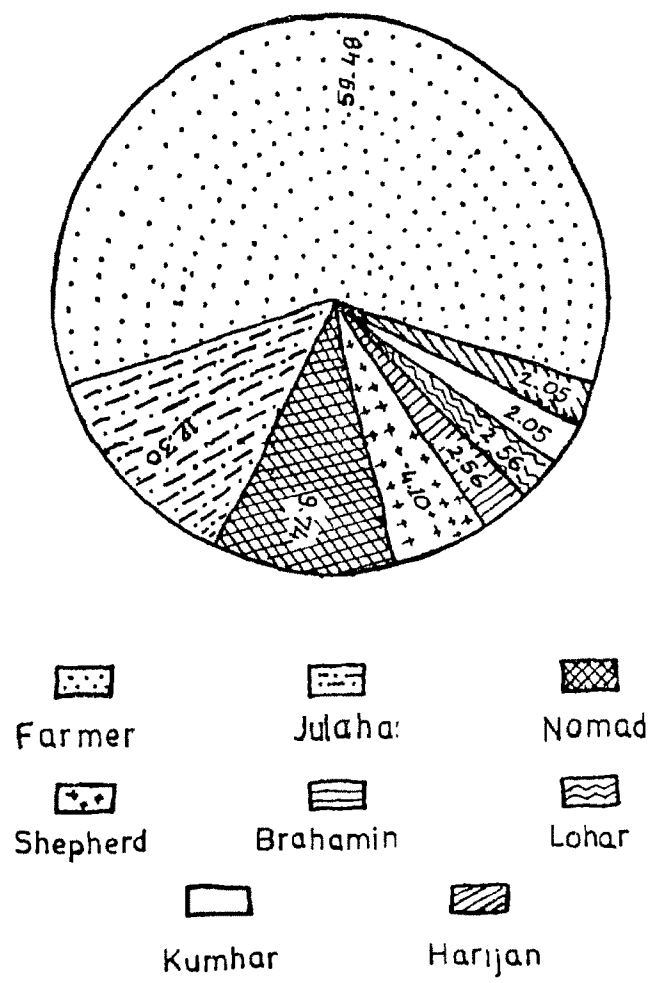


FIG.12 DISTRIBUTION OF CRAFTSMEN ACCORDING TO CASTE (%)



revealed that 59.48 per cent of the respondents were farmers of Tibetan or Rajput origin. Next largest group consisted of Julahas or the weavers who formed 12.30 per cent of the sample. Craftsmen from other castes engaged in this work were nomads - 9.74 per cent, shepherds/gaddis - 4.10 per cent, brahamins - 2.56 per cent, lohar (blacksmiths) - 2.05 per cent, kumhars (potters) - 2.05 per cent and harijans - 2.56 per cent (Figure 12).

Farmers, nomads and shepherds of Tibetan origin were engaged in weaving of Tibetan carpets and chugdang. A small number of women belonging to Rajput origin also manufactured Tibetan carpets and borus. Weaving of thobies and kharchas was carried out by farmers and gaddis (shepherding tribe of Himachal Pradesh). Durries were woven only by julahas, who were the hereditary weavers.

#### 5.2.2.4 Education of the craftsmen

A look into the educational status of the craftsmen revealed that 50.25 per cent of the respondents were illiterate and 25.12 per cent were educated till primary level (Table 9). Another 17.94 per cent were educated till middle class and only 6.66 per cent had passed high school.

Table 9 Distribution of craftsmen according to education

Floor Covering	Educational Status			
	Illiterate	Primary	Middle	High/ Higher Secondary
	(%)	(%)	(%)	(%)
Tibetan carpets weavers	15.89	13.84	10.76	4.61
Galicha weavers	1.02	3.58	2.05	1.02
Chugdan weavers	2.56	1.02	3.58	1.02
Durrie weavers	11.79	0.51	-	-
Kharcha weavers	8.71	0.51	-	-
Thobi weavers	6.66	4.10	0.51	-
Nanda makers	1.02	-	-	-
Boru makers	2.56	1.53	1.02	-

Furthermore weavers of Tibetan carpet, galicha and chugdan had higher educational status than the durrie, kharcha, thobi and nanda makers. This was attributed to the fact that majority of craftsmen belonging to the former category were younger than the ones falling in the latter.

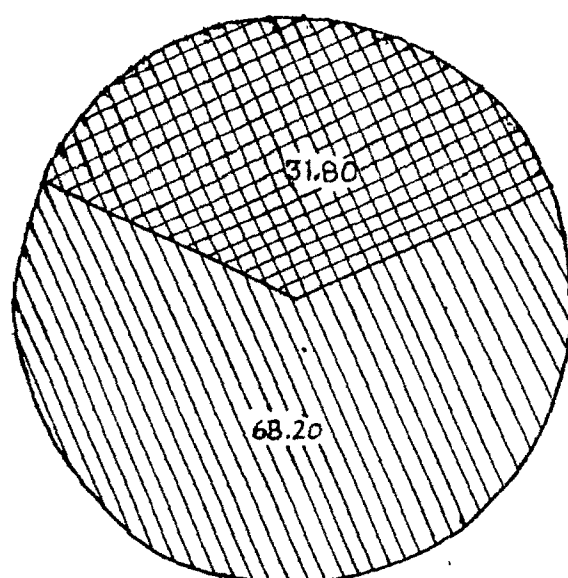
#### 5.2.1.5 Family composition and monthly income of craftsmen

From the distribution of craftsmen according to family composition, it was observed that 68.20 per cent of the respondents came from joint families with number of family members ranging from 4 to 13 members. The rest of them had nuclear families comprising of one to six members (Figure 13).

To gain an insight into the socio-economic background of the craftsmen, monthly income of the respondents was studied in relation to the number of earning members in the family. It was observed that the monthly income of the craftsmen was Rs.500 and below to more than Rs.2500/- and the number of earning members in a family ranged from one to five.

From the data it was elucidated that 39.48 per cent of the respondents had a monthly income of Rs.501/-

FIG.13 DISTRIBUTION OF CRAFTSMEN ACCORDING TO  
FAMILY COMPOSITION (%)



Joint Family



Nuclear Family

to Rs.1000/- (Table 10). Of these 30.25 per cent belonged to families having two earning members while 4.10 per cent had only one earning member and the rest came from families in which three persons worked to earn a living (Figure 14).

Total family income of 30.25 per cent of the craftsmen was between Rs.1001/- to Rs.1500/- per month. In this category 0.51 per cent respondents had one and four earning members each in the family while 16.41 per cent had two earning members and there were four earning members in the families of 2.56 per cent respondents. Another 14.36 per cent craftsmen came from families where family income was between Rs.1501/- to Rs.2000/-. These families consisted of one to five earning members (Table 10). Only 1.02 per cent of the respondents belonged to families having monthly income of Rs.2001/- to Rs.2500/- and the income of 5.64 per cent of the respondents was more than Rs.2500/- (Table 10, Figure 14).

Out of 39.46 per cent of the respondents having a family income of Rs.501/- to Rs.1000/-, 8.20 per cent were makers of Tibetan carpets who had two earning members in the family. In the families of 1.53 per cent of the respondents, all weavers of Tibetan carpets, three persons worked to earn Rs.501/- to Rs.1000/- per

Table 10 Distribution of craftsmen according to monthly family income and number of earning members

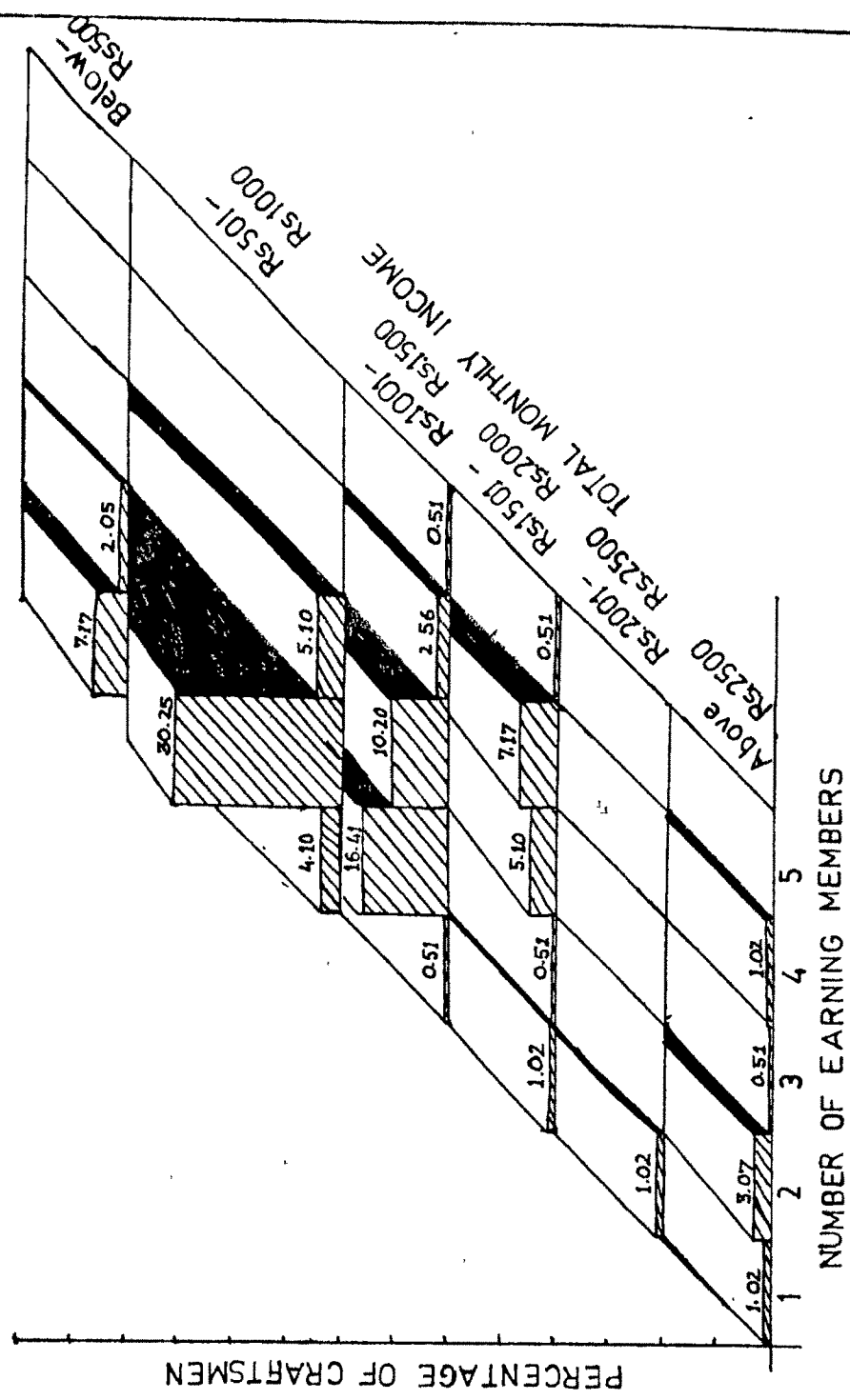
Monthly Income (Rs.)	No. of Earning Members	Tibetan Carpet Weavers (%)	Galicha Weavers (%)	Chugdan Weavers (%)	Durrie Weavers (%)	Kharcha Weavers (%)	Thobi Weavers (%)	Namda Makers (%)	Boru Makers (%)	Total
Below 500	1	5.12	-	-	-	1.53	-	0.51	-	7.17
	2	1.02	0.51	-	-	-	-	-	10.51	2.05
	3	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-
501-1000	1	-	-	-	3.58	-	-	0.51	-	4.10
	2	8.20	4.10	3.07	5.64	5.12	2.05	-	2.05	30.25
	3	1.53	-	0.51	-	2.05	-	-	1.02	5.10
	4	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-
1001-1500	1	0.51	-	-	-	-	-	-	-	0.51
	2	8.71	0.51	2.56	2.05	-	1.53	-	1.02	16.41
	3	1.53	1.53	0.51	0.51	0.51	5.12	-	0.51	10.20
	4	1.53	1.02	-	-	-	-	-	-	2.56
	5	0.51	-	-	-	-	-	-	-	0.51

..

Table 10 contd..

Monthly Income (Rs.)	No. of Earning Members	Tibetan Carpet Weavers (%)	Galicha Weavers (%)	Chugdan Weavers (%)	Durrie Weavers (%)	Kharcha Weavers (%)	Thobi Weavers (%)	Namda Makers (%)	Boru Makers (%)	Total
1501- 2000	1	1.02	-	-	-	-	-	-	-	1.02
	2	0.51	-	-	-	-	-	-	-	0.51
	3	3.58	-	1.02	0.51	-	-	-	-	5.60
	4	5.64	-	-	-	-	1.53	-	-	7.17
	5	-	-	-	-	-	0.51	-	-	0.51
										14.36
2001- 2500	1	-	-	0.51	-	-	0.51	-	-	1.02
	2	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-
										1.02
Above 2500	1	1.02	-	-	-	-	-	-	-	1.02
	2	3.07	-	-	-	-	-	-	-	3.07
	3	0.51	-	-	-	-	-	-	-	0.51
	4	1.02	-	-	-	-	-	-	-	1.02
	5	-	-	-	-	-	-	-	-	-
										5.64

FIG.14 DISTRIBUTION OF CRAFTSMEN ACCORDING TO MONTHLY FAMILY INCOME AND NUMBER OF EARNING MEMBERS



month. There were 5.64 per cent weavers engaged in the manufacture of these carpets whose family income was more than Rs.2500/- per month. Most of the galicha weavers hailed from families where two or four people worked to earn Rs.501/- to Rs.1500/- per month. The family income of most of chugdan weavers was also between Rs.501/- to Rs.1500/-. Majority of durrie and kharcha weavers and boru makers, 9.22 per cent, 7.17 per cent and 3.07 per cent of the total, had families in which one to two and two to three persons contributed towards the family income of Rs.501/- to Rs.1000/- per month. Monthly family income of thobi weavers ranged from Rs.501/- to Rs.2500/- with the largest percentage of the respondents falling under the category of Rs.1001/- to Rs.1500/-. Namda makers were the sole earning members of their families and they earned Rs.500/- and below to Rs.1000/- per month. The family income of majority of boru makers was between Rs.501/- to Rs.1000/- per month (Table 10).

It was elucidated that the family income of the weavers of Tibetan carpets and thobies was higher than the rest of the respondents. Furthermore, kharcha and galicha weavers had the minimum family income among the craftsmen.

#### 5.2.1.6 Wages earned by the craftsmen

It was stated by the craftsmen working in the organised sector that the wages earned by them depended upon their work output. Remunerations of the carpet and the chugdan weavers were determined by the knot or the loop density and the area of the floor covering woven in a month while wages to durrie weavers were paid on piece rate basis, the rate per durrie being dependent on the intricacy of the design woven. Namda makers were also paid wages on piece rate basis, the remuneration being determined by the size of the namda.

Weavers of Tibetan carpets were paid Rs.11/- to Rs.17/- for weaving a 30 cms square of carpets. The wages of chugdan weavers were Rs.7/- and Rs.11/- per 30 cms square. Depending on the number of knots in 2.50 cms square, the weavers were paid Rs.14/-, Rs.28/-, Rs.36/-, Rs.50/- and Rs.800/- for weaving 30 cms square of galicha. According to the design of the durrie, the weavers were paid Rs.11.95 to Rs.23.05 per piece. Depending upon the size of the namda, a namda maker was paid Rs.11/- to Rs.20/- per piece.

Distribution of craftsmen working in the organised sector, according to their monthly wages has been given in Table 11. Since the wage pattern of the durrie

weavers was different from the rest, it has also been dealt with separately in Table 12.

From Table 11 it can be observed that minimum wages of Rs.100/- to Rs.150/- per month were earned by 7.63 per cent of the respondents working in organised sector. For this they worked for 4 to 8 hours per day. The largest percentage, 23.66 per cent, of the craftsmen managed to earn Rs.250/- to Rs.300/- per month by putting in 8 to 9 hours of work daily. The maximum wages of more than Rs.500/- per month were earned by 12.21 per cent respondents (Table 11). The mean monthly income of the weavers of Tibetan carpets was Rs.245/-, that of galicha weavers was Rs.315/- per month while that of chugdang weavers was Rs.210/-. The mean of the monthly income of the durrie weavers was Rs.558/-.

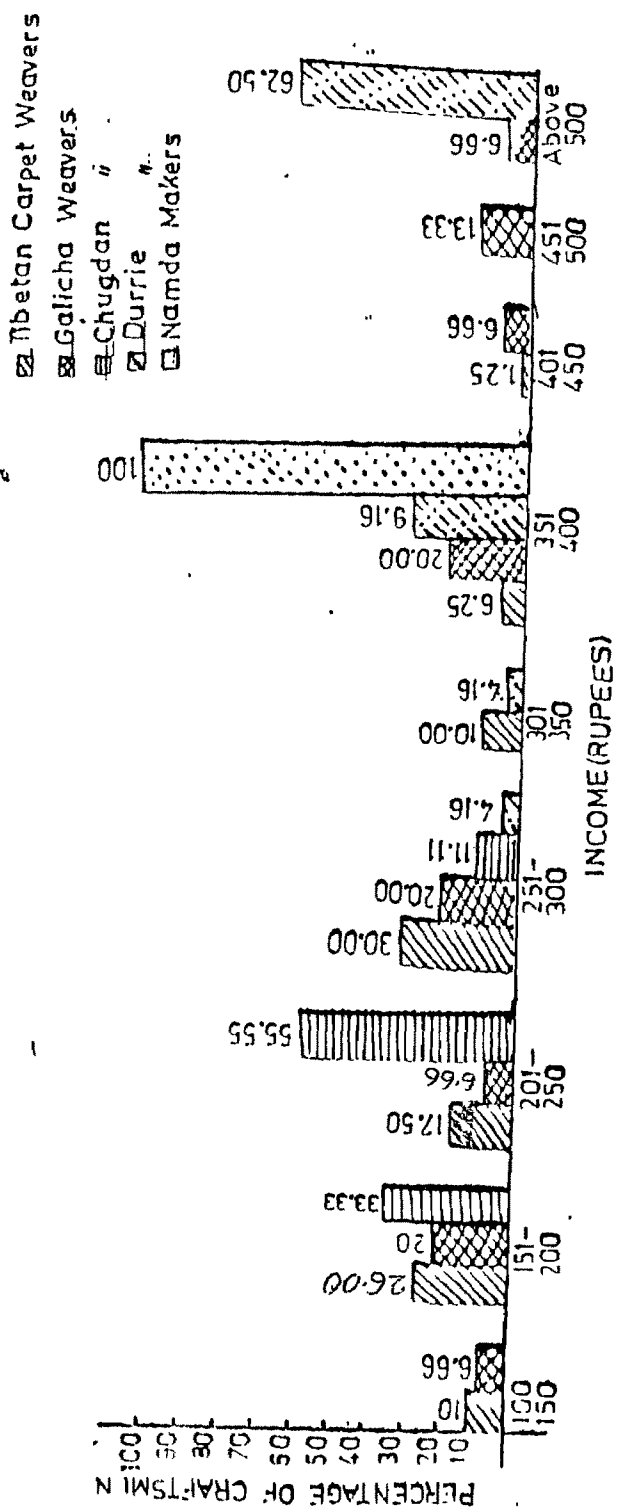
A comparison of the wages earned by the craftsmen engaged in the manufacture of Tibetan carpets, chugdang, galicha, durries and namda makers revealed that durrie weavers were paid higher wages than the rest (Table 12, Figure 15) as 62.25 per cent of them earned more than Rs.500/- per month. This was so inspite of the fact that weaving of floor coverings having pile was much more laborious than that of the flat-woven durries. Lowest



Table 12 Details of wages earned by kurrie weavers

Wages Earned (Rs. / month)		Percentage of Weavers
100 and above	...	-
101 - 150	...	-
151 - 200	...	-
201 - 250	...	-
251 - 300	...	4.16
301 - 350	...	4.16
351 - 400	...	29.16
401 - 450	...	-
451 - 500	...	-
501 - 550	...	4.16
551 - 600	...	20.8
601 - 650	...	-
651 - 700	...	8.33
701 - 750	...	-
751 - 800	...	12.50
801 - 850	...	4.16
851 - 900	...	-
901 - 950	...	8.33
951 - 1000	...	-
1001 and above	...	4.16

FIG.15 COMPARISON OF MONTHLY INCOME OF CRAFTSMEN ENGAGED IN THE MANUFACTURE OF DIFFERENT FLOOR COVERINGS.



wages of Rs.100/- to Rs.150/- per month were earned by weavers of Tibetan carpets and galicha weavers. Majority of weavers of Tibetan carpets and galichas earned between Rs.251/- to Rs.300/- and Rs.151/- to Rs.400/- respectively (Figure 15). The range of income of the largest percentage of chugdan weavers was Rs.201/- to Rs.250/- per month and that of the nanda makers was Rs.301/- to Rs.350/-.

Furthermore, weavers of Tibetan carpets and chugdans who worked in the unorganised sector and were self-employed earned much more than the one's working for enterprenuers. Weavers manufacturing Tibetan carpets in unorganised sector were able to earn Rs.1500/- to Rs.10000/- in a month depending upon the looms installed and the persons engaged in weaving. Chugdan weavers who worked independently earned Rs.1200/- to Rs.2000/- per month.

When the wages earned by carpet weavers of Himachal Pradesh were compared with those of the ones belonging to Kashmir (76) and Bhadohi (50) it was observed that the Himachal weavers earned much less than the rest. Again, most of them earned wages which were far below the minimum wages suggested for carpet weavers under the minimum wage act (32).

#### 5.2.1.7 Facilities provided to craftsmen

An inquiry into the facilities provided by the employers to the craftsmen working in the organised sector revealed that the weavers working in the Tibetan weaving centres were provided with maximum facilities. These included free residence, free medical aid, free education for children, free electric and water supply and three months leave (without pay) in winters. Besides these some of the centres also distributed food and clothing articles which had been given in charity by donors. Some of these centres also ran nurseries for small children.

The Himachal Pradesh Handloom and Handicraft Corporation provided provident fund and leave facilities to their craftsmen. Weavers working for private entrepreneurs were not provided with any facilities at all.

#### 5.2.1.8 Reasons for practising the craft

On investigating the reasons for practising the craft it was found that 37.43 per cent of the respondents had taken up the craft due to economic reasons, i.e. to earn a living (Table 12). Weaving was the family occupation of 15.38 per cent of the craftsmen out of which 12.30 per cent were the julahas engaged in durrie

weaving. Since 18.97 per cent of the respondents had undergone training in carpet weaving and they took it up as a profession. Weaving of thobies and kharchas and embroidery of borus was carried out by 18.97 per cent of the respondents as it was customary to make these floor coverings. Other reasons given for executing this craft were interest in weaving (1.53 per cent), leisure time activity in winter (5.64 per cent) and trained for and interested in weaving (0.51 per cent)(Table 13).

#### 5.2.1.9 Place of learning the craft

An inquiry about the place of learning the craft revealed that the respondents had acquired the skill either from an institution, or from family members and friends. The data showed that 35.89 per cent of the weavers had learnt the technique of weaving in private weaving centres and another 35.89 per cent had learnt the craft of carpet, durrie, kharcha, thobi and boru making from family members. Training to 19.48 per cent craftsmen had been imparted by government institutions such as Carpet Production and Training Centres. Family friends and fellow villagers were responsible for training 8.17 per cent of the respondents in the art of carpet, chugdan and boru making while the namda makers had learnt the technique in the production centres of



Khadi Gram Udyog Mandal.

The Himachal Pradesh Handloom and Handicraft Corporation conducted one year training courses in carpet and durrie weaving at its Carpet Production and Training Centre. Here, alongwith training the trainees were also given a scholarship of Rs.100/- to Rs.200/- per month. The weavers of Tibetan carpets and galichas also learnt the craft at private weaving centres where 2 to 7 months were needed for mastering the craft. The respondents took about 2 months to develop the skill of weaving chugdans which was taught to them by their family members or fellow villagers. Weavers were able to pick up the technique of weaving durries in 3 to 6 months. Craftsmen managed to learn the art of manufacturing kharchas, thobies and borus by making one rug each. A maximum of one month was needed for this.

#### 5.2.1.10 Experience of the craftsmen

The data elicited that there was a wide variation in the experience of the craftsmen with regard to the manufacture of different floor coverings. The minimum experience of respondents engaged in weaving of Tibetan carpets was 1 year and the maximum was 29 years. Majority of the weavers had only 2 to 5 years experience.

Galicha weavers had been practising the craft since 2 or 8 years while chugdan weavers had 1 to 41 years of experience. In this category the experience of weavers of Tibetan origin was greater than that of the weavers of Indian origin as they had an experience of 12 to 41 years. The minimum experience of durrie and kharcha weavers was 3 and 15 years and the maximum was 38 and 47 years respectively. Similarly, thobi weavers had been making these floor coverings since the past 24 to 51 years. The experience of namda makers was 21 and 32 years. Girls making borug had started the practice since the past 1 to 5 years.

Thus the experience of the craftsmen in their chosen professions ranged from a minimum of 1 year to a maximum of 51 years and the craftsmen engaged in the manufacture of indigenous floor coverings i.e. kharcha and thobi had more experience than the rest. Similarly, the experience of the weavers of Tibetan origin in weaving of Tibetan carpets and chugdan was more than the weavers of Indian origin as these were the traditional floor coverings for them and they started practising the craft at a very young age.

#### 5.2.1.11 Ownership of the units

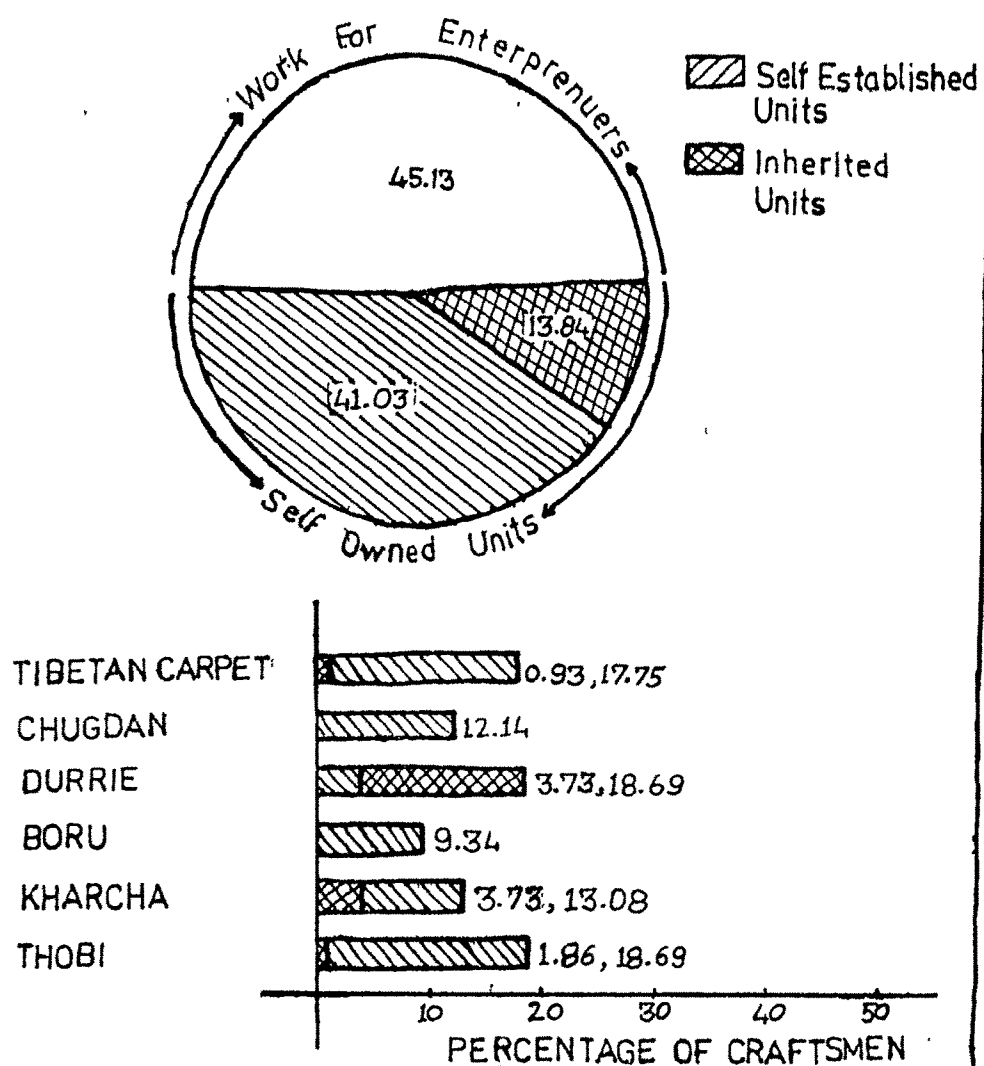
It was seen that 54.87 per cent of the craftsmen had their own weaving units. Of these 13.84 per cent had inherited the units while the rest had established these on their own. Only 3.73 per cent of the durrie weavers had started their weaving units themselves (Figure 16). As regards to the rest 13.08 per cent were kharcha weavers, 18.69 per cent were thobi weavers and 17.75 per cent were engaged in the manufacture of Tibetan carpets. The rest of them had inherited the units. All the chugdan weavers having their own weaving units had established these themselves (Figure 16).

From the above data it can be elucidated that the majority of durrie weaving establishments had been inherited by the weavers but the ones engaged in the manufacture of kharchas, thobies and Tibetan carpets were self-established. All the chugdan<sup>weavers</sup> who had their own ~~weavers~~ had weaving units had started these themselves.

#### 5.2.1.12 Financial assistance

The data revealed that only 5.62 per cent of the craftsmen had sought financial assistance. This was taken either for establishing or developing their

FIG.16 DISTRIBUTION OF CRAFTSMEN ACCORDING TO OWNERSHIP OF MANUFACTURING UNITS (%)



weaving units. The respondents who had taken financial aid included manufacturers of Tibetan carpets and durrie weavers (4.09 per cent and 2.56 per cent of the respondents respectively). Scheduled Castes and Scheduled Tribes Welfare Council rendered financial aid upto Rs.8000/- to start weaving units and 0.51 per cent of the craftsmen had sought their help for starting their own weaving unit. This agency provided financial assistance to the residents of Lahul Spiti and Kinnuar at subsidised rate of interest of 4 per cent per annum. The Department of Industries also rendered financial assistance to the craftsmen who had undergone training in durrie or carpet weaving in the centres run by the Handloom and Handicraft Corporation. A loan of Rs.800/- was given to such craftsmen for the purchase of looms and accessories. Half of this loan had been subsidised. This agency also gave loan to already established weavers. Aimed at development of the existing units, the loan was given to the respondents on the basis of their previous performance. It was seen that 3.07 per cent of the craftsmen, Tibetan carpet and durrie weavers had taken monetary help from this department. Only 0.51 per cent of the respondents had taken financial assistance from banks who charged 11 per cent interest per annum. Previous performance of the

respondents was the criteria adopted by the banks for giving financial aid.

#### 5.2.1.13 Workers employed by the craftsmen

Weavers of Tibetan carpets was the only category of craftsmen which employed paid help. Depending on the number of looms installed by the respondents, 6.81 per cent of them had 1 to 9 weavers working for them. These workers were paid a salary of Rs.100/- per month (by one respondent) or were given Rs.11/- to Rs.13/- for weaving a 2.50 cms square of carpet. Only 5.68 per cent of the craftsmen who wove Tibetan carpets made use of services of trimmers for trimming and contouring the carpets. The rest of them either carried out trimming and contouring of the carpets themselves or sold unfinished carpets. For finishing a carpet of .92x1.82 m size the trimmers were paid Rs.50/-. Other craftsmen who owned their weaving units sought the help of their family members for performing various tasks related to the manufacture of floor coverings.

#### 5.2.2 Capital Investment of the Craftsmen

To study the details of the capital investment of the craftsmen having their own manufacturing units, the total capital investment was categorised into fixed

capital, working capital and overhead charges.

Expenditure on looms and accessories were the two heads under which the fixed capital had been studied.

Total capital investment of the craftsmen varied from Rs.500/- and below to more than Rs.15000/- (Table 14). It was observed that 37.38 per cent of the respondents having their own units had made a total capital investment of less than Rs.500/- (Table 14). Only 2.80 per cent craftsmen had invested more than Rs.15000/-.

Weavers of Tibetan carpets had invested Rs.1500/- to more than Rs.15000/- on their weaving units, out of which fixed capital was between Rs.501/- to Rs.2500/- and the working capital investment varied from Rs.7000/- to more than Rs.15000/-. The expenditure on looms and accessories was between Rs.500/- and below to Rs.6000/- and Rs.500/- and below to Rs.3000/- respectively. Total expenditure incurred on setting up chugdan weaving units was Rs.1500/- to Rs.12500/-. Investment on fixed capital ranged from Rs.500/- and below to Rs.1500/-, the working capital being Rs.500/- and below to Rs.12000/-. Chugdan weavers had spent Rs.500/- and below to Rs.1000/- on the purchase of looms and the cost of accessories was Rs.500/- and below (Table 14).

Table 14 Details of the capital investments made by the craftsmen\*

Details of Capital Investment																		
Amount of Investment (in Rs.)	Fixed Capital			Loose			Accessories			Working Capital			Total Capital					
	Tibetan carpets	Kharcha	Thodi	Tibetan carpets	Kharcha	Thodi	Tibetan carpets	Kharcha	Thodi	Tibetan carpets	Kharcha	Thodi						
500 and below	-	..93	17.10	16.31	20.59	11.20	0.28	4.62	10.32	20.56	12.14	22.41	16.31	20.56	-	-	16.31	20.56
501-1000	9.25	10.28	11.10	-	-	1.86	-	17.79	-	-	1.86	-	-	-	-	-	9.25	-
1001-1500	1.46	0.93	-	-	-	1.46	-	-	-	-	0.93	-	-	-	-	9.25	13.08	-
1501-2000	1.86	-	-	-	-	1.86	-	-	-	-	-	-	-	-	-	0.93	-	-
2001-2500	1.96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2501-3000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3001-3500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.93	-
3501-4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4001-4500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4501-5000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5001-5500	2.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5501-6000	-	-	-	-	-	0.93	-	-	-	-	-	-	-	-	-	-	0.93	-
6001-6500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6501-7000	2.93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7001-7500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7501-8000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8001-8500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.86	-
8501-9000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9001-9500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10001-10500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10501-11000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.86	-
11001-11500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.93	-
11501-12000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12001-12500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12501-13000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13001-13500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13501-14000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14001-14500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.93	-
14501-15000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Above 15000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.86	-

\* Capital investment of all the 1023 weavers was less than Rs.100/-.

Total expenditure incurred on setting up a durrie weaving unit was between Rs.501/- to Rs.1500/- while that of kharchag and thobies was less than Rs.501/- to Rs.1000/-. Fixed capital investment on durrie weaving units was between Rs.501/- to Rs.1500/- and the working capital came to less than Rs.500/-. The cost of looms varied from Rs.500/- and below to Rs.4000/- and Rs.500/- and below to Rs.4000/- had been spent on the accessories. For the kharcha and the thobi making units fixed and working capital came to Rs.500/- and below to Rs.2000/- respectively. The total capital investment of all the boru makers was less than Rs.500/-.

It was observed that the investment required for setting up a weaving unit depended on the type of floor covering to be woven. The results also showed that the expenses incurred on setting up a kharcha and thobi weaving unit were much less than those required for Tibetan carpet manufacturing units and chugdan units. Furthermore some respondents who made Tibetan carpets and chugdans did not incur any working capital since the yarn was supplied to them by the enterprenuers. Working capital of durrie weavers was directed only towards the purchase of dyes and chemicals required for dyeing. They were supplied yarn by the enterprenuers.

### 5.2.3 Constructional Features of the Floor Coverings

#### 5.2.3.1 Pile density of the floor coverings

The data showed that there existed a great diversification in the constructional features of the floor coverings manufactured in Himachal Pradesh. These features were pile density, pile height/thickness, size and the weight of the floor coverings.

It was stated by the respondents engaged in the manufacture of Tibetan carpets that these had a knot density of 48 knots per 2.50 cms square. The galichas were made with 48, 64, 100, 139, 144 and 256 knots to a 2.50 cms square while the knot density of the prayer rugs was 1296 knots per 2.50 cms square. The chugdangs woven by the respondents had 24 knots or loops per 2.50 cms square. The rest of the floor coverings made in the state were pileless.

#### 5.2.3.2 Pile height/thickness of the floor coverings

Pile height of the Tibetan carpets manufactured in the state was 9 to 15 mm while that of the galichas was 6 to 12 mms. Pile of the prayer rugs made in the state was about 3 mms and the chugdangs had a pile height of 12 to 18 mms.

Among the pileless floor coverings, durries were about 6 mms thick. The thickness of kharchas and namdas was between 6 to 9 mms. Thobies and borus were 3 to 5 mms and 3 mms thick respectively.

#### 5.2.3.3 Size and weight of the floor coverings

It was stated by the craftsmen that the weight of the floor coverings depended upon their size and the knot density of the floor covering. Tibetan rugs of .46x.46 m weighed less than 1 to 3 kgs while the weight of .61x1.52 m and .61x1.82 m carpet was 4 to 6 kgs (Table 15). A Tibetan carpet having 48 knots 2.50 cms square and made in .92x1.82 m size weighed between 6 to 8 kgs while a galicha made in .92x1.52 m size had a weight range of 21 to 23 kgs.

The weight of Tibetan carpets of 1.82x2.74 m was between 18 to 20 kgs but a superior galicha of the same size weighed as much as 45 kgs. The weight of the prayer rugs of .46x.61 and .61x.92 m sizes ranged from 1 to 3 kgs.

The size of the chugdangs ranged from .61x1.52 to .91x1.82 m and weight varied from 5 to 7 kgs. Durries were manufactured in two sizes i.e. 1.10x2.20 and 1.20x2.35 m and these weighed between 2 to 3 kgs (Table 15).

Kharchas were made in different sizes ranging from .91x1.52 to 1.52x2.13 m. The weight of a .61x1.52 and .76x1.52 m rug was between 4 to 6 kgs and a 1.22x1.82 m kharcha weighed 5 to 7 kgs (Table 15).

It was observed that the thobies were woven in three sizes. These were 1.00x2.83, 1.22x2.35 and 1.22x2.43 m. These weighed between 6 to 8 kgs (Table 15). Only two sizes of namdas were made in the state i.e. 1.22x1.82 and 1.82x2.74 m. The weight of a 1.22x1.82 m namda varied from 2 to 3 kgs while that of the 1.82x2.74 m was 6 kgs.

The sizes of the borug were .46x.61 and .61x.92 m and these weighed less than one kilogram (Table 15).

#### 5.2.3.4 Raw materials used

An inquiry into the materials used for manufacturing different types of floor coverings revealed that the types of fibres and yarns used for the floor coverings depended upon the type of the carpet or the rug to be woven.

It was stated by the craftsmen that cotton yarn was used for the warp and the weft in the manufacture of Tibetan carpets, galichas and chugdangs. Both the

Table 15 Size and weight of the floor coverings made by the craftsmen

Weight (kg)	Tibetan carpets	Galicha	Chugdan	Durrie	Kharoba	Thobi	Nanda	Boru
Size (Meters)								
1.000 kg and below	46x 46	-	-	-	-	-	-	-
1.001- 2.000	.46x.46	.46x.61	-	-	-	-	-	-
2.001- 3.000	.46x.46	.61x .92	-	1.10x2.20, 1.20x2.35	-	-	1.52x2.13	-
3.001- 4.000	-	-	-	-	-	-	-	-
4.001- 5.000	.61x1.52	-	-	-	.61x1.52, .92x1.82	-	-	-
5.001- 6.000	.61x1.82, .61x2.74	-	.61x1.52, .61x1.82, .76x1.82, .92x2.74	-	.76x1.52, .92x1.82, 1.22x1.82, 1.52x2.13	-	2.10x2.74	-
6.001- 7.000	.61x2.74, .92x1.82	-	.61x1.52, .61x1.82, .76x1.82	-	1.22x1.82, 1.52x2.13	1.00x2.43, 1.22x2.35	-	-
7.001- 8.000	.92x1.82	-	-	-	-	1.22x2.43	-	-
8.001- 9.000	-	-	-	-	-	-	-	-
9.001-10.000	.92x1.82, 1.22x2.13	-	-	-	-	-	-	-
10.001-11.000	-	-	-	-	-	-	-	-
11.001-12.000	-	-	-	-	-	-	-	-
12.001-13.000	-	-	-	-	-	-	-	-
13.001-14.000	-	-	-	-	-	-	-	-
14.001-15.000	-	-	-	-	-	-	-	-
15.001-16.000	-	-	-	-	-	-	-	-
16.001-17.000	-	-	-	-	-	-	-	-
17.001-18.000	-	-	-	-	-	-	-	-
18.001-19.000	1.82x2.74	-	-	-	-	-	-	-
19.001-20.000	1.82x2.74	-	-	-	-	-	-	-
20.001-21.000	-	-	-	-	-	-	-	-
21.001-22.000	-	.92x1.52	-	-	-	-	-	-
22.001-23.000	-	.92x1.52	-	-	-	-	-	-
23.001-24.000	-	-	-	-	-	-	-	-
24.001-25.000	-	-	-	-	-	-	-	-
25.001-26.000	-	-	-	-	-	-	-	-
26.001-27.000	-	-	-	-	-	-	-	-
27.001-28.000	-	1.52x2.13	-	-	-	-	-	-
28.001-29.000	-	1.52x2.13	-	-	-	-	-	-
29.001-30.000	-	-	-	-	-	-	-	-
Above 30.000 Kgs	-	1.82x2.74*	-	-	-	-	-	-

\* 45 to 48 Kgs



ILLUS. I. RAW MATERIALS USED FOR TIBETAN AN CARPETS



ILLUS.2. RAW MATERIALS USED FOR GULICHA



ILLUS.3. RAW MATERIALS USED FOR DURRIES



ILLUS.4. RAW MATERIALS USED FOR KHARCHAS



ILLUS.5. RAW MATERIALS USED FOR THOBIES.



ILLUS.6. RAW MATERIALS USED FOR NAMDAS

warp as well as the weft were made of 4 to 6 ply yarn of 20s or 30s. The yarn used for the pile was 2 ply wool of 20s or 30s. It was reported that 2 to 3 strands of wool yarn were used together in Tibetan carpets but for galichas single ply wool of 30s to 60s was used. Silk was used for warp, weft and the pile of the prayer rugs. The warp yarn used was of 6 or 8 ply and the weft yarn consisted of 4 ply. An extra weft yarn of cotton was used in both, galichas and prayer rugs. The respondents who wove Tibetan carpets used 1 to 3 kgs of cotton yarn and about 10 kgs of wool yarn in one month while the monthly consumption of galicha weavers was 3 to 5 kgs of cotton yarn and 8 to 10 kgs of wool yarn. The weavers who made prayer rugs used 20 to 40 gms of cotton yarn and 150 to 225 gms of silk yarn in one month. The quantity of cotton and wool yarn used by chugdan weavers in one month was 3 to 5 kgs and 6 to 14 kgs respectively.

Weavers of Tibetan carpets and chugdang who worked independently bought wool<sup>yarn</sup> from Panipat, Amritsar, Ludhiana, Manali and Beed. They bought cotton yarn at the rate of Rs.20/- to Rs.35/- per kilogram and the cost of wool yarn was Rs.60/- to Rs.110/- per kilogram. The craftsmen belonging to this category used Indian wool

which according to them was easily available, economical and was most suitable to the selling price of the floor coverings. The weavers who worked for other enterpreneurs were provided the yarn by the employers.

Durries were woven with 2 or 3 ply cotton warp yarn. The weft yarn too comprised of cotton. The weavers used 4, 6, 7 or 8 ply weft yarn for weaving durries. Depending on the number of looms owned, their work output and the number of persons working on one loom, the weavers were able to consume 35 to 105 kgs of yarn in one month. One respondent even used as much as 200 kgs of yarn in one month as his family members helped him in weaving. The craftsmen engaged in the manufacture of durries were supplied yarn by the Khadi Ashram.

Kharchas and thobies were made of thick home spun 2 ply wool yarn. Namdas were made from cotton and wool fibres which were felted together. The base fabric for borus was gunny bags or hessian cloth made of jute. Namdas and borus were embroidered with 3 to 6 ply of wool. Kharcha weavers used 6 to 25 kgs of wool annually; the amount of wool used being determined by the number of rugs woven in a year. Similarly, 15 to 35 kgs of wool yarn were consumed by the thobi makers in one year. Most of the kharcha and thobi weavers had their own sheep

and used the fleece for making these rugs. If required they purchased the fibres locally at the rate of Rs.20/- to Rs.25/- per kilogram. Depending on the availability of fibres namda makers used about 10 kgs of cotton and 70 to 90 kgs of wool in one month. They were provided the fibres by their employers. Boru makers used about 100 gms to 150 gms of wool yarn for embroidering one rug.

#### 5.2.4 Looms and Accessories Used by the Craftsmen

##### 5.2.4.1 The looms used

The data elucidated that depending on the type of floor covering manufactured, two types of looms, i.e. horizontal and vertical, were used by the craftsmen. The size of the looms varied according to the type and the size of floor coverings to be woven.

For weaving Tibetan carpets as well as galichas, vertical looms were used. Tibetan carpets were woven on 1.52x1.52 to 1.82x2.74 m or even bigger looms which were either frame looms or had been fixed into the ground. Fixed vertical looms of 1.22x2.74, 1.52x2.13 and 1.82x2.74 m were used for manufacturing galichas (Table 16). Prayer rugs were woven on fixed vertical looms of 1.37x1.52 m size. The price of Tibetan carpet

Table 16 Size and type of looms used for making floor coverings

Size of the Loom	Type of the Loom			
	Vertical Loom		Horizontal Loom	
	Tibetan carpet	Galicha Chugdan Durrie	Kharcha Thobi carpet	Tibetan Galicha Chugdan Durrie Kharcha Thobi carpet
36 cms	-	-	-	✓ - - ✓
41 cms	-	-	-	✓ - - ✓
1.20 m	-	-	-	- ✓ - -
1.35 m	-	-	-	- ✓ - -
.92 x	-	-	✓	- - - -
1.20 m	-	-	-	- - - -
1.20 x	✓	-	-	- - - -
1.52 m	-	-	-	- - - -
1.20 x	-	✓	✓	- - - -
1.82 m	-	-	-	- - - -
1.20 x	-	✓	-	- - - -
2.74 m	-	-	-	- - - -
1.52 x	✓	-	✓	- - - -
1.50 m	-	-	-	- - - -
1.52 x	✓	✓	-	- - - -
2.13 m	-	-	-	- - - -
1.82 x	-	-	✓	- - - -
2.43 m	-	-	-	- - - -
1.82 x	✓	-	-	- - - -
2.74 m	✓	-	-	- - - -

looms varied from Rs.400/- to Rs.800/-. The craftsmen got these made from local carpenters. As all the respondents engaged in the manufacture of galicha and prayer rugs had been employed, they were provided the required equipment by the enterprenuers.

Chugdang were woven by two techniques which have been dealt with in Section II of this chapter. Tibetan respondents used a .36 or .41 m wide horizontal loom for the purpose whereas the Indian craftsmen wove these rugs on vertical looms of 1.22x1.82 or 1.52x2.13 m. The price of horizontal looms was between Rs.400/- to Rs.550/- but the vertical looms had been made at the cost of Rs.400/- to Rs.800/-. The looms had been fabricated locally.

Durries were woven on 1.20 to 1.35 m wide pitlooms (Table 16). The weavers purchased the required parts of the loom such as reed from Ambala or Nahan and assembled it themselves. The expenses incurred on installing one loom ranged from Rs.400/- to Rs.800/-.

A horizontal loom was used for manufacturing kharchas. The size of the loom depended on the size of the rug to be woven. It varied from .92x1.22 to 1.82x2.43 m (Table 16). The craftsmen were able to fabricate the loom themselves at the cost of Rs.75/- to Rs.100/- only.

A narrow horizontal loom of .36 to .41 m width was used for making thobies. With an investment of Rs.50/- to Rs.75/- the respondents were able to make the loom themselves.

#### 5.2.4.2 The accessories used

The accessories used alongwith the Tibetan carpet looms were axis rod, heddle stick, shed stick, gauge rod, knife, pin needle, comb beater, mallet, shuttle, scissors and measuring tape. The craftsmen who worked for enterprenuers were provided all the required accessories by the employers. The ones who had their own weaving units purchased these from Amritsar, Panipat, Manali, Re Kang Plo or Rampur Bushahar.

The accessories required for weaving galichas and prayer rugs included comb beater, scissors, knife, shuttle and measuring tape. These were supplied to the craftsmen by their employers.

Comb beater, shuttle, scissors, gauge rod and measuring tape were the accessories needed for weaving chugdangs in the traditional (Tibetan) style. The respondents had bought these from Amritsar or Ludhiana. The accessories used for chugdangs in Indian style were the same as the ones used for Tibetan carpets.

The craftsmen engaged in durrie weaving made use of boat shuttle, bobbin, wooden plank, scissors, reeling frames, spinning wheel and measuring tape. The weavers purchased these from Ambala, Nahan, Paonta Sahib and Saharanpur or these were fabricated locally.

Shed sticks, heddle stick, batten, fork beater and measuring tape were the accessories used in the manufacture of kharchas and thobies. Besides these, hand card, drop spindle, and winder were required for spinning the yarn for these rugs. Most of the accessories were made locally but hand card, scissors, measuring tape etc. were purchased from Chamba, Rampur Bushahar, Manali, Keylong or Shimla.

Fork, mat and a stick were required for making felt for namdas. The respondents were provided these by the enterprenuers.

Embroidery of boru did not require any equipment except a needle which the respondents purchased from the local market.

### 5.2.5 Time Taken for Pre-Weaving, Weaving and Post-Weaving/Manufacturing Operations

#### 5.2.5.1 Pre-Weaving/Manufacturing operations

An inquiry into various pre-weaving, weaving and post-weaving/manufacturing operations carried out by the craftsmen revealed that different pre-weaving processes undertaken by them included grading, carding, spinning, plying, dyeing and warping.

It has already been stated that the yarn used for kharchas and thobies was hand-spun. Before spinning, the wool fibres were graded and carded. Grading and carding of wool for kharchas and thobies was done by women folk of the family. For carding, the respondents sought the help of their wives, sons or daughters. They reported that grading of wool for kharchas was accomplished in 1 to 6 days but for thobies 1 to 3 days were needed for grading and its carding required another 1 to 12 days (Table 17). For this, the respondents worked for 4 to 6 hours daily.

A minimum of 1 day and a maximum of 9 days was needed to spin yarn for one kharcha. Depending on the daily input of 3 to 7 hours, thobi yarn was spun in 19 to 45 days (Table 17). The process of plying the yarn for kharchas took 1 to 3 days while 1 to 9 days were

Table 17 Time taken for carrying out various pre-manufacturing and post-manufacturing processes

Time taken	Process				
	Grading	Carding	Spinning	Plying	Dyeing      Warping      Finishing
Less than 1 day	-	-	-	-	<u>Chugdan, thobi</u> Tibetan carpets, <u>galicha, chugdan, durrie, kharcha, thobi</u> <u>Chugdan, durrie, kharcha, thobi</u>
1 to 3 days	<u>Kharcha, thobi</u>	<u>Kharcha, thobi</u>	<u>Kharcha</u>	<u>Durrie, kharcha, thobi</u>	<u>Durrie</u> Tibetan carpets
4 to 6 days	<u>Kharcha</u>	<u>Kharcha, thobi</u>	<u>Kharcha</u>	<u>Durrie, thobi</u>	-      Tibetan carpets
7 to 9 days	-	<u>Thobi</u>	<u>Kharcha</u>	<u>Thobi</u>	-      Tibetan carpets
10 to 12 days	-	<u>Thobi</u>	-	-	-
13 to 15 days	-	-	-	-	-
16 to 18 days	-	-	-	-	-
19 to 21 days	-	-	<u>Thobi</u>	-	-
22 to 24 days	-	-	-	-	-
25 to 27 days	-	-	<u>Thobi</u>	-	-
28 to 30 days	-	-	-	-	-
31 to 33 days	-	-	-	-	-
34 to 36 days	-	-	-	-	-
37 to 39 days	-	-	-	-	-
40 to 42 days	-	-	-	-	-
43 to 45 days	-	-	<u>Thobi</u>	-	-

needed for thobi yarn. All the adult members of the family of the craftsmen helped in spinning the yarn for kharchas but the yarn for thobies was spun and plied only by the male members of the family i.e. fathers or sons of the respondents helped them with the spinning and plying of the yarn. Kharcha yarn was converted into two ply yarn by the respondents themselves or by their sons.

Durrie weavers were supplied undyed, single<sup>ply</sup> yarn which was dyed and converted into multi ply yarn by the craftsmen. The process of dyeing the yarns in different colours was accomplished in 1 to 3 days (Table 17). All the members of the family of the respondents rendered help in plying and dyeing the yarn. Plying of yarn took 1 to 3 days initially and when the weaving commenced the yarn was made into multi ply yarn while filling the bobbins. For this, the craftsmen wound yarn from 4 to 8 reeling frames on to one bobbin simultaneously. All the family members of the respondents family rendered help in dyeing and plying the yarn.

Most of the thobies were woven in natural colours though a few respondents dyed the yarn in red and green colour. The process of dyeing was executed by the craftsmen themselves in one day. Kharchas too were woven

in natural colours, using undyed yarns.

The yarns used for Tibetan carpets and chugdang were mill spun and mill dyed, hence the above mentioned processes were not required for these. Only one chugdan weaver, working at Tibetan Refugee Self Help Handicraft Society, Shimla, dyed the yarns used for weaving the rugs. She was able to complete the dyeing in one day. The respondents who had their own weaving units took help from their family members for winding the yarn into balls. In Tibetan weaving centres the balls were made by helpers while the craftsmen themselves made the balls in private enterprises and the government undertakings.

The respondents were able to complete the warping and dressing of loom for the woven floor coverings in one day. Time taken for warping depended upon the type and size of the floor covering and the number of floor coverings being warped at one time. Warping of Tibetan carpets took  $1\frac{1}{2}$  to 6 hours while warping of galichas required 4 to 7 hours. The craftsmen warped 4 cushion sized (.46x.46 m) Tibetan rugs in one warping but for all other sizes only one carpet was warped at one time. To make optimum use of the available looms the weavers at the Tibetan weaving centre, Dalhousie warped two

lengths of .92x1.82 m size carpets on a larger loom. Only one galicha or prayer rug was warped at one time. The process of warping chugdang took 4 to 5 hours and one full day was needed for warping durries. In one warping the respondents were able to warp 8 to 15 durries. Tibetan weavers were able to warp 4 to 6 chugdang in one warping. Similarly one thobi or kharcha was warped at one time but each thobi had 5 to 6 strips which were warped together.

The craftsmen who worked in weaving centres took help of other craftsmen during warping. The ones working at home were assisted by their family members in carrying out the process.

#### 5.2.5.2 Time taken for weaving/manufacturing

It was reported by the respondents that time taken for weaving one floor covering depended upon the number of weavers working on the loom, size and type of floor covering, pile density of the carpets and the daily input of the weavers.

The data revealed that carpet weavers were able to tie 3000 to 9000 knots in one day i.e. 4 to 9 hours. Majority of Tibetan carpet weavers (29.95 per cent) (Table 18) were able to make 6001 to 7000 knots daily

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Table 18 Daily output of weavers of Tibetan carpets,  
galichas and chugdang

Number of Knots Loops per Day	Weavers of Tibetan Carpets (%)	<u>Galicha</u> Weavers (%)	<u>Chugdang</u> Weavers (%)
Less than 3000	-	-	-
3000-4000	-	-	43.75
4001-5000	1.13	-	18.75
5001-6000	20.45	60.00	37.50
6001-7000	32.95	6.66	-
7001-8000	28.40	-	-
8001-9000	28.40	33.34	-

while 60 per cent of the galicha workers made 7001 to 8000 knots daily. Chugdan weavers tied 3001 to 6000 knots/loops per day.

Out of 88 respondents engaged in the weaving of Tibetan carpets only 30.18 per cent made rugs of .46x .46 m size. They took 5 to 15 days for weaving these (Table 19). Weaving of .61x1.52, .61x1.82, and .61x 2.74 m runners was completed in 15, 15 to 30 and 15 to 25 days respectively. For making a carpet of .92x1.82 m 9.54 per cent respondents required 15 to 45 days. For weaving larger carpets 2 or 3 weavers worked on one loom. There were 17.04 weavers who wove 1.82x2.74 m carpets. Taking help of one or two weavers the respondents finished weaving of one carpet in 46 to 75 days. It was reported that only 2.27 per cent of the weavers made 2.43x3.04 m carpets. They worked alongwith one or two more weavers to complete the carpet in 51 to 60 days (Table 19). Daily input of these weavers varied from 4 to 9 hours.

The time taken to complete one galicha depended upon its knot density. More time was required for weaving carpets having higher knot density. It took about 30 days to finish a .92x1.52 m carpet having 144 knots to 2.50 cms square when two weavers worked on it

Table 14 Time taken for the manufacture of different floor coverings

Time taken (days)	Tilghat Tilghat carpets	Gallaha wallum	Phojon vuguan	Murrie	Aharaha	Thobi	Nanda	Boru
	Size (Meters)							
Upto 5 days	.46x.46	-	.61x1.52, .61x1.82, .61x1.97	-	.92x1.82	1.22x2.31, 1.22x2.43	1.22x1.82, 1.62x2.74	-
6 to 10 days	.46x.46	-	.61x1.52, .61x1.82, .61x1.97, .92x1.82	-	.92x1.82	1.22x2.31, 1.22x2.43	-	-
11 to 15 days	.46x.46, .61x1.52, .61x1.82, .61x2.74	-	-	-	-	-	-	-
16 to 20 days	.61x1.82, .61x2.74, .92x1.82	-	-	-	-	-	-	-
21 to 25 days	.61x1.82, .61x2.74, .92x1.82	-	-	-	-	-	-	-
26 to 30 days	.61x1.82, .61x2.74	.92x1.52	-	-	-	-	-	.46x.61, .61x.92
31 to 35 days	.92x1.82	-	-	-	-	-	-	.46x.61, .61x.92
36 to 40 days	-	-	-	-	-	-	-	.46x.61, .61x.92
41 to 45 days	.92x1.82	-	-	-	-	-	-	.46x.61, .61x.92
46 to 50 days	1.82x2.74	-	-	-	-	-	-	-
51 to 55 days	1.84x2.74, 2.43x3.04	-	-	-	-	-	-	-
56 to 60 days	1.82x2.74, 2.43x3.04	.92x1.52, 1.52x2.13	-	-	-	-	-	-
61 to 65 days	1.82x2.74	-	-	-	-	-	-	-
66 to 70 days	1.82x2.74	-	-	-	-	-	-	-
71 to 75 days	1.82x2.74	-	-	-	-	-	-	-
76 to 80 days	-	-	-	-	-	-	-	-
More than 80 days	-	.46x.61, .61x.92 and Prayer rugs	-	-	-	-	-	-

but the same was woven in 60 days when the number of knots per 2.50 cms square increased to 256.

Time needed for weaving a 1.52x2.43 m carpet with 144 knots per 2.50 cms square, with two weavers working on it was 55 to 60 days. Since prayer rugs were of a superfine quality with 1296 knots to 2.50 cms square, it took 6 to 8 months to complete one rug. For making these only one weaver worked on one loom. These weavers put in 7 to 8 hours of work per day.

It was observed that 37.50 per cent of the chugdan weavers took upto 5 days to weave chugdang of .61x1.52, .61x1.82 and .61x1.97 m sizes while an equal percentage needed 6 to 10 days to weave these. Time required for producing a .92x1.82 m chugdan ranged from 5 to 10 days (Table 19).

The task of weaving .92x1.82 m kharchas was accomplished in 5 days by 36.36 per cent of the weavers. The rest of the respondents took 6 to 10 days to make a kharcha, daily input of the weavers being 6 to 7 hours.

Time taken for weaving 1.22x3.1 and 1.22x2.4 m thobies was about 5 to 10 days. A namda maker was able to make felt for one namda in  $2\frac{1}{2}$  to  $3\frac{1}{2}$  hours. Depending on the availability of fibres, in one day 2 or 3 namdas

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were made. Time taken for embroidering one namda depended upon the design but usually it was possible to embroider one namda in 2 to 3 days. The working hours of these craftsmen were 8 hours per day. Borus were embroidered by the respondents in their spare time. Working for half an hour to one and a half hour daily, they were able to complete one boru in one to one and a half month. Time taken for the embroidery depended upon the design of the embroidery and the daily input of the embroiderer.

Depending on the design, the respondents were able to complete weaving of one durrie in 2 to 9 hours. The weavers managed to weave 13 to 80 durries in one month. The production being dependent on the daily input of the weaver and the design of the floor covering. Majority of them produced 19 to 21 or 34 to 36 durries in a month. A maximum of 85 durries was produced by one weaver whose family members helped him in weaving. It was observed that the output of the weavers<sup>who</sup> made complicated designs, tended to farm operations or household work was less than the rest.

To study the relationship of different variables to the time taken for weaving Tibetan carpets and durries, co-efficient of co-relation was calculated. The results of the test have been given in Tables 20 and 21.

The data elicited that time taken for weaving Tibetan carpets had a negative co-relation to the number of weavers working on the loom, working hours per day and number of knots made per day (Table 20). An increase in these variables manifested in a decrease in the time taken for weaving Tibetan carpets. A marked co-relation of  $-0.45$  existed between the time taken for weaving and the number of weavers working on a loom. Similarly there was a marked co-relation of  $-0.52$  between the working hours per day and the time taken for weaving while it was negligible ( $-0.25$ ) between the number of knots made per day and the time taken for weaving. A high co-relation of  $0.60$  was observed between the age of the craftsmen and the time taken for weaving, signifying that with the increase in age the time taken for weaving Tibetan carpets also increased. Co-relation between the wages earned and the time taken for weaving was negligible (Table 20).

From Table 21 it can be observed that no significant relationship existed the age of the weavers, working hours per day, wages earned per month and number of durries woven in a month.

Table 20 Relationship between time taken for weaving  
Tibetan carpets and different variables

Variable		Coefficient of Co-relation
Age of the weavers	..	.60**
Number of weavers/loom	..	-.45**
Working hours/day	..	-.52**
No. of knots made/day	..	-.25*
Wages earned/month	..	.25*

\* Significant at .05 level of significance.

\*\* Significant at .05 and .01 levels of significance.

Table 21 Relationship between number of durries  
woven per month and different variables

Variable		Coefficient of Co-relation
Age of the weavers	..	.18
Working hours/day	..	.26
Wages earned/month	..	.26

#### 5.2.5.3 Post-weaving/Manufacturing operations

According to the craftsmen the post-weaving operations undertaken by them included trimming and contouring of carpets, knotting of fringes, stitching of strips and finishing of raw edges.

The respondents who worked at home reported that their husbands or brothers helped them with trimming and contouring of Tibetan carpets. A few of them also took help of professional trimmers for this. These trimmers worked on contract and were paid wages on piece rate basis. Knotting of the warp ends was done by the family members of the craftsmen. Stitching and finishing the edges of chugdang was undertaken either by the mother-in-law or the daughter-in-law of the respondents who also finished the warp ends of the rug. The process of stitching and finishing took about 4 hours. Trimming and contouring of Tibetan carpets was accomplished in 2 to 7 days while the time taken for finishing of warp ends was about half an hour. Finishing of durrles included knotting of loose warp ends. The operation was usually undertaken by the wives or the daughters of the respondents.

Strips of thobies were stitched together by the weavers themselves. It took about 2 to 3 hours to stitch

the rug and to finish its raw edges. Most of kharcha and boru makers executed the required finishing operations themselves which they were able to finish it in about one hour.

Nayyar (50) and Wani (76) reported that in Bhadohi and Kashmir, finishing operations were conducted by helpers. In Himachal Pradesh helpers and trimmers were employed only in the Tibetan weaving centres. According to Malhi (43) and Virk (75) durries in Ludhiana and Punjab were finished by the weavers themselves or by their family members, similar to the practice followed by durrie weavers of Himachal Pradesh.

#### 5.2.5.4. Pattern of weaving/manufacture

An inquiry into the methods adopted by the craftsmen for referring to the designs during manufacture elucidated that the weavers of Tibetan carpets worked out the design either with the help of designs illustrated on graph papers or by referring to old carpets. Galicha and prayer rug weavers copied the design from illustrated graph papers. The designs used for chugdang and durries were simple and repetitive in nature. Consequently the weavers did not need to refer to the illustrated graph papers or old floor coverings. They

simply worked out the design by counting the number of yarns. The weavers engaged in thobi weaving referred to old floor coverings during warping. Boru designs were copied from old textiles, carpet designs and design books.

The investigator found that the method of referring to the carpet designs in the state was different from the one mentioned by Chattopadhyay (16) and Dhamija (20). According to these authors talim system was used for weaving carpets in the state. It was also observed that the method of referring to the designs was different from the one followed in Kashmir (76) but was similar to the one used by Bhadohi (50) carpet weavers. In Punjab, durrie weavers referred to old floor coverings while weaving but the designs used by them were slightly different from the ones used by the weavers of Himachal Pradesh (43).

#### 5.2.5.5 Symbolism of the motifs, designs and colours

An inquiry into the awareness of the craftsmen regarding the symbolism of the designs, motifs and the colours used for making the floor coverings elucidated that only Buddhist weavers were aware of the symbolic significance. They were the craftsmen engaged in the

manufacture of Tibetan carpets and chugdans. Galicha weavers did not relate any significance to the motifs, designs and colours used by them for weaving carpets.

The data revealed that 72.72 per cent of the Tibetan carpet weavers, all Buddhists knew the symbolism attached to different motifs, designs and colours. It was seen that 44.31 per cent of them were aware of the importance of the dragon motif and 15.90 per cent knew the symbolism attached to the pheonix. Only one respondent was aware of the signiflcance of the sage and the deer design which had been adapted from thanka paintings. The respondents were aware of the seméotics of maroon, red, yellow, green and blue colours. A large majority of chugdan weavers, 68.75 per cent, also possessed knowledge about the signiflcance attached to different colours. Details of the symbolism of various motifs and designs has been discussed in Section III of this chapter.

#### 5.2.7 Production Pattern

When the pattern of production of different floor coverings was studied it was revealed that the craftsmen who worked independently produced floor coverings either in anticipation of demand or to cater to the orders placed by buyers.

Table 22 Distribution of craftsmen according to pattern of production of different floor coverings\*

Production Pattern	Tibetan carpet weavers	Galicha weavers	Chugdan weavers	Durrie weavers	Kharcha weavers	Thobi weavers	Namda makers	Boru makers	Total
Work for Employer	41.02	7.69	4.61	12.30	-	-	1.02	-	66.66
In Anticipation	4.10	-	3.58	-	7.17	8.20	-	1.02	24.07
On Order	2.05	-	3.58	-	-	1.02	-	-	6.66
Only for Self-Consumption	-	-	-	-	2.05	3.07	-	5.12	10.25

\* Multiple Responses.

The data showed that 66.66 per cent of the respondents worked for enterprenuers and manufactured floor coverings as per their requirements (Table 22). These craftsmen included weavers of Tibetan carpets, galicha weavers, chugdan makers, durrie weavers and namda makers. The percentage of respondents who produced carpets in anticipation of demand for these floor coverings was 24.07 per cent. This group was made of weavers of Tibetan carpets (4.10 per cent), chugdang (3.58 per cent), kharchas (7.17 per cent) and thobies (8.20 per cent) and borus (1.02 per cent) (Table 22). Another 6.66 per cent weavers manufactured floor coverings on order. These included weavers of Tibetan carpets and thobies. It was observed that 2.05 per cent of the craftsmen, all engaged in the weaving of Tibetan carpets executed orders as well as made these in anticipation of demand. Out of the total sample, 10.25 per cent respondents did not make the floor coverings for sale. This group was made up of kharcha makers (2.05 per cent), thobi weavers (3.07 per cent) and boru makers (5.12 per cent) (Table 22).

Nayyar had reported that in Bhadohi the weavers as well as the loom owners manufactured carpets only on order (50) but in Himachal Pradesh most of the

production was carried out in anticipation of a demand for it.

#### 5.2.8 Marketing Pattern

From the data it was elicited that 66.66 per cent. of the craftsmen worked for enterprenuers and carried out their orders (Table 22). The percentage of respondents who sold the floor coverings directly to the buyers was 23.50 per cent. These included weavers of Tibetan carpets, chugdans, kharchas and thobies and boru makers. Weavers also sold Tibetan carpets through government agencies and private firms (1.02 per cent each).

The buyers of Tibetan carpets were tourists visiting the area, army officers and Tibetan and Lahuli traders who either sold these in plains but smuggled most of these across the Tibetan border. Weavers also sold their products in the Lavi fair which was held every year at Rampur Bushahar in the month of November. Private firms from Panipat also bought these carpets. Galicha weavers worked for different enterprenuers who were responsible for marketing these.

Tibetan carpets were sold at the rate of Rs.75/- to Rs.100/- per 2.50 cms square. The selling price of chugdans was Rs.600/- to Rs.850/- per piece. Chugdan

weavers from Manali sold these to the tourists. In Tashi Jong and Chauntra the buyers of these rugs were Tibetan and Lahuli traders. These rugs also found a large market during Lavi fair.

The buyers of kharchas, thobies and borus were usually local people who did not practise the craft themselves. Kharchas were also sold during Lavi fair. The selling price of a kharcha varied from Rs.250/- to Rs.350/- and the thobies were sold for Rs.250/- to Rs.500/- per piece. Borus were sold at the rate of Rs.75/- to Rs.80/- a piece.

#### 5.2.9 Changes in the Manufacture of Floor Coverings

It was stated by the respondents that there had been a number of changes in the manufacture of floor coverings. These have been manifested in the type of fibre and yarn used, the pre-weaving and the post-weaving processes and the colours and designs used. In certain floor coverings the process of weaving has also undergone changes.

Earlier Tibetan wool was used for making Tibetan carpets. According to the craftsmen these fibres were longer, softer and had more luster than the ones used these days. The fibres were carded, spun and dyed at

home. The processes of making yarn was similar to the one used for spinning the yarn for kharchas and thobies. Natural dyes, either vegetable or mineral, were used for dyeing. Alongwith cotton yarn, the use of wool in warp and weft yarns was very common. In the post-weaving processes, earlier, trimming and contouring was done while the carpet was still on loom. Many types of decorative knots were used for making the fringes. These days a larger variety of colours and designs were being used. Some of the craftsmen were of the view that the bold, traditional designs of the past have now been replaced by pastel colours.

The changes which had taken place in the fibres and pre-weaving processes of chugdang were similar to the ones reported for Tibetan carpets. Earlier a larger variety of designs was used and the rug was finished by stitching a fabric binding all around it. These days the binding was rarely put.

Durrie weavers reported that the fibres used for durries were earlier carded by hand and the yarn was spun on a charkha. These days the use of Amber Charkha has become quite common for spinning the yarn for durries. Now a days a reed was used for beating the weft yarns instead of punja. Furthermore a wider range

of designs was used for making durries which has now been cut down to a few selected designs only.

Earlier the thobies were made with yak hair which were much longer, softer, lustrous and warmer than the goat hair which were being used these days. The fibres were now carded on machine but earlier a hand card was used to card the fibres. A larger variety of designs was used in the past but these days only one design was being used.

It was observed that some of the changes manifested in the manufacture of durries were similar to the ones reported by Malhi (43). These changes were reduction in number of colours and designs used for weaving durries.

### 5.3 THE TRIMMERS AND THE DESIGNERS

In order to gain an insight into the socio-economic aspects and the working pattern of all the personnel involved in the manufacture of floor coverings, the investigator also interviewed the trimmers and the designers working in the industry.

For this purpose, three trimmers, one each from Tibetan weaving centre, Satuan, Dalhousie and Shimla

and two designers, one each from Shimla and Dalhousie were interviewed. One of the designers was employed by the Tibetan weaving centre, Dalhousie and the other worked for the Himachal Pradesh Handloom and Handicraft Corporation, Shimla. The data elucidated that the trimmers were employed only by the Tibetan weaving centres. In the Carpet Production Centres, trimming and contouring of the carpets was done by the weavers themselves and the private enterprenuers either gave work to trimmers who worked on contract basis or the trimming and contouring was done by the weavers only. Similarly none of the weaving centres except the one at Dalhousie had employed any designers. The rest of them either copied from old floor coverings and made the design on graph papers themselves. Furthermore the designers interviewed for the study were employed not exclusively for designing carpets but they also made designs for Tibetan flags, shawls, wood carvings and did thangka painting.

### 5.3.1 Background Information of the Trimmers and the Designers

#### 5.3.1.1 Occupation of the respondents

A look into the annual work pattern of the respondents revealed that the trimmers took up a secondary

occupation as well. During winter months all the trimmers took leave and went to plains where they worked as traders. The designers did not have any secondary occupation.

#### 5.3.1.2 Sex and age of the respondents

It was observed that all the respondents, the trimmers as well as designers were men. Their age varied from 36 to 65 years. All the three trimmers were 56 to 65 years of age while the age of the designers was between 35 to 40 years and 60 to 65 years (Table 23).

#### 5.3.1.3 Caste and religion of the respondents

The religion followed by the respondents were Buddhism and Hinduism. All the respondents except the designer from the Himachal Pradesh Handloom and Handicraft Corporation were Buddhist. Nomads of Tibetan origin. The designer from Shimla was a Hindu farmer of Rajput origin.

#### 5.3.1.4 Education of the respondents

From the data it was found that the majority of the respondents were illiterate. All the trimmers and the designer from Dalhousie lacked formal education but the designer working for the Himachal Pradesh Handloom and

Table 23 Distribution of trimmers and designers  
according to age

Age (years)	Trimmers	Designers
	Number of Respondents	
Upto 35 years	-	-
36 - 40	-	1
41 - 45	-	-
46 - 50	-	-
51 - 55	-	-
56 - 60	2	-
61 - 65	1	1
Above 65	-	-

Handicraft Corporation was a graduate.

#### 5.3.1.5 Family composition and the monthly income of the respondents

It was seen that three trimmers came from joint families having 7 to 9 members. Both the designers had nuclear families and had 2 to 4 members.

The total family income of the respondents varied from Rs.501/- to Rs.3500/- per month. Monthly family income of two trimmers was between Rs.501/- to Rs.1000/- and each one of them had two earning hands in the family. There were three earning members in the family of the third trimmer and their total monthly income ranged between Rs.1501/- to Rs.2000/-. The designer working at Dalhousie had two earning members in his family and his total income was between Rs.1001/- to Rs.1500/-. The other designer working at Shimla was the sole earning member of his family and he earned Rs.3500/- per month (Table 24).

#### 5.3.1.6 Wages earned by the respondents

It was reported by the trimmers that they were paid wages on the basis of work done by them. The basis of payment was Rs.2.50 to Rs.2.80 for finishing a 2.50 cms square of the carpet. The designers were paid a fixed

Table 24 Distribution of trimmers and designers  
according to monthly family income

Monthly Income	No. of Earning Members	No. of Respondents	
		Trimmers	Designers
Rs. 500 and below	1	-	-
	2	-	-
	3	-	-
Rs. 501 - Rs.1000	1	-	-
	2	2	-
	3	-	-
Rs.1001 - Rs.1500	1	-	-
	2	-	1
	3	-	-
Rs.1501 - Rs.2000	1	-	-
	2	-	-
	3	1	-
Rs.2001 - Rs.2500	1	-	-
	2	-	-
	3	-	-
Rs.2501 and above	1	-	1
	2	-	-
	3	-	-

salary.

Depending upon the square cms of the carpet trimmed and contoured, the trimmers were able to earn Rs.401/- to Rs.500/- in a month (Table 25). The working hours of the trimmers were 9 hours per day.

Both the designers managed to earn more than Rs.500/- per month. The designer from Dalhousie earned a salary of Rs.600/- a month by working 9 hours in a day, while the salary of the one from Shimla was Rs.3500/- per month and his daily working hours were 8 hours.

The data showed that though the working hours of the designer working for the Handloom and Handicraft Corporation were less than that of the one working for Tibetan weaving centre, he was paid a better salary than the latter.

#### 5.3.1.7 Facilities provided

The respondents working in the Tibetan weaving centres were provided same facilities as the ones given to the weavers i.e. they were given free medical aid, free residential accommodation, free water and electricity, free education for their children and annual leave. The facilities provided to the designer

Table 25 Distribution of trimmers and designers  
according to wages/salary earned

Wages earned (Rs./Month)	Trimmers	Designers
	Number of Respondents	
Upto Rs.150/-	-	-
151 - 200	-	-
201 - 250	-	-
251 - 300	-	-
301 - 350	-	-
351 - 400	-	-
401 - 450	1	-
451 - 500	2	-
Above Rs.500/-	-	2

from Shimla were provident fund, annual leave, house rent allowance and medical aid.

#### 5.3.1.8 Place of learning the craft and the experience of the respondents

It was reported by the trimmers that they had learnt the craft at their respective weaving centres. It took them about 15 to 20 days to pick up the art of trimming and contouring but about six months were needed to master it. The experience of the trimmers varied from 12 to 23 years.

The designer working at the Tibetan weaving centre had learnt painting in a Buddhist monastery. He was basically a thanka painter who had mastered the art after 7 years of training. The designer from Shimla had learnt painting at the Arts College, Shimla. Basic knowledge of painting helped these designers to illustrate designs for carpets, an art which they had learnt only after taking up the designer's job. These designers had been practising the craft since past 14 and 17 years respectively.

All the respondents, the trimmers as well as the designers lacked practical knowledge of weaving. They had taken up their respective profession as it provided a means of livelihood.

### 5.3.2 Equipment Used

The equipment required for trimming and contouring carpets was provided by the weaving centres. This included scissors of different sizes, flat shears, iron comb, carpet brush and a broom. A stone was needed to sharpen the scissors. The constructional features of these have been mentioned in Section II of this chapter.

The designers needed water colours, graph papers, painting brushes, pencils, eraser etc. which were provided by the employers.

### 5.3.3 Pattern of Work

It was stated by the trimmers that they started working on a carpet by giving an initial trimming to the carpets. Then these were contoured. The process of contouring started from the guards and the borders of the carpet and later moved on to the field. Larger carpets were finished by 2 or 3 trimmers who worked together. Time taken for trimming a carpet depended upon the size of the carpet, its design and the number of persons working on it. Normally a carpet was finished in 3 to 7 days.

The designer made the design either by illustrating its one-fourth or one half portion. The colours to be

used were suggested through painting as well as by mentioning the shade number of the yarn from the shade card of carpet yarns. Depending upon the designs it took them 3 to 4 days to work on a design.

The designer from Dalhousie made the design as per requirements of his employers. Some times he tried to adopt designs of printed Tibetan textiles into carpet designs. The other designer consulted design books and other textiles for getting designs for carpets. He stated that aesthetic appeal and market value were the features which he kept in mind while designing carpets. Both these designers designed only Tibetan carpets though the Handloom and Handicraft Corporation also produced galichas in a few of its carpet production centres. The designer from Shimla was not aware of either the names or the symbolism of the motifs and designs which he made. He simply referred to these through design numbers. The designers working in the Tibetan centre knew the semiotics of the motifs, designs and colours used by him.

#### 5.3.4 Problems Faced by the Enterprenuers, Craftsmen, Trimmers and the Designers

An inquiry into the problems of the enterprenuers, craftsmen, trimmers and the designers revealed that the

following difficulties were faced by them:

- 1) The main complaint of all the respondents was the irregular and delayed supply of yarn. Earlier the yarn was purchased from Amritsar which was much nearer to them than Panipat from where most of the yarn was purchased these days as the yarn supplier had shifted to Panipat due to Punjab terrorism. The respondents stated that the suppliers were not prompt in their service which resulted in delayed supply of yarn.
- 2) A similar grievance was also felt by the manufacturers of namdas who worked for government undertakings. According to them they were unable to buy wool fibres at the competitive market prices as there was a sudden hike in the prices of wool and the present price was above the officially approved price slab for the purchase of wool fibres. Only a few businessmen were willing to sell wool at lower rates. Because of this they felt an acute shortage of fibres and were unable to put their resources to optimum use.
- 3) The units situated in the remote places faced the problem of lack of transportation. Roads to Lahul Spiti were open only for about 5 months in a year. The enterprenuer from Jahalman had to purchase the yarn from Panipat and bring it down to the weaving centre

during this period. Furthermore, ample amount of yarn had to be purchased which would see them through till the next season. Since no alternative means of transportation were available, a slight delay in the supply of yarn resulted in withholding the consignment till the next season. This difficulty was also encountered by the enterprenuers from Sarahan as well as the weavers who resided in remote villages in Kinnuar district.

4) Another problem faced by the respondents from the remote areas was the lack of communication facilities. There were no provision for telephone in Jahalman, Sarahan and different areas of Kinnuar district. Even the postal facilities were erratic in Jahalman and Kinnuar. Thus it was very difficult for the enterprenuers to establish communication with yarn suppliers, buyers, selling agents etc.

5) Some of the respondents complained regarding the supply of yarn which was uneven in thickness and dyeing. They reported that this problem had arisen ever since they started purchasing yarn from Panipat. Due to this, the manufacturers were not able to maintain consistency in the quality of their products.

6) It was stated by some of the enterprenuers that due to the steep rise in prices of wool in the past few months, it had become very difficult for them to cater to the existing orders within the price range specified earlier.

7) Incharge of the Carpet Production Centres engaged in the manufacture of galichas were of the view that the carpets manufactured by them were not able to compete with the ones woven at Amritsar. Hence it was difficult for them to find market outside the state. The reason given for this was the lack of variety in designs and fineness (knots per 2.50 cms square) of carpets.

8) The respondents felt that the existing marketing facilities were not adequate. The sales were maximum during the Lavi fair, where most of the carpets and chugdang were sold. This resulted in blocking the investment for the whole year. With continuous and regular marketing facilities some of the blocked investment could be channelised to create more resources. Moreover kharcha and thobi weavers had enough raw materials to make these rugs in larger numbers if they were assured of a market for these.

- 9) Some of the small scale enterprenuers and weavers of Tibetan carpets who worked independently experienced a lack of varlety in designs and found it difficult to get new ones.
- 10) Lack of trained weavers was another difficulty reported by the enterprenuers. Since most of the weavers working in these units were unmarried girls, they left their jobs as soon as they got married. The problem was very acute in Kangra and lower Chamba districts in the areas adjoining Punjab.
- 11) Some of the weavers working in galicha manufacturing unit were not paid their wages regularly. Their payment was held for six months.
- 12) Another problem faced by the carpet weavers was the lack of financial aid and the difficulty in getting financial aid. Some of the weavers were interested in starting their own business but were unable to do so because of lack of financial help and guidance regarding the same.

#### Suggestions given by the respondents

To overcome the problems faced by the respondents they had suggested certain measures. These have been

listed below:

- 1) The government should take immediate steps to check the steep rise in prices of wool.
- 2) Outlets to supply good quality wool at control rates should be opened at two or three places in the state. To ensure supply of good quality yarn having even thickness and level dyeing, the supplier should be made to adopt certain quality control measures.
- 3) Marketing facilities should be provided to small scale enterprenuers who face problem in marketing the floor coverings. Government should also try to develop transport and communication facilities so that supply of yarn, retailing and marketing of carpets would become easy.
- 4) To increase the sale of carpets, the Handloom and Handicraft Corporation should allow the Carpet Production Centres to accept orders from private buyers. Presently, they supplied carpets to government agencies and the State Emporia only which restricted their market.
- 5) By increasing the knots per 2.50 cms square and introducing new designs the carpets could be made export oriented. The enterprenuers were not willing to

adopt this unless they were assured of a market for such carpets though this definitely was a profitable preposition.

6) Local bodies should advertise the craft so that the tourists could visit the weaving centres and make purchases.

7) Thobi weavers were of the view that the manufacture of this particular rug was a dying tradition and unless steps were taken to commercialise the production, the craft might become altogether extinct.

## Section II

### MANUFACTURING TECHNIQUES OF FLOOR COVERINGS

One of the objectives of the investigation was to study the techniques used in the manufacture of different floor coverings in Himachal Pradesh. The investigator studied these techniques by interviewing the craftsmen and through simple and participatory observation method.

It was stated by the craftsmen that the techniques adopted for manufacturing the floor coverings depended upon its type. To acquire a deeper and comprehensive

understanding of the manufacturing processes, these have been dealt with individually. These have been discussed under the following heads:

- The equipment used
- Pre-weaving/Manufacturing processes
- Weaving/Manufacturing processes
- Finishing processes.

#### 5.4 MANUFACTURE OF TIBETAN CARPETS

Tibetan carpets of medium quality were woven all over the state. The knot density of these carpets was 48 knots per 2.50 cms square. These were known as sabdan in Tibetan, Kinner and Lahuli language but were simply referred to as dalicha in other districts. The most popular size of these was .92x1.82 m or the bed size but these were made in other sizes as well. The square rugs were locally known as gdan. Weaving of Tibetan carpets was carried out by Tibetan as well as Indian weavers.

##### 5.4.1 The Equipment Used

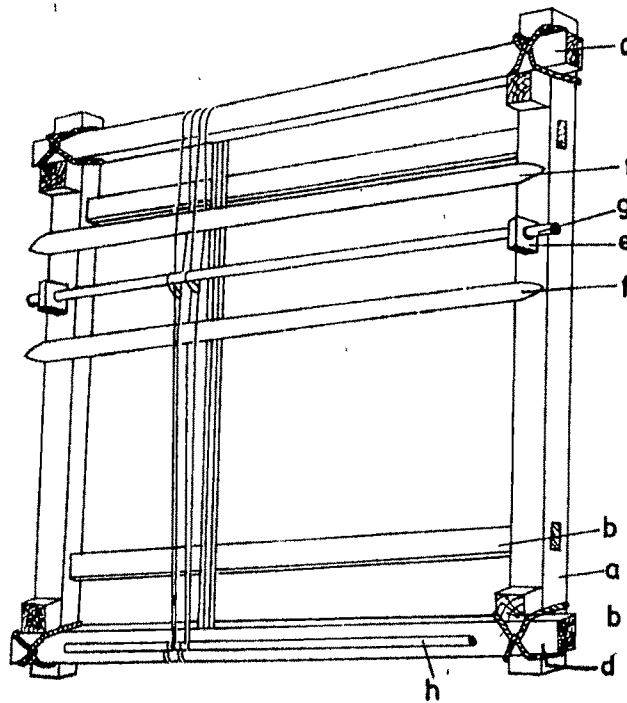
###### 5.4.1.1 The loom used

A vertical loom called thagcha or thagktri in Tibetan, was used for weaving these carpets. The loom (Figure 17)

consisted of two thick wooden planks 'a' in which tenons of two widthwise beams 'b' had been inserted. On this vertical frame, the warp and the breast beam 'c' and 'd' were held together with the help of four wooden pegs 'e' mortised in the upright bars of the loom. The warp beam was placed on the upper two pegs of the loom whereas the lower two pegs held the breast beam. In large looms these pegs had been replaced by a nut and bolt arrangement. The warp and the breast beams were longer in width than the cross beams, projecting outwards on either side of the loom. With the help of a rope these were firmly tied to the frame. About half way through the length of the upright bars, two wooden pegs, having holes were inserted. These held the heddle stick which was pushed through the holes of the pegs. Some of the larger looms had been provided with several mortises to hold the warp beams of smaller sized carpets, thus facilitating the use of these looms to weave carpets of smaller size as well.

These looms were made in the standard sizes ranging from 1.22x1.82 to 1.52x2.13 m and the large sizes according to requirement of enterprenuers. During weaving, frame looms of standard sizes were supported against a wall but the larger looms had to be firmly secured to the floor with iron clamps.

FIG.17 LOOM USED FOR WEAVING TIBETAN  
CARPETS



a. Lengthwise beams b. Widthwise Beams c. warp  
beam d. Breast Beam e. Pegs f. Shed sticks  
g. Heddle stick h. Axis rod .

#### 5.4.1.2 The accessories used

The structural and functional details of the accessories used in the manufacture of Tibetan carpets have been described below:

- i) Axis Rod (Hrok) - The axis rod, a metal rod of about 1.25 cms in diameter, held the warp threads on a dressed loom. This was placed at a distance of about 7.50 to 10 cms from the breast beam and it kept the front and the back warps in place, preventing these from unravelling (h, Figure 17).
- ii) Shed Stick (Wolu) - Two shed sticks, a little wider than the carpet and about 5 cms in length were used to separate the odd warp yarns from the even. For easy movement of sticks between the warps, the ends of these were made pointed (f, Figure 17). Sometimes the lower shed stick was replaced by two shed sticks.
- iii) Heddle Rod (Nenyu) - Heddle rod was a horizontal wooden rod of about 5 cms length. Yarn leashes holding even set of warp yarns were wound around this rod (g, Figure 17). By pulling the heddle rod, odd and even warp yarns could be held apart to form a shed.
- iv) Shuttle (Phushing) - Simple flat sticks of about 30 to 46 cms length were used for holding the weft yarn



PLATE 1. ACCESSORIES USED FOR WEAVING  
TIBETAN CARPETS

during weaving. To facilitate winding of the yarn a V-shaped notch was given at the either end of the shuttle. Some weavers used a pair of shuttles to throw the weft across the shed whereas some did not use any shuttle at all, making do with a ball of yarn only.

v) Comb Beater (Tuk) - A forked comb beater was used for pressing down the weft yarns firmly. About 15 cms long, the beater comprised of a straight handle and a solid wooden head into which the curving teeth of the beater had been fixed.

vi) Gauge Rod (Chada) - A thin metal rod, about one quarter of an inch in diameter was used for knotting the pile yarns. To make the process of cutting the pile easier the rod had a groove in its centre, along the whole of its length.

vii) Mallet (Thowa) - Mallet was used for pressing the knots firmly against the woven portion of the carpet. It was a wooden hammer, with a heavy head which tapered into a wedge shape on one side.

viii) Knife (Thi) - A small flat knife was used to cut the pile yarn which had been knotted on the gauge rod. Sometimes the knife and the pin needle were combined

together.

ix) Pin Needle (Nyung gli) - A sharp needle, 10 to 12 cms in length with a wooden handle at one end was used to open out and spread the pile yarns evenly. Sometimes the pin needle and the knife were combined together with the handle of the pin needle being replaced by a sharp, flat knife used for cutting the knots of the pile.

x) Scissors (Jemtse) - Different sizes of scissors were used for trimming, embossing and contouring the pile of Tibetan carpets.

xi) Flat Shears (Jemtse) - These shears had about 15 to 17 cms long blades and raised handles which facilitated trimming. These were used for giving the final trimming to the carpets. The longer handles resulted in evenly cut pile.

xii) Saw Toothed Comb - A metallic saw toothed comb was used for teasing the pile of carpets. The comb had saw like teeth at one end and a handle was put at the other end. When it was moved through the pile of the carpet, it removed all the loose fibres and yarns and opened up the pile.

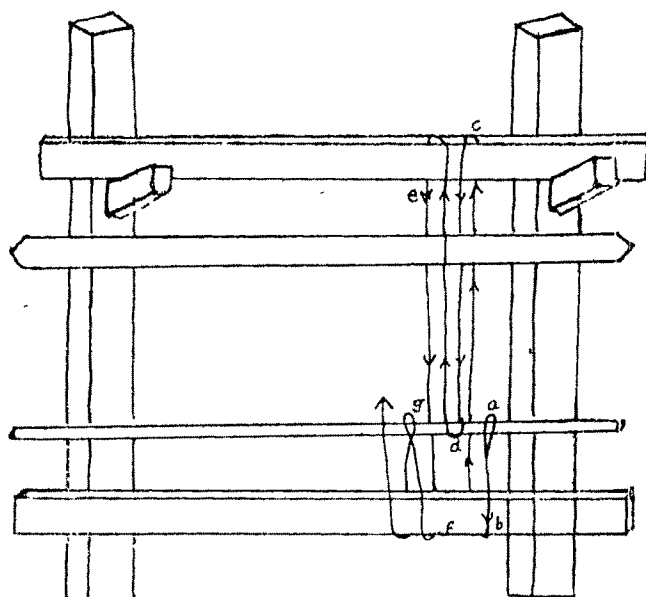
Other equipment needed for making Tibetan carpets included a lever (usually 60 to 90 cms long piece of wood) used for stretching the warps, a carpet brush and a broom to clean the carpets during trimming and contouring, few wooden wedges for packing and a stone or a slab which was used to sharpen the scissors.

#### 5.4.2 Pre-Weaving Processes

##### 5.4.2.1 Warping

Warping of the vertical loom for weaving Tibetan carpets was done by directly stringing the yarns onto the loom. For this purpose the loom was either put against a wall or it was laid flat on the ground. The upper shed stick was laid across the frame at a distance of about 30 cms from the warp beam and the axis rod was kept 7.5 to 10 cms above the breast beam (Figure 18). The yarn was rolled into a ball and kept at hand. To begin warping, the loose end of the warp yarn was tied to form a loop which was slipped on to the axis rod (Figure 18a). The yarn was guided over and under the breast beam (Figure 18b), led towards warp beam, under and over it (Figure 18c), under the shed stick, around the axis rod (Figure 18d), back over the shed stick, over and under the warp beam (Figure 18e), under the

FIG18 DETAILS OF WARPING OF TIBETAN CARPETS



shed stick and axis rod and under and over the breast beam (Figure 18f) and then back to the axis rod (Figure 18g). In this manner one mounting cycle of the warp was completed, which was followed by other cycles till the desired width was obtained. The length of the warp depended on the distance between the warp and the breast beam. The warping moved from right to left. When required number of warp yarns had been mounted on the loom the end of the yarn was made into a loop which was slipped on the axis rod. The mounted yarns were spread evenly along both the beams. Along the breast beam the yarns were splayed to make these equal to the desired width of the carpet whereas on the warp beam, these were kept slightly apart so that the width was 5 to 6 cms more than the intended width of the carpet. This was done to keep an allowance for drawing in of the edges by the weft yarns during weaving. For making the selvedge, 6 or 8 strands of yarn were used together.

In the next step the yarns were put under tension by stretching. For this purpose the breast beam was pressed down with a wooden lever and wooden wedges were inserted between the beam and the pegs. This packing was done on both the sides of the loom. Adjusting warp yarns to correct tension was very important because if the

tension was kept slightly less than the required, it led to carpet being crooked and extra stretch resulted in breaking of the yarns. After this, the lower shed stick was inserted and the shed was opened to tie the heddles. A heddle stick was held in the left hand and a loop of an extra yarn was slipped over it. Since the even yarns had already been raised by opening the shed, each one of these was strung by passing the yarn loop through an even warp and the heddle rod alternatively and then pulling the yarn to tighten these a little. These loops were held in place, albeit a little loosely, by tying an extra yarn across the length of the heddle stick. After finishing this, the shed was closed. In some establishments the heddle stick was attached to a harness which controlled the movement of warp yarns.

Normally two people did the warping although even one person could dress the loom. For dressing larger looms, minimum of two persons was necessary.

#### 5.4.3 Weaving Technique

The weaving technique used for manufacturing Tibetan carpets has been discussed under shed formation, formation of edge & end binding, knotting, weaving cycle and weaving.

#### 5.4.3.1 Shed formation

In Tibetan carpets the shed and the counter shed were formed by manoeuvring the shed sticks. The shed sticks were operated in the following manner:

i) To form the shed, the lower shed stick was twisted to the horizontal, along its axis. This lifted a set of warp yarns and a shot of weft was thrown across the shed. The shed stick was then twisted back to its vertical position. The lease was then brought down with a stick and the weft yarn was beaten back. The lower shed stick was then withdrawn.

ii) The counter shed was formed by pulling the heddle rod towards the weaver and simultaneously inserting the lower shed stick gradually. To feed the whole of the shed stick, the manoeuver was repeated several times at different positions along the heddle rod. In some instances weavers used two small shed sticks instead of one long one. This was also true when more than one weaver worked on one loom. In looms having harnesses the counter shed was formed by pulling down the stick attached to the harness towards the worker. This opened the second shed, the lease of which was brought down by introducing the lower shed stick which had been taken out. After throwing a shot of weft yarn, the lease was

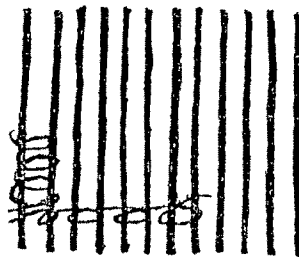
brought down and beaten.

In this manner the weaving progressed, interspersed by knotting cycles.

#### 5.4.3.2 Formation of edge and end binding

In order to check the ravelling of weft yarns one or two rows of Egyptian knots were made at the either end of the carpet. Before commencing the actual weaving, the weavers tied an extra yarn to the extreme left warp yarn at a distance of about 7.5 cms from the axis rod. This extra binding yarn was taken around a pair of warp yarns in the front (Figure 19), behind the next pair, then turning back, the yarn was led around the second pair of warps. By separating the yarns from the lower edge of the binding, it was again taken to the back. The yarn was then taken through the next pair and turned around it in front, going back from left to the right across the whole width of the carpet. At the end, the yarn was tied to the extreme right warp yarns and was then cut off. In case another row of Egyptian knots was needed the binding yarn was turned back instead of cutting it and then the process was again repeated, the work now moving from the right to left.

FIG.19 FORMATION OF EDGE AND END BINDING OF  
TIBETAN CARPETS



After binding, a 2.5 to 4 cms long strip of plain weave was woven. This acted as a base for beating the first few rows of knots. To reinforce the selvedge, a yarn of the field colour was wound around the selvedge yarns and one or two warps. Similarly, a second yarn was introduced at the other side of the carpet and as the weaving progressed these yarns moved upwards along-with. Sometimes a loosely twisted cord, slightly thicker than the binding yarn, was also used for the purpose. After finishing the whole of the pile, a strip identical to the one woven at the lower end of the carpet, was woven. The loom operations of the Tibetan carpets ended with binding one or two rows of Egyptian knots at the upper end.

#### 5.4.3.3 Knotting

When the required length of plain weave had been obtained at the lower end of the carpet, knotting of the pile was started. The knots used for making the pile was 'senna' knot or the Turkish knot (Figure 20). Tibetan technique of tying knots was different from the popular Indian technique of tying individual knots. In this the weavers used a gauge rod and the knots were cast on this rod, progressively moving from left to right.

FIG 20 THE TURKISH KNOT

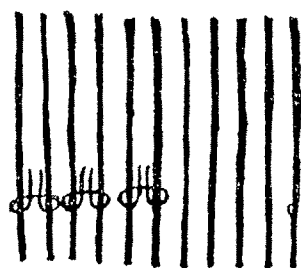
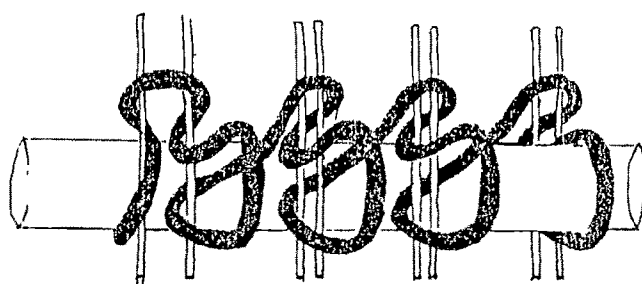


FIG. 21 STRUCTURE OF TIBETAN CARPETS



a. Knotting



b. Cross-Section

To start with, the selvedge on either side was woven with binding yarns. For knotting the weaver held the gauge rod in the left hand, at right angles to the warp yarns. The pile yarn was introduced by twisting two strands of it around the extreme left warps once or twice so that it did not ravel. Next, two pairs of warps were separated and the pile yarn was taken to the right side at the front, a part of it still being loosely held with the left thumb and the index finger. Then a loop of the pile yarn was introduced from the back of two warps, passed beneath the pile yarn and slipped on to the gauge rod. The pile yarn was then pulled to tighten the loop. The next pair of warp yarns was taken up and knotted. The last knot of a particular colour ended by leaving or cutting the pile yarn either above or below the gauge rod. The next colour was introduced by twisting the pile yarn around two warps and the knotting proceeded in this manner.

#### 5.4.3.4 Weaving cycle

The weaving cycle of the Tibetan carpets consisted of warp and weft to form the backing of the carpets and knotting of the pile. The steps included in the weaving cycle of the Tibetan carpets were:

i) To begin with, a row of knots was tied in the following manner:

- a) Winding the selvedge binding
- b) Making a row of knots
- c) Beating these down with a mallet

ii) The first shed was formed and a shot of weft yarn was thrown across it. The shed was closed and the weft was firmly beaten back. Gauge rod was then beaten with a comb beater and the knots were cut. Later, the pile was opened out and trimmed.

iii) Another row of knots was formed, beaten, cut, spread and trimmed.

iv) Counter shed was opened and a weft yarn was passed through it. The weavers then closed the shed and beat the weft firmly.

#### 5.4.3.5 Weaving

After the whole row of knots had been made, these were firmly beaten back with a mallet. Then as required, either the shed or the counter shed was formed and a shot of double strand weft yarn was thrown across it. The yarn was then beaten by bringing the lower shed stick downwards. After the shed had been closed, the weft



PLATE 2. A TIBETAN CARPET WEAVER AT WORK



PLATE 3. KNOTTING OF PILE IN TIBETAN CARPETS

was again beaten, this time with the comb beater. The teeth of the beater pushed through the warp yarns and since it was brought downwards with force, the weft yarn was deeply embedded into the previous row of the weft. The process was repeated twice or thrice across the whole width of the carpet. The knots were then cut by moving a sharp knife over the knots of the gauge rod. To cut the knots in a straight line the weavers made use of both the hands, carefully pressing the knife firmly across the knots in a straight line. The pointed end of the knife or the pin needle was then used to disentangle the pile and open it so that it would spread out evenly on the surface. The loose ends of the pile were then trimmed with a pair of scissors. This completed only half a weaving cycle, the other half being carried out after knotting of the next row of pile. The process was repeated till the required length of the pile for the carpet had been woven. Then, plain weaving was done for another 2.5 to 4 cms after which a row or two of Egyptian bindings were made.

When more than one weaver worked on one loom, individual gauge rods of smaller length were used. In such instances, one weaver would start knotting from the extreme left and the others started from the centre

or the one-third portion along the width all of them moving from left to right. When the pile yarn was too thin or when a carpet of heavier weight was needed three strands of yarn were used for making pile. The weavers used either old carpets or illustrated graph papers for referring to the design. The balls of wool were kept in a wooden box or a carton, towards the right of the weavers. When the woven portion reached the eye level of the weavers or when the weavers felt <sup>the</sup> need, the wooden wedges between the breast beam and the pegs were removed to feed more warp length for weaving. Later the warps were again stretched. When the desired amount of pile length had been woven, the end was woven in plain weave and Egyptian binding was done. Later the heddles were cut and the sticks were removed. Finally, the extra length of the warp yarns was cut at both the ends and the carpet was removed from the loom. An alternate method was to loosen the warps by removing the packing and slipping the carpet off the beams.

The method of manufacturing Tibetan carpets was different from the one used for making carpets in Kashmir (76), Bhadohi (50) and Punjab (75). While discussing the carpets of Himalayan region Dhamija (19) has explained this method of weaving carpets which was

prevalent along the Himalayan range starting from north and moving towards the north east. Chattopadhyay has also made a mention of this type of carpet weaving which was practised by Bhutias and the Tibetan settlers residing in Darjeeling hills (17). The same technique was used to make carpets in Nepal (53). There has been a slight change from the method of weaving mentioned by Denwood (18) who studied the traditional Tibetan carpets. This change has been mainly in the accessories used for beating the pile and the weft yarn.

#### 5.4.4 Finishing of Tibetan Carpets

Finishing of Tibetan carpets included processes such as teaseling, shearing, contouring and knotting of fringes. These operations helped in improving the appearance of the carpets.

##### 5.4.4.1 Teaseling

For teaseling, the carpet was put flat on the floor and the saw toothed comb was dragged along its surface. The operation scrapped off any loose yarns, fluff and lint which might have settled on the carpet surface. At this juncture the trimmer or the shearer even used a broom to clean the carpet surface.

#### 5.4.4.2 Shearing

After teaseling, the carpet was shorn to get a smooth and levelled pile. A special pair of flat shears was used for this. The handle of the shears was raised to enable the shearer to use his hands to clear the shorn pile lint simultaneously.

#### 5.4.4.3 Contouring

Contouring of Tibetan carpets was done to delineate the pattern. A highly skilled operation, contouring involved belevelling the carpet surface at points wherever the colours changed. To begin with, the shearer clipped away pile yarns at the junction of two colours by holding the scissor blades vertically and carefully trimming the pile diagonally. Later the whole pattern was was contoured but the cuts given along the rest of the designs were not as deep as the initial cuts. The shearer always kept a broom within easy reach to clean the carpet surface and judge the results as the work progressed.

#### 5.4.4.4 Knotting of fringes

After contouring, the loose warp ends on both the ends of the carpet were knotted. Usually simple knots were tied by taking three or four yarns in either hand

and knotting these with one another. Sometimes decorative knots were put. This was the last carpet manufacturing operation.

At this juncture the carpets were inspected for any manufacturing defect. Later these were labelled and stored by putting these flat on the floor, one on top of another.

While discussing the finishing processes of Tibetan carpets Denwood (18) has mentioned that these carpets were shorn and contoured on the loom itself. The investigator found that it was the traditional method of finishing of Tibetan carpets which was not used any more. As explained earlier, these days the carpets were put flat on the floor for shearing and contouring.

## 5.5 MANUFACTURE OF GALICHAS

Galichas of fine and superfine quality were woven in Himachal Pradesh. The weaving of this type of carpets centred around Kangra district. In the local language these were known as dalicha also. Besides carpets, prayer rugs in silk were also made. The size of the carpets varied from .92x1.52 to 1.82x2.43 m or even bigger and the prayer rugs were made in .46x.61 and .61x.92 m sizes.

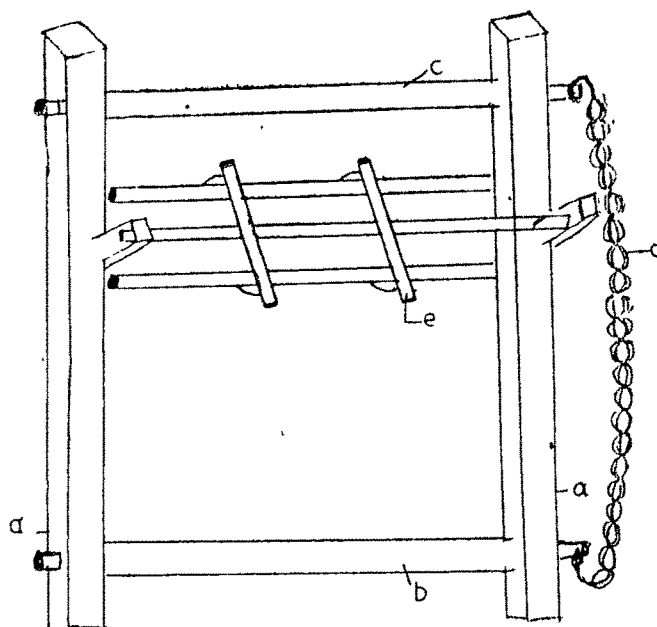
### 5.5.1 The Equipment Used

#### 5.5.1.1 The loom used

For weaving galichas a vertical loom called khaddi was used. The loom consisted of two mortised vertical beams (Figure 22 a) fixed in the ground. Two portable horizontal rollers were tenoned through these beams. The breast roller (Figure 22 b) was fixed at a distance of 45 to 60 cms from the ground, whereas the warp roller (Figure 22 c) was kept at a distance of about 2.13 m from the ground. The distance between the two rollers was dependent on the length of the carpet. In prayer rugs the warp roller was put at a height of 1.22 to 1.52 m. The upper roller had holes through which a chain called sangal (Figure 22 d) was inserted. The sangal held the warp yarns under tension. Extra length of warp was rolled on the upper roller whereas the lower one held the woven carpet.

The loom operations were manoeuvred by harness sticks called makre (Figure 22 e). A bamboo stick held on two pegs about halfway through the loom acted as a harness. The weavers sat on a wooden plank supported by two iron hooks hung from the ceiling or on some kind of raised surface.

FIG.22 LOOM USED FOR WEAVING  
GALICHAS



a Vertical Beams   b Breast Roller  
c.Warp Roller   d Chain   e Makre

#### 5.5.1.2 The accessories used

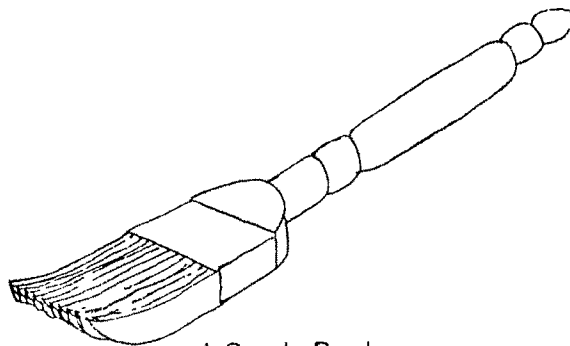
The accessories used for the manufacture of galicha have been listed below:

- i) Axis Rod (Saria) - An iron rod of about half an inch diameter was used to separate the odd and even set of yarns.
- ii) Heddle Stick (Soti) - A wooden rod of 6.5 to 7.5 cms diameter was used as a heddle stick. Thread heddles which held the even warp yarns were looped through this rod.
- iii) Shed Stick (Soti) - A 5 cms long flat wooden piece, slightly wider than the carpet width was used as a shed stick. The ends of the shed stick were usually made pointed to facilitate easy mobility through warp yarns.
- iv) Wooden Plank (Phatti or Panakh) - A flat wooden plank of 17.5 to 20 cms in length and as wide as the rug was used as a tenter to keep the woven portion stretched. The plank had sharp nails on either side and it was inserted in the woven pile of the rug. This accessory was used only by the weavers engaged in making prayer rugs.
- v) Shuttle - The weavers used stick shuttle to hold the weft yarn. It had V-shaped notches at either end

FIG.23 ACCESSORIES USED FOR GALICHAS



a Knife



b. Comb Beater

which made the winding of yarn easier. Yarn for making the prayer rugs was held on shuttle bobbins.

vi) Knife (Chaku) - A sickle shaped knife with a sharp outer edge was used for cutting the pile yarn during knotting. The shape and the method of using the knife was different from the one used for Tibetan carpets (Figure 23a).

vii) Scissors

viii) Flat shears (Vadi Kainchi)

ix) Comb Beater (Punja)

x) Saw Toothing Comb

The structural and functional features of the accessories listed from vii) to x) have already been explained in 5.4.1.2. Besides these a measuring tape, a carpet brush and a broom and a stone for sharpening the scissors were also used.

## 5.5.2 Pre-Weaving Processes

### 5.5.2.1 Warping

Warping of these carpets was done on two vertical

beams fixed in the ground. The distance between these depended upon the length of the carpet. Extra length of warp yarns slightly more than the distance between the two beams of the loom was taken to enable the warp yarns to be rolled on the warp beam. For warping, one end of the warp yarn was tied to one of the poles and the ball of yarn was carried over to the second pole. There it was taken around the pole and moved back and forth around the two poles till the requisite number of yarns had been warped. This was determined by the density of knots and the width of the carpet. For the selvedge 6 to 8 strands of yarn were warped. Sometimes the weavers used a thick cord of cotton to reinforce the selvedge.

After the warping had been completed the yarns were transferred to the rollers of the loom. Here the yarns were spread evenly on the rollers. The axis rod and the shed stick were introduced. The heddles were tied by introducing the heddle stick from the left side. For making the heddles, each yarn of the odd set of yarns was picked and looped through the heddle stick with the help of an extra yarn. In some looms two heddle sticks were used; one each for the odd and the even set of warp yarns. The heddle sticks were later tied to the

harness. If only one heddle stick had been used the even set of warp yarns were put on a shed stick. Tension of the warp yarns was then adjusted and the iron chain was put on the warp roller.

Usually warping operation was carried out by two or three persons. Some weavers dressed the loom directly by winding the warp yarns around the breast beam and the warp beam of the loom. For weaving the prayer rugs harness was not used. A shed stick was used to open the sheds instead. In such cases the heddles were tied only around even set of warps. Since weaving of prayer rugs was very fine and the designs were very intricate, marks were put at every inch of the warp yarns. Similarly, the borders were also marked in the lengthwise as well as the widthwise direction, so that the weaving was consistent and evenly spaced and any irregularity in weaving could be checked at the earliest.

### 5.5.3 Weaving Technique

#### 5.5.3.1 Shed formation

In the manufacture of galichas the movement of warp yarns were controlled by harness or the shed stick and the heddle stick. These were operated in the following manner:

i) In the looms having harnesses the first shed was formed by pulling the harness stick downwards. This lifted one set of warp yarns and opened the shed. Where there were no harnesses the shed was formed by bringing down the shed stick and rotating it to the horizontal. After throwing the weft yarn across the shed, it was closed by putting back the harness stick to its original position or by twisting the shed stick to the vertical.

ii) The counter shed was formed by moving the harness stick upwards, away from the weaver. Alternatively, where there was no harness, the heddle stick was lifted to separate the yarns to form a shed. After the weft had been thrown across the shed, the lease was brought forward and beaten before closing the counter shed.

#### 5.5.3.2 Formation of edge and end binding

To make the edges of the galichas three or four strands of woollen yarn were used. The colour of this yarn was similar to the one used in the field of the carpet. This yarn was wound and looped around the selvedge and two or three warp yarns of the carpet. In Bod, the weavers used an extra cord to reinforce the selvedge. As the weaving progressed this cord, along with the binding yarn, moved upwards. The second selvedge was

also bound in a similar manner.

For making the edges at the two ends of the carpet, the weavers did 3.5 to 5 cms of plain weave with a woollen weft. This yarn was also of the same colour as the field of the carpet. Knotting of the pile commenced only after this as the plain weave acted as a base against which the weft yarn was beaten back during weaving of carpets. After weaving the requisite length of a galicha, 3.5 to 5 cms of plain weave were made at the other end of the carpet also. At the end of edge formation the yarn was cut off.

#### 5.5.3.3 Knotting

For making the pile of the galichas the 'senna' knot was used. Though the same knot was used for making the pile of the Tibetan carpets as well, the technique of knotting the two differed from each other. In Tibetan carpets a gauge rod was used for making the knots which was not the case in galichas.

Before starting the process of knotting a shot of extra weft yarn was thrown which served as a base for the knots. For making a knot, the weavers held the pile yarn in the left hand and the knife in the right. For

knotting, the loose end of the yarn was passed between the first and the second warp yarns, taken under the first yarn, over the first and the second yarn and again brought out through the first and the second yarn (Figure 20 ). The knot thus formed was pulled down against the previously woven plain weave binding. On reaching the base the knot was given one final tug and was cut with the help of the knife held in the right hand. Same way the knotting was done for the third and the fourth warp yarns and the process was repeated till the whole width of the carpet had been knotted.

Wherever a change of colour was needed, the weavers simply took the next colour and made the next knot with it. When the whole row of knotting had been completed these were beaten with a comb beater.

#### 5.5.3.4 Weaving cycle

Weaving cycle of these carpets included not only the interlacing of warp and the weft yarns but also the knotting of pile. The steps involved in one weaving cycle of galicha were:

- 1) The weavers tied a row of knots across the whole width of the carpet in the following manner -
  - a) Putting across an extra weft

- b) Knotting a row of pile
  - c) Beating the knots.
- ii) Forming a shed to throw a shot of weft yarn across it. The yarn was firmly beaten back against the previously woven weft.
- iii) A shot of extra weft yarn was thrown across the shed and was beaten back with a comb beater. The shed was then closed.
- iv) Another row of pile knots was formed across the width of the carpet.
- v) To interlace the weft yarn, the countershed was opened and shuttle containing the weft was passed through it. The yarn was beaten against the previously woven weft yarns to lie firmly against the fall of the carpet.
- vi) A shot of extra weft yarn was thrown across the shed. It was beaten with a beater and the counter shed was closed.

The extra weft yarn was put after each of the weft interlacing and it was beaten back without bringing the lease forward. The weavers were of the view that the extra weft yarn formed a soft base for the knots of the pile tufts.

#### 5.5.3.5 Weaving

After completing one row of knotting, the weavers completed half a weaving cycle. The next row of pile was then started from the left side. Normally two or more weavers worked on one loom. Each one of them was assigned specific work area and all of them worked moving from left to right. For making the prayer rugs, only one weaver worked on one loom as the size of the loom was comparatively smaller. The weavers referred to the designs through illustrated graph papers which had been provided by the manufacturers. These were usually hung towards one side of the loom, facing the weavers. Balls of wool of different colours were put on a cord and hung across the loom, within an easy reach of the weaver. Whenever needed, more warp yarn was fed to the loom by removing the iron chain which had been inserted in the warp beam to hold these under tension. The warp roller was rolled to release required length of warp yarns. At the same time the woven portion of the carpet was rolled onto the breast beam. The iron chain was then put back in position so that the warp yarns were once again stretched evenly. After weaving the required length of the pile, a narrow strip of plain weave, identical to the one made in the beginning, was woven.



PLATE 4. WEAVERS WORKING  
ON A GALICHA LOOM.

On completion of weaving the carpet was taken off the loom by opening the iron chain and rolling out the carpet on both the ends.

#### 5.5.4 Finishing

In most of the centres the galichas were only woven, the finishing operations being carried out elsewhere. In the state run Carpet Production Centres two finishing operations were carried out. These were shearing and knotting of fringes.

##### 5.5.4.1 Shearing

Shearing of galichas was done to get a smooth and even pile. For this, the carpet was laid flat on the floor and the pile was trimmed with the help of flat shears. Afterwards the carpet was cleaned with a broom or a carpet brush to remove lint and clipped fibres.

##### 5.5.4.2 Knotting of fringes

Loose warps on the two ends of the carpet were tied to form a fringe at either end. For making the knots of the fringe an equal number of warp yarns was taken in both the hands and were tied together.

The technique used for making galichas in Himachal

Pradesh was similar to the one used in Bhadohi (50), Punjab and several other parts of the country (75, 17). Though the method of making the pile tufts remained the same even for the carpets woven in Kashmir, a talim system was used to refer to the designs (76). Unlike Kashmir, Bhadohi and Punjab no chemical wash was given to the galichas manufactured in Himachal Pradesh.

#### 5.6 MANUFACTURE OF CHUGDANS

Chugdan was a Tibetan term for a coarse pile rug usually manufactured from leftover wool. The pile of the chugdang was loosely woven and was longer than that of the Tibetan carpets and the galichas. Two methods were used to make chugdang, the Indian method and the traditional Tibetan one. The Indian method was similar to the one used for weaving Tibetan carpets and the pile was made by knotting an extra weft yarn. The difference in Tibetan carpets and chugdang made in Indian style was; it had lesser number of knots per 2.50 cms square, a longer pile and that these were made from leftover wool. This technique of weaving has already been explained in 5.4. In traditional Tibetan style of weaving chugdang the pile of the rug was made by looping

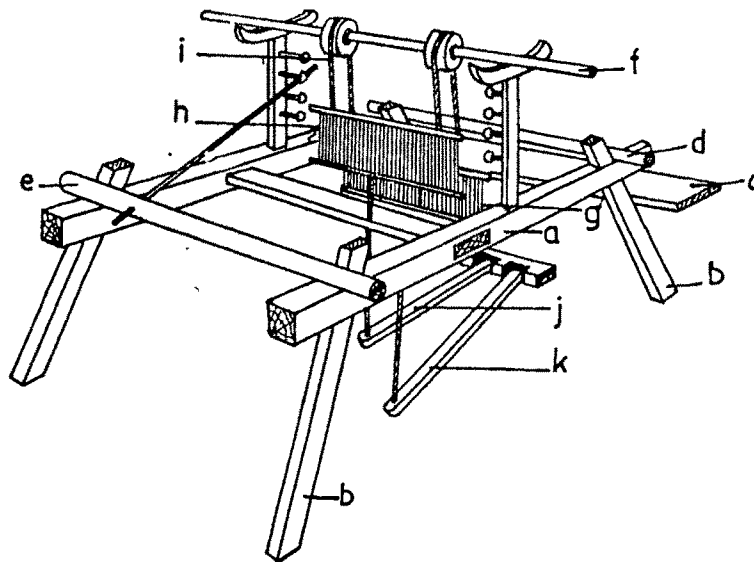
the pile instead of knotting it. The pile density of these rugs was 24 knots/loops per 2.50 cms square. The size of the chugdangs varied from .61x1.52 to .92x1.82 m. Since the Indian method of weaving chugdangs has already been explained, Tibetan method of making chugdangs has been dealt with here.

#### 5.6.1 The Equipment Used

##### 5.6.1.1 The loom used

In the traditional method the chugdangs were woven on horizontal loom called thatti or thrituk in Tibetan language. The loom consisted of two wooden beams running parallel to each other, sideways (Figure 24a). These beams were supported on four legs (Figure 24b), each one 5 cms high, sloping and projecting outwards at the floor level. A wooden plank (Figure 24c) was tenoned through the side beams, towards the breast beam of the loom. While weaving the weaver sat on this plank. Two wooden rollers (Figure 24d and 24e) acted as the warp and the rug beams. With the help of ropes these were firmly tied to the side beams of the loom at the four corners or were tenoned through the sidebeams. Halfway through length the side beams supported two erect, vertical projections, each one having a small bar running parallel

FIG.24 LOOM USED FOR CHUGDAN WEAVING



a.Sidebeams b.Legs c.Plank d,e,Rollers f.Iron Rod  
g,h.Heddle Frames i.Chain j,k.Treadle

to the beams. This was meant for holding an iron rod (Figure 24f) which served as an axle for two pulleys. The pulleys were used to raise or lower the heddle frames. These frames (Figure 24g and 24h) were connected to each other with the help of a cord or chain, (Figure 24i) which was tied to a heddle frame at one end passed over a pulley and was joined to the second heddle frame. An identical cord was used to join the two heddle frames at the other end. Each heddle frame consisted of two bamboo sticks, tied to each other with the help of a yarn. At the ground level, the loom had two treadles (Figure 24j and 24k) which were joined to the heddle frames with the help of cords. The movement of the heddle frames was controlled by pressing the required treadle.

#### 5.6.1.2 The accessories used

The accessories used for weaving chugdans were similar to the ones used for weaving Tibetan carpets. These were gauge rod, comb beater, knife, a pair of scissors, shuttle, and measuring tape. Sometimes the weavers used a small round dowel or a reed instead of the gauge rod. The details of the accessories listed above have already been explained in 5.4.1.2. A tapestry

needle was used for stitching the strips of the rug and the fabric binding.

## 5.6.2 Pre-Weaving Processes

### 5.6.2.1 Warping

The warping of the chugdans was done on horizontal beams which were supported on a wooden or an iron frame. The beams were placed at the required distance from each other, which was determined by the length of the chugdan and the number of rugs warped. In one warping the weavers warped 4 to 6 chugdang each one consisting of 35 to 40 cms wide strips. The length of the warps was about 1.22 to 1.52 m more than the required length.

To start warping, the loose end of the yarn was tied to one beam and then it was taken to the other beam. Here it was passed over the beam and brought back to the first beam again. The process was repeated till the desired width of the warps had been obtained. The warp yarns were then cut at one end. The loose ends of the yarn were rolled on the warp beam of the loom which was later placed across the side beams of the loom. The two beams were then tied to each other with a rope. Instead of beams some weavers used bamboo sticks for doing the initial warping.

After putting the warp yarns across the beams, the loom was dressed. For this, the weavers took one heddle stick and introduced<sup>it</sup> from the left hand. An extra yarn for tying the heddles was taken in the right hand. The weaver picked up yarns of the odd set of warps and one by one, strung these through the loops of the thread heddles formed around the heddle frame. Similarly, the even set of the warps was also tied to the second frame. When the heddlings had been completed the warp yarns were stretched by rolling the warp beam.

Usually two persons did the warping but the weavers reported that it was possible to conduct this operation alone as well.

### 5.6.3 Weaving Technique

#### 5.6.3.1 Shed formation

Since the loom used for chugdang had foot controls, the shedding operations were controlled by treadles instead of stick and harness. The shedding mechanism of chugdan loom was:

- i) By pressing down the required treadle foot, the weaver brought down one heddle frame. Since the two heddle frames were joined to one another with pulleys

and ropes, this automatically lifted the second heddle frame up, thus separating the odd and the even set of yarns to form the shed. After the weft yarn had been passed through the shed, the weavers closed it by lifting the foot from the treadles.

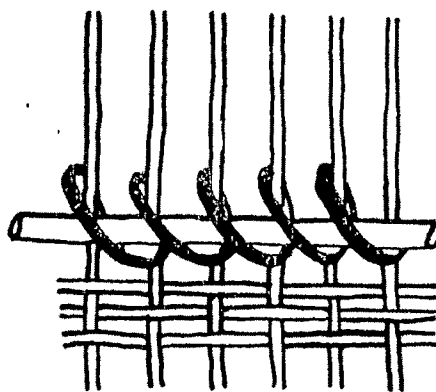
ii) For forming the counter shed, the weavers stepped on the second treadle to bring *down* the second heddle frame. This led to the lifting of the first heddle frame up, picking up the set of warp yarns alongwith to form the counter shed. A shot of weft yarn was thrown across the shed which was later closed by removing the foot from the treadle.

#### 5.6.3.2 Looping

The method used for making the pile of chugdang was different from the ones used for making the pile of Tibetan carpets and the galichas. In this 'soumak technique' was used in which the pile was formed by looping the extra weft around the warps instead of knotting these.

The weaver held the gauge rod in the left hand and the pile yarn was held in the right. To start the pile, the extra weft was taken around a single warp yarn twice or thrice so that it did not ravel. A pair of warp yarns

FIG.25 LOOPING OF CHUGDANS



was then separated with the gauge rod and two strands of pile were slipped between these. This was then cast over the gauge rod and the pile yarn was pulled to tighten the loop. Then, the next two warp yarns were separated and the process was repeated (Figure 25). In this manner the weaver progressively moved across the whole width of the rug. At the end of one colour or when one row of pile looping was completed, the yarn was cut. For introducing a new colour the yarn was twisted two, three times around one warp and then the looping was carried on. On completion of one row of pile, the gauge rod was beaten firmly.

#### 5.6.3.3 Weaving cycle

Weaving cycle of the chugdan involved two processes, interlacing of the warp and the weft yarns and the formation of loops. One weaving cycle of a chugdan consisted of:

- i) The pile was made in the following manner -
  - a) Making one row of loops across the whole width of the chugdan.
  - b) Beating the gauge rod containing the loops.
- ii) Throwing a shot of weft across the shed and then



PLATE 5. A CHUGDAN WEAVER WORKING ON A  
HORIZONTAL LOOM



PLATE 6. LOOPING OF CHUGDAN PILE

beating it down firmly. The weavers then closed the shed by lifting the foot from the treadle. The loops of the pile were then cut.

iii) Making the counter shed by pressing the second treadle with foot.

iv) Another shot of weft was put across the shed. The shed was again closed after beating the weft yarn with a comb beater.

#### 5.6.3.4 Weaving

After completing a row of pile, the gauge rod was firmly beaten. Then as per requirement, the shed or the counter shed was formed and a weft yarn was thrown. It was beaten down against the previously woven material after which the shed was closed. The loops were cut by dragging a knife across the gauge rod.

When the required length of chugdan had been woven, about 2.5 to 4 cms plain weaving, identical to the one made in the beginning, was done. To start the next strip of the rug the weavers left a gap of 3 to 6 mms between the two and plain weaving for the next strip commenced.

The weavers kept the balls of the pile yarn in a box or a carton towards their right side. Whenever

required, the warp yarns were fed by moving cross beams and rolling the chugdan on the breast beam and releasing more warp length simultaneously. The beams were put back to original position after adjusting the warp tension. Since most of the designs used for chugdang were very simple and repetitive in nature the weavers worked these out by counting the yarns. No help was taken from illustration or old floor coverings. The designs usually made were stripes and borders but if a chess board or any other design with symmetrical placement was to be made, the weavers worked out one half of the design on one strip and the second half was woven on the second strip of the chugdan. When the whole length of the warps had been used for weaving, the rugs were taken off the loom. For this either the warp yarns were cut or the two crosswise beams of the loom were removed and the rugs and the yarn were removed from the two rollers.

#### 5.6.4 Finishing

As mentioned earlier these rugs were woven in the form of narrow strips, two strips were joined together to make a chugdan. Hence the finishing operations involved stitching, binding and knotting of fringes.

#### 5.6.4.1 Stitching

Strips of chugdans were joined together by stitching these with a needle and a woollen yarn. The edges of the two strips were held together and joined to each other with the help of slip stitch. For a wider rug three strips were made and joined.

#### 5.6.4.2 Binding

The selvages of chugdans were finished by attaching a fabric strip of a matching colour on either side of the rug. Traditionally the edges of all the chugdans were bound with fabric but these days it was done only on the chugdans meant for self use.

#### 5.6.4.3 Knotting of fringes

Long warp yarns on both the ends were finished by tying these into simple knots.

### 5.7 MANUFACTURE OF DURRIES

Durries, the flat woven, weft faced rugs were woven only in one district of the state. Sirmuar district lay on the south eastern border of Himachal Pradesh, adjoining the states of Punjab, Haryana and Uttar Pradesh.

The district had a considerable population of julahas who wove durries. Khadi Ashram supplied undyed, single yarn to the weavers who dyed, plied and wove the floor coverings from this yarn. Durries were woven in 1.10x2.20 to 1.20x2.35 m sizes, their thickness being approximately 3 mms.

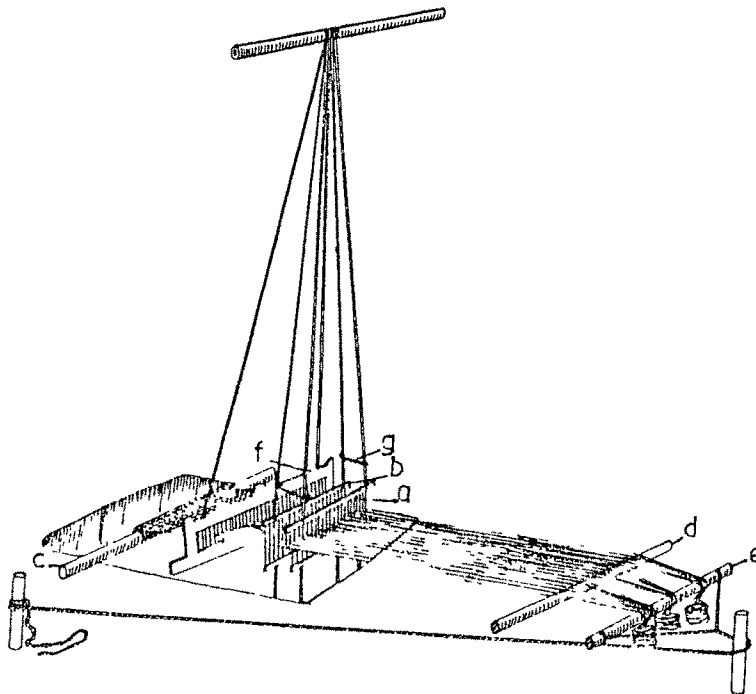
#### 5.7.1 The Equipment Used

##### 5.7.1.1 The loom used

Durries were woven on a horizontal pitloom called adda. The loom was named so because 60 to 75 cms deep pit was dug into the ground to hold the treadles. The loom consisted of heddle frames (Figure 26a and 26b), cloth beam (Figure 26c), warp sticks (Figure 26d and 26e) and a reed (Figure 26f). The width of the loom varied from 1.10 to 1.20 m but it was not held by any frame.

The heddle frames were made of two parallel wooden sticks, held in place with two cords. These frames were kept at a distance of about 30 cms from the ground. Two or three wooden bars positioned at right angles to heddle frames joined the first and the second heddle frame. A cord tied to the either end of the wooden bar supported one heddle frame at the other end (Figure 26g).

FIG 26 LOOM USED FOR WEAVING DURRIES



a & b Heddle Frames   c.Cloth Beam   d.&e.Warp Sticks  
f.Reed   g. Wooden Bar

Two such wooden bars were put at the sides of the frames whereas a third was placed on the centre in some looms. These were kept afloat with the help of a cord tied to a bar in the ceiling.

The loom did not have any warp beam. Instead, a group of warp yarns was splayed and knotted on a warp stick (Figure 26e). The remaining length of the warp yarn was made into a chain near the warp stick and knotted tightly so that it would not open. To hold the warp yarns stretched, a thick rope was tied in the centre of the warp stick. The rope was tightly twisted around a wooden stump put into ground near the warp stick. The remaining length of the rope was twisted around another peg put into the ground to the right hand of the weaver, within his easy reach. The cloth beam (Figure 26c) was tenoned into two wooden blocks, holding it above the pit. A ratchet was provided on the right side of the cloth beam to keep the movement of the rope in check. A reed was used to beat the filling yarns, put in the front of the heddle frames, towards the weaver. The reed was tied to the bar.

#### 5.7.1.2 The accessories used

In durrie weaving the following accessories were

required:

- i) Hook (Ghundian) - A long metal hook, fixed into a wooden handle was used to thread the warp yarns through the dents of the reed (Figure 27d).
- ii) Bobbins (Phirki) - 7 to 8.5 cms long bobbins were used to wind the weft yarns. The yarn was wound around the bobbins. These were earlier made of wood but these days plastic bobbins had become more popular (Figure 27a).
- iii) Shuttle - Single bobbin boat shuttle was used to throw the weft yarn across the shed. Bobbin containing the filling yarn was put in the iron shaft of the shuttle and the yarn was threaded through its eye. This made the movement of weft yarns across the shed easy and smooth, checking the warp breaking (Figure 27b).
- iv) Shed Stick (Baskare) - Shed sticks used for weaving durries were made of long pieces of reed or thin bamboo sticks. In durrie weaving shed sticks were used only while weaving complicated overshot designs such as jaldar. In such designs, shed sticks were used to control the movements of a specific number of yarns.
- v) Wooden Plank (Panakh) - A 25 cms long wooden plank

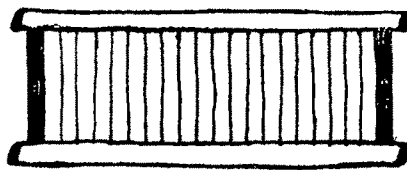
FIG. 27 ACCESSORIES USED FOR WEAVING DURRIES



a. Bobbin



b. Boat Shuttle



c. Reed



d. Hook

was used as a tenter to keep the width of the durrie even. The plank had nails on both the sides and after weaving a little of ~~the~~ durrie, it was fixed into the woven material. It kept the woven material stretched, thus preventing the width from becoming uneven.

vi) Iron Rod (Rach) - A heavy iron rod was used as a lever to rotate the ratchet and roll the woven durrie onto the cloth beam, simultaneously releasing more length of warp yarns.

vii) Spinning Wheel (Charkha) - A wooden spinning wheel having a drive wheel and a handle on the right hand side and a spindle shaft on the left was used for spinning and plying the yarn. A thick cord joined the shaft to the drive wheel of the charkha.

viii) Reeling Frames/Spindle (Charakhadi) - Home-made spindles were used to hold the skein of the yarn during plying. These consisted of a central spindle shaft supported on a wooden base. Two circular frames of thin wire were fixed around the axle and a rope was taken around the spindle., joining the upper and the lower frame in a zig zag manner. During plying the skeins were put around this rope. The number of spindles required for plying was determined by the ply of the composite yarn.

Besides these accessories a pair of scissors, measuring tape and several different types of twines and cords were also used.

### 5.7.2 Pre-Weaving Processes

#### 5.7.2.1 Dyeing the yarn

The enterprenuers provided the weavers with a known quantity of single yarn. Before commencing with the weaving the yarn was dyed into various colours. The choice of colours depended on the design to be woven. The weavers used direct dyes for dyeing. These were purchased from local market or a nearby town.

Dyeing of the yarn was an outdoor operation. The equipment needed for dyeing included -

- i) Three or four large vessels to hold the dye solution.
- ii) A chulah or the fire stove for heating the dye solution.
- iii) A minimum of two tubs or large vessels for steeping and rinsing the yarn.
- iv) A few sticks for stirring the yarn.

Skeins of undyed yarn were loosely tied into bunches and were steeped in cold water for about half an hour. In the meanwhile the dye bath was prepared. For this the water required for dyeing was kept on fire. After sometime the stock solution, prepared by dissolving dye powder in a small amount of water was added. For dyeing one kilogram of cotton yarn 50-60 gms of dye powder was taken. When the dye bath reached near boiling stage, the skeins of yarn were given a slight wring and added to the dye bath. Dyeing continued for 45 minutes to 2 hours. Common salt, about 25 gms for litres of the dye bath was added to the dye bath in case the direct dyes had been used. It was added after 10 to 15 minutes of introduction of the yarn. To get an even dyeing, the yarns were continuously stirred with the help of sticks.

On completion of dyeing the skeins were taken out of the dye bath and rinsed thoroughly to remove the unbound dye. These were then put for drying which was done outdoors.

#### 5.7.2.2 Plying

The weavers were given only single yarn which necessitated plying. For this, a spinning wheel,

spindles and bobbins were needed.

For plying, skeins of yarn were put on spindles and yarn from two or more spindles was fed to the spinning wheel. The yarn was fed by holding it in left hand while the drive wheel of the spinning wheel was rotated with the right hand. The resultant yarn was wound in the form of a spool on the spindle shaft. Such a spool of yarn was called a galota. Warp yarn was made into two ply yarn in this manner and it was given a few more twists to make it stronger.

For making the weft yarn, a bobbin was used. This bobbin was put on the spindle shaft and yarn from a number of spindles was fed to it by moving the spinning wheel. The number of spindles used for feeding the yarn to the bobbin depended on the number of ply of the yarn to be made. The composite yarn was given a few more twists to reinforce and hold the yarns together. The process of spinning was usually combined together with plying but sometimes it was carried out separately also. When the two processes were combined together the resultant yarn was wound on the bobbins but a spool of yarn was made in case the spinning of the plied yarn had to be done later. Plying of the weft yarn was a



PLATE 7. SPINNING AND PLYING OF WARP  
YARNS FOR WEAVING DURRIE



PLATE 8 A DURRIE WEAVER  
AT WORK.

continuous operation, the yarn being plied and wound on the bobbins as and when required.

#### 5.7.2.3 Warping

Warping of durries was carried out in open air. In one warping the weavers warped about 8 to 15 durries.

Warping was done on two sticks tied to four wooden poles pegged into ground. The distance between the two pairs of poles was about 4 m more than the total warp length required. It varied according to the number of durries to be warped in one warping. Two or more persons carried out the warping. To begin with, the loose end of the warp was tied to one beam and the ball of yarn was taken to other side where it went over and under the second beam. It was then brought back, put under and over the first beam, on to the other side again. The warping cycle proceeded in this manner till the desired width of the warps had been obtained. The yarns were then cut and made into a chain at one end. Selvedges were made by using 6 to 8 strands of yarn together. Sizing was not done on the warp yarns.

For dressing the loom, each warp yarn was passed through the reed. For this the reed hook was passed through each dent of the reed and a warp was looped

through it. When the hook was pulled back the warp automatically crossed over to the other side. One by one, all the warp yarns were threaded through the reed. One end of the yarns was rolled over the cloth beam and these were splayed evenly by moving the reed several times. The other end of the warp yarns was pulled and these were divided into small units which were tied in bowknots around the warp stick. The two ends of the warp stick were joined to each other with a cord. Another thick rope was tied to the centre of this cord and was later twisted around the wooden stumps pegged into ground.

In the next step the heddles were tied with the help of a twine. The loose end of the twine was tied to one heddle frame. The twine was wound around the two sticks of the heddle frame. On the way, one odd warp yarn was picked up and the twine was looped through it. This way the odd set of warp yarns was tied to one heddle frame. In the same manner the even set of warps was tied to the second heddle frame.

### 5.7.3 Weaving Technique

#### 5.7.3.1 Shed formation

For weaving durries the horizontal pitloom was operated by two treadles, each one being tied to one heddle frame. The shedding mechanism of this loom was similar to that of the horizontal loom used for making chugdang which has already been explained in 5.6.3.1.

#### 5.7.3.2 Weaving cycle

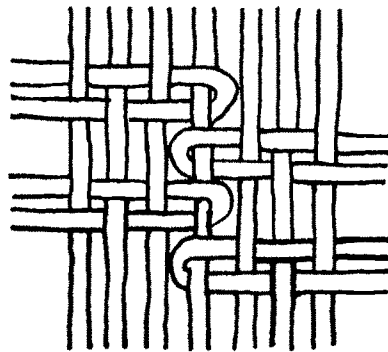
Unlike pile rugs the weaving of durries involved only one step, namely, interlacing of the warp and the weft yarns. The steps included in this process were:

- i) Opening the shed.
- ii) Passing a shot of weft through it as per design.
- iii) Beating the weft yarn with the reed to embed it firmly against the fell of the cloth, and closing the shed.
- iv) Forming the counter shed.
- v) Throwing the weft across the counter shed.
- vi) Beating the filling yarn and closing the shed.

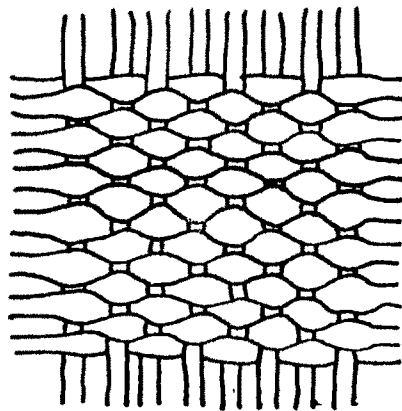
### 5.7.3.3 Weaving

To start durrie weaving a 3.5 to 5 cms strip of plain weave was made with a white, undyed weft yarn. After making this end binding, the colour and the design were introduced. Stripes in durries were made by weaving certain width of the rug in one colour and then switching over to the next colour. The filling yarn of the first colour was broken at the end and then turned inwards so that it did not ravel. For making guddedar design, which had a temple-like triangular shape on both the sides, three sets of filling yarns were used as in tapestry weave. The first and the third set were used to make the triangular shape on either side whereas the main field was made with the second set of weft yarns. For making the pattern, the shed was formed and first and third set of weft yarns was inserted till a given depth of the triangle. Then the main field colour was introduced from the right side by looping its loose end through the last warp of the other colour. On reaching the end of the triangle on the other side, this weft yarn shared a warp yarn with the weft yarn of the third set. Whenever a change of colour took place, the filling yarns of the two colours shared a warp yarn with each other in the dovetail method of interlacing (Figure 286). For weaving the

FIG.28 STRUCTURE OF DURRIE



a Dovetail Tapestry Technique



b. West-Faced Plain Weave

next row, the weft yarn turned back on itself. Moving back and forth according to the design, the process of weaving continued till the desired length was obtained.

For weaving complicated designs such as gulchaman and jaldar, overshoot technique of weaving was used. These had three thread construction, one for warp and two for weft. One weft was used for creating pattern and the other for weaving the base. In such designs, the pattern was formed by overshoots of pattern weft which were thrown across a block of warp yarns. For weaving these the heddles were tied as in plain weave. Later dowels or shed sticks were used to control the movement of warp yarns over local areas. According to the pattern, a number of dowels or shed sticks were inserted at the back of the second heddle frame, towards the warp beam. When any of these was pulled forward, next to the second heddle frame, it lifted a specific number of warps to form a shed. A shot of pattern weft was thrown through it and was beaten down. Then the weaver formed the main shed by pressing down a treadle and a weft yarn was interlaced through it to make the base fabric. Another dowel was then pulled forward and the cycle continued, creating ornamental patterns on the surface of the durrie. Wherever the pattern weft did not float

at the top, it overshot the weft yarns at the back of the durrie, resulting in a reversible, all over pattern.

When 25 to 27.5 cms of durrie had been woven, the wooden plank panakh was put to keep it stretched. This helped in maintaining even width of the durrie. For rolling the woven rug on the cloth beam, the plank was removed and the ratchet was rotated with the help of an iron rod. The cloth beam moved with the movement of ratchet and the durrie was wound around it. As this process pulled the warp yarn as well, more length of rope holding the warp was fed so that the warp stick started moving towards the weaver. Later the plank was put back in its position and the weaving recommenced. For feeding the warp yarns the bowknots at the warp stick were untied and a length of warp yarns was opened out. The knots were retied after this and the tension of the warps was adjusted by manipulating the rope holding the warp stick. The weaving of durrie ended with the formation of a 3.5 to 5 cms long strip of plain weave, made with undyed weft yarn. The weavers started weaving the next durrie after leaving a distance of 20 to 25 cms between the two durries. When the whole length of warp yarn had been woven, these were removed from the

loom by untying the bowknots and pulling out the yarns through heddle frames and the reed. The other end was rolled off the cloth beam.

#### 5.7.4 Finishing

Finishing of durries included only knotting of warps at both the ends.

##### 5.7.4.1 Knotting of fringes

In this operation warp yarns hanging at the two ends of the durrie were knotted to form fringes on either side. These days simple knotting was done for the purpose, but as reported, a lot of decorative fringes were tied earlier.

It was observed that the method of weaving durries in Himachal Pradesh was very different from the one used in Punjab (43, 75). In Punjab the yarn used for warps was mill spun though the weft yarn was hand spun and home dyed yarn. In Himachal Pradesh the warps too were hand spun yarn only. Again, a fly shuttle loom or a simple horizontal loom was used for weaving durries while a pitloom was used in Himachal Pradesh. In Punjab weavers also manufactured Punja durries which were not woven in this state. The variety of colours and designs

used for making durries was much larger in Punjab though some designs such as Pattedar, Guddedar, Jaldar and Gulchaman were common to both the states.

## 5.8 MANUFACTURE OF KHARCHAS

Kharcha was a flat-woven rug made in plain weave. It was made from rough goat hair and had a napped surface as the hair used were not very resilient and protruded out of the woven surface. Because of this newly woven rugs were very rough to touch but with wear, these became smoother. This floor covering was made in Kulu, Mandi, upper Shimla and Kinnuar districts of the state. In Kulu and Mandi district, the rug was known as sela. The size of the kharchas varied from .61x1.52 to 1.52x2.13 m.

For weaving kharchas wool was carded at home, later it was spun into a thick yarn with the help of a drop spindle and woven into a rug.

### 5.8.1 The Equipment Used

#### 5.8.1.1 The loom used

The loom used for weaving kharchas was a temporary

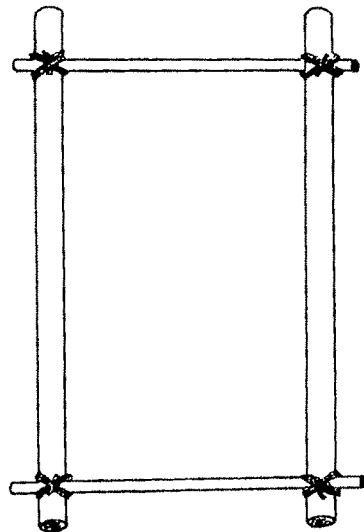
vertical frame called khaddi. For making the loom, poles meant to be side beams (Figure 29a) were laid parallel to each other. With the help of a rope, smooth, even surfaced sticks, comprising the cross beams were leashed onto the poles. The distance between the warp and the breast beam depended on the length of the kharcha. During weaving the loom was supported against a wall. Since it was a temporary loom it was dismantled after use.

#### 5.8.1.2 The accessories used

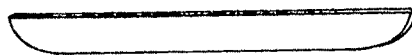
Only a few simple accessories were required for the manufacture of kharchas. These were:

- i) Shed Stick and Heddle Stick (Sotian) - Round, smooth sticks, slightly larger than the width of the kharcha were used as shed sticks and heddle sticks. Usually two shed sticks and one heddle stick was needed for weaving kharchas.
- ii) Batten (Phatti) - A flat, smooth stick of .92x.46-.61 m was used as a batten to hold the shed open. The batten was round and smooth along one side to make it easier to handle (Figure 29b).
- iii) Shuttle and Holder (Nadu) - A stick shuttle was used to hold the warp yarn. The yarn was wrapped on the

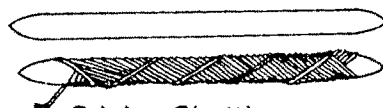
FIG.29 LOOM AND ACCESSORIES USED FOR  
WEAVING KHARCHAS



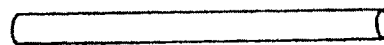
a. Loom



b Batten and Beater



c. Stick Shuttle



d. Shuttle Holder

shuttle which was put into a bamboo-like holder having a hollow centre (Figure 29d). Many a times the weavers did not use the shuttle at all. Instead they wrapped the weft yarn and put it into the holder.

iv) Hand Card (Kangi) - A hand card was used for carding wool fibres. The card consisted of a rectangular piece of rubber mounted on a wooden frame to which a handle had been attached. A number of small, metal teeth had been set into the rubber. The cards were available in pairs.

v) Drop Spindle (Takli) - A drop spindle was used for spinning the yarns for kharcha. The spindle consisted of a hand shaft of about 35 cms length and a bottom shaft of about 7.5 cms. Between the two shafts was a heavy wooden disc, the whorl, which gave momentum to the spindle.

Alongwith the above mentioned accessories, a pair of scissors and a measuring tape were also needed in the manufacture of kharchas.

### 5.8.2 Pre-Weaving Processes

Wool used for kharchas was usually a home product. Before spinning the fibres were graded, picked, teased and carded. All these operations were carried out with

hand, either by the weaver himself or by one of his family members.

#### 5.8.2.1 Grading and picking

Grading of wool included separating the fibres of different colour from each other. For this the fibres were kept in front of the worker who separated the mass of fibres into two or three heaps of different colours. For making kharchas fibres were not graded according to length.

Picking and grading of fibres was done to loosen and open up the mass of fibres. Alongwith this the process also cleaned the fibres. For picking, the fibres were heaped in front of the picker who picked these and put away in another pile. The picker took a handful of unpicked fibres and pulled at these to open them. With gradual pulling and teasing, the fibres opened up. These were then graded and put into different heaps. All the fibres were given a similar treatment, the end result being cleaner and less tightly packed fibres than the unpicked ones. Most of the fibres opened up with one picking but very dirty fibres were given another picking.

#### 5.8.2.2 Teasing and carding

Prior to carding the fibres were teased to lie more or less evenly against each other. The process of teasing was similar to picking. In this also the fibres were pulled apart to separate the mass into smaller groups in which these lay more or less parallel against each other.

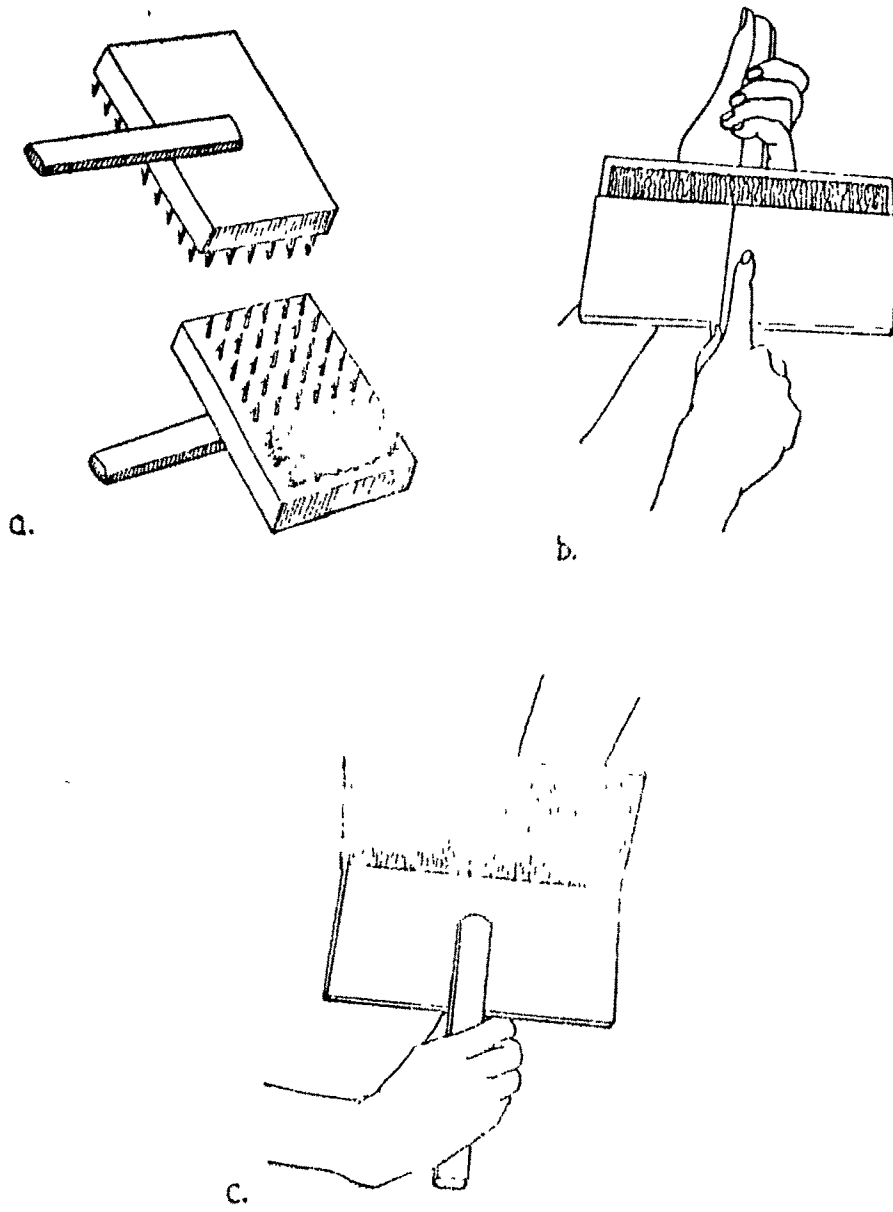
Before starting the teasing operation the wool was kept in the sun. This warmed up the fibres and made it easier to handle these as the wool grease became softer. A bundle of fibres was taken in the left hand and with the fingers of the right hand the worker pulled out and separated these. The process of teasing was usually combined with carding. Instead of teasing the whole lot of fibres, the workers teased each handful as they carded these.

Carding of wool was done with a hand card. Steps involved in the process of carding have been mentioned below:

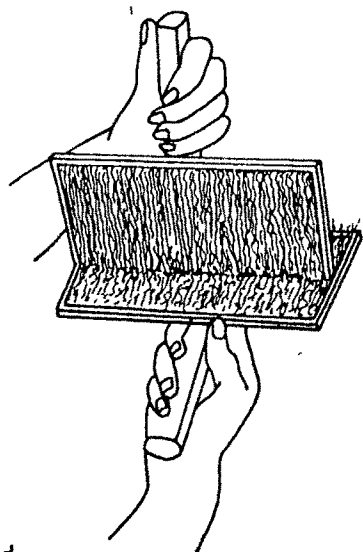
- i) The worker filled the card by holding it in left hand and placing the teased fibres between its teeth (Figure 30). Enough fibres were put into the card so that its teeth were barely visible. Care was taken to

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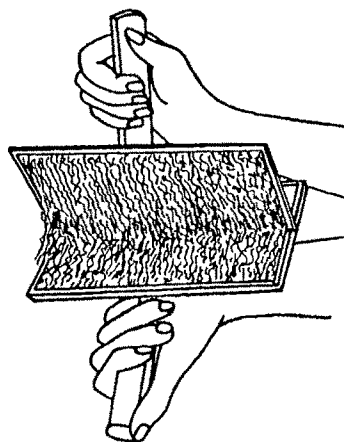
FIG. 30 CARDING OF WOOL



Contd. Fig. 30



d



e



PLATE 9. CARDING AND SPINNING OF WOOL



PLATE 10. BALLS OF KHARCHA YARN

keep the fibres parallel to the card length and distributed these evenly through card.

ii) In the next step the other card was grasped firmly in right hand and was placed on top of the left card so that the teeth of the two touched (Figure 30b). To comb the fibres, the worker pulled the card towards self a few times. The stroking transferred the fibres from left hand card to the right hand one.

iii) The card was stripped by twisting the right card inwards, drawing it at right angles across the left card (Figure 30c) so that all the fibres in the left card were transferred to the right one.

iv) The two cards were exchanged and the process was again repeated. Carding was done to thoroughly comb the fibres (Figure 30d).

v) At the end of carding, the fibres from both the cards were stripped without disturbing the alignment (Figure 30e). These were then rolled into slivers for spinning.

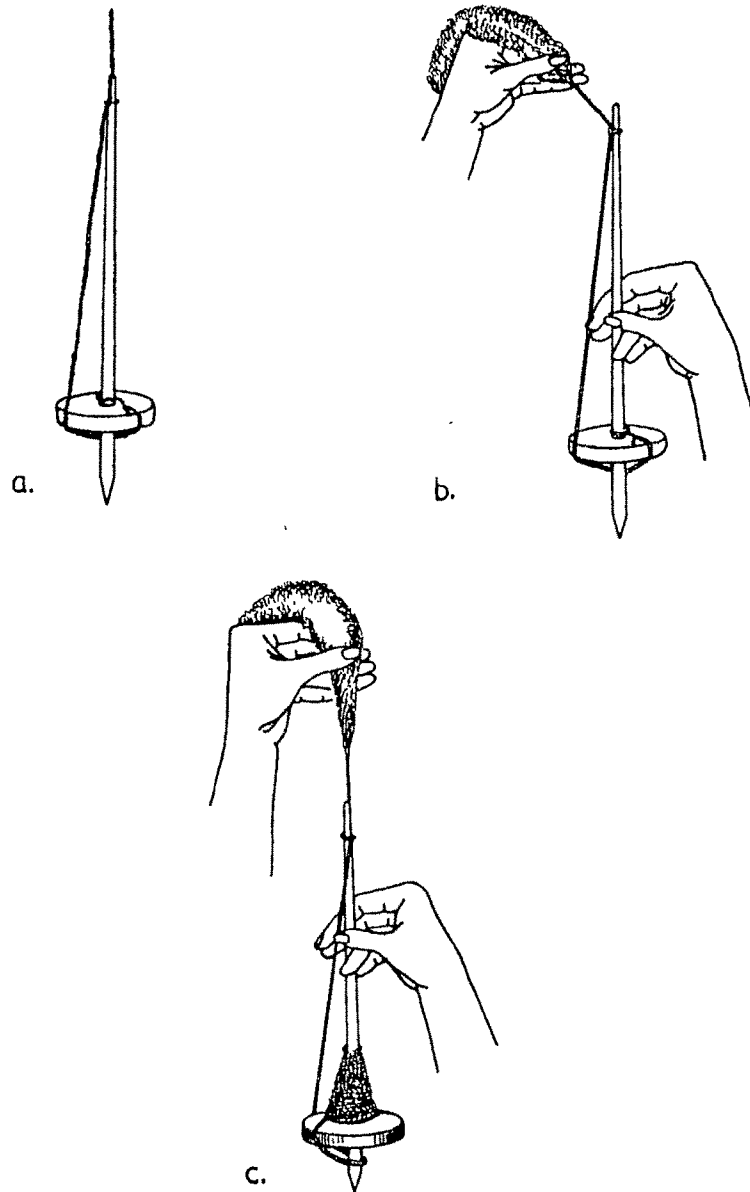
#### 5.8.2.3 Spinning

Spinning of yarns for kharcha was done on a drop spindle. The spinning operation consisted of the following

steps:

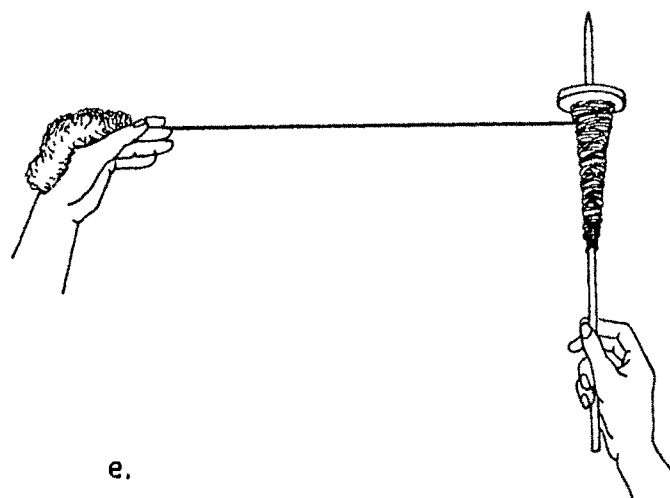
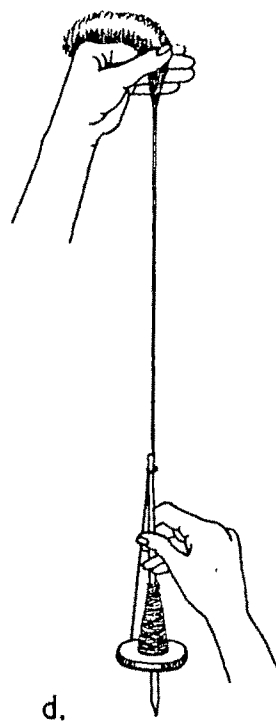
- i) To begin with the leader, a thread about one and a half times the length of the spindle was put on the spindle. It was tied to the hand shaft above the whorl and looped at the top of hand shaft (Figure 31a), the looping being similar to the casting of stitches for knitting.
- ii) A sliver of carded wool was taken in the left hand and was joined to the loose end of the leader, overlapping it (Figure 31b).
- iii) Holding the two between the thumb and the forefinger the spindle was turned in clockwise direction. It was then allowed to spin freely in a hanging position. Pressing the sliver a little with the thumb and the forefinger, the fibres were drawn out (Figure 31c and 31d) using the right hand to stop the motion. The right hand was also used to guide the spun yarn over the spindle.
- iv) After spinning a length of the yarn, it was wound on the spindle. For this, the upper loop was slipped off the spindle and the lower loop was also unwound, all the while the spun yarn being held in the left hand. Another clockwise turn was given to the spindle and the

FIG.31 SPINNING OF WOOL



Contd. ...

Contd. Fig 31



yarn was wound on it in the form of a cone (Figure 31e). After winding, the two loops were again put into place. The process was repeated till the whole of the sliver had been finished. The method of joining a new sliver was similar to the one for joining the first sliver to the leader which has been explained earlier.

v) When enough yarn had been spun or when the cone became too large to be handled comfortably it was simply slid off the spindle. Required amount of yarn was spun in this manner.

#### 5.8.2.4 Plying

The spun yarn had to be made into two ply because double ply yarn was used for weaving kharchag. For this the craftsmen took cones of equal size and put these into two small boxes or holders. Loose ends of the two were taken and joined to the leader of the spindle which was then set into motion in the direction opposite to the one used for initial spinning. Again the spinning was done but the number of twists given to two ply yarn was lesser than that used for the initial spinning.

Some craftsmen used a skein winder for making skeins which were later made into balls. For this two ply yarn was again spun in the direction opposite to the one used for

spinning the yarn earlier. Finally, the yarn was made into balls, ready for weaving.

#### 5.8.2.5 Warping

For warping the loom, loose end was put on the breast beam. The ball of the yarn was then carried over to the other beam, taken over and under it and was again brought back to the first beam. Here the loose end of the yarn was tied to the warp length. It was put under and over the breast beam and again taken to the opposite side. The warping went on like this till the required number of yarns had been warped. The number of yarns depended upon the width of the kharcha. At the end of warping the yarn was broken and its end was tied to a warp length. The yarns were then spread out to distribute these evenly along the width of the rug. Kharcha did not have a selvedge reinforced with several warp yarns as the yarn used was very thick.

In order to have a border a few warps of a darker shade were used on the two sides. Since only undyed yarns were used for these rugs, yarns made from black or light or dark brown goat hair were used for the purpose.

For tying the heddles the batten was inserted to open the shed. The heddle stick was then laid parallel to the batten and one end of the heddle string was tied to it. Moving from left to right a warp yarn from the odd set of yarns was picked up and a loop of string was passed through it which was later slipped onto the heddle stick. The string was then pulled to tighten the heddle. One by one all the warp yarns of the odd set were tied to the heddle stick. The loops were kept loose enough to pick up the heddle stick and lift the warp yarns. A shed stick was inserted on the other side of the lease, behind the heddle stick.

### 5.8.3 Weaving Technique

#### 5.8.3.1 Shed formation

Sheds in this loom were formed by manoeuvring the shed stick and the heddle stick. With this the sheds were operated in the following manner:

- i) The first shed was formed by moving the shed stick. It was brought forward to meet the heddle stick. The action pulled the odd and the even set of warp yarns apart. The weaver inserted the batten in this and turned it to ~~horizontal~~ to open the shed further.
- ii) To open the counter shed, the shed stick was

pushed back. The weaver then lifted the heddle stick with the left hand, brought it forward and introduced the batten just below it. The shed was opened further by twisting the batten to horizontal. For closing the shed, batten was removed and the heddle stick was put back at its original place.

#### 5.8.3.2 Weaving cycle

The weaving cycle of kharcha proceeded in the following manner:

- i) Opening the shed.
- ii) Throwing a shot of weft.
- iii) Bringing the lease forward with the batten, and beating it back.
- iv) Closing the shed.
- v) Opening the counter shed.
- vi) Feeding the weft yarn to the counter shed.
- vii) Beating the weft yarn against the fell of the rug.
- viii) Closing the counter shed.

#### 5.8.3.3 Weaving

Weaving of kharcha was very simple and did not require any special technique. To feed more warp yarns,

the weavers simply rotated the warps around the cross beams and adjusted it to the desired length. Sometimes the two ends of the kharcha were made with a darker yarn to get border on all the four sides. On completion of weaving the rug was removed from the loom by cutting the warps from both the ends.

#### 5.8.4 Finishing

Finishing of kharcha involved tying of warp yarns at both the ends into knots. For this one warp yarn was taken in either hand and was knotted with each other. Some times the ends of the kharcha were finished by tacking a fabric binding.

### 5.9 MANUFACTURE OF THOBI

Thobi was a warp-faced, flat-woven rug which was used as a floor covering and blanket. The manufacture and use of this particular floor covering was limited to the higher reaches of Chamba district and the district of Lahul Spiti. The yarn was made from goat or yak hair which were locally available. The thobi was made (in the form) of long strips of 17.5 to 20 cms width. Six or more of these strips were joined together

to get the required width which was about 1.22 m.

The yarn used for thobies was homespun. Earlier the wool was graded and carded at home. Ever since Khadi Gram Udyog had opened a few carding plants in Lahul Spiti district, people had started getting the fibres carded by machine. These were then spun into yarns at home, using a drop spindle. The method of grading, carding, teasing, spinning and plying was similar to the one used for kharcha which has already been explained in 5.8.2.

#### 5.9.1 The Equipment Used

##### 5.9.1.1 The loom used

A temporary horizontal loom called tagthal was used for weaving thobies. The loom was made by putting four wooden stakes into ground at a height of about 30 to 45 cms. The distance between these stakes was usually 1.82 to 2.13 m in lengthwise direction and 35 to 40 cms in the widthwise direction. Top portion of each stake was notched so that the cross beams could be put into these. Two smooth wooden sticks were used as the warp beam and the breast beam. These were put into the notches of the pegs and were tied securely with ropes (Figure 32). For weaving, the weaver had to squat on the floor.

### 5.9.1.2 The accessories used

The loom used for weaving thobies was very simple requiring only a few accessories. The details of these have been mentioned below:

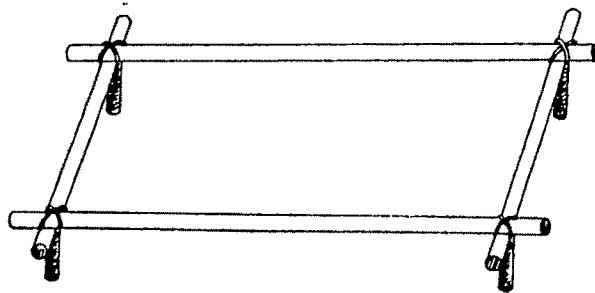
- i) Shed Stick and Heddle Stick (Neinu) - Two smooth and round sticks of 35 to 40 cms were used as shed sticks and heddle sticks (Figure 32c).
- ii) Batten (Woluo) - A 25 to 30 cms long and 7.5 cms wide batten was used for opening the sheds during weaving (Figure 32b).
- iii) Forked Beater (Tuk) - The beater used for weaving this type of rug was about 25 cms long and nearly 5 cms wide at its forked end. The other end was shaped into a handle (Figure 32c).

### 5.9.2 Pre-Weaving Processes

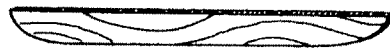
#### 5.9.2.1 Warping

For warping, two 1.22 m high poles were pitched into ground. The distance between the two poles was half of the total length to be warped which depended on the length of the thobi and the number of strips needed for making one rug. To make the warping easier sometimes a shed stick was used.

FIG.32 THE LOOM AND THE ACCESSORIES  
USED FOR WEAVING THOBIES



a Loom



b. Batten



c. Shed stick



d. Beater

One end of the warp was tied to one end of the pole and the ball of yarn was passed around the second pole, turned back towards the first pole and was taken around it. This completed one warping cycle. The yarn was again taken towards the second pole and the process went on till the desired number of yarns had been warped. Since thobi was a warp faced floor covering, the designs in the field were made by warping yarns of different colours. For making stripes and bars in the field, yarns of different colours were used for warping. To introduce the second colour, the first yarn was cut at one end and its end was tied to that of the second yarn. The warping was then resumed. After completing the required number of warping cycles the first colour was again taken up. For warping of thobies following arrangement of two colours were used:

- i) To produce a wavy line, the second colour was wound twice, once to float over the shed and to go under it in the second cycle.
- ii) Solid stripes or bands were made by warping the yarn of second colour for a few cycles.
- iii) Horizontal bars in the design were obtained by warping all the yarns floating over the shed in one

colour and using another colour for the ones going underneath. This type warping was done for 28 to 32 cycles to get long bands of horizontal bars.

When the whole of warping had been completed the yarns were cut at one end and put on the loom. For this, one end of the warps was spread and tied to the back beam with the help of two or three bowknots. The extra length of the yarns was then wrapped on the beam which was later tied to the loom stakes. The other end of the warp yarns was brought forward and knotted to the breast beam.

A batten was inserted to open the shed for stringing the heddles. The heddle stick was then introduced from the left side and each odd numbered warp was picked up and tied to it with loops. When all the warp yarns of the odd set had been tied, the heddle yarn was broken. After this, all the warp yarns of the even set were picked up with the help of a shed stick which was put at some distance behind the heddle stick. The process of dressing the loom completed with this operation.

Two persons were needed for warping a thobi.

### 5.9.3 Weaving Technique

While weaving the sheds were formed in the following manner:

#### 5.9.3.1 Shed formation

- i) The first shed was formed by moving the shed stick. For this the shed stick was brought forward next to the heddle stick. The action brought the lease forward. The shed was opened further by putting a batten and turning it to vertical position.
- ii) To open the counter shed the first shed was closed by moving the shed stick back to the original position. Then the heddle stick was brought forward. With this the shed opened and it was moved farther apart with the help of a batten. To close the shed the batten was taken out and the heddle stick was pushed back.

#### 5.9.3.2 Weaving cycle

Since thobi was a warp-faced floor covering its weaving was slightly different from that of other floor coverings, Though the weaving cycle remained similar, there was a change in the method of beating the weft yarn. In this the counter shed was opened before beating back the weft so that its lease could be brought forward. This covered the weft yarn and the warp yarn floated at

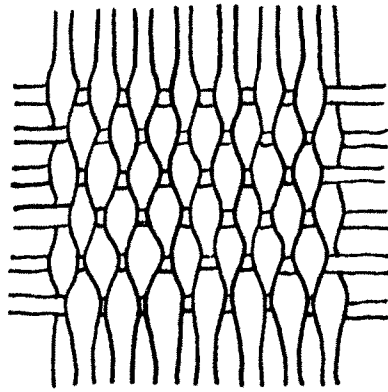
the surface of the rug on both the sides, making it warp-faced. The weaving cycle of the thobi included the following steps:

- i) Opening the first shed.
- ii) Feeding a weft yarn through the shed and closing it.
- iii) Opening the counter shed.
- iv) Beating the weft yarn and the lease of the counter shed together so that these lay firmly against the fell of the cloth.
- v) Throwing a shot of weft across the counter shed.
- vi) Closing the shed.
- vii) Opening the first shed again.
- viii) Beating the weft yarn and the lease of the shed against previously woven material.

#### 5.9.3.4 Weaving

In thobi weaving the lease of the shed and the weft yarn were beaten back together. Due to this the warp was sometimes pulled and bunched together making the width of the thobi uneven. Because of this the tension of the weft yarn had to be carefully adjusted every time. The edges of thobi were pulled out several times to adjust the width of the rug. Whenever needed, more warp length

FIG.33 WARP FACED PLIAN WEAVE



was fed by rolling out more yarn from the warp beam. At the same time woven rug was wound on the front beam. Since thobi was a warp-faced floor covering, designs were made by putting warp yarns of two colours.

On completion of weaving, the thobi was taken off the loom by untying the bowknots of the warp yarn at the back. The shed stick was then removed and the heddles were slipped off.

#### 5.9.4 Finishing

Finishing of thobi included cutting and stitching the strips of the woven rug and finishing the raw edges.

##### 5.9.4.1 Cutting and stitching the strips

The long woven piece of thobi was cut into six or more equal sized strips. One by one these smaller strips were joined to each other with the help of slip stitch, thus adding width to the rug.

##### 5.9.4.2 Finishing of raw edges

Raw edges of the rug were tucked in two narrow folds and running stitch was done along the whole width to hold it in place. In this manner the raw edges of the rug were finished to prevent these from ravelling.

## 5.10 MANUFACTURE OF NAMDA

Namda was a pileless floor covering made from felt wool. In Himachal Pradesh nandas were made only in Kulu and Shimla. At both the places these were manufactured at the production centres of Himachal Pradesh Khadi Gram Udyog Mandal. The floor covering was made in two sizes, 1.22x1.82 and 1.82x2.74 m. Different types of nandas made at the two centres were - plain nandas, embroidered nandas and applique nandas.

Nandas were either made in pure wool or by mixing cotton and wool fibres in 1:9 proportion by weight. Wool used for these was produced in the state but cotton had to be brought from other states.

### 5.10.1 The Accessories

- i) Mat (Chatai) - A mat made of palm leaves was used as a base for spreading fibres. The size of the mat had to be slightly bigger than the size of the required nanda.
- ii) Fork (Punja) - A wooden fork, about 1.22 m in length having .46 m long teeth, was used to spread the fibres evenly and press them down.

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iii) Stick (Soti) - A 1.22 to 1.52 m long stick was used for pressing down the fibres.

#### 5.10.2 Pre-Manufacturing Processes

##### 5.10.2.1 Carding

In both the centres carding of fibres for making namdas was done by machine as these centres had carding plants on the premises.

#### 5.10.3 Manufacturing Process

Manufacture of namdas involved the following steps:

##### 5.10.3.1 Making the felt

The felt used for namdas was made manually. The manufacture was based on the basic principle of making felt i.e. moistening a web of fibres and then pressing and rolling it to form a sheet of felt. The process included the following steps:

i) Making the Web - To make the web the fibres were spread on the mat. In pure wool namdas a mesh of carded fibres was spread on the mat till it formed a 10 to 12.5 cms thick layer. For making a mixed namda cotton and wool fibres were mixed in the ratio of 1:9. These were blended with the help of the fork and were then spread on the mat. Fork and stick were used to spread

the fibres evenly and later pressing these down. The corners of the web were gently pressed inwards to make these slightly rounded (Plate 11).

ii) Sprinkling Soap Solution - After getting an even web of fibres, a mild soap solution made of soap and water was sprinkled over it. This provided the requisite amount of moisture for setting the fibres. With the fork, gentle and even pressure was applied to spread the moisture through layers of fibres.

The whole exercise of sprinkling the water was completed in about half an hour. Afterwards the mat, alongwith the web was rolled over and was tied with a rope.

iii) Rolling - The tied mat was rolled on floor by pushing it forward and backward with foot. Sometimes the workers firmly pressed the mat by standing on it or walking across it. Rolling was again resumed and the process continued for an hour. The purpose of rolling the mat was to set the fibres to make a felt.

iv) Rolling with Hands - For finally setting the fibres the mat was rolled with hands, exerting even pressure along the whole width of the mat. This was done for 30



PLATE 11. SPREADING FIBRES FOR MAKING FELT



PLATE 12. ROLLING THE MAT FOR MAKING FELT

to 45 minutes. After this, the roll was un~~k~~ed and the felted mat of fibres was taken out.

Depending upon the size of the namda, the process of making felt took about 2½ to 3 hours. These rugs were then either sold as such or were dyed or embroidered.

#### 5.10.3.2 Dyeing the felt

In Kulu namdas were made in natural white or grey colours and only the felt meant for doing the applique work was dyed. But in Shimla, plain namdas, dyed in different colours were also marketed.

Acid dyes were used for dyeing these. The dyes were purchased from the local market. A large tub, a few bowls and sticks were needed for dyeing the namdas.

The namdas or the felt which was to be dyed was steeped in plain water for about half an hour. In the meanwhile the required amount of water was taken in the tub and kept on fire for heating. The stock solution of the dye was prepared by taking 50 gms of dye for dyeing 1 kg of felt. For making the stock solution dye was dissolved in cold water in a bowl. After heating water for about half an hour or till it started boiling the dye solution was added and stirred thoroughly. Then

the felt was introduced into the dye bath. After fifteen minutes, small amount of acetic acid (50 ml to 1 kg of felt) was added to the dye bath. Dyeing was carried out for one to one and a half hour. For level dyeing the material was continuously stirred. On completion of dyeing the felt was thoroughly rinsed under running water. This was done to remove the unbound dye matter. Later it was dried and either marketed as such or was embroidered.

#### 5.10.3.3 Embroidering the felt

Embroidery of nandas was done on contract basis. Plain nandas, felt for applique and woollen yarn for embroidery was supplied to the contractor who further gave these to embroiderers who executed the work on piece rate basis.

Embroidery designs were traced with the help of perforated design sheets. For tracing the design, nanda was put on a flat, firm surface, usually floor. Perforated design sheet was put on the top of felt and smoothened. The sheet was held by one person and another rubbed a paste of charcoal powder and kerosene on it. This way design was transferred from the sheet on to the nanda.

Pieces for applique work were cut with the help of paper drafts. The drafts were placed on the felt pieces and its outline was traced with the help of a chalk. Later the material was cut along the outline.

Tracing and cutting of applique was done by the embroiderers themselves. They then took all the required materials to their houses where the embroidery was done.

Chain stitch embroidery was done on nandas. The work was executed with a hook needle called ari and the work itself was called ari di kadai. Ari was a 6.5 to 7.5 cms long hook fixed with a wooden handle. While doing embroidery the worker held the material between her knees. The needle was held in the right hand and the yarn for embroidery was wrapped around the index finger of the left hand. For executing embroidery, the hook was inserted from the right side of the material and a loop of yarn was put into it from the obverse side. When the hook was brought back the loop of embroidery yarn came out alongwith. The loop was tightened by pulling the yarn from the underside. Next stitch was taken from the inner side of the top end of loop and the work progressed in the same manner. For introducing a new colour, the first yarn was knotted at the obverse side of the material. The next yarn was also

looped and knotted to avoid its ravelling later.

Only outline or a small amount of filling of the designs was done in nandas made in Himachal Pradesh. For doing applique work, the applique was put and chain stitch was worked around it.

The manufacture of nandas was similar to the one used in Kashmir (76). But the nandas made in Himachal Pradesh were scarcely embroidered and lacked richness of embroidery found in Kashmiri nandas.

#### 5.11 MANUFACTURE OF BORU

Boru was a flat floor covering made by embroidering a gunny bag or hessian cloth. These were made in the lower hills of Chamba, Kangra and Mandi district. It was customary for a girl to make two or three borus for her trousseau. This rug was much smaller than other floor coverings made in the state, .61x.92 m being the most common size. Since the manufacture of borus was very different from the rest of the floor coverings made in the state, it has been discussed under the following heads:

##### 5.11.1 The Materials Used

#### 5.11.2 The Technique Used

#### 5.11.3 Finishing

##### 5.11.1 The Materials Used

The base material used for embroidery was gunny bags or hessian cloth made from jute. This acted as a ground fabric or a canvas on which surface ornamentation was rendered in the form of cross stitch embroidery. This was embroidered with leftover woollen yarn.

##### 5.11.2 The Technique Used

Cross stitch embroidery was done on boru with multi-coloured woollen yarns. To start the work, the embroiderer marked the centre and the margins and began working on the embroidery. Depending on the designs the embroidery was started either from the centre or from one side. To execute the embroidery, a square of two or three yarns of the ground fabric was taken as one unit. The designs were taken from old embroidered textiles, carpet designs or from design books.

After embroidering the pattern design, the ground was filled. This was done to cover the dull background and the rough surface of the rug. It also provided an appropriate background for the design. The margins around

the work were executed either in the beginning or at the end of the work.

### 5.11.3 Finishing

Finishing of boru included putting a lining and making decorative edging around the rug.

#### 5.11.3.1 Putting a lining

When hessian cloth was used for work, a lining was put underneath. An old, leftover fabric of the size of the embroidered boru was taken and the two were put together, right sides facing each other. These were stitched together with running stitch or back stitch. The stitching was done on three sides only and the fourth side was left open. The work was then turned inside out and later the fourth side was also stitched. Since the gunny bags already had two layers of fabric, no lining was put to these. Its open mouth was stitched with slip stitch.

#### 5.11.3.2 Decorative edging

Some embroiderers finished the rug by working out decorative edging of buttonhole stitch on all the four sides.

### Section III

#### DESIGNS USED FOR FLOOR COVERINGS

This part of the investigation has been directed towards details of the motifs, designs and colours used in the manufacture of different types of floor coverings in Himachal Pradesh. To facilitate discussion, the motifs and the designs used for making each floor covering have been dealt with one by one. The motifs used in designs have been further categorised according to their shapes and source of inspiration. Different types of motifs such as floral, leaf and tree motifs, animal and geometrical motifs have been discussed individually. Placement of these motifs to create different designs, characteristic features of each design and the colour combinations used have been dealt with in the latter part of discussion on each floor covering.

#### 5.12 DESIGNS AND COLOURS USED IN TIBETAN CARPETS

##### 5.12.1 The Motifs Used

A wide range of realistic and mythical motifs was used in Tibetan carpets. Most of these motifs were based on Tibetan iconography and thus carried a symbolic

significance. The motifs used in Tibetan carpets have been discussed below.

#### 5.12.1.1 Floral motifs

A large variety of floral motifs was being used in Tibetan carpets. Lotus, roses, sage flowers, peonies, peach blossoms and orange flowers (Figure 34, Plate 13 and 14) were the most frequently used motifs belonging to this category. In the field of carpets these motifs took the shape of medallion or a branching out design. Trellised flowers branching out of a vase was another popular arrangement of these motifs. Flowering buds and trellised flowers interspersed with oblong shou or a cloud motif were used to form borders of these carpets. Sometimes the floral motifs were used for pictorial representations such as a garden with a few birds enjoying the scene.

#### 5.12.1.2 Tree and leaf motifs

In Tibetan designs extensive use of leaves and stalks was made especially in all over and field patterns. Lotus flowers, mingled roses, orange blossoms and sage flowers were made up of thick, sinuous stalks and leaves usually took a bold, serrated form. Bamboo shoots, peony

FIG.34 FLORAL MOTIFS USED IN TIBETAN CARPETS



a. Peony



b. Chrysanthemum



c. Lotus



PLATE 13. DESIGNS MADE FROM  
& FLORAL, TREE AND  
PLATE 14. LEAF MOTIFS

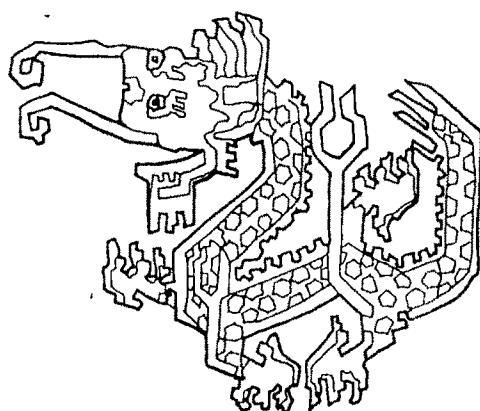


bushes, peaches and pomegranates were also used in the field of these carpets. Sometimes clustering tree forms with a deer poised for flight were used to depict a jungle scene. Highly stylised lotus roots was another motif used in the field of Tibetan carpets. For borders, leaf motifs were combined with different floral forms.

#### 5.12.1.3 Animal motifs

Highly stylised and symbolic mythical animals find a popular use in these carpets. Mythical animals included dragons, snow lions and ghelings (Figure 35). Dragon, by far, was the most frequently used motif in the Tibetan carpets, and the investigator came across many natural and stylised forms of dragons - sleeping benevolent form, a flying dragon, dragons playing with each other and two pairs of dragons arranged in the form of a medallions. Each one of these forms was a pantheon of Buddhist iconography. Other animal motifs used in Tibetan carpets were deer, tiger, a pair of bats, twin fish, otters and crocodiles. All these motifs were used in the field. In the border, small dragon forms were used alternating with floral, thunderbolt or Tashi-tu-Gya (eight Buddhist symbols).

FIG.35 ANIMAL MOTIFS USED IN TIBETAN CARPETS



a. Dragon



b. Gheling



c. Snow Lion

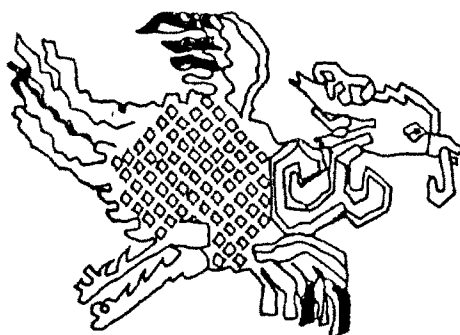
#### 5.12.1.4 Bird motifs

In comparison to floral and animal motifs, only a few bird motifs were used in these carpets. The bird motifs which the investigator came across were pheonix, eagle, highly stylised parrots and ducks (Figure 36). Pheonix was a mythical form which was mostly used in combination with dragons. All these were used as field motifs. The investigator did not come across any design in which the bird motifs had been used in border.

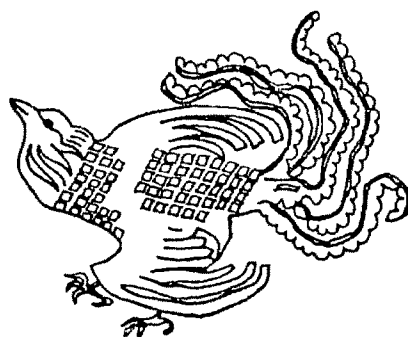
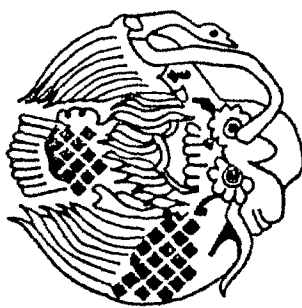
#### 5.12.1.5 Geometrical motifs

Purely rectilinear field forms were seldom used in Tibetan carpets. Coins and roundels are formed by arranging shou motif or Tibetan inscription arranged in a circle. Circular medallions were also formed by placement of dragons or lotus flowers in the field. In a few designs small, circular forms depicting stars in the sky were distributed all over the field. In borders and guards geometrical motifs were used in the form of four petalled flower enclosed in lozenges, key, swastika and poe-gya borders, small round p... and squares or rectangles of different colours. In certain designs the corners of the carpet were filled with meander and swastika motif or a combination of meander and a variation of endless knot.

FIG.36 BIRD MOTIFS USED IN TIBETAN CARPETS



a. Pheonix



b.&c. Eagles

#### 5.12.1.6 Religious motifs

As most of Tibetan designs were representations of Tibetan iconography and beliefs, a number of religious motifs were used in these. The eight Buddhist symbols of happy augury were the most common motifs used in cushion sized rugs. Known as Tashi-tu Gya these symbols included the Baldwin or the white parasol, the standard, the vase, the conch shell, the fishes, the lotus, the wheel, and the endless knot (Figure 37). Shou, either round or oblong, found a popular use as a field and border motif. Sometimes Sanskrit inscriptions were worked out in shou or swastika. A stylised form of religious drums used to invoke angels during religious ceremonies was also used as a field motif in these carpets. Burning gems, signifying His Holiness the Dalai Lama, were used in combination with highly symbolic bird and animal motifs.

#### 5.12.1.7 Scenic motifs

Motifs inspired from scenic beauty of the hills, reminiscent of Tibet were woven in these carpets. These included highly stylised forms of rocks, mountains and water known as chu-dak (Figure 38). Similarly, cloud bands of different shapes and sizes were worked out as field and border motif. Natural elements such as

FIG.37 TASHI-tu-GYA, EIGHT BUDDHIST SYMBOLS



a.



b.



c.



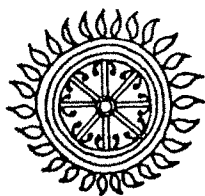
d.



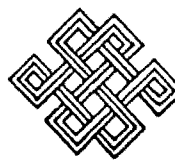
e.



f.



g.



h.

a. Standard b. Lotus c. Baldwin d. Vase  
e. Conch Shell f. Fish g. Fire Wheel h. Endless Knot

FIG.38 SCENIC MOTIFS USED IN TIBETAN CARPETS



a. Clouds



b. Thunderbolt

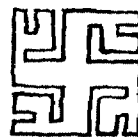


c. Waves

FIG.39 SHOU AND SWASTIKA USED IN  
TIBETAN CARPETS



a. Shou



b. Swastika

lightening and thunderbolt were also used in Tibetan carpet designs.

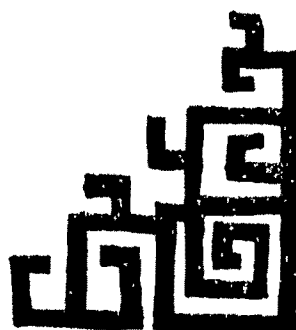
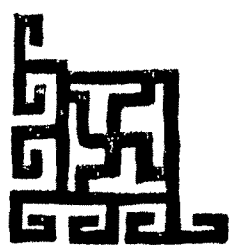
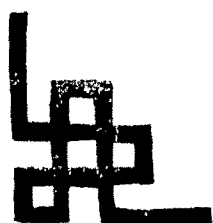
#### 5.12.1.8 Miscellaneous motifs

Some of the motifs used in Tibetan carpets have been derived from the articles of daily use. A few of these were - gawa a field motif inspired from a charm box worn by Tibetan women; poe gaya, a border and field motif taken from incense covers and the santa, a border motif copied from Tibetan writing slates. A number of Sanskrit and Tibetan alphabets were inscribed in the round motifs.

#### 5.12.2 The Designs Used

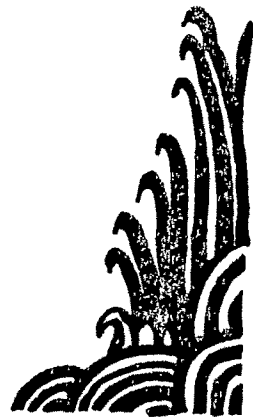
The method of creating designs in Tibetan carpets was altogether different from the one used for galichas made in the state. The motifs used in these were composed of bold and strong lines and an added emphasis was achieved through use of light and dark tones of the same colour. The placement of motifs was again different from the other type of carpets as in most designs one big motif was used to fill the field. In some cases the motif were repeated on the second half of carpet but a marked repetition of motifs in the field was absent. Medallions were used only in a few designs.

FIG.40 CORNER MOTIFS USED IN TIBETAN CARPETS



Contd. ..

Contd. Fig. 40



In all the Tibetan carpets, the motifs used were less closely packed than the galicha motifs, yet the effect of richness was achieved through the use of bright colours and the special trimming given to these carpets.

The borders of Tibetan carpets were slightly delineated from the field. In many cases two or three borders were used. Some of the designs did not make use of borders at all. Details of a few popular designs used for making Tibetan carpets in Himachal Pradesh have been mentioned below:

1) Gocha Pema Khorsum (Petalled Lotus in Three Circles)

This perhaps was the most common design used in Tibetan carpets. The outstanding features of this design were three medallions in the field, each one built up by an arrangement of four or six lotus flowers. When four lotus flowers were used the design was called Pe-shi-khorsum. The field of this design might be enclosed with one broad border or two smaller ones. The border designs popularly employed alongwith this field design were - two bands of cheri border; one row of cheri flanked by two pearl guards; cheri border on the inner side with a broad band of Tibetan slates forming the outer border; poe-gya border, inspired from incense covers or khatri,

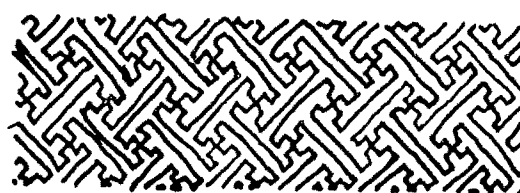
FIG.41 BORDER DESIGNS USED IN TIBETAN  
CARPETS



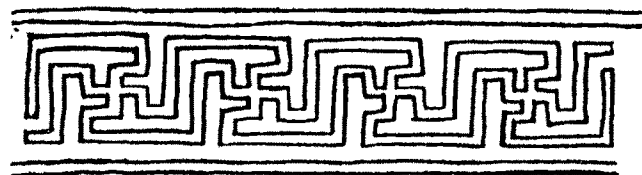
a Meander Border



b. Cheri Border



c Swastika Border



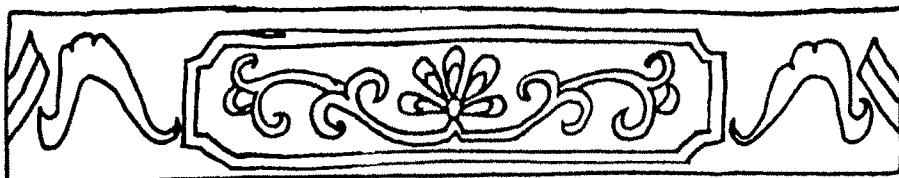
d. Swastika Border

Contd. .

Contd. Fig.41



e. Khatri Border



f. Samta Border

border made up by arranging floral buds in the shape of lozenges (Figure 41). Sometimes a broad border of rocks and mountains was also used in this design. Depending on the design used in the border and its width a carpet having this design might have two or three guards.

Ghochha Pema Khorsum design was usually made on maroon, blue or ivory background with the motifs worked out in lemon yellow, golden yellow, green, red, maroon, navy blue and pink. In rocks and mountains border as many as fifteen colours were used. The designs symbolised happiness and carpets having this design were given as a wedding gift to newly married couples. When made on a blue background the carpet might also be gifted to the Lamas. This design was woven in all the weaving centres visited by the investigator.

ii) Duk-Goh (Dragon Design) Dragon, the most popular symbol of Tibetan iconography was used in carpets in many shapes and forms. Duk-Goh was the most common dragon design in which dragon was depicted standing still and staring out. Duk-Khatho-chu-dak was the name given to the design depicting two dragons facing each other, accompanied by a border of rocks, mountains and water waves. In such a border the guards were usually



PLATE 15. DUK GCH



PLATE 16. SANG-BO, THE  
VASE DESIGN

absent. In Ja-Duk-khatho chu-dak design pheonix and the dragon dominated the field of the carpet with rocks, mountains and water waves filling the corners. When the corners were made with cloud motifs instead of the rock motif, the design was called Ja Duk-khatho-Chi. Duk-khorsum design had three medallions in the field of the carpet. Each medallion was worked out by arranging four dragons in a circle. In the border, small dragon motifs and santa, were used alternatively to give an ornate effect. The designs either had two plain guards or the inner guard was decorated with small pearl motifs.

In this design white, lemon yellow, black and red colours were used on maroon or navy blue background and golden yellow, pink, maroon with a little black on ivory background. Dragon was a symbol of prosperity, happiness, strength and benevolence. Different types of dragon design were made in almost all the weaving centres and the weavers who worked independently also made these designs.

iii) Ja-thang-Pema (Bird and Lotus Design) This was an all over field design which did not have a border or the guards. The main motif was the lotus in the centre of the carpet, flanked by a pheonix on either side.

Trellised lotus flowers might be worked out in the corners of the design. The design was a highly stylised pictorial representation of a garden scene, meant to depict birds enjoying themselves in a lotus garden. Sometimes one of the birds was replaced by a dragon. The design was then known as Ja-Duk-thang-Pema bird, dragon and the lotus design.

The colours used in these designs were white, yellow, shades of green, pink, red and black. The background of these carpets was maroon, navy blue or ivory. This design was made only in Satuan, Bhuppur, Dalhousie and Shimla.

iv) Sang-Bo (The Vase Design) The field of this design consisted of a floral vase placed in a small peg table with the flowers branching out of it (Plate 16). This might be used as a single dominant motif in the field or two such motifs might be used to make the design, one in either half of the field. A variety of border designs sometimes accompanied it. Some of the popular borders used in this design were - santa, the Tibetan writing slates, with plain guards, one on either side of the design; a broad band of running swastikas with plain guards, border made up of oblong shou with narrow guards having cheri motif.

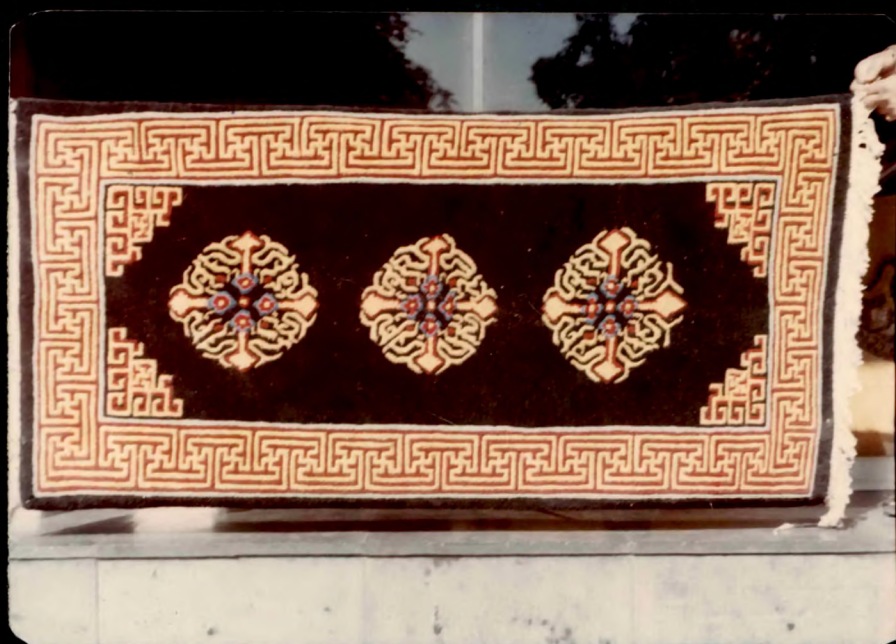


PLATE 17. A MEDALLION MOTIF HAVING  
SWASTIKA BORDER

Sang-Do design was made on a navy blue background with the motifs worked out in lemon yellow, white, two shades of green and pink. The design was of a religious importance and was usually made for monasteries and Lamas. This design was made in all the Tibetan weaving centres.

v) Yon-di-Leti It was reported that this was a relatively new design and was meant to cater to the contemporary tastes. The whole of the design, both the field as well as the border, were decorated with oblong shou motif. The field had bigger shou whereas a smaller form of the same motif was employed in the border of the carpets. The border was enclosed on either side by two guards and a third guard ran as a continuous band along the outer rim of the carpet.

In this design only two colours were used. Made on a pastel background, the design was worked out in the darker tone of the same colour. A little bit of ivory colour was also used in Yon-di-Leti design. The design was made in Dharamshala, Dalhousie and Satuan.

vi) Changi Bulue The main feature of this design was the round shou interspersed at various places in the field. Usually three roundels were placed in a row or

341

seven roundels were juxtaposed in the field. A rectilinear scroll was used to fill the four corners. The border might have the same motif repeated in a smaller size, an oblong shou or a pattern built up from swastikas. The guards used in the carpet were plain. A similar design was also formed by using coin motifs or either Tibetan or Sanskrit inscriptions placed in roundels.

The colour combinations used in Changi Bulue design were black on a red, white on navy blue background and yellow on a maroon, brown or beige background. This design was made in almost all the Tibetan weaving centres.

vii) Chadok (Dragon and Orange Flowers) The dominant motif of this design was that of a dragon comprising the centre of the carpet. Two orange flowers facing each other were worked out on either side of the dragon. The pattern had three guards, one having cheri motif and two plain. The border was made of multi-coloured rocks, mountains and water design.

In this design white, red, black, pink, maroon, yellow colours were used on an ivory or a maroon background. In rocks, mountains and water motif a number 1

colours were used for making the border. The design was made only in Dharamshala, Bhuppur, Satuan.

viii) Tashi-tu-Gye (Eight Buddhist Symbols)

These symbols were mostly used in small, cushion sized rugs. In such a design one of the eight symbols dominated the whole field of the rug. Borders were usually absent in these designs. If at all a border was used, it had swastika or cheri designs enclosed in two plain guards. The popular symbols used were the conch shell, the white parasol, the standard, the vase and the endless knot.

Only two or three colours were used to make these designs. These colours were white or lemon on a maroon background and rust brown or beige on a maroon or ivory background. These symbols signified happiness and good wishes. The design was made in all the Tibetan weaving centres and at Sarahan. Some of the Kinner weavers working independently also made these designs.

Besides these Pema-thang-Nehtsho (lotus and parrot), Pema-thang-Tsi-Tsi-Gampo (lotus and bats), Ghelings (mythical animals) and snow lions holding gems were some other designs which were used to decorate the surface of Tibetan carpets in Himachal Pradesh. Bigger Tibetan



PLATE 18. SNOW LIONS HOLDING  
BURNING GEMS



PLATE 19. SAGE AND DEER DESIGN

weaving centres also made carpets imitating the thankas (Tibetan religious paintings) but such designs were made only on order.

The investigator observed that a larger variety of designs was made in the weaving centres run by Tibetans. Rest of the enterprises as well as the weavers working independently made only a few designs such as the dragon design, dragon and pheonix, floral medallions and the eight symbols. Again, the Tibetan weaving centres had started making use of pastel colours which were traditionally not popular with the Tibetans but were better suited to contemporary tastes. The rest of the enterprenuers and the weavers in the state made use of traditional colour combinations only.

#### 5.12.2 Designs and Colours Used in Galichas

The details of the motifs used in galichas made in Himachal Pradesh have been discussed below:

##### 5.12.2.1 Floral motifs

Floral motifs alongwith leaf and tree motifs was the most dominant class of motifs used in these carpets. Different arrangements of roses, palmettes, almonds, rosettes (rose buds), lilies, irises, narcissus, poppy and lotus flowers and myrtles were used to decorate

these carpets (Figure 42). The field of the carpets was filled with these motifs set in a variety of medallions, cartouche or in a concentric system of arabesques. Spiralled floral tendrils trellising all over the field was another popular arrangement of these motifs. In the borders these motifs were usually set in interices.

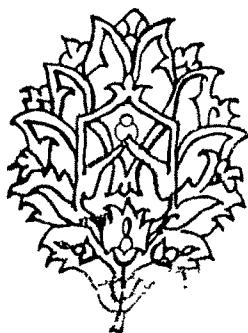
#### 5.12.2.2 Tree and leaf motifs

Tree of life and henna flowers were the most popular tree and leaf motifs used in galichas. One variation of tree of life motif had a vase with the tree branching out of it in flowing, curvilinear lines. Sometimes the motif was enclosed in an arabesque, cartouche or a simple rectangle. Besides these, innumerable trellised leaves and tendrils were used as decorative motifs which served to complete the field and the border decorations.

#### 5.12.2.3 Geometrical motifs

The investigator did not come across any dominant geometrical motif which might stand out in a galicha though the placement of floral, tree and leaf motifs gave rise to several rectilinear forms in the field and the guards. The most common example of these were the Herati and the Bukhara designs. In Herati four rosettes were enclosed in a diamond shape, and the Bukhara had a

FIG.42 FLORAL MOTIFS USED IN GALICHAS



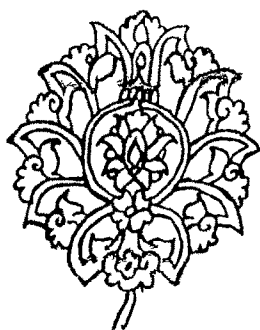
a. Palmette



b. Palmette

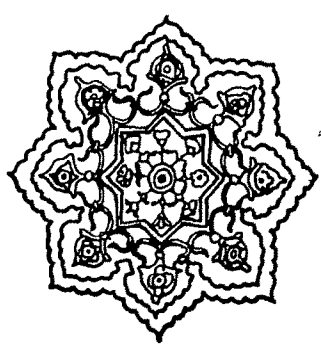


c. Iris

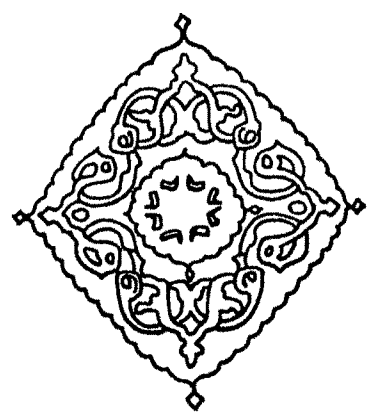


d. Palmette

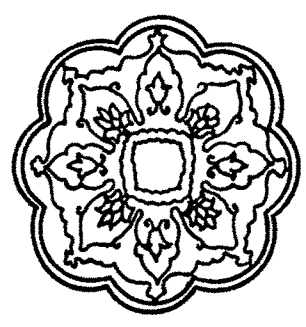
FIG.43 DIFFERENT FIELD FORMS USED IN GALICHAS



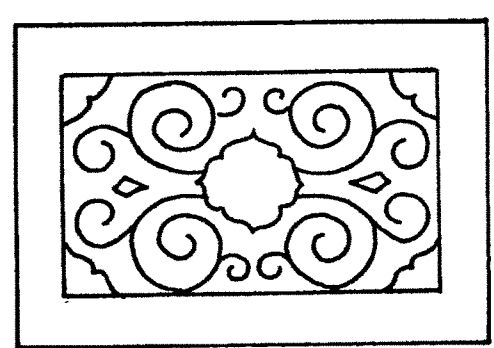
a. Eight pointed star medallion



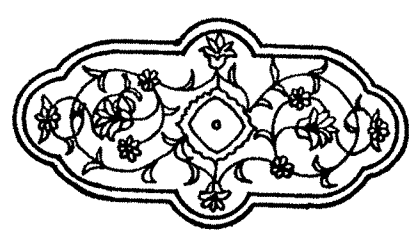
b. Rhomboid medallion



c. Round medallion



d. Concentric system of Arabesques.



e. Cartouche

stylised octagonal shape. Various types of geometrical shapes were also formed through the use of central medallions. Depending on the design the medallions were round, oval, rhomboid or in the form of an eight pointed star (Figure 45). Geometrical motifs found a popular use in the guards of the carpets. Here, the motifs were woven in the form of small roundels which in turn were enclosed in squares, succession of parallelograms, triangles, diamonds and lozenges, zig zag forms or a triangle and a diamond having a common vertex. Rectilinear shapes having serrated leaves were also made in borders or guards.

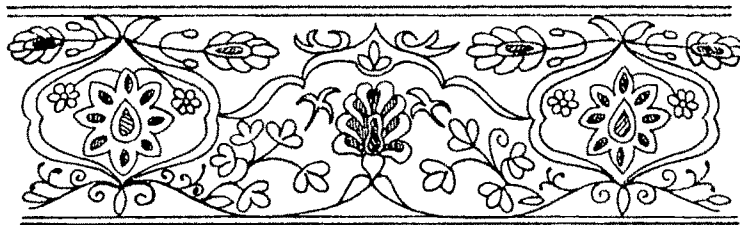
#### 5.12.2.4 Miscellaneous motifs

Different types of motifs used in the guards of the carpets fell in this category. These included key pattern, diamonds, lozenges, diagonal and quadrilateral shapes and meanders.

#### 5.12.3 The Designs Used

The designs in galichas produced in Himachal Pradesh were created by repetition and placements of motifs used in a manner to achieve balance and harmony in designs. For this different placements of motifs were employed, the most common being the use of central medallions and

FIG.44 DIFFERENT TYPES OF BORDERS AND  
GUARDS USED IN GALICHAS .



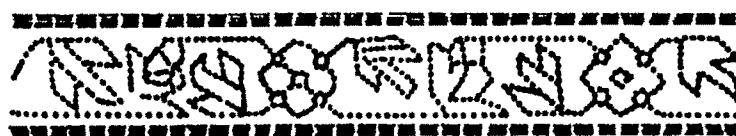
a. Border Herati



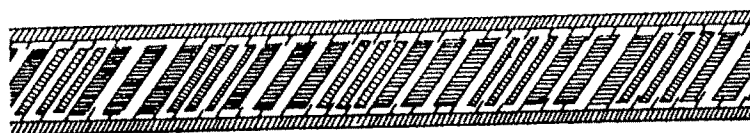
b. Buteh Border

Contd...

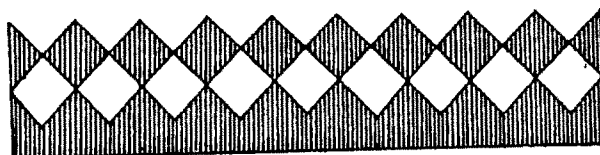
Contd. Fig: 44



c. Garland of Roses guard

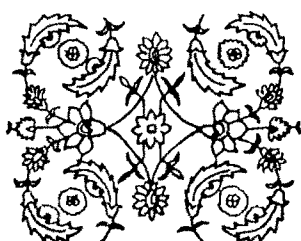


d. Parallelogram Guard

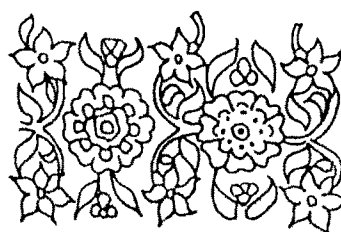


e. Diamonds and Triangles having common Vertex Guard Design.

FIG.45 DIFEERENT FIELD DESIGNS USED IN  
GALICHAS .



a. Herati design



b. Meena khani



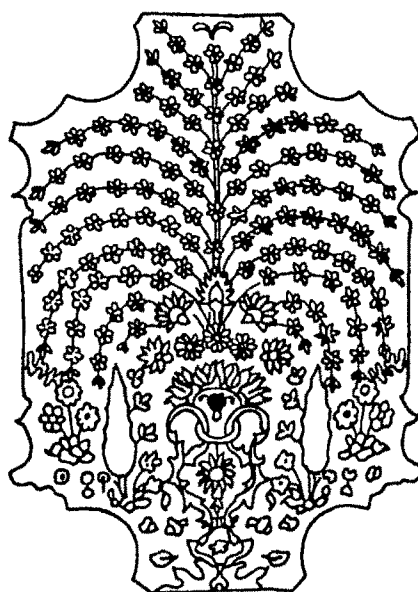
c. A trellise of leaves and  
tendrils - Shah Abbassi  
design .

Contd...

Contd. Fig. 45



d. Vase and Flowers



e. Tree of Life design

arabesques (Figure 45). When a medallion was made in the centre, the emphasis was on the centre of the field and the subordinate motifs were arranged around it. Eight pointed star and circular or a rhomboid medallion, were the different forms of medallions used. In some of the designs the medallions were repeated in the corners of the carpet, the rest being filled with a tracery of flowers, leaves, vines and tendrils. In certain arrangements the central medallion was replaced by a concentric, circular, system of arabesques, to fill the whole of the field with delicately trellised patterns. Sometimes the medallion and arabesque arrangements of motifs were used together. Arranging these elements to form a cartouche was another method of creating designs in these carpets. In this, the dominating motif of the design was enclosed in a cartouche. Various types of leafy scrolls and trellises were added to fill the rest of the field. The field was accompanied by a broad band of border flanked by two or more guards.

It was observed that the weavers were not aware of the names of the designs used in galichas. During weaving these were referred to by numbers. They did not know the symbolic significance of these designs also. It was found that the following designs were popularly

used in galichas:

i) Bukhara - Bukhara, a field design, was made of highly stylised gul or the rose motif. The design consisted of square forms containing two lozenges, one placed in the other. The squares in turn had two saw toothed enclosures (Plate 20). Protruding out of the points of each saw tooth was a pin like form with a prominent diamond shaped head. This motif was placed in systematic rows in the field of the carpet, which did not have any delineation of borders and guards. Sometimes, the field of the carpet had rows of Bukhara worked out on a dark background enclosed by wide border, made up of the field motif. Two narrow guards made of triangles or a succession of parallelograms enclosed the border, accompanied by a wide, plain outer most guard. Colours used in Bukhara were red, yellow, black, brown, white and off white on a red, brown or ivory background. This design was made in Kuthar and Sujjanpur Tira.

ii) Herati - An all over design created by enclosing a rosette shape in a diamond. On the outer side small rosettes or palmettes were placed at each point of the diamond, while a curled, serrated leaf was made on each side of the diamond. The design was normally repeated over the entire field of the carpet. The border consisted



PLATE 20. BUKHARA DESIGN



PLATE 21. A TABRIZ GALICHA

of a continuous band of palmette calyxes (Figure 42) interlinked by trellised floral or leaf motifs, known as border Herati. Two guards made of garland of rosettes (Figure 44) enclosed the border on either side with a plain outer guard of the field colour running along all the four sides of the carpet.

Herati design was made in golden yellow, red, lemon yellow, green, black, maroon and beige colours on a red, maroon or ivory background. The design was made in Bod.

iii) Shah Abbasi - Shah Abbasi was an all over design. Rosettes and palmettes were the main elements of the design, which were placed in succession as flowering branches of different shapes. A meander of trellised branches and tendrils formed the decorative motifs in design. Border Herati of rosettes or palmettes formed the border of these designs. The guards consisted of either a garland of rosettes or trellised palmettes.

Red, black, brown, maroon, green and golden yellow colours were used on maroon or ivory background for making this design which was woven in Bod and Old Kangra.

iv) Tabriz - This was a richly ornate design, the central motif of which was the dominant feature of these carpets. The medallion was in the shape of a circle,

eight pointed star or a cartouche accompanied by a tracery of flowers, branches and leaves. These motifs were arranged in the form of a corner design. The border was made up of a wide band having the repeat of the field design or the border Herati. Two guards of triangles and diamonds having a common vertex or parallelograms enclosed the border, one on either side of the band. A third plain guard of the field colour ran on all sides of the composition (Plate 21). Tabriz was made in maroon, red, golden yellow, brown, beige, blue, green and black colours on a red, maroon or ivory background. Tabriz galichas were manufactured in Bod.

v) Kashan - Kashan was one of the most popular designs used in this category of carpets and rugs. A central medallion turning into an arabesque of coronets at the upper and the lower end was the hallmark of the Kashan design. Same motifs and colours were repeated in the four corners as well. The rest of the field was decorated with flowers and vine tendrils. The border was made of two or five guards and a central continuous band, decorated with border Herati. The guards usually had garland of rosettes design. The field and the band were made in one colour whereas the colours used in the



PLATE 22. THE KASHAN DESIGN



PLATE 23. TREE OF LIFE

central medallion were repeated in the corners and the guards (Plate 22).

The colours used in Kashan design were golden yellow, beige, red, green, black and ivory on a maroon or an ivory background. Carpets having this design were made in Bod and Old Kangra.

vi) Tree of Life - A vase containing tree of life branching out to fill the whole of the field with delicately trellised leaves and flowers was a popular motif used in prayer rugs manufactured in Old Kangra. The pattern had a cartouche shape with arched top, typical of prayer rugs. The border of these were ornamented with either border Herati or Butch border, surrounded by two or four guards of garland of rosettes for parallelograms (Plate 23).

Golden yellow, red, black, blue, maroon and ivory colours were used to make tree of life design on a maroon white or a navy blue background while black, rust brown and copper colours were used when the background was ivory coloured. The design was widely used on prayer rugs made in Old Kangra and on galichas manufactured in Book.

### 5.12.3 Designs and Colours Used in Chugdang

Formal placement and repetition of motifs and elements to create elaborate designs was absent in chugdang. These usually had broad plain borders on two sides or running on all the four sides of the rug. The field sometimes had small rectilinear floral forms in four corners or placed at regular intervals on the surface of the chugdan (Figure 46). Sometimes a bigger lozenge was put in the centre with smaller motifs in the corners. In Lahul Spiti chugdang having border designs in pyramid shapes were also woven (Plate 25). Since chugdang were made from leftover carpet wool, it was a common practice to weave multi-coloured stripes and bands in the field of the rug or along its two ends. Another colour variation was used to achieve a salt and pepper effect with the help of two or three strands of different colours which were used together to make the pile. No names were assigned to these motifs and designs.

### 5.12.4 Designs and Colours Used in Durries

In Himachal Pradesh very simple, rectilinear designs were used to weave durries. Most of designs were made through variation in the colour and the size of the bands running across the field of the durrie. Hence stripes, alongwith two types of geometro-floral forms were the

FIG.46 GEOMETRICAL MOTIFS USED IN CHUGDANS

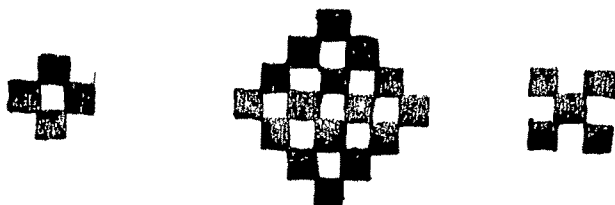
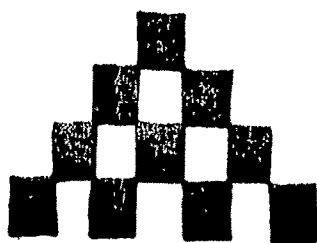




PLATE 24. MULTI-COLOURED,  
STRIPED CHUGDAN

PLATE 25. CHUGDAN IN PYRAMID  
DESIGN



only motifs used in these floor coverings. The motifs were repeated to make several designs, details of which have been mentioned below:

i) Pattedar or Borderdar - As the name suggested, the design was made by using patties (stripes) of two or more colours. Use of two colours was common in this design but at times a third colour was also used. When the design was worked out in two colours, the width of the bands of both the colours was kept the same but with the third colour the width was either kept the same or a thinner band of one of these colours was used alternatively with a thicker band of other two colours.

ii) Guddedar - This design consisted of a big rectangle in the field, enclosed in a broad border running all along the four sides of the durrie. On two sides, the border extended into the field in the form of long and short serrated, indented forms akin to the temple design used in sarees. The design was made only in two colours though for weaving the field, yarns of two colours were used to give a salt and pepper effect. The two ends of the durrie were sometimes woven in white or it had a broad band flanked by two thin stripes in the border or one of the field colours.

- iii) Durrie Tussary - Tussary was a multi-coloured, striped design. A minimum of four colours were used to make this design. In this three broad bands of varying colours were alternated with five very thin stripes to form the design. The two ends were usually woven in white colour.
- iv) Durrie Gulchaman - Gulchaman was one of the more decorative durrie designs used in the State. The design was made of broad bands of hexagonal structures, one enclosed in another. This was accompanied by three or four narrow stripes of different colours on either side. The ends of the durrie had slightly wider stripes of the field colour, woven in plain weave.
- v) Durrie Jaldar - This was the most elaborate of the durries woven in Himachal Pradesh. The design used in this was an all over floral but rectilinear pattern, made in two colours. A fret work of big and small hexagonal forms was arranged in closely formed rows running in lengthwise direction. In the widthwise direction, each of these rows was interspersed with a line of decorative lozenges. Two bands of the field colours were woven at both the ends of the durrie.



PLATE 26. GUDDERAR DURRIE

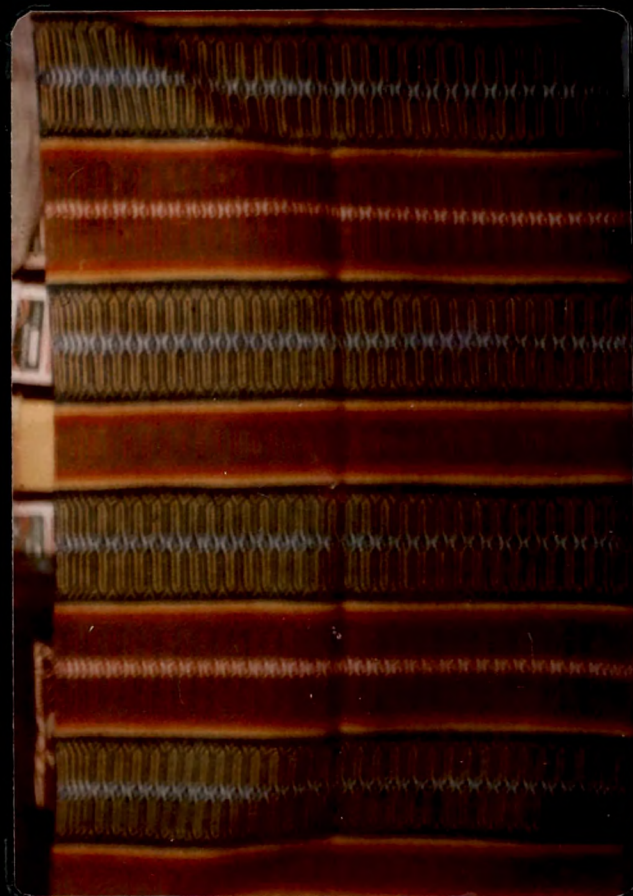


PLATE 27. GULCHAMAN DURRIE

#### 5.12.6 Designs and Colours Used in Kharoha

The only design effect used in kharcha were bands or borders of a darker shade. For this purpose natural, darker hair of goat, either of grey or brown colour were used. The use of bands of different colours in the field was very rare. Border in kharchas was usually put only along the two sides of the rug. The investigator did not come across any kharcha having stripes or bands in the field.

#### 5.12.7 Designs and Colours Used in Namda

A large variety of felt namdas produced in the state were plain, without any ornamentation. Since only a few namdas were embroidered or appliqued the range of motifs and designs used in these was limited.

The investigator came across only three designs in these rugs. The motifs used in these were stylised sparrows, flowers and lozenages which were used as the central motif in the field.

#### 5.12.8 Designs and Colours Used in Thobies

Thobi was a warp-faced floor covering, hence only a few designs were possible in this. Moreover, only two colours were used for weaving these. Mostly off white



PLATE 28. A KHARCHA MADE FROM  
UNDYED WOOL

and beige colour with dark grey or brown designs were used for making thobies. This further cut down the scope for designing.

The motifs used in thobies were geometrical but no names were given to motifs or designs. The most popular design used had a combination of thick and thin vertical stripes with horizontal bars running between two thin, wavy stripes. The investigator came across only this design in thobies, though as reported by the craftsmen, a few other designs were also made earlier.

#### 5.12.8 Designs and Colours Used in Borus

Borus were flat, embroidered rugs which were taken from old embroidered textiles, carpet designs or design books. Details of the motifs, designs and the colours used in borus have been given below:

##### 5.12.8.1 The motifs used

i) Floral Motifs - Rose buds and full blooming roses were the most popular floral motifs used in borus. Another common motif was a basket holding flowers. Several rectilinear shapes were also worked out in these rugs.

ii) Tree and Leaf Motifs - A number of tree motifs were used in this work. The flowers were sometimes accompanied



PLATE 30. A FLORAL DESIGN IN  
A NAMDA



PLATE 31. A NAMDA WITH A BIRD MOTIF

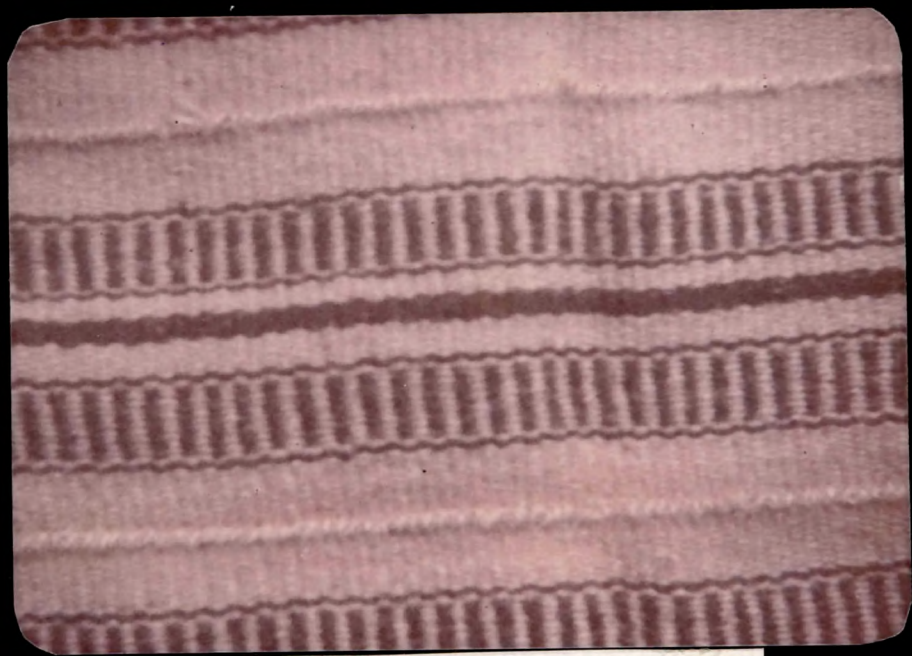


PLATE 29. A THOBI MADE FROM  
UNDYED WOOL

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by stylised leaf motifs.

iii) Bird Motifs - Parrots and peacocks were the two bird motifs used in borug. Many a times a pair of parrots was shown sitting on a flower. Peacocks holding a flower or a garland was another popular motif. Since cross stitch was employed in borug, the work moved along the woven structure of the fabric and it was not possible to embroider smooth, flowing lines in it. Hence these motifs were sometimes stylised beyond recognition.

iv) Geometrical Motifs - Geometrical motifs were very common in this work as the stitch used in embroidery lent itself readily to geometric formations. Different geometric shapes such as squares, rectangles, eight petalled flowers and hexagons were interspersed in the rug. Some of the borug were embroidered using only geometrical motifs.

Most of the designs used for embroidering boru were taken from embroidered bed covers, table cloths and occasionally from carpet designs or design books, hence no names were assigned to these.

#### 5.12.8.2 The colours used

Pink, red, maroon, light pink, yellow, green and white were the most popular colours used in borug.



PLATE 32. A BORU HAVING GEOMETRICAL,  
FLORAL AND BIRD MOTIFS

Sometimes blue, lemon yellow and black colour were also employed for embroidery.

### 5.13 WEAR CHARACTERISTICS OF CARPETS

One of the objectives of the present investigation was to study the effect of acrylic finish on the wear characteristics of the carpets. For this purpose the investigator had applied two concentrations of *Akzacryl* TX 50 on the carpets. To study the effect of finish on the wear characteristics of the carpets, treated samples were compared with the control sample. The properties (included in the wear characteristics of the carpets) studied were compressibility, recovery, resiliency, appearance retention, and the abrasion resistance of the carpets. The results of the experiment have been discussed below:

#### 5.13.1 Construction Particulars of the Carpets

The construction particulars of the carpets used for the experiment have been given in Table 26. Pile of all the carpets had been woven with a Turkish knot. Pile height of the carpets varied from 11.1 mm to 12.6 mm and the pile density was 1966 to 2176 knots/10 cms square.

Table 26 Construction particulars of carpets used  
for experiment

Sample Code	Construction Particulars			
	Pile Height (mm)	Pile Density (knots/ 10 cm <sup>2</sup> )	Weight of Carpets (g/m <sup>2</sup> )	Weight of Pile (g/m <sup>2</sup> )
To	11.1	2060	4.1	3.6
T <sub>1</sub>	11.7	2026	3.9	3.3
T <sub>2</sub>	12.2	1966	3.9	3.3
T <sub>3</sub>	12.6	2114	4.4	3.7
T <sub>4</sub>	12.3	2176	4.1	3.4

The weight of these carpets ranged from 3.9 to 4.4 gms/square meter. When the carpet pile was weighed by itself, it was observed that its weight was 3.3 to 3.7 gms/square meter (Table 26).

#### 5.13.2 Effect of Acrylic Finish on Compressibility, Recovery and Resiliency of the Carpets

A study of the compressibility and recovery of both, treated and the untreated carpets showed that carpets  $T_1$  and  $T_2$  had better compressibility and recovery than the control (Table 27). But samples  $T_3$  and  $T_4$  had 32.26 per cent and 30.34 per cent compressibility respectively. This was less than the compressibility of  $T_0$ , the control sample which showed 37.02 per cent compressibility. An increase in recovery values was observed. Carpet  $T_0$  had 88.47 per cent recovery whereas the recovery of samples  $T_3$  and  $T_4$  had 93.64 per cent and 97.54 per cent (Table 27). Finishing treatment also resulted in a marginal improvement in the recovery values of the  $T_1$  and  $T_2$  samples.

From the above data it was elucidated that application of acrylic finish resulted in improvement in compressibility and recovery of carpets but the effect was dependent on the concentration of the finish applied. A comparison of the effect of concentration of finish on the two

properties showed that application of 2 per cent finish resulted in increase in compressibility as well as recovery but an increase in the concentration of the finish to 4 per cent resulted in improvement of only recovery values (Figure 47). A comparison of method of application of finish showed that better results were obtained in both, the compressibility as well as the recovery values when the finish had been applied with by dipping method (Table 27, Sample T<sub>2</sub>).

A study of the resiliency of the carpets showed that there was increase in the resiliency of T<sub>1</sub> and T<sub>2</sub> samples (Table 27, Figure 48), which had been treated with 2 per cent finish. Resiliency of the control sample was 35.16 per cent but T<sub>1</sub> and T<sub>2</sub> treated with 2 per cent finish had 41.35 and 36.16 per cent resiliency. A decrease in resiliency was observed in T<sub>3</sub> and T<sub>4</sub> which had been finished with 4 per cent concentration of the finish. A comparison of the method used for the application of finish revealed that the brushing method resulted in improvement in resiliency of the carpets.

A study of relationship between compressibility, recovery and resiliency of carpets treated with acrylic finish showed that 2 per cent concentration of the finish led to an improvement in all the three properties (Figure 49).

Table 27 Effect of application of finish on  
compressibility, recovery and resiliency  
behaviour of carpets

Sample Code	Compressibility (%)	Recovery (%)	Resiliency (%)
T <sub>0</sub>	37.02	88.48	35.16
T <sub>1</sub>	38.05	90.09	41.35
T <sub>2</sub>	40.08	90.20	36.16
T <sub>3</sub>	32.26	93.64	33.81
T <sub>4</sub>	30.34	97.54	30.30

FIG. 47 EFFECT OF ACRYLIC FINISH ON COMPRESSIBILITY AND RECOVERY BEHAVIOUR OF CARPETS

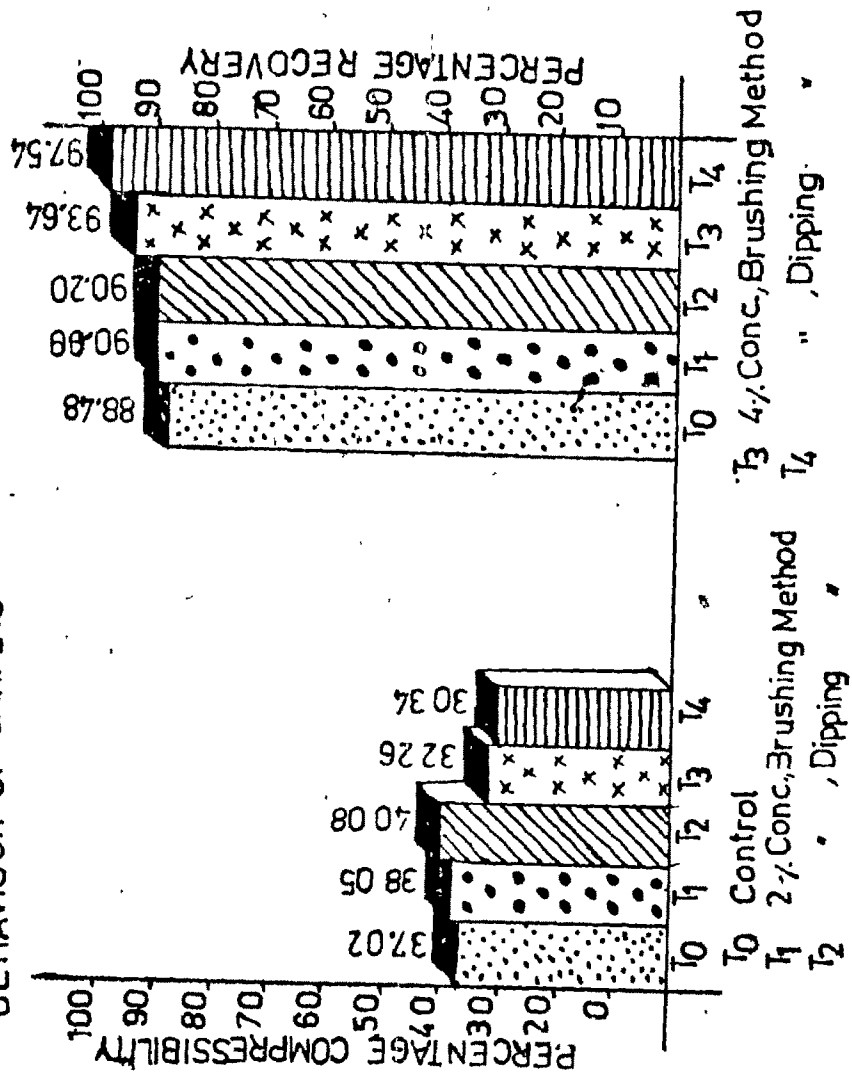
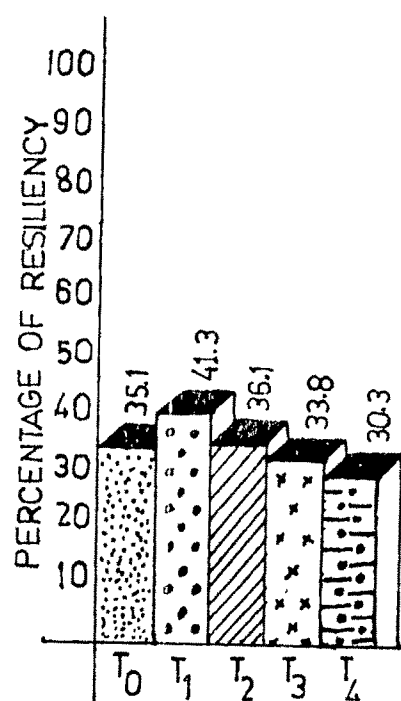


FIG.48 EFFECT OF ACRYLIC FINISH ON RESILIENCY  
OF CARPETS



T<sub>0</sub> Control Sample.

T<sub>3</sub> 4% Conc., Brushing Method

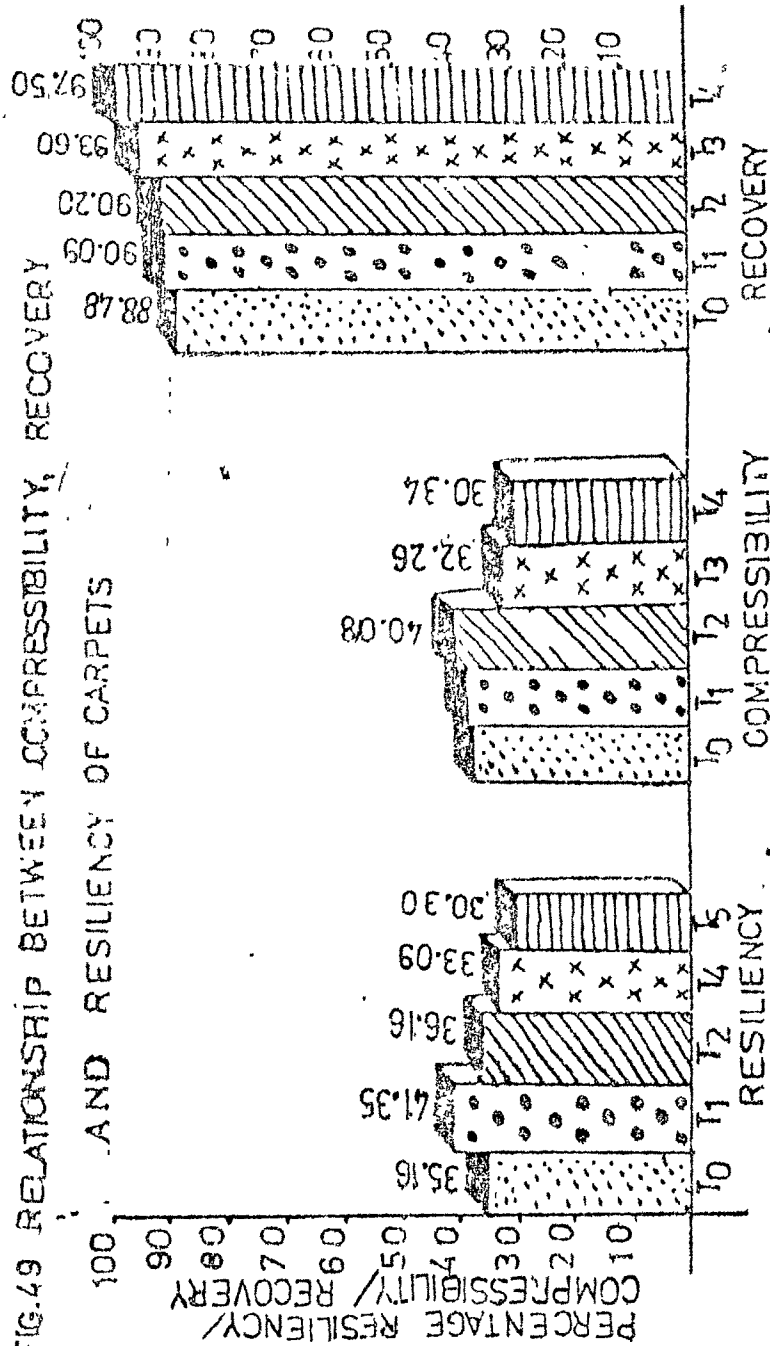
T<sub>1</sub> 2% Conc., Brushing Method.

T<sub>4</sub> " " , Dipping "

T<sub>2</sub> " " , Dipping "

FIG.49 RELATIONSHIP BETWEEN COMPRESSIBILITY, RECOVERY

AND RESILIENCY OF CARPETS



T0 Control  
 T1 2% Conc., Brushing Method  
 T2 " , Dipping  
 T3 4% Conc., Brushing Method  
 T4 " , Dipping

Application of 4 per cent finish led to a decrease in compressibility and resiliency though the recovery of the carpets was greater than that with the application of 2 per cent finish. This was attributed to an improvement in the limp and sleazy pile tufts (81) of the carpets which were better able to withstand the forces of bending. Thus an increase in concentration of finish led to decrease in compressibility and increased recovery values.

### 5.13.3 Effect of Acrylic Finish on Appearance Retention of Carpets

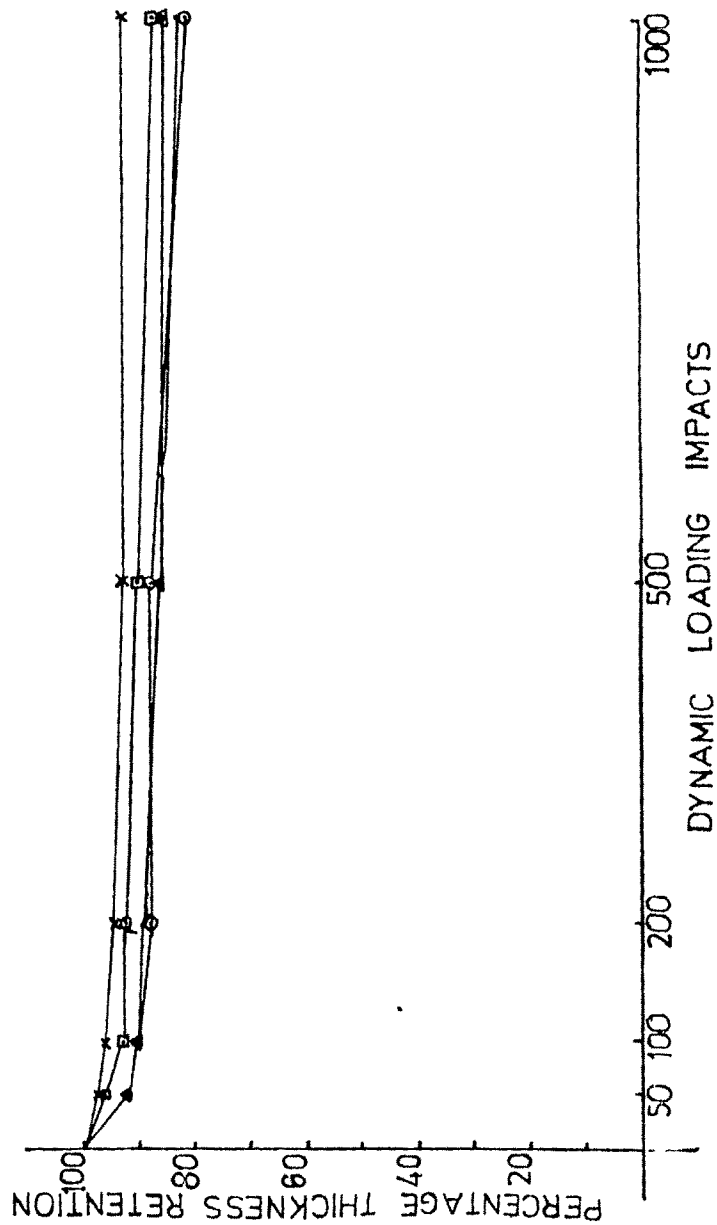
#### 5.13.3.1 Effect of acrylic finish on thickness retention after dynamic loading

Thickness retention of the carpets was judged from the percentage of thickness retained after 1000 Dynamic Loading Impacts. The results showed that both the control as well as the treated samples followed a similar pattern of loss of thickness due to Dynamic Loading Impacts. In all these samples the initial loss in thickness was higher which later stabilised to a steady pattern (Table 28, Figure 50). The loss of thickness was proportional to the number of impacts i.e. as the number of impacts increased the loss of thickness also increased. Both these observations were consistent with findings

Table 28 Effect of application of finish on thickness retention of carpets after dynamic loading

Sample Code	No. of Dynamic Loading Impacts				
	50	100	200	500	1000
	Percentage of Thickness Retained				
T <sub>0</sub>	96.7	96.4	90.3	86.6	82.7
T <sub>1</sub>	97.8	91.8	87.7	87.3	85.8
T <sub>2</sub>	97.3	95.8	94.2	93.1	91.7
T <sub>3</sub>	92.6	90.4	89.4	86.4	85.5
T <sub>4</sub>	95.6	93.9	91.9	89.9	87.5

FIG.50 EFFECT OF ACRYLIC FINISH ON THICKNESS RETENTION OF CARPETS  
AFTER DYNAMIC LOADING



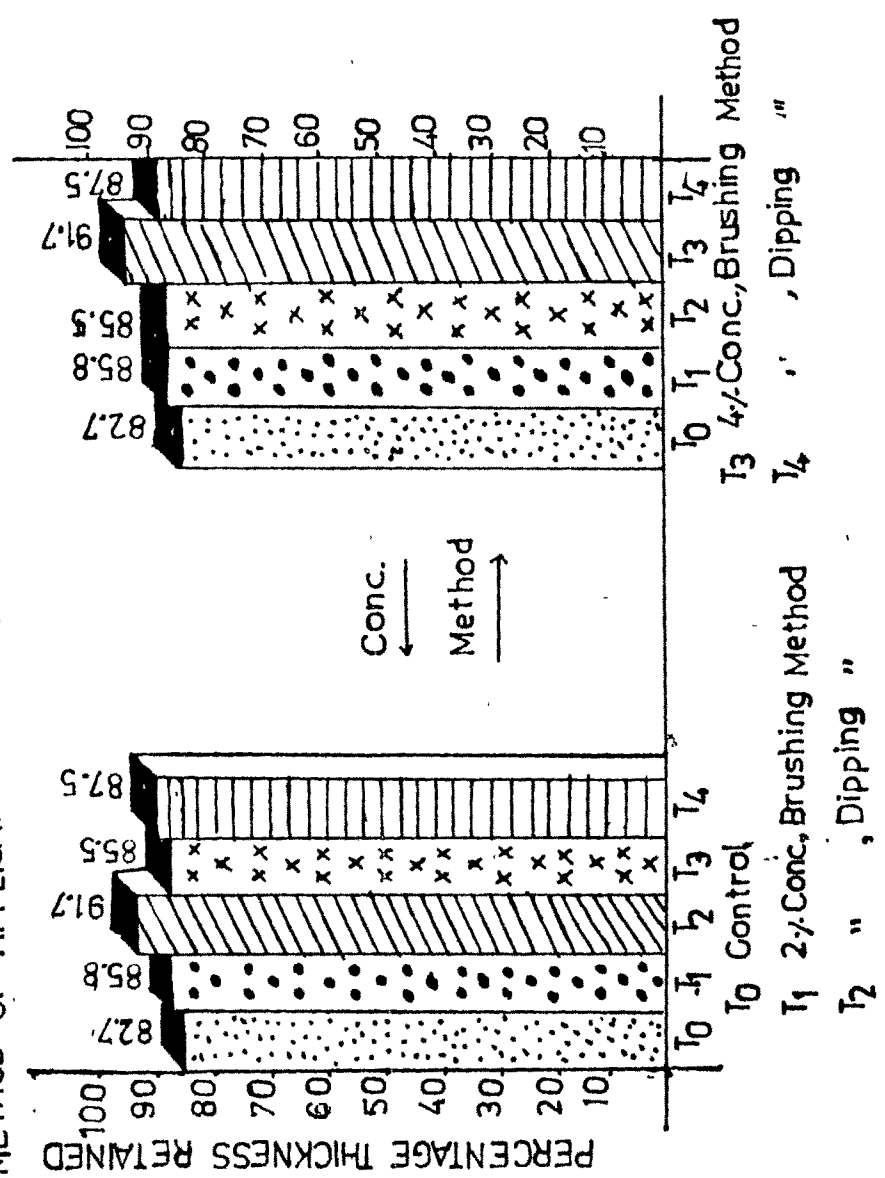
of Batra and Rawat (8).

As compared to the control, carpets treated with acrylic finish showed higher thickness retention after 1000 impacts. In samples  $T_1$  and  $T_2$ , both treated with 2 per cent concentration of the finish, thickness retention after 50 as well as 1000 impacts was higher than that of the control. Though the thickness retention of samples  $T_3$  and  $T_4$  after 50 impacts was less than that of the control sample these showed better thickness retention after 200 impacts (Table 28). At 1000 impacts the thickness retention of  $T_3$  (85.5 per cent) and  $T_4$  (87.5 per cent) was better than that of  $T_0$  (82.7 per cent).

Out of all the carpet samples  $T_2$  showed the maximum thickness retention of 91.7 per cent after 1000 impacts (Figure 51). This sample had been finished with 2 per cent acrylic finish applied by dipping method.

The results elicited that irrespective of the finishing treatment all the samples followed a similar pattern of loss of thickness. The reason for this was that in the early stages of carpet wear, the predominant mechanism causing changes in thickness was mainly the flattening of pile (59). This initial flattening soon

FIG. 51 RELATIONSHIP OF THICKNESS RETAINED TO CONCENTRATION AND METHOD OF APPLICATION OF FINISH



settled down to a fibre packing density which remained more or less constant. Furthermore, introduction of soft acrylic polymers just below the fibre surface was helpful in checking the loss of thickness. The effect of finish was dependent on the concentration and method of application. The results of investigations carried out by Wolfram and Menkart (81) have also shown that the appearance retention of the carpets derived considerable benefit from the presence of internally deposited polymer.

#### 5.13.3.2 Effect of acrylic finish on compressibility and recovery after dynamic loading

To bring the simulated carpet wear as close to the actual wear as possible, changes in compressibility and recovery of carpets were studied after subjecting these to 500 and 1000 Dynamic Loading Impacts. The results of the experiment showed that all the carpets showed higher initial loss of compressibility and recovery which gradually became steady (Table 29). Only a slight difference was there in the compressibility after 500 and after 1000 impacts. It was observed that the application of acrylic finish was helpful in checking the initial loss in compressibility but later the treated sample T<sub>2</sub> showed higher loss than the control. The initial

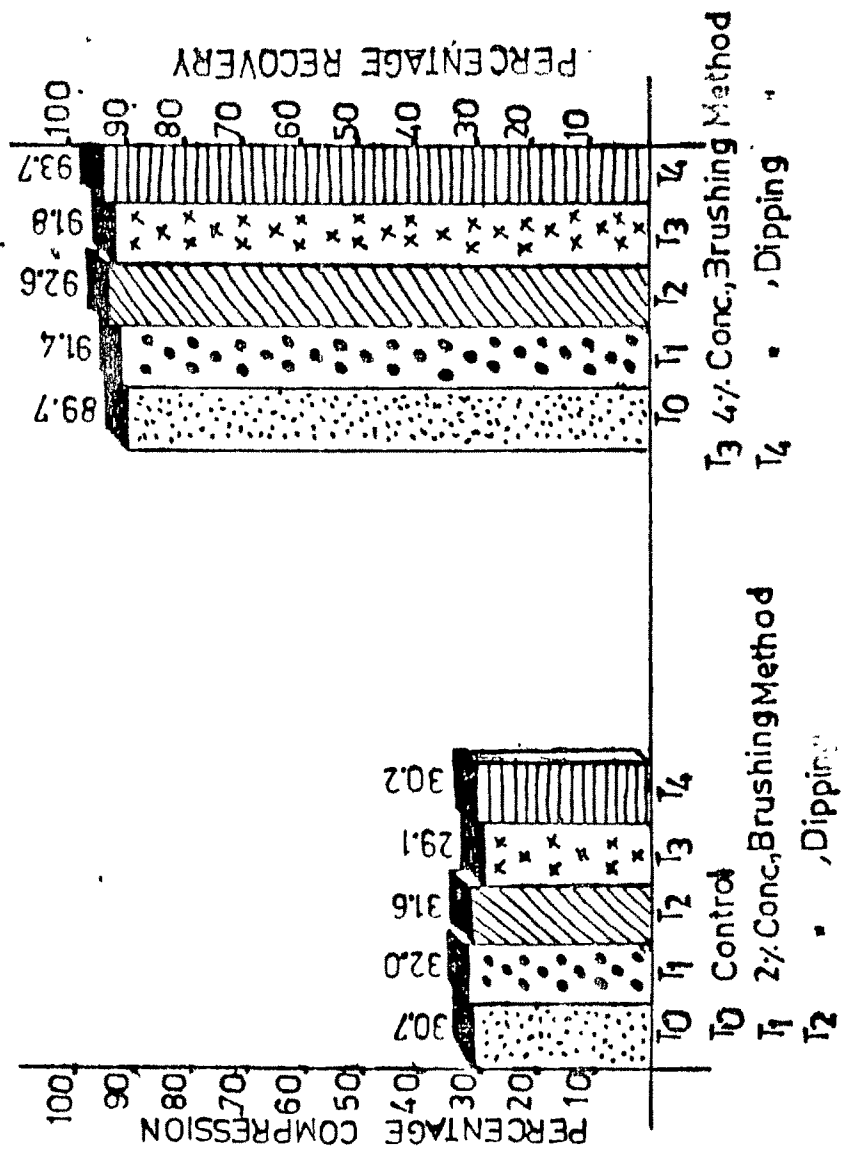
compressibility of 39.7 per cent and 39.1 per cent of the samples  $T_1$  and  $T_2$  changed to 33.0 per cent and 36.3 per cent respectively after 500 impacts while that of the control came down to 31.7 per cent from the original of 38.8 per cent (Table 29). Compressibility of former two samples after 1000 impacts was 32.0 per cent and 32.6 per cent respectively while that of the control was 30.7 per cent (Figure 52). Both these samples had been treated with 2 per cent concentration of finish. The results also elicited that with an increase in the concentration of the polymer add on, the ability of the finish to check loss of compressibility was slightly increased. This phenomenon too was similar to the one observed by Wolfram and Menkart (81) in which larger depositions of acrylic resulted in better appearance retention but at later stages of wear showed that polymethylacrylic acid containing materials deteriorated rapidly. The results of the present investigation also revealed that samples treated with acrylic finish applied by dipping method was more effective in controlling the initial loss in compressibility (Table 29).

Furthermore, it was seen that dynamic loading led to an increase in the work of recovery of all the carpet samples, though the control sample showed only a

Table 29 Effect of application of finish on compressibility and recovery behaviour of carpets after dynamic loading

Sample Code	Compressibility (%)			Recovery (%)		
	Original	After Dynamic Loading		Original	After Dynamic Loading	
		500	1000		500	1000
To	38.8	31.7	30.7	88.4	90.1	89.7
T <sub>1</sub>	39.7	33.0	32.0	87.9	94.2	91.4
T <sub>2</sub>	39.1	36.3	31.6	85.8	91.7	92.8
T <sub>3</sub>	34.0	30.9	29.1	90.4	93.5	91.8
T <sub>4</sub>	35.0	31.0	30.2	87.5	94.4	93.7

FIG. 52. EFFECT OF ACRYLIC FINISH ON COMPRESSIBILITY AND RECOVERY.  
BEHAVIOUR OF CARPETS AFTER DYNAMIC LOADING



marginal increase. There was a rapid increase in the recovery percentage of all the samples after 500 Dynamic Loading Impacts but later there was a slight decrease in all the sample except  $T_2$ . Sample  $T_2$  showed an increase in percentage recovery from 85.8 to 91.7 per cent after 500 impacts and there was a further increase to 92.8 per cent after 1000 impacts (Table 29). This sample had been treated with 2 per cent concentration of the polymer which had been applied by dipping method. Sample  $T_4$  which had been treated with 4 per cent concentration of finish, applied by dipping method showed maximum increase in recovery which was initially 87.5 per cent but increased to 94.4 per cent and 93.7 per cent after 500 and 1000 impacts respectively (Table 29). This sample had also shown maximum recovery when the compressibility and recovery of the carpets had been studied without subjecting them to dynamic loading.

It can be elucidated that application of acrylic finish did not improve the compressibility of woollen carpets after dynamic loading but had a marked positive effect on the work of recovery. Furthermore the treatment with 2 per cent finish was helpful in controlling the rapid initial loss of compressibility. It was revealed that as regards to these two properties, dipping method of applying the finish served better than brushing method.

#### 5.13.4 Effect of Acrylic Finish on Abrasion Resistance of Carpets

Abrasion resistance of the treated as well as the control sample was studied by calculating the percentage of weight retained after 1000, 2000, 3000 and 4000 abrasion cycles.

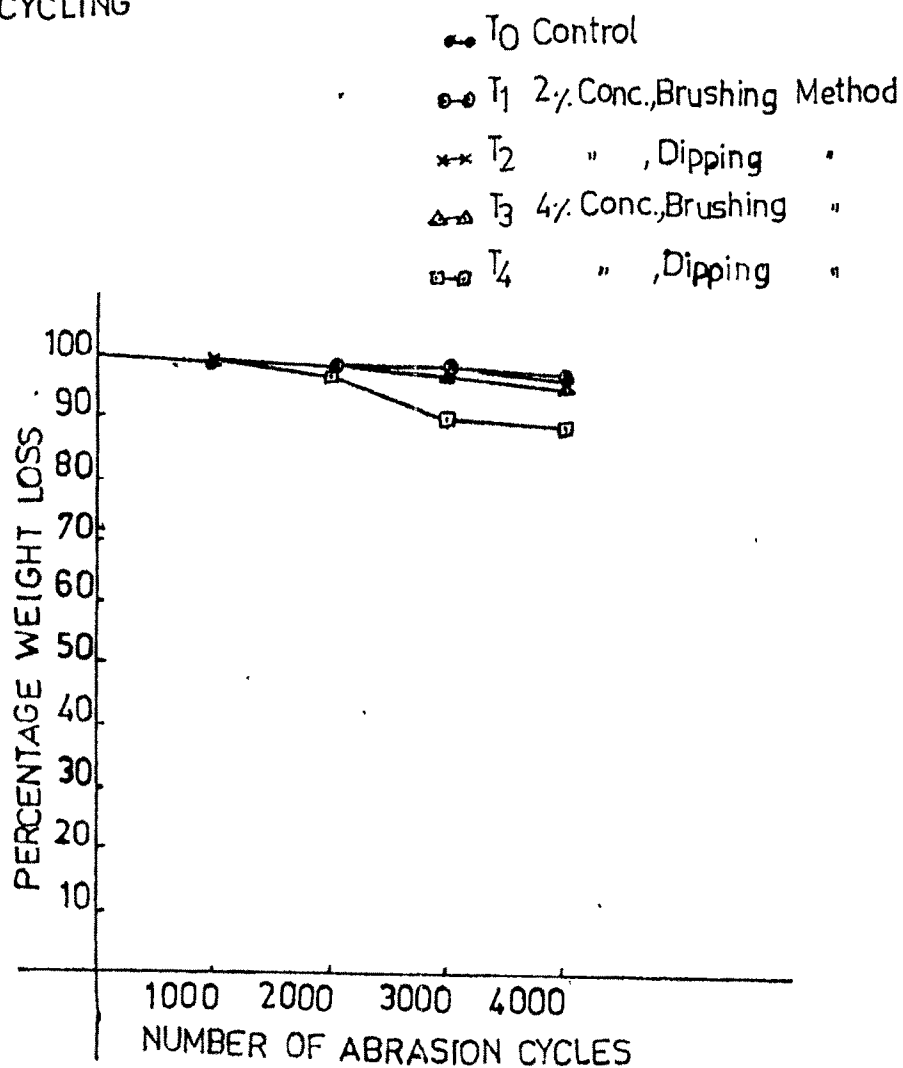
The results showed that all the carpet samples except one followed the conventional pattern of carpet abrasion, as there was a steady loss of weight due to consecutive abrasion cycling (5). After 2000 cycles the loss of weight was rapid in sample  $T_4$  (Table 30, Figure 53). After 2000 abrasion cycles the sample showed 97.7 per cent weight retention which came down to 88.6 per cent after 4000 cycles. It was also observed that application of acrylic finish led to a slight reduction in the abrasion resistance of all the treated samples except  $T_2$ . This sample showed marginal improvement in abrasion resistance as it had retained 97 per cent of its original weight after 4000 cycles in comparison to 96.1 per cent of  $T_0$  (Table 30, Figure 53). Reduction in abrasion resistance increased with the increase in percentage of polymer add on and sample  $T_4$  finished with 4 per cent concentration of the finish applied by dipping method showed maximum loss weight.

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Table 30 Effect of application of finish on rate of loss of weight due to abrasion cycling

Sample Code	No. of Abrasion Cycles			
	1000	2000	3000	4000
Percentage of Weight Retained				
To	99.3	98.3	97.6	96.1
T <sub>1</sub>	99.2	98.1	97.3	95.8
T <sub>2</sub>	99.3	98.3	96.7	97.0
T <sub>3</sub>	99.2	98.0	96.4	95.2
T <sub>4</sub>	99.0	97.7	90.0	88.6

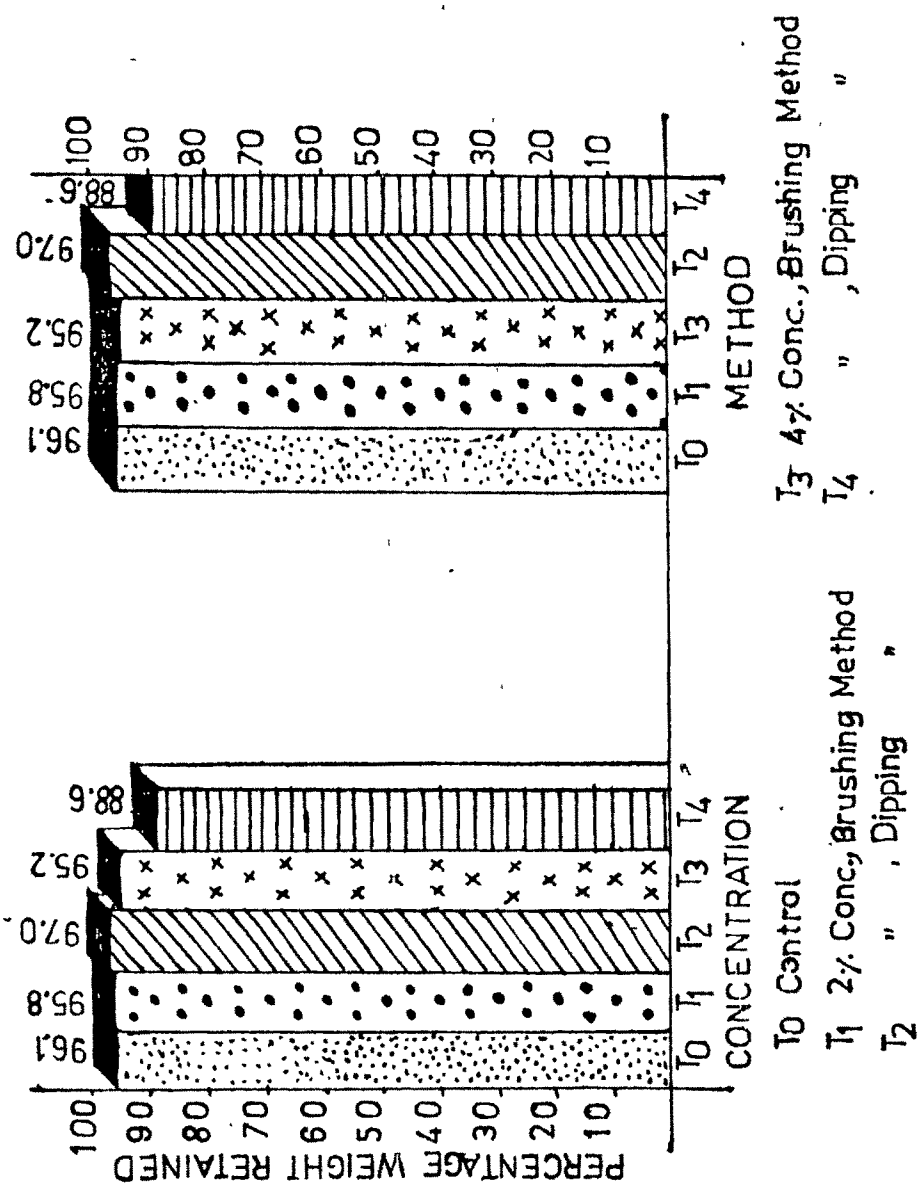
FIG.53 PATTERN OF LOSS OF WEIGHT DUE TO ABRASION CYCLING



A comparison of the weight retained after 4000 cycles revealed that application of 2 per cent concentration by dipping method resulted in slight increase in abrasion resistance (Figure 54). An increase in concentration of the polymer add on led to reduction of abrasion resistance.

The data elicited that there was no change in the pattern due to the application of acrylic finish. This loss of weight was the result of continuous removal of short sections of fibres from the surface of the pile (60). The loss in weight was linearly related to the number of treads or deformation. Furthermore, the finishing treatment with acrylic finish led to increased loss in weight, which increased with an increase in concentration of the finish applied. Similar results were obtained by Simpson and Ninon (65) when abrasion resistance of wool carpets made from wool fibres treated with polyacrylonitrile and polymethylacrylic acid <sup>was studied.</sup> Treatment of wool with polyacrylonitrile had reduced the wear life of carpets, more the addition of polymer, greater being the reduction. Again no significant change was found in the wear life of the carpets with the softer polymethylacrylic acid polymer <sup>(65).</sup> This reduction in abrasion resistance can be explained by the theory put forward

FIG.54 EFFECT OF ACRYLIC FINISH ON RETENTION OF CARPETS AFTER ABRASION CYCLING



by Haycock (34) and Warfield (77). According to them, the resin finished fabrics had better retention of fabric fibres within the yarn structure, contributing to greater inter-fibre friction which resulted in ruptures and fractures leading to a greater loss of fibre fragments in resin treated textiles.