THE GRASS IS GREENER ON THE OTHER SIDE !
A STUDY OF RAIKAS, MIGRANT PASTORALISTS OF RAJASTHAN

Arun Agrawal

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THE GRASS IS GREENER ON THE OTHER SIDE !

OBJECTIVES OP THE STUDY

In this case study from the state of Rajasthan in India, I present an account of the life of raika shepherds[1]. Where appropriate, I draw comparisons with other migrant shepherd groups, but the emphasis in the note is on presenting a coherent picture of the activities of raika shepherd camps during migration. The activities carried out by the raikas in their daily life on their migration cycle comprise a survival system which is well suited to their environment given the constraints under which the raikas live and the problems they face. The strategies they adopt change dynamically in a changing context. However their actions have a clear rationale. Contrary to popular official misconceptions, the movements and daily activities of the

[1]Raikas are also known as Rebari or Dewasi. Most of the raikas in Rajasthan, with whom this study is concerned, belong to the Maru group of Raikas.

raika nomadic groups cannot be explained as random behavior, nor be ascribed to ignorance or lack of intelligence. The major purpose of this note is to contribute to this view through a discussion of decision-making among raikas of Rajasthan. A secondary objective of the note is to look at the interactions between the migrant raikas and the sedentary farmers in the villages on the migration routes of the raikas.

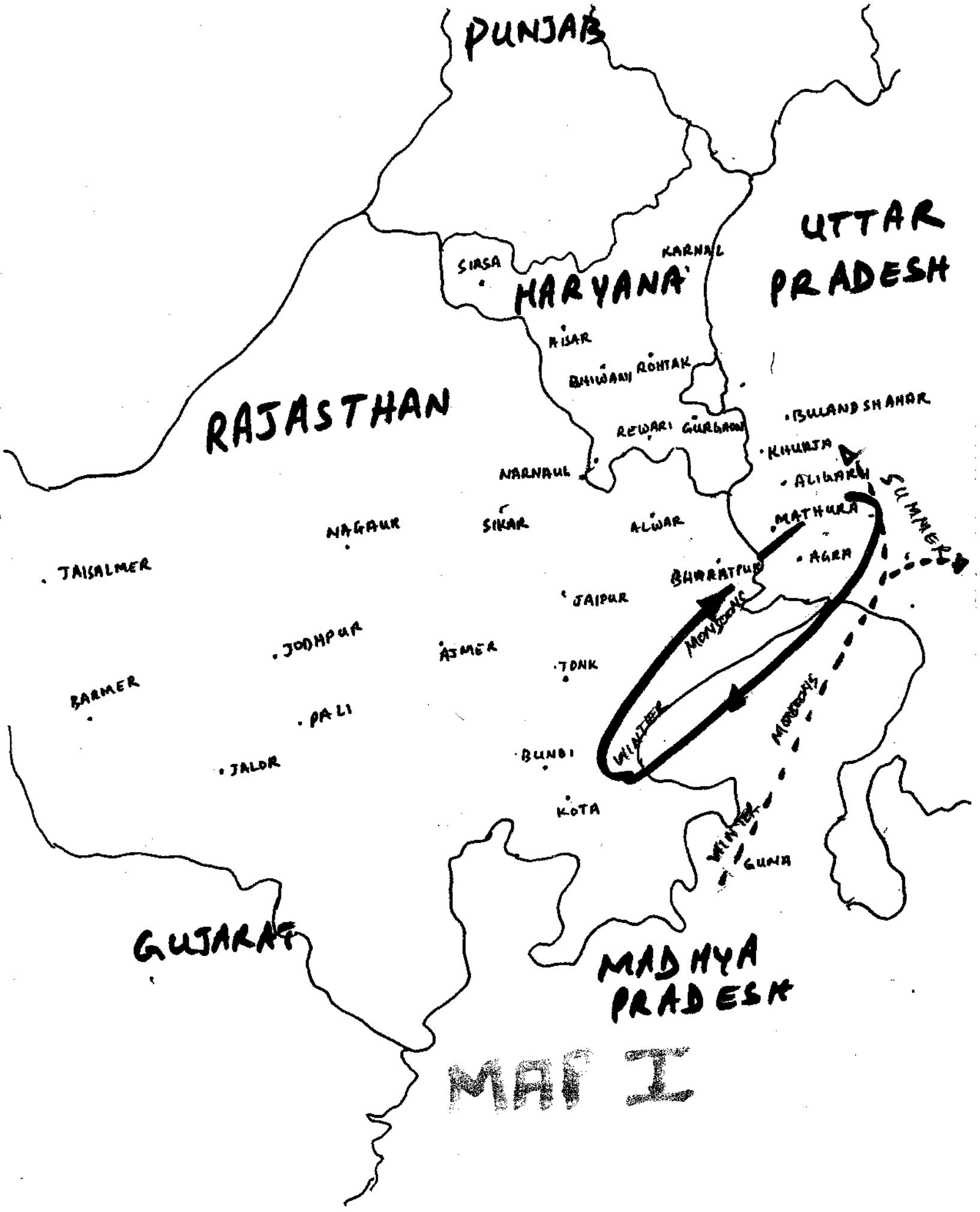
The introduction to the note is a brief sketch of the imperatives behind nomadism in a risky environment. The second chapter introduces the raikas as a group. It deals with the basic features of the raika society, such as their social structure, kinship, and factors influencing migration. In the third chapter I provide information regarding the organization of the shepherd camps during migration. It is in this chapter that I will talk about the interactions of raikas with sedentary populations during their migration. The fourth chapter discusses the economics of raika sheep-herding. The fifth and final chapter is a discussion of the decision-making in the migrating camps. Here I look at the factors behind the distribution of decision-making responsibilities in the camp and the rationality behind this distribution.

I. INTRODUCTION

Questions about whether pastoral production systems are profitable, or even if it is possible for such systems to survive, trouble the most sanguine of analysts working on pastoralists. Owen (1973, p.122) states that "the trend is for cultivation to increase at the expense of pastoralism"; Frantz pessimistically asks (1975) if some kind of proletarianized pastoral groups will become characteristic of nations in the future; and Monod (1975, p.183) conjectures that "pastoral societies may be historicaly 'determined' essentially to disappear. However, for certain levels of technological development, pastoralism can prove to be the most efficient and sustainable adaptation possible. Less polemically, nomadic pastoralism has features which are "manifestations of an adaptive flexibility which has allowed herding groups to survive in marginal environments" (Dyson-Hudson, 1972: 9).

Most pastoral societies and production systems are situated in environments that lie in either hilly regions or dry areas. Such regions are characterized by variability in environmental factors that produce corresponding variability in the food supply - whether the food supply comes from agriculture, hunting-gathering, or pastoralism. Usually such variability has a temporal as well as a spatial aspect.

Human adaptations to environmental risk, distributed temporally or spatially, are collectively termed "buffering mechanisms", Buffering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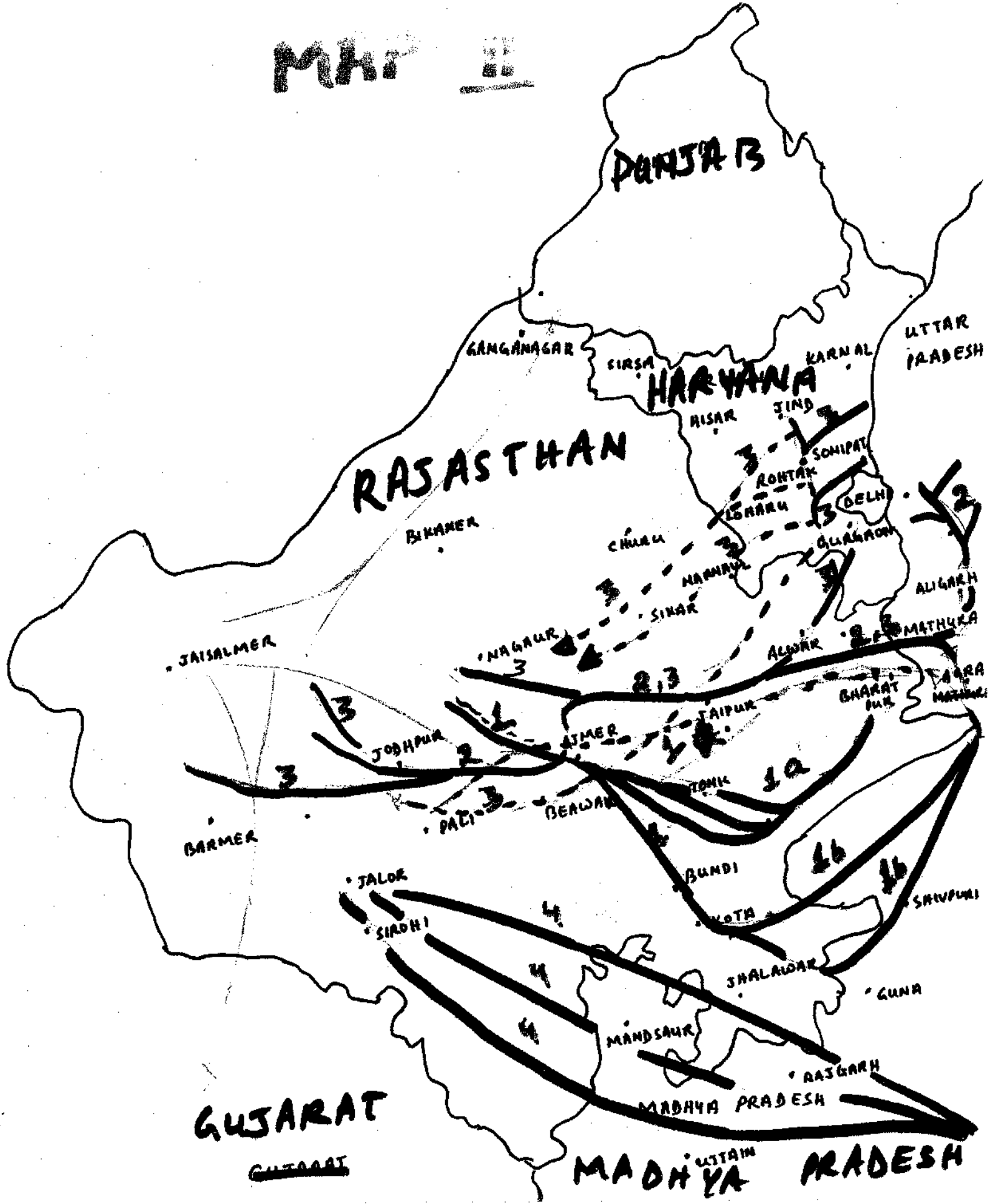
MAP I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GUJARAT
GUJARAT
MADHYA PRADESH

Diagram I : WHEN WOMEN ARE PRESENT IN DANG

X : Deva (women, children, belongings

S : Sheep

C : Camels

• : Guards

Diagram II : WHEN NO WOMEN ARE PRESENT IN the DANG

S : Sheep

C : Camels

X : Deva + guards (belongings) + guards.

SPATIAL ORGANIGATION OF RAIKA DANGS AT NIGHT

T A B L E III.l
(Number of Ewars in a Dang)

Category (n=30)	No. of Dangs falling in that category
less than 5 ewars	0
6 to 10 ewars	10
11 to 15 ewars	16
more than 15 ewars	4

Average no. of ewars in a dang is 12.

T A B L E III. 2
(Distribution of Dangs by Number of Villages their Ewars come from)

Category (n=29)	No. of dangs falling in that category
Ewars from	
2 villages	3
3 - 4 villages	9
5 - 6 villages	10
7 - 8 villages	3
More than 8 villages	4

T A B L E III. 3
(Ownership of Fields Raika Shepherds camp in)

Category (n=14)	Proportion of Campsites
Govt. owned land	16%
Village owned lands	15.3%
Pvt. land (irrigated)	21.4%
Pvt. land (unirrigated)	47.1%

T A B L E III.4

(Size of a Dang in terms of Animals)

No,	Ewars	Sheep	Goats	Camels	Donkeys	Dogs
1	13	5,500	250	35		5
2	12	5,900	110	63		8
3	14	5,600	100	61		2
4	12	5,100	300	64		4
5	11	7,200	130	40		3
6	12	4,300	130	45		8
7	11	5,700	150	42		2
8	6	3,500	65	16		3
9	17	7,400	330	56		14
10	6	2,300	55	21		
11	14	6,700	160	**54**	30	4
12	17	7,300	140	4	40	-
13	10	4,400	125	33		5
14	11	6,300	525	65	3	8
15	9	4,900	150	4	40	8
16	10	5,300	120	45	3	2
17	**11**	4,200		15	6	5
18	9	3,500	35	62		4
19	16	6,100	200	75		12
20	14	6,500	410	100		12
21	17	5,300	125	51		3
22	13	6,400	325	57		7
Average per Dang	12	5,427	187	46	20	**5**
Average per Ewar		452	16	**4**	**-**	**-**

T A B L E III.5
(Family Composition of Ewars by Villages)

Category (n=30)	No. of Ewars
Ewar members are from 1 village	13
Ewar members are from 2 villages	13
Ewar members are from 3 villages	4

T A B L E III.6
(Family Composition of Ewar; by Households)

Category (n=30)	No. of Ewars
Ewar members are from 1 household	7
Ewar members are from 2 households	9
Ewar members are from 3 households	12
Ewar members are from 4 households	2

T A B L E III.7

(Ewar Size according to Membership and Animal Ownership)

No.	Persons	Units	Sheep	Camels	Dogs	Goats
1.	6	3	470	3	1	9
2.	5	1	330	2	-	6
3.	5	3	665	9	-	5
4.	5	2	620	3	1	40
5.	7	4	310	2	-	3
6.	6	3	325	3	1	11
7.	6	3	410	4	1	15
8.	5	2	425	6	-	5
9.	3	1	350		1	3
10.	5	2	335	6	-	-
11.	5	3	460	3	-	10
12.	4	3	410	2	-	7
13.	6	1	350	4	-	14
14.	5	3	560	2	-	18
15.	6	2	340	3	-	5
16.	5	2	570	4	1	17
17.	7	2	530	2	1	10
18.	5	3	380	3	1	20
19.	5	3	340	2	1	5
20.	5	1	315	2	-	5
21.	5	3	510	3	-	6
22.	6	1	380	4	-	8
23.	8	4	625	2	-	-
24.	4	2	305	1	1	12
25.	6	1	615	3	-	4
26.	3	1	525	4	1	6
27.	4	1	490	30	1	20
28.	6	2	530	3	1	-
29.	4	1	375	2	-	22
30.	5	2	455	2	1	-
Avg. No.	5.2	2.2	443	4	.5	9.5

T A B L E III.8

(Reasons for Disputes between Shepherds and Farmers)

Category (n=25)	No. of incidents	Where people were injured	And matters reached law
1. Grazing	9	3	1
2. Passage through village	1	1	-
3. Sheep theft	7	5	2
4. Water	4	1	-
5. Blackmail	3	1	1
6. Fuelwood	1	-	-
Total	25	11	4

T A B L E IV.1
(Distribution of Flocks by Size)

Size Category	No. of Flocks
Less than 100 sheep	5
101 to 150 sheep	23
151 to 250 sheep	21
251 to 350 sheep	7
351 to 450 sheep	7
More than 450 sheep	6
Total	69

T A B L E IV.2
(Proportion of male to female sheep in the flock)

No.	Flock Size	Total Adults	Male Adult	Female Adult	Male %	Female %
1.	95	64	21	43	33	67
2.	107	67	12	55	18	82
3.	110	72	17	55	24	76
4.	148	103	28	75	27	73
5.	212	114	18	96	16	84
6.	228	149	38	111	26	74
7.	255	197	46	151	23	77
8.	330	267	50	217	19	81
9.	350	295	58	237	20	80
10.	380	295	83	212	28	72
11.	425	312	54	258	17	83
12.	430	320	60	260	19	81
13.	490	387	51	336	13	87
Total					Avg. for total	
	3560	2642	536	2059	22	78

T A B L E IV.3

(Proportion between males and females including culled animals)

No.	Adult	Adult+ Culled	Males+ Culled	Female	Male %	Female %
1.	64	68	25	31	37	63
2.	67	79	24	55	30	70
3.	72	72	17	55	24	76
4.	103	111	36	75	32	68
5.	114	148	52	96	35	65
6.	149	169	58	111	34	66
7.	197	209	58	151	28	72
8.	267	291	74	217	25	75
9.	295	323	86	237	27	73
10.	295	295	83	212	28	72
11.	312	357	99	258	28	72
12.	320	345	85	260	25	75
13.	387	432	96	336	22	78

T A B L E IV.4

(Proportion of adults to Lambs in the Flock)

No.	Flock Size	Ewar Size	Adult Total	Lambs Total	Adult(%)	Lambs(%)
1.	95	380	64	31	67	33
2.	107	335	67	40	63	37
3.	110	310	72	38	68	32
4.	148	560	103	45	70	30
5.	212	560	114	98	54	46
6.	228	335	149	79	65	35
7.	255	455	197	58	77	23
8.	330	530	267	63	81	19
9.	350	350	295	55	84	16
10.	380	380	295	85	78	22
11.	425	425	312	113	73	27
12.	430	530	320	110	74	26
13.	490	490	387	103	79	21
Overall:						
	3560		2642	918	74	26

T A B L E IV.5

(Proportion of lambs and adults in the flocks: Including Rams sold)

No.	Flock Size	Sales	Total	Adults +Sales	Lambs	Adults (%)	Lambs (%)
1.	95	4	99	68	31	69	31
2.	107	12	119	79	40	66	34
3.	110	-	110	72	38	65	35
4.	148	8	156	111	45	71	29
5.	212	34	246	148	98	60	40
6.	228	20	248	169	79	68	32
7.	255	12	267	209	58	78	22
8.	330	24	354	291	63	82	18
9.	350	28	378	323	55	85	15
10.	380	-	380	295	85	78	22
11.	425	45	470	357	113	76	24
12.	430	25	455	345	110	76	24
13.	490	45	535	432	103	81	19
Total		257	3817	2899	918	76	24

T A B L E IV.6

(Proportion between male and female lambs)

No.	Flock Size	Total Lambs	Male Lambs	Female Lambs	Male %	Female %
1.	95	31	12	19	39	61
2.	107	40	16	24	40	60
3.	110	38	22	16	58	42
4.	148	45	25	20	55	45
5.	212	98	39	59	40	60
6.	228	79	44	35	56	44
7.	255	58	31	27	53	47
8.	330	63	38	25	60	40
9.	350	55	24	31	44	56
10.	380	85	38	47	45	55
11.	425	113	54	59	48	52
12.	430	110	53	57	48	52
13.	490	103	57	46	55	45
Total	3560	918	453	465	49	51

T A B L E IV.7

(Income from folding sheep in farmer fields)

Dang No.	No. of Ewars in Dang	No. of Sheep in Dang	Amount Recd. 1989	Ewar Avg.
4	12	5100	8910	743
6	11	5700	7481	680
10	6	2300	4620	770
16	14	6700	12090	864
26	16	6100	14364	898

Avg. per ewar Rs. 791.00

T A B L E IV.8

(Joint expenses incurred by different flocks)

No.	Flock Size	Guests	Transport	Fines/Bribes	Festivals	Total
1.	95	6	20	107	38	171
2.	107	33	92	134	67	326
3.	110	10	25	100	38	173
4.	148	22	30	150	62	264
5.	212	22	30	150	62	264
6.	228	33	92	134	67	326
7.	255	48	42	154	81	425
8.	330	33	53	160	73	314
9.	350	75	88	300	112	575
10.	380	89	144	300	178	711
11.	425	50	68	382	100	600
12.	430	9	29	161	57	256
13.	490	79	86	350	114	629
Avg.		39	61	199	81	387

T A B L E IV.9
(Returns from Stock Sales)

No.	Flock Size	Mature Stock	Rate	Distress Sales	Rate	Total
1.	95	4	325	2	110	1,520
2.	107	12	340	7	95	4,745
3.	110	-		3	140	420
4.	148	8	290	4	120	2,800
5.	212	34	290	3	120	10,220
6.	228	20	340	7	95	7,465
7.	255	12	410	13	100	6,220
8.	330	24	375	4	145	9,580
9.	350	28	410	7	80	12,040
10.	380	-		12	145	1,740
11.	425	45	450	7	110	21,020
12.	430	25	400	12	75	10,900
13.	490	45	360	11	130	17,630
					Avg. per flock	8,177

T A B L E IV.10
(Returns from shearing of sheep)

No.	Flock Size	Sheep Sheared/ Wool Obtained	Rate - Rs./Kg Rs/ sheep	Total Rs.
1.	95	55 kg	31/kg	1,705
2.	107	60 Kg	35/Kg	2,100
3.	110	85 sheep	27/sheep	2,295
4.	148	130 sheep	28/sheep	3,640
5.	212	140 sheep	28/sheep	3,920
6.	228	145 Kg.	35/Kg	5,075
7.	255	180 Kg.	33/Kg	5,940
8.	330	270 sheep	26/sheep	7,020
9.	350	300 sheep	24/sheep	7,200
10.	380	290 sheep	27/sheep	7,830
11.	425	310 kg	32/kg	9,920
12.	430	345 sheep	28/sheep	9,660
13.	490	330 kg	36/kg	11,880
			Avg./Flock	6,014

T A B L E IV.11
(Total returns for each flock)

No.	Flock Size	Folding	Wool Sales	Animal Sale	Total
1.	95	264	1,705	1,520	3,489
2.	107	335	2,100	4,745	7,180
3.	110	227	2,295	420	2,942
4.	148	396	3,640	2,800	6,836
5.	212	396	3,920	10,220	14,536
6.	228	335	5,075	7,465	12,875
7.	255	396	5,940	6,220	12,556
8.	330	396	7,020	9,580	16,996
9.	350	791	7,200	12,040	20,031
10.	380	791	7,830	1,740	10,361
11.	425	791	9,920	21,020	31,731
12.	430	396	9,660	10,900	20,956
13.	490	791	11,880	17,630	30,301
Avg.		485	6,014	8,177	14,676
Proportion		3.3%	40.9%	55.7%	100%

T A B L E IV.12
(Expenses incurred directly on sheep)

No.	Flock Size	Feed/grazing	Medicines	Shearing	Total
1.	95	1,425	475	95	1,995
2.	107	1,498	642	107	2,247
3.	110	1,760	605	138	2,503
4.	148	1,998	814	163	2,975
5.	212	2,544	1,081	233	3,858
6.	228	2,508	958	228	3,694
7.	255	2,805	1,020	268	3,734
8.	330	3,465	1,320	396	5,181
9.	350	3,500	1,330	333	5,163
10.	380	3,724	1,330	437	5,491
11.	425	2,975	1,785	510	5,270
12.	430	2,580	1,290	559	4,429
13.	490	3,430	1,225	588	5,243

T A B L E IV.13
(Expenses incurred on labor)

No.	Flock Size	Men in Flock	Gwala	Consumption	Transport	Total
1.	95	1	-	1,040	250	1,290
2.	107	2	900	1,800	350	3,050
3.	110	1	800	1,760	400	2,960
4.	148	2	-	1,600	350	1,950
5.	212	3	-	3,120	600	3,720
6.	228	3	1,200	3,360	750	5,310
7.	255	3	-	3,600	900	4,500
8.	330	3	1,200	7,680	1,300	7,920
9.	350	3	1,500	2,240	600	4,340
10.	380	6	1,050	4,620	800	6,470
11.	425	5	3,500	6,480	1,500	10,480
12.	430	4	1,700	5,400	1,200	8,300
13.	490	4	-	7,440	1,600	9,040

T A B L E IV.14
(Total expenses incurred by each flock)

No.	Flock Size	Joint	Sheep	Labor	Total
1.	95	171	1,995	1,290	3,456
2.	107	326	2,247	3,050	5,623
3.	110	173	2,503	2,960	5,636
4.	148	264	2,975	1,950	5,189
5.	212	264	3,858	3,720	7,842
6.	228	326	3,694	5,310	9,330
7.	255	425	3,734	4,500	8,659
8.	330	314	5,181	7,920	13,415
9.	350	575	5,163	4,340	10,078
10.	380	711	5,491	6,470	12,672
11.	425	600	5,270	10,480	16,350
12.	430	256	4,429	8,300	12,985
13.	490	629	5,243	9,040	14,912

T A B L E IV.15

(Income and Expenditure statement for the flocks)

No.	Flock Size	Expenses	Income	Surplus (Deficit)	Surplus/ Sheep
1.	95	3,456	3,489	33	0.3
2.	107	5,623	7,180	1,557	14.5
3.	110	5,636	2,942	(2,694)	(24.5)
4.	148	5,189	6,836	1,647	11.1
5.	212	7,842	14,536	6,694	31.6
6.	228	9,330	12,875	3,545	15.5
7.	255	8,659	12,256	3,597	14.1
8.	330	13,415	16,996	3,581	10.8
9.	350	10,078	20,031	9,953	28.4
10.	380	12,672	10,361	(2,311)	(6.1)
11.	425	16,350	31,731	15,381	36.2
12.	430	12,985	20,956	7,941	18.5
13.	490	14,912	30,301	15,389	31.4

A P P E N D I X 1
(Kin Relationships in Raika ewars)

No.	Total Members	Composition
1.	6	Head, son, 2 nephews, f-in-l, b-in-l.
2.	5	Head, 2 sons, wife of elder son, gwala.
3.	5	Head, wife of head, brother, b-in-l, cousin.
4.	5	Head, son, 3 nephews.
5.	7	Head, wife, nephew, 2 friends, wife of one friend.
6.	6	Head, 4 brothers-in-law, f-in-l.
7.	6	Head, 3 sons, d-in-l, nephew.
8.	5	Head, 2 brothers, wife of brother, gwala.
9.	3	Head, younger brother, gwala.
10.	5	Head, brother, wife, son, gwala.
11.	5	Head, 2 sons, b-in-l, grandson.
12.	4	Head, brother, 2 friends.
13.	6	Head, 3 sons, wife, d-in-l.
14.	5	Head, brother, 2 brothrs-in-law, nephew.
15.	6	Head, brother, wives of both, brother of b-in-l, son.
16.	8	Head, wife, 3 brothers-in-law, son, 2 grandsons.
17.	6	Head, wife, son, daughter, brother, nephew.
18.	5	Head, brother, brother's wife, brothr's b-in-law, aunt's grandson.
19.	5	Head, 2 sons, cousin, gwala.
20.	5	Head, brother, son, wife, gwala.
21.	5	Head, son, d-in-l, niece's f-in-law, gwala.
22.	6	Head, 2 sons, d-in-l, grand-daughter, gwala.
23.	8	Head, son, wife, s-in-l, 3 cousins, gwala.
24.	4	Head, 2 brothers, gwala.
25.	6	Head, wife, daughter, 3 gwalas.
26.	4	Head, 2 brothers, gwala
27.	4	Head, wife, 2 brothers.
28.	6	Head, 2 daughters, son, s-in-l, gwala
29.	4	Head, son, d-in-l, gwala
30.	5	Head, wife, 3 brothers-in-law.

f-in-l = Father in Law; b-in-l = Brother in Law;
s-in-l = Son in Law; d-in-l = Daughter in Law;

Appendix II
(Consolidated list of decision issues)

Decision Areas/issues	Not know	Mukhiya	Nambardar	Council
1. Dang formation and dissolution				
-Selection of nambardar	2	21	7	-
-Leaving the dang (Dissolution)	-	28	2	-
2. Migration				
Direction:				
-General direction/ route	-	-	26	4
-Which state	-	-	24	6
-Scouting: short term	-	-	29	1
-Scouting: longer term	-	-	27	3
Timing:				
-When to begin migration	-	-	30	-
-When to start return journey	-	1	22	7
Distance:				
-How far to travel each day	-	-	30	-
-Whether to become permanent migrants	16	-	2	12
Camp Setting:				
-Which village to camp in each day	-	-	30	-
-Where camp should be set	-	-	29	1
-Whether to stop for mid-day	-	-	26	4
3. Ewar Management				
Household decisions:				
-Cooking	-	30	-	-
-Gathering water/fuelwood	-	30	-	-
-Buying supplies for cooking	1	29	-	-
-Breaking camp	-	28	2	-
-Setting camp	-	27	3	-
Flock Management:				
-Separation of sheep in morning	-	30	-	-
-Grazing and watering sheep	-	30	-	-
-Grazing and watering camels	-	6	24	-
-Milking sheep and camels	-	30	-	-
-Taking care of young sheep	-	28	2	-
-Maintaining ewar accounts	1	28	2	-
-Order in which ewar members will keep night watch	2	5	23	-
-Gwala's salary	9	21	-	-

4. Dang Management

<u>People Management</u>:				
-Permission for people wanting to visit village household	-	3	24	3
-Appoint people for leaving dang to do dang related tasks	-	-	29	1
-Arrange for receiving those returning to dang	1	2	27	-
-Arbitrate disputes	-	-	22	8
<u>Collective task</u>:				
-Supplies for collective feasts	-	-	28	2
-cooking for feasts	-	2	26	2
-cooking for guests	-	2	27	1
-Accommodation for guests	1	2	27	-
-Talking with visitors	-	6	24	-
-Purchase medicines	-	5	25	-
-Accounts for common fund	-	-	26	4
-Using the common fund	-	-	28	2
-Whether to join another dang	-	-	24	6
<u>Security</u>:				
-Prescribe order for setting camp	-	4	23	3
-Fine guards for carelessness	-	-	14	16

5. Market Interactions

-When to call sheep merchants	-	-	10	20
-When to call wool shearers	-	-	12	18
-When to call wool merchants	-	-	17	13
-Who to sell wool to	-	2	26	2
-Who to sell sheep to	-	14	16	-
-Rate for wool sale	-	-	27	3
-Rate for sheep sale	-	28	2	-
-Rate of sheep shearing	-	-	28	2
-How much wool to sell	-	-	30	-
-How many sheep to sell	-	27	3	-

6. **External Relations**

<u>Government Officials</u>:				
-Getting passes for grazing animals in forest	-	3	24	3
-Bribing forest officials	4	5	21	-
-Making reports to police	-	-	27	3
-Bribing police	-	-	28	2
<u>Settled Population</u>:				
-Handle disputes with villagers	-	-	17	13
-Where to fold sheep	-	-	30	-
-Develop acquaintances with locals	-	-	25	5
-Payment of fines	-	-	3	27
-Go for recovering stolen sheep	A L L G O			
<u>Legal System</u>:				
-Selecting a lawyer for a lawsuit	)			
-Collect money for lawsuit	) ALL DANG MEMBERS ARE INVOLVED			
-Go to court for hearings	)			

A P P E N D I X III
(Migration Routes)

There are a large number of different migration routes that shepherds follow. Most shepherds follow different routes for going from and returning to their villages in their migration cycle. One reason for following different routes is to not wear their welcome thin in an area by being there too often. In this appendix I will list some of the major routes. I describe the routes under two classifications. Routes followed by shepehrds engaging in permanent migaration and routes used by shepherds for six to nine month migrations.

Permanent Migration

In general shepherds from Jaisalmer and Barmer do not stay out of their villages on a permanent basis. They go out during the winter and the summer and return home in the rainy season. It is more the shepherds from Jodhpur, Jalore, Pali and Nagaur districts that are on permanent migration. There is lesser variability in the routes followed by shepherds on permanent migration. Divided by season, there migration routes can be broadly classified as follows:

Monsoons

Most of the monsoon months are spent in forest ranges in the area of Karoli, Sawai Madhopur, Dholpur, Kota, Bundi, Jhalawar, and Chittorgarh in Rajasthan.

Summer

The summer months are spent for the most part in districts in Uttar Pradesh. These districts will be Bulandshahar, Mathura, Agra, Etawah, Etah, Mainpuri, Shikokabad and Hathras.

Winter

There are two options followed by shepherds during the winter months. They can spend them in either agricultural fields in districts bordering between Rajasthan and Uttar Pradesh - such as Dholpur, Bharatpur, Jagner, Gangapur and Hindaun. However, not many dangs follow this option. Most dangs graze their flocks in forest areas in Madhya Pradesh in the winter months in the districts of Gwalior, Guna, Rajgarh, Ashoknagar and Chanderi. Two major migratory patterns can be thus distinguished. One is an oscillatory pattern in which the different dangs move up and down spending winter and monsoon in forest areas in the districts bordering Rajasthan and Madhya Pradesh and the summers in Uttar Pradesh. During winter and monsoons, the dangs move from place to place within the forest areas depending on the availability of fodder. The movement from day to day is over short distances, seldom more than two to three miles. As summer approaches, the fodder available in the forests declines and the dangs start moving to the agricultural districts in Uttar Pradesh where stubble in the fields from winter crops can be found for the sheep. At this time, their is greater direction to their movement and they move upto ten

miles every day. But once they reach districts in Uttar Pradesh, their movement is again slower. Dangs following this pattern are shown in dotted lines on Map I.

The other is a more of a circular pattern in which the dangs move from forest areas of Rajasthan in the monsoons to agricultural districts in Uttar Pradesh in summer to forest areas in Madhya Pradesh in the winter. This route is shown in solid lines on the same map.

Migration for six to nine months:

Most of the migration taking place for six to nine months relies on harvested fields in single cropped fields for the earlier part of the migration (between late November and late February) and on the stubbie of the winter crop for the latter part of the migration (March to June) during spring and early summer. This means that they there are constraints imposed on the distance and direction of migration by agricultural cycles in the areas where the shepherds are migrating to. Shepherds tend to stay in Rajasthan until the winter crops have been harvested in the canal irrigated fields in Haryana and Uttar Pradesh. Oilseeds and pulses are harvested earlier than wheat and many shepherds enter into contracts for paying farmers for grazing sheep in harvested fields of pulses.

There are four major routes followed by the shepherds that I interviewed. (These routes are shown on Map II. Return routes are shown in dotted lines and routes for going into Madhya Pradesh, Uttar Pradesh, and Haryana are shown in solid lines. Where return routes are substantially the same as outgoing routes, no dotted lines are marked).

1. One group of shepherds follows a circular pattern.Most of the shepherds in this group are from the districts of Pali, Ajmer, and Nagaur. Two routes in the circular pattern can be distinguished - based on distance travelled. Shepherds travelling the shorter distance remain in Rajasthan - moving from Ajmer, Beawar, and Nagaur to Tonk, Gangapur, Karoli, and Dausa area in the winter, to Bharatpur and Alwar during the spring and early summer and beginning the return towards their villages in mid-summer. This is the route marked la on Map II.

The other group of shepherds follows a larger circular path. In winter they move from their villages near Sojat, Nagaur, Beawar, Ajmer and Bilara towards Boondi, Kota, Jhalawar and Aklera where they spend the winter. They move into Madhya Pradesh in late winter to Rajgarh, Guna, Ashoknagar, Shivpuri, and start moving north towards Agra, and Bharatpur. In spring and early summer they are on the bordering districts between Rajasthan and Uttar Pradesh. These groups also start returning to their villages by mid summer and are home by the time monsoons arrive. This group is shown by the route marked 1b on Map II.

2, Shepherds in this group move from their villages in Pali, Jodhpur, Ajmer and Nagaur, towards Uttar Pradesh. They spend most of their winter in Rajasthan moving slowly and spending the winter months in Dudu, Sanganer, Dausa, Bharatpur and Alwar. By late winter they start moving into Uttar Pradesh and spend spring and early summer in the districts of Agra, Mathura, Aligarh, Mainpuri, Etah, Ettawah, Shikokabad, Perozepur, and Firozpur. They start moving back to their villages by late summer and reach back just around the time monsoons are breaking. They do not cross the Yamuna river to enter Rajasthan

until they have heard that rains have arrived since by the time they are ready to return to their villages, there is little vegetation on the ground. The first showers allow some germination and growth of grass which is what their sheep survive on in the march home. They move very fast on their return, often making the journey back home within twenty days, travelling upto 25 and 30 kms. every day. Shepherds from this group are marked on routes numbered 2 in Map II.

3. Shepherds in this group are also primarily from villages in the districts of Nagaur, Pali, Jodhpur and Ajmer. Some of them are also from Barmer and Jaisalmer. During the winter their migration routes are more or less the same as those of shepherds in group 2. However, by late winter they start moving into Haryana. They move to Rohtak, Panipat, Sonipat, Gurgaon, Rewari, Mahendragarh, Hissar, Bhiwani, Palwal and Faridabad. Many of them come back along routes close to the ones they used while moving into Haryana. But approximately half come back using more westerly routes along Jhunjhunu, Narnaul, Sikar and Churu.They also return in mid summer, at a very fast pace, just by the time monsoons start. This route is marked 3 on the map.

For both groups 2 and 3, shepherds on the routes also join in the migration cycle. However, few villagers who join the migration from districts lying midway on the migration routes (such as Alwar, Bharatpur, Jaipur) go towards Uttar Pradesh. Most of them move into Haryana.

4. Shepherds in this group move between the more southern districts of Western Rajasthan and the eastern districts of Madhya Pradesh. These shepherds are from districts such as Sirohi, Jalore, and Southern Pali. They move to Chittorgarh, Banswara, Partapgarh on their way to Mandsaur, Dhar, Ujjain, Rajgarh, and Indore in Madhya Pradesh. They spend most of their late winter and summer in Madhya Pradesh and return to their villages by the time monsoons break. This route is marked 4 on Map II.

I have not talked about a substantial number of shepherds who migrate from Rajasthan into Gujarat. Most of these shepherds are from districts of Jaisalmer and Barmer as well as from the southern districts of Western Rajasthan - Jalore, Sirohi. Some of the shepherds in Jaisalmer and Bikaner also move north towards the canal irrigated districts of Rajasthan - Ganganagar and Churu. I have also not mentioned these in this appendix. None of the shepherds I interviewed used these migration routes.

T A B L E II.1
(Average months of migration during the year)

Year -->	1989-90	1988-89	1987-88	1986-87
Duration				
Nambardar (30)	8.23	8.12	7.9	7.2
Shepherds (29)	8.08	6.08	6.12	6.17

T A B L E II.2
(Distribution of Migration Periods: Nambardars)

Year -->	1989-90	1988-89	1987-88	1986-87
Duration of period of grazing				
3 months or less	None	None	2	2
3.1 to 6 months	3	2	2	3
6.1 to 9 months	23	24	21	23
more than 9 months	4	4	5	3

T A B L E II.3
(Distribution of Migration Periods: Shepherds)

Year -->	1989-90	1988-89	1987-88	1986-87
Duration of period of grazing				
3 months or less	None	8	9	7
3.1 to 6 months	3	1	2	3
6.1 to 9 months	23	18	16	18
more than 9 months	3	2	2	1

mechanisms exhibit a wide range of forms. However, their exact form is a function of both social structure and the nature of variability. Thus, it will be hasty to assume that nomadism is simply an environmentally induced reflex (Lattimore, 1940: 331-34). Both politics and ecology play a role in determining the specific nature of the nomadic response that a society will produce. Societal responses can be conveniently analyzed as one or a combination of the following four basic categories: mobility, diversification, storage, and exchange (Halstead and O'Shea, 1989:3-5). The raikas use all of these, but especially mobility and different forms of exchange, in their repertoire of survival mechanisms. This will be evident in the course of the discussion but especially in sections three and five.

The criticality of nomadic pastoralism to the economy of Rajasthan cannot be denied. The prevailing environmental conditions (aridity and poor soils) in Rajasthan, especially in its western districts where the homes of most migrant shepherds are located, make it well-suited to a combination of agriculture and livestock rearing. However, the large number of animals in these districts cannot be supported by existing fodder resources. While part of the fodder deficit in the state is met by importing fodder from neighboring Punjab, and Haryana, a significant proportion is met through the migration of animals, especially sheep, to Punjab, Uttar Pradesh, Haryana, and Madhya Pradesh (CSE, 1985: 9-11)[2]. Estimates on the proportion of the flocks

[2]Currently a large proportion of migration of sheep is to Haryana and Uttar Pradesh. However, historically, a large number of animals also went to Gujarat and Sind (Kavoori, 1990).

that migrate annually from Rajasthan to other states, vary from as low as twenty percent to as high as ninety percent. The data collected during this survey reveals that while the proportion of sheep owners who migrate is low (35%) the proportion of sheep that migrate is far higher - closer to 90%[3].

[3]This is in agreement with Kavoori's findings (1990) as well as the informal estimates of the sheep and wool department of Rajasthan (quoted by Kavoori, 1990).

II. THE RAIKAS

The raikas trace their ancestry to their creation by Lord Shiva and his consort Parvati. Today, they are divided into several exogamous clans[4] (gotra):

1. Aal	2. Aandu
3. Ajjana	4. Bar
5. Basant	6. Bharka
7. Bhim	8. Bhukkia
9. Bhuku	10. Chelana
11. Dhugal	12. Dhula
13. Gair	14. Gangal
15. Hoon	16. Janj
17. Jhuan	18. Kalar
19. Kalotra	20. Kargatta
21. Khamla	22. Khatana
23. Kheka	24. Kirmata
25. Kola	26. Makwana
27. Mandawat	28. Nangu
29. Parihar	30. Piswala
31. Samar	32. Shabdara
33. Shekhawat	34. Tira

Most of the clans have subclans. Thus the Bhim clan has twelve subclans and the Parihars have five. Each clan is also subdivided into several lineages (naak). For example, the Aal clan has four lineages, as also the Gaangal clan. Of all the clans, the Samar is held in the highest regard because members of that clan are seen to be directly created by Shiva.

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[4]The information given below is based on interviews with raika shepherds as also a survey of the raikas carried out in 1980 by FAIR (Foundation to Aid Industrial Recovery), New Delhi.

The social life of raikas is still influenced to a great degree by caste panchayats known as nyaats. Nyaats are assembled at festive occasions, as well as on occasions of births, marriages, and deaths. A nyaat can also be called to settle a dispute between two feuding parties[5]. Such disputes may originate over land, over breaking of marriage or engagement contracts, or over conduct by a raika which is highly disapproved of by other members of the caste in the village or in the community. Usually the size of the nyaat will depend on the gravity of the occasion, the status of the persons involved in hosting the nyaat, and the impact that the person hosting the nyaat wants to make. The size of the nyaat is based on the number of villages which are invited to participate in the nyaat. Usually, people from ones own village, or from 6, 12, or 24 neighbouring villages will be called to participate in the nyaat. Nyaats are presided over by elder raikas, (each of whom is called a panch) and it is they who make decisions regarding what must be done in cases of nyaats in which disputes are settled. Their decisions are final, on pain of social ostracism by other members of the caste if the disputants do not adhere to the decisions handed down to them.

Raikas are the major pastoral nomad caste of Rajasthan. While many groups in Rajasthan - jaats, gujars, rajputs, muslims and ahirs -

[5] When nyaats assemble, they are usually hosted by the individual in whose house the birth or death has taken place. In case of marriages, the groom's side hosts the nyaat. In case of nyaats called to settle disputes, the expenses of hosting the nyaat are borne by the parties involved in the disputes. The expenses are incurred on feeding the kinsmen and villagers who have assembled for the occasion.

practice nomadic livestock rearing, raikas are the largest of the pastoral nomadic groups. This is not to say that raikas do not engage in agriculture. In fact most raika households combine agriculture during the rainy season with nomadic pastoralism for part or rest of the year[6]. The manner in which raika families create viable herding and agricultural units through intra-family division of labor is discussed later in the note.

Raikas are distributed throughout Rajasthan. Most of them are, however, concentrated in the districts in Western Rajasthan, especially in Pali, Jodhpur, Nagaur, Sikar, Ajmer and Barmer. Typically, they migrate from these districts towards the east into Haryana, Uttar Pradesh, and Madhya Pradesh in herding camps each known as a dang[7]. The leader of a dang is the nambardar[8]. Dangs comprise anywhere between eight and twenty herding units. Each herding unit, headed by a mukhiya is called an ewar. The migration of the dangs can be categorised along several dimensions. The period over which migration lasts, the distance travelled during migrations from the village, the frequency with which migration is undertaken, the

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[6]Of course, there are some raikas who do not migrate with their animals at all, even if they do engage in livestock rearing. Typically, these are raikas who own fewer than twenty-five to thirty sheep and goats. A small percentage of raikas are also on the move for the entire year. But most members of even such "permanent migratory groups" own land and engage in agriculture.

[7]Dang is pronounced with a soft "d". The "a" is short as the "u" in "but".

[8]Nambardar literally means the "holder of a number". The word dates back to the British period when migrating shepherd leaders were assigned a number by the administration.

direction of travel - these are the more obvious dimensions which I consider.

Of these, the duration and frequency of migration and the distance travelled during migration are very closely inter-related. (see the section following immediately). Each of these depends on the size of the flock belonging to a shepherd and the vegetation available in a village. The direction in which a dang migrates depends for the most part on the contacts that a nambardar has developed over time with settled groups along the migration route.

II•1 Duration, Frequency and Distance of Migration

The raika migration cycle begins at the end of the monsoons. Depending on the fodder-animal balance in their village and in the surrounding areas, the period of migration can vary from as little as three months to as much as the entire year. For most of the shepherds that I interviewed, the duration of migration was approximately six to eight months. Starting their migration in October and November from the drier western districts of Rajasthan, the shepherds move east both in a northerly and southerly direction towards the states of Haryana, Uttar Pradesh, Madhya Pradesh, and Gujarat.

The shepherds spend three to five months on the migration before they reach their destinations in these states. After spending approximately a month to two months in these states, they begin their journey back home, with the approach of the monsoons. The return journey is often completed by a different route and is much faster, lasting approximately two months, than the outward journey. This is

because the shepherds want to reach home before the monsoons actually arrive so that they can till their lands and sow the crops. At the same time they do not want to begin the return journey without at least a few showers. If the land they are passing through has received a few showers, it provides better forage for their sheep. Throughout their migration they opportunistically seek forage for the sheep - in dry or irrigated private fallow, government owned pastures and forest land, road sides and village owned commons.

From the accounts of shepherds, the average duration of migration has registered an increase over the last few years. This is true for the shepherds that I interviewed in the dangs, as well as for the nambardars (see Table II.1).

While four years is too short a period of time to allow a definite conclusion regarding the existence of an increasing or decreasing trend in the duration for which the shepherds migrate, the figures in the table do confirm other evidence that the average duration for which shepherds migrate has increased even during the last few years (Kavoori: 1990). For the nambardars, the average length of the migration period has increased by a month. It seems that the rise in the duration of migration for the herders has increased even more precipitously from about six months to eight months. However, the figures for the ordinary herders need to be interpreted somewhat more cautiously.

Almost all the nambardars own flocks of 250 to 400 sheep. Thus the flocks of the nambardars are "viable herding units" without the nambardar having to combine his flock of sheep with another person to

make a viable unit[9]. Quite a few of the shepherds, however, own a hundred sheep or less. To make up an ewar, shepherds often combine their flocks. Thus two or more shepherds will combine to make up an ewar, the viable herding unit for the purpose of migration. This has two implications. It is possible that at least in some of the years, the shepherds will not find a partner with whom they may be willing to migrate. Also, in some years, it may rain enough in the home village of a shepherd owning a small flock so that he manages to find adequate grazing in and/or around his village for his flock. Thus the shepherd may be able to ensure the survival of his sheep without having to embark on a long migration. This will be clearer if we look at the distribution of the migration periods for the shepherds and the nambardars (Tables II.2 and II.3).

From tables II.2 and II.3, it is clear that the average duration for which the shepherds migrate has a bi-modal distribution. They often migrate for three months or less. But when they do migrate, the period of migration is between 6 and 9 months. This particular distribution of migration periods may also result from the fact that in my sample a large number of shepherds own flocks consisting of more than 200 sheep. It is only when flock sizes are less than 100 sheep that it becomes possible to find good forage for the flock without migrating over a long distance.

There are, thus, three conclusions to be drawn from the data presented in tables II.1 to II.3 and from the discussion in this

[9]See section 4 on econmics of the flock.

section on migration. First, the duration for which migration takes place is directly proportional to the size of a shepherd's flock. Second, flock size is also directly related to the distance travelled by shepherds during migration. If a shepherd has a small flock, he needs to leave the village for a shorter priod of time. Therefore in years when the shortfall in vegetation around the village of a small flock owner is not extreme, (owing to relatively good rainfall) he will attempt to manage without embarking on a long migration. In such years, small shepherds herd their sheep individually in the pastures around their village. Even if they leave their villages, they do not go far from the village - preferring to herd the sheep close to the village and travelling between their homes and their flock every week. Finally, if a shepherd has a large flock (numbering 200 sheep or more) then he will normally migrate almost every year. This is so because even in years of average or better than average rainfall, the village pastures will not have sufficient fodder for the flock. On the other hand,if a shepherd has a small flock, then it is likely that he will migrate more infrequently. Thus duration, distance and frequency of migration are all interrelated, in addition to being a function of the size of a shepherd's flock, given a certain level of fodder availability in a village.

Of course, this is a somewhat rough analysis. If in some village, there are only a couple of shepherds owning 200 sheep or more, and no other sheep owners, they may not have to go far beyond the boundaries of the village. Similarly, if in another village with the same amount of vegetation for sheep, there are ten or fifteen shepherds each

owning around 50 sheep then some of them may have to choose to go on a longer migration by combining their sheep into an ewar.

II.2 Direction of migration

While the duration, distance and frequency of migration are strongly influenced by economic factors - in the sense that they are closely and obviously linked with resource availability and flock size[10], the direction in which a dang will migrate has correlates that are more overtly socio-political rather than economic. First of all, given that during a migration cycle, a raika dang can cover as much as two thousand kilometers, it is feasible for them to travel across national and state boundaries. This means that not only must we consider ecological and economic factors when looking at raika migration patterns, we must also take into account questions of national security and differences in state policies regarding livestock migration.

Prior to Indian independence, a large number of pastoralists from Western Rajasthan went to Sind after the monsoons. However, with most of Sind going to Pakistan, the option of migrating in this direction was formally closed to Indian shepherds (Kavoori, 1990:11; Famine Reports from Rajputana Agency, 1899-1900, quoted by Kavoori, 1990).

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10 • This, of course, is not to say that government policies do not influence the duration, distance and frequency of migration. It should be sufficient to point out here that government policies regarding agriculture, irrigation, fodder and pasture development, species specific livestock health, credit, law and order, and famine - to name a few - will significantly affect different aspects of migration.

Policies followed by different Indian provinces today also drastically affect the direction for migration chosen by the shepherds. In 1979 (CSE, 1985) the state government of Madhya Pradesh increased the taxes levied on livestock immigrating from out of the state by as much as a factor of ten[11]. This drastically affected all shepherds and camel herders. As a result, most of the migrants who went to Madhya Pradesh either do not go there any longer or are forced to make side payments to petty forest officials in Madhya Pradesh.

When several major directions are feasible for migration, (towards Uttar Pradesh, Haryana, Delhi, or southern Rajasthan) the actual choice of the direction depends on the familiarity that a nambardar has with the farmers and other villagers on a given route. The relative advantage of going to a particular state - Uttar Pradesh or Haryana or towards Delhi - do not seem to be prominent in any of the cases. (See maps in Appendix III for the directions chosen by the different dangs I interviewed as well as for a general map of shepherd migration).

The routes described in appendix III and shown in maps I and II confirm that there is no overwhelming advantage to going in a particular major direction. Dangs from the same region go in different directions. We must then, seek the explanation for the choice of directions in the manner in which nambardars are created and in the

[11]For goats and sheep the grazing tax was increased from Rs. 1.00 per animal per year to Rs. 10.00; for camels from Rs. 10.00 to Rs. 50.00; and for cattle from Rs. 0.75 to Rs. 2.00 per animal. (Written communication, 1990, Bhopalaram Dewasi, President, Rajasthan Livestock Breeders Federation,).

relationships that they develop. This is especially so because it is the nambardar in a dang who chooses the general direction of movement for the dang (see appendix II, section on migration decisions).

Nambardars are selected by shepherds each year. In general, a number of shepherds approach a person who they feel is influential, has good contacts among the settled population over some migration route and is capable of interacting with government bureaucracy - in short, a person who has leadership qualities. If a person has been a nambardar for some years, his choice may become routine. But for a person being approached for the first time, it helps if the person being approached is a shepherd and has had several years of experience in long distance migration. Often some relative, possibly the father, of the new nambardar may also be (or have been) a nambardar. The choice of a good nambardar is crucial to the successful conclusion of a migration cycle[12].

Once a nambardar has been chosen, the choice of the route for the dang devolves on him. While he will usually consult the elder shepherds in the dang before he takes a major decision, his decision is accepted as final by the shepherds. The nambardar's decision in turn will depend on how familiar he is with a given route, and with the people and villagers on that route. Knowledge of the route, and familiarity with villagers on the chosen migration route are very important. For one, shepherds often get into fights/conflicts with settled populations along their migration route. What is more, the

[12]This will be evident when we look at the range of decisions that a nambardar is entrusted with (see appendix II).

incidence of conflicts among settled populations and passing shepherds has increased over the past years according to shepherds. Local acquaintances, if a fight occurs, can prove to invaluable. But quite apart from being useful for mediation and negotiation in case of fights, local acquaintances are also useful for providing sheleter and help when sheep are sheared.

The preceeding paragraphs should make it clear that the choice of the direection of migration is dependent on socio-political rather than purely economic factors. State policies, presence of acquaintances, familiarity with the route - these are the major reasons that determine the attractiveness of one migration route over another. And it is these that in turn determine the possibilities of better subsistence while on the move.

III. **THE MOVING VILLAGE**

III.l Dana Characteristics

Raikas migrate in "dangs" - the corporate social unit during migration. A dang is a closely knit (for the most part) group of shepherds, cooks, sheep, camels, goats, dogs and sometimes donkeys, organized by "households". On the average a dang consists of 12 "households", each known as an "ewar" (see Table III.l). The ewar consists of five to seven persons (men, women and children)[13] who need not necessarily be from a single household, but are in general affinally or agnatically related (see appendix I).

Dangs are formed by a number of ewars coming together. Ewars in a dang are usually from different villages. For the dangs that I have information on, no dangs had all ewars from the same village (see table III.2). Therefore to avoid confusion, dangs are usually known by the name of the nambardar or by the name of the village of which the nambardar is a resident. This is the case even if most of the ewars in the dang are not from the nambardar's village. Not only is it possible for the ewars to be from different villages, the villages may

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[13]While many raika dangs have women members, not all do. Even the dangs which have women and children, have them only for part of the migration period. During the return of the dang from the east, women and children are sent back to the home villages in advance.

all be quite far from the village of the nambardar. Distances of 60 kms between the village of the nambardar and the village of other shepherds in the dang are common-place.

The dang begins its migration cycle from the village of the nambardar each year after the monsoons are over and the raikas have harvested their fields. Those of the ewars which are from villages behind the village of the nambardar on the migration route come to his village before the dang sets out. If the villages of the shepherds lie on the migration route, they join the dang on the way. If they are out of the way, then the nambardar tells them where they should meet up with the dang.

There is a reasonable amount of consistency in the membership of a given dang from one year to another. However, if members of any ewar are dissatisfied with their experience in the dang in some year, the option of joining another dang for the next year is easy to choose. A shepherd can join another dang on the basis of kin relationship with any member of the new dang, or even friendship with another shepherd in the dang which he wants to join. There is no formal criterion that a new member has to fulfil to join a dang, apart from not having a reputation of being a trouble maker.

While on the migration cycle, raikas set camp keeping in mind two basic requirements - fuelwood for cooking, and sufficient water for the sheep and for their own needs. The particular fields in which they set camps may be private, government owned or owned by the village community (see table III.3). The raikas themselves have no stated preference between setting camp in irrigated vs. non-irrigated fields.

If anything they prefer fields which have irrigation - especially irrigation from a tubewell since water from the tubewell can also be used for the sheep and for their own needs of drinking, cooking, washing and so forth. Farmers have a clear prefererence for having the shepherds fold sheep in fields with irrigation possibilities because fertilization by sheep manure in irrigated fields provides better crops.

There is of course another reason why raikas prefer to fold their sheep in irrigated fields. In general irrigated fields belong to the better off and more influential persons in the village and by folding their sheep in the fields of the richer individuals, the shepherds in some sense are reducing their chances of being harassed by trouble-makers in the area. The preference for folding sheep in the fields of more influential villagers is especially clear when a dang is alone in a given area. The shepherds I interviewed, narrated instances of how farmers in whose fields they folded their sheep have sometimes helped them look for culprits in case they had any sheep stolen while they were camped in his fields.

From its superficial appearance when at camp, a dang resembles nothing as much as a mobile village. The belongings of different ewars are laid out in a circle, there are little camp fires[14] burning for cooking the food (each ewar cooks its food separately), and by night, the animals return from grazing. After the animals have come back for the night, the sheep are folded inside the circle of the camp-fires,

[14]Camp fires are almost religiously put out in the night to prevent detection by thiefs and trouble-makers.

and the camels outside. The raikas do not use any tents and sleep in the open.

Sleeping in the open entails its own problems regarding safety of different assets belonging to the raikas. There are two ways in which the raikas tackle this. To begin with, they settle for the night in fairly precise patterns, somewhat resembling concentric rings. When women and children are with the dang, raikas put their belongings (known as "dera" in the center of the circle, or the innermost ring, and women and children sleep in the center of the innermost circle for the night. The sheep are in the second circle, the camels next and the guards in the outermost circle. After the women have left for home, the sheep are in the innermost ring, the camels next, and then the men in the ewar with their belongings (see diagram 1 and 2 for a schematic of the arrangement).

Raikas also have a system of maintaining watches during the night to guard their sheep and belongings. In each ewar, members keep night watch in a fixed order for the entire period of migration. (Depending on the strength of the ewar, the members will have to keep watch for a longer or shorter duration). While keeping watch, the guards keep themselves and other watchers awake through periodic shouts, warning, and calls to be careful and to keep awake. They also talk with each other, sing, and walk to prevent themselves from falling asleep. In areas known for criminal activity, or for hostility to herders, guards walk from their position around to the position of the next guard, who walks to the position of the next guard and so on, until the circle is complete. Often to ensure that nobody falls asleep, they carry a stick

with them which is rotated by the watchers from one to another as they move along the circumference of the circle. Then if any of the guards falls asleep, the stick remains with him, and he can't pass it on to the next person. In the morning, the person who fell asleep is discovered by the location of the stick, and appropriately fined. The prospect of a punishment in the morning that is used as a disincentive to falling asleep.

While the dang may resemble a village superficially, it differs in major ways from a village. No village carries with it its entire set of productive assets. This fact is not incidentally related to degree of organization and corporateness in a dang which is much higher than in any village. Corporateness and internal cohesion[15] in a dang is essential if the dang is to successfully traverse distances of upto 2000 kms. a year and deal with all the challenges and problems that a new and changing environment can throw at resource poor groups of 50 to 100 individuals and their animals. Managing the movement and various production and consumption activities in a corporate unit the size of a dang (see table III.4) requires cooperation among dang members if the dang is to survive and function[16].

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[15]In section 5, I will examine at length the degree of corporateness in a dang, the extent to which members combine cooperation and corporateness with individualistic decision-making and the rationale for the particular distribution of these qualities in the decision-making of dang members.

[16]This table merely given an indication of the size of the dangs that I interviewed. Section five provides a justification for the level of corporateness and cooperation found in shepherd dangs and for the manner in which decisionmaking responsibilities are distributed within the dang.

III.2 Ewar Characteristics

Ewars are the constituent units of dangs. An ewar in a dang is comparable to a household in a village. It is the elementary unit along which production and consumption are organized in the dang (FAIR, 1980). While most ewar members are related to each other[17], in a majority of the cases the ewar members belong to different households (see tables III.5 and III.6), and there are also some examples of friends coming together to form an ewar (in my sample two out of the thirty ewars have friends among members). The households may or may not be from the same village.

For the most part an ewar has five or six members (of the 30 ewars I interviewed, 22 had either five or six members - see table III.7). Together, they carry out tasks such as grazing the sheep and camels, taking care of the young sheep, cooking and taking care of household tasks, communicating between the ewar and the village and carrying out other activities associated with the migration, and so forth. The head of the ewar - the mukhiya - assigns different tasks among the different ewar members. This will be the case even when the ewar members belong to from different households and villages. Indeed, it is in situations where there is greater possibility of disagreement (as will be the case when the persons in an ewar come from different families) that the task of distributing responsibilities is more important. Usually, tasks will be assigned keeping in mind the age and

[17]See appendix 1 for the range of relationships among the interviewed ewar members.

sex of the members of the ewar[18]. Some dynamics of how such assignment takes place will be clearer from the idealized picture of responsibility distribution in the following paragraph.

Normally two males graze a flock of three hundred to four hundred sheep - the average size of the flock in an ewar (see table III.7). Of these usually one is an adult, and the other a child around ten years old. An adult female and in some cases, a younger female child carry out cooking and other related household tasks such as milking the animals[19], setting camp, unpacking, and breaking camp. An adult male maintains contacts between the ewar and the household back in the village by travelling back and forth between the ewar and the village household. This person also carries out other tasks related to the migration and herding of the animals such as gathering information about rainfall, about fodder availability, about selling sheep and wool, and purchase of medicines and supplies. Shepherds who graze the sheep cannot double in this task because most of their time is taken up in grazing the sheep. This person also grazes camels when assigned this task by the nambardar and sometimes helps the women in the ewar in packing balongings and breaking camp. A teenager normally takes care of the new-born sheep.

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[18] At the same time, when the ewar is formed, members are also chosen with an eye to the daily different tasks that normally must be carried out during migration.

[19] However, camels are milked exclusively by males and camel milk is drunk fresh. There are religious taboos on the sale of all milk, (but especially the milk of camels), the heating of camel milk and its use for making tea.

Of course none of the task assignments according to age and sex are inviolate. The opportunistic flexibility which characterizes migratory grazing is also in evidence in division of labor within the ewar. When women leave the dang towards the end of the migration cycle, male members of the ewar double as graziers and cooks. Depending on the availability of labor in the family, the mukhiya can employ a shepherd - called gwala - for grazing sheep. The relationship with the gwala is usually an economic one in which the gwala grazes the sheep and often also carries out other tasks in the ewar in exchange for food, some clothes and cash[20]. 40% of the ewars I interviewed employed gwalas.

Daily life in the ewar is fairly harsh. The shepherds rise before day break and take their sheep for grazing - usually to distances ranging from 3 to 5 kilometers from the camp. They return after three to four hours and have their breakfast which by this time would have been cooked. Before their return, the persons in the dang in charge of grazing camels also leave with the camels. After the shepherds have had their breakfast/lunch, they leave again with the sheep. After they have left, the camels return from their grazing and are loaded with the household goods so that they can move off to the new camping location for the day. Raikas move camp almost every day, and seldom stay in any location for more than two days. Often the young lambs are also transported on camel back.

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[20]See section IV "Economics of Sheep Herding" for the economics of and for details on contracts between the gwalas and the mukhiya of the ewar.

The dang reaches its new campsite for the day in two to seven hours of walking, depending on the distance of the new camp from the old. During the migration, men and women move on foot, guiding the camels. Younger children and infants often travel on the backs of camels. Once the dang has reached the new camping site, the camels are unloaded, camp is struck and the camels are again taken away for grazing. The shepherds return to the camp with the sheep a little after sunset. When women are there in the camp or someone else who is specifically in charge of cooking, the dinner for the shepherds would be cooked by this person before the shepherds return from grazing. If there is noone in charge of cooking the meals, then the shepherds cook for themselves after returning from grazing the sheep.

When women are in camp, sheep are milked regularly every morning and evening. The milk is used for drinking, and making yogurt, tea, butter, buttermilk and ghee (clarified butter). Making all of these products from milk is the responsibility of women. Women are expected to fetch firewood and water, and wash and mend clothes. In addition, they are also responsible for spinning sheep's wool. (Men only spin goat and camel wool and only on hand spindles).

III.3 Nomad-Farmer Relationships

The distinction between sedentary and nomadic populations is questionable when it is depicted as the distance between two polar extremes - where sedentary and nomadic populations are necessarily "separate from, opposed to and disdainful of" each other (Dyson-Hudson, 1972:18). Bates (1972), Irons (1972) and Horowitz (1972) call

such facile category creation into question and provide a thoughtful analysis of the relationship between nomads and farmers without treating these categories as inviolate. This questioning is particularly apt in the context of the raikas.

We have already seen how raikas are both settled farmers and mobile pastoralists (see footnote 6). At the same time, once we reject farmer and shepherd as rigid polar extremities, the analytical distinction between sedentary farmers and mobile shepherds helps us to understand raika nomadism better. Even if most raika shepherds are also farmers for part of the year during the monsoons, they have to interact with settled farmers during the period of their migration. They must interact with them for buying their food, for getting campsites, for water,, and for fuelwood[21]. Equally importantly, most of their available grazing falls inside village boundaries, very often on lands owned privately. On the other hand, farmers also depend on the raikas (although their dependence is not crucial) for fertilization of their fields. (Sheep droppings are perceived to be better manure for the fields than either chemical fertilizers or cattle dung). However, if we look simply at the list of items for which the shepherds and the settled depend on each other, the asymmetry in the levels of dependence is very high.

[21]The shepherds can buy their food in shops in towns. However, it is often easier to buy grains in village shops because then they do not have to carry grains for long periods of time, nor do they have to make detours from their migration route just for getting foo from the town. But for water, fuelwood, and for campsites, they must depend on villagers for the most part. Carrying these is out of question.

The asymmetry is reduced to some extent because customarily the shepherds have collected firewood, obtained water, camped on village lands, and grazed their animals on the fallow without their activities being called into question for the most part. At the same time their activities imposed little cost on villagers unless their animals browsed on standing crops. This the shepehrds were, and still are, careful to prevent[22]. While their activities imposed little cost on the villagers, manure for the fields in the form of sheep droppings was an important help to many farmers. Even today, many farmers along the migration route of the shepherds compete with each other in inviting shepherds to fold sheep in their fields for the night[23]. But before chemical fertilizers became available, such addition to the fertility of the land was invaluable. Today, however, several strands in the web of mutual dependence between shepherds and farmers have started disappearing or at least becoming less important.

No longer are farmers as dependent on sheep manure. Inorganic fertilizers are widely available and for many farmers as good as sheep manure. With greater availability of irrigation, more fields are being enclosed and/or cropped a second time[24]. The government has also

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[22]See The State of India's Environment (CSE, 1985:11) for reports containing a different view.

[23] See next section on the extent to which this practice is still followed.

[24]Increase in irrigation has also resulted in the creation of new grazing possibilities for the shepherds in the state of Haryana. Canal irrigation in Haryana has created a "new adaptive niche" for the pastoralist in the form of crop stubble in a previously barren region (Kavoori, 1990).

enclosed large land areas for development and protection of vegetation. The pressure on village common lands is increasing. For one, the area of common lands is decreasing owing to encroachments on such lands by the rich, and the distribution of common lands (supposedly) among the landless[25]. Village panchayats (councils) are also taking advantage of government programs encouraging tree plantation and enclosing village commons in the name of tree growing. At the same time, the absolute number of village animals grazing on the common lands has also increased. All of these mean lesser fodder availability for sheep belonging to migrants. On the other hand, the raika dependence on migration has not declined. The number of animals migrating out of Rajasthan each year, as well as the period for which migration takes place, both have registered an increase[26]. Water and fuelwood, always scarce in a semi-arid environment, are no longer as easily available even over the more wet parts of the raika migration routes - even village residents having to walk long distances to collect sufficient amounts of fuelwood for cooking (CSE, 1982, 1985).

In such changing circumstances conflicts between the settled populations and the raikas are almost inevitable and they do take place. What is remarkable, as Kavoori (1990) points out, is not that there are fights between shepherds and farmers, but that "out of the thousands of independent interactions that that take place between

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[25]See Brara's Shifting Sands: A study of rights in common pastures, which contains an excellent of this issue.

[26]The data in table II.1 support the latter statement. For estimates on the increasing trend in the number of migrating animals (CSE, 1985:4-11).

shepherd and cultivator in the course of a cycle of migration, only a handful at the most lead to minor altercations". According to shepherds, the occurrence of 'altercations' is not randomly distributed along their migration route. In fact most of the conflicts that most of the shepherds are drawn into in most of their migration cycles take place in just a small number of villages. The interactions between shepherds and farmers in these points in space are characterised by a history of hostile incidents related to water, grazing, theft of animals, and in exceptional cases, collection of fuelwood. Table III.8 provides a summary of the reasons behind 25 shepherd-farmer disputes that the interviewed dangs had in their current migration cycle.

These 25 disputes were reported by 16 of the 30 dangs that I interviewed. Clearly not all the dangs experience conflicts that are significant. Of the 25 incidents, 16 occurred as a result of differences over grazing and because of attempts by villagers to steal sheep. Theft of sheep seems to be the most serious reason for conflicts - the probability of injury among disputants, and the incident being reported to the police or even judicial courts is the highest among conflicts related to sheep theft. This is of course quite natural - both because theft of the sheep directly attacks the very basis of raika livelihood, and because in cases of sheep theft the raikas stay on in an area to pursue the matter. For disputes related to grazing, water or fuelwood, the offenders may not be discovered, or the parties to the dispute may not be willing to enter a major conflict. But theft is a serious matter, is always discovered

by the shepherd[27], and it is not surprising that of the 7 reported cases of conflicts over sheep theft, 70% resulted in someone getting hurt, while the corresponding figure for disputes related to other reasons is just 33%.

"Blackmail" in table III.8 refers to the occurrence of a hazard particular to migration into areas which a nambardar is not very familiar with. All the three reported incidents of blackmail occurred with dangs that had begun their migration cycle in a new direction. When the shepherds are camped for the night they may be approached after sunset by a group of people who will attempt to extort money from the shepherds in exchange of security for the period that the shepherds are camped in the given fields. The shepherds pay off in the form of a small amount of money or a couple of sheep after first estimating the strength and credibility of the threat. The typical issues they consider are the size of the group that comes to demand money, whether members of the group carry any firearms, whether the villagers in the area they are camped know anything about the people who are threatening them, whether somebody suspicious had been hanging around the dang earlier in the evening and so forth.

[27]Raikas and their sheep display a very high degree of familiarity with each other. Raikas can recognize all their sheep without any markings. They have a name for each sheep in the flock. The sheep too can distinguish the calls from their masters from calls by other persons. It is often said that if the shepeherd orders his sheep to sit down, the sheep will die but not move from the spot in which it was asked to sit down. Usually shepherds discover thefts in the morning when they are separating their sheep from sheep of other ewars in the dang. At this time, if any sheep is missing, the shepherd will know without needing to count the sheep.

However, for the most part, raika-farmer relations are characterised by, if not harmony, at least a mutual acceptance of each other's presence and consequent exchanges that improve the welfare of both. The shepherds I interviewed acknowledged this in stark contrast to my expectations on this issue. The nambardars praised their cultivator friends on numerous occasions saying, "Migration will not be possible without their help". Clearly, the general state of affairs between the raikas and the farmers is reflected neither in the reports in newspapers regarding their conflicts nor in statements attesting to the harmonious relations prevailing between them. The vast majority of their interactions lie in the region between mutual acceptance to subdued antagonism.

What is important from both a policy perspective and a general theoretical stance is the role that government administration or the state plays in this relationship and the cues that the state receives for future action through the role it plays at present. The raikas invoke the help of the state only as a last resort - in extremis. Government administration, however, is ill-equipped to deal with the needs of a mobile population and this has come home to the raikas time and again through their experiences not just with the police and the system of justice, but also through their dealings with other administrative instiutions and personnel as in the forest department, or at the borders between states. Indeed, even those government departments which ostensibly exist to help them such as organizations providing veterinary medicine prove indifferent to the requirements of

the shepherd, often when the shepherd needs them most - when his sheep are sick or dying.

IV. ECONOMICS OF SHEEP-HERDING

A number of factors influence the returns that shepherds can expect from sheep rearing. Some, not all are manipulable. The duration and direction of migration; the size, and age and sex composition of the flock; the timing of sheep-shearing and wool sale, and of the sale of animals; are under the control of the shepherd - at least to some extent. On the other hand, the ability of the shepherd to influence the factors such as duration and severity of a drought; the resultant availability of water and fodder; availability of medicines; policies followed by the government; or the prices of wool or animals; are severely restricted. But if the shepherd cannot influence some factors, he can still control his response to such factors[28]. In the discussion that follows, we will find that shepherds constantly attempt to gather information on factors they cannot influence much so as to come up with the best possible response. We will also find shepherds attempting to manipulate those of the factors they can for ensuring the best possible returns from their flocks.

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[28] Kavoori (1990) details how during the drought of 1987 the shepherds, faced with the prospect of no fodder for the sheep anywhere in Rajasthan, used trucks to transport the sheep to areas where grazing could be found. More prosaically, shepherds constantly deal with water and fodder scarcities through migration and sale of animals; adverse wool and animal prices by delaying sales; changes in government policies by changing migration patterns and so forth.

The discussion in this section is organized under the analytical categories of income and expenditures incurred by the raikas. Of the animals that the raikas rear, goats and sheep are the more important, more regular, sources of income. Camels are used primarily for transport, though camel milk is also consumed by all raikas. The major heads of income are sales of animals, wool sale, and income from folding sheep in fields of farmers. Raikas as a rule do not sell animal skins, nor the milk of sheep or goats. The major items of expense for the raikas are purchase of medicines and feed for sheep, payments to gwalas, shearing of the sheep, transport, and consumption expenditure related to the migration cycle.

The unit of analysis for making cost-benefit calculations in this section is the flock owned by a single household - not the ewar or dang. It is true that the decisions for the flocks are not made by each shepherd individually - especially in the cases where more than one flock comes together to form the ewar. But even in the case of ewars where all the sheep belong to a single household many of the decisions that affect the returns for the shepherds are taken by the nambardar for the dang as a whole. The analytical locus for economic calculations is clearly not the decision-making unit - it is the level at which costs and benefits are disaggregated and allocated. This is true even where the accounting for the entire ewar is done by an individual. At the end of the migration cycle, the accounts are examined and income and expenditures scrupulously shared according to formulae that are agreed upon before the beginning of the migration cycle. Thus in the following discussion the economics of sheep herding

is calculated for the individual flock. At the same time, factors which affect costs and returns, especially decision-making by shepherds, are discussed at the level of the dang or the ewar, as the case may be.

IV.1 Income from Sheep Rearing

Of the three sources of income that raikas have, wool and animal sales are the more important. The heads of the ewars, the mukhiyas, receive the returns from these two sources directly. The income from folding sheep in fields of the farmers go to a general fund in the dang - income and expenses from which are shared by all the members of the dang and accounts for which are settled at the end of the migration cycle.

Wool Sale:

Sale of wool takes place each time sheep are sheared - usually twice a year[29]. The primary caution that must be observed when sheep are being sheared is that they do not get wet after they have been sheared. Raikas get their sheep sheared once while they are at their Village homes. This shearing takes place after monsoons are over and before winter arrives - in the month of October. This also gives the sheep some time to grow back their wool before winter arrives. A seond shearing takes place while the shepherds are on the migration cycle -

[29] According to the raikas, in recent year this pattern is underoing some change as shepherds are forced to shear sheep even three times a year owing to financial pressures and need for quick cash.

in most cases after they have begun the return journey. There is greater flexibility as regards the timing of this shearing. Raikas prefer to get the sheep sheared the second time in March/April, although they may be sheared as late as June.

For the most part sheep are sheared by professional shearers - called "lavas"[30]. Whether sheep are sheared at home, or during the migration cycle, a number of shepherds get together to invite a party of lavas. (During the migration, the task of inviting lavas and attendent organizational details are the responsibility of the nambardar. At home, the responsibility is usually given to an experienced elder raika). The person in charge of inviting shearers chooses a date for the shearing - often in consultation with other elder shepherds whose sheep will also be sheared. During the migration, the nambardar also has to consider whether a friendly farmer is willing to provide a covered space for the lavas to shear the sheep. Once a date has been set, the nambardar contacts a party of shearers for the task and invites them to the designated place at the time that had been decided.

At home, after the shearing, wool is stored raw in sacks and kept in a hut. Usually, there isn't any great pressure to dispose of the

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[30]Many raikas also shear their own sheep, especially when the shearing is done at home. This is more likely for poorer shepherds. When shepherds shear the sheep themselves, the task is undertaken either by the immediate family of the shepherd, or with the help of some neighbours. Today however, more and more raikas get their sheep sheared by lavas - professional shearers - even when they are at their home bases. This implies a higher level of organization and coordination than earlier when individual shepherds could undertake to shear their own sheep.

wool after it has been sheared which means that it may stay with the shepherds for a while before it is disposed of to the wool merchants, or to their agents. There are major wool mandis (markets) in Beawar, Sojat, Pali, Jodhpur, Merta, Nagaur, Degana, Barmer and Sanderao - all in Rajasthan. Wool markets also exist in Uttar Pradesh, Gujarat and Madhya Pradesh.

The nambardar is also in charge of contacting wool merchants or their agents for disposing of the wool. However, depending on the prevailing conditions in the market, wool merchants may also contact nambardars for buying the wool. Wool can be bought and sold either by animal or by weight. If the proportion of lambs is high, or if the growth of wool has been poor, the nambardar will attempt to sell the wool by animal. The shepherds may also attempt to delay the sale of wool in case the prices are very unfavorable. However this strategy works only to a limited extent because most of the shepherds have little staying power and are always in need of ready cash. Their flexibility is even less in the case of wool sheared during the migration because they cannot carry the sheared wool with them. During the migration, wool is often sold (by weight or by animal) even before the shearing takes place - indeed, often the nambardar contacts wool merchants and attempts to negotiate the sale of wool even before contacting shearers.

With a greater number of shepherds choosing to get their sheep sheared by lavas, the organizational complexity of shearing sheep at home has also increased in comparison to earlier. Yet, the shearing of sheep on the migration cycle requires a much greater level of

coordination and organization than shearing of sheep at home. Not only do a large number of sheep have to be sheared at a time, three different sets of tasks - arrangements for a site for shearing, the actual shearing, and the sale of sheared wool - have to be coordinated so that they can take place sequentially without too much delay between each task. The complexity of the process increases because although the three sets of tasks take place sequentially, the arrangements for all the tasks have to be completed before any one of them can begin.

The task of contacting shearers is rendered easier because a large number of shearers are located in just two or three cities in Rajasthan. Thus in Pipar city in Rajasthan alone, there are 60 parties of shearers[31]. The nambardar, after contacting the shearers, negotiates a price, usually per animal, for the shearing. Depending on the demand for the shearers, the shepherds agree to pay the travelling costs of the shearers and provide them food. This includes two meals, tea served three to five times during the day, and tobacco. Typically, lavas receive between Rs. 0.75 to Rs. 1.25 for each sheep they shear.

During the migration, wool merchants are usually contacted and a tentative price for the wool negotiated with them before shearers are

[31]Parties of shearers and the way they are organized would itself make a fascinating study in cooperation and mobility. Shearing parties share their earnings from shearing equally - in fact, they do not even keep count of the number of sheep that each individual shears. They have their own trade union (formed in 1989), and travel thousands of miles each year to shear the sheep of migrant shepherds. Over the last few decades their migration patterns have changed together with those of the shepherds. While they spent a lot of time in Gujarat earlier, today they spend more time in Uttar Pradesh and Madhya Pradesh.

contacted. Indeed, sometimes, the nambardar may just sell the wool on the sheep, letting the merchants take care of the arrangements for contacting the shearers. In these contracts, the merchant also pays for the shearing. However, most nambardars prefer to personally arrange for and supervise the shearing because if the merchant is in charge of arranging the shearing, the shearers may pay less attention to the task, resulting in a greater number of sheep being nicked or cut during shearing. Another reason nambardars prefer to arrange personally for the shearing is that if the wool merchant or his agent arranges for the shearing, the amount that the shepherds receive is very low - bewteen Rs. three and five per sheep.

The wool merchants or their agents, once the shearing has taken place, arrange for the wool to be transported to the wool mandis (markets). Usually shepherds sell the wool raw, without either cleaning or grading it[32]. Transactions of wool sales are finalized in the following places in Madhya Pradesh (Nagda, Ratlam, Ujjain, Indore, Guna and Gwalior), Uttar Pradesh (Dibiyapur, Agra, Etawah, Kanpur, Aligarh, Hathras, Tundla, Mathura, and Mainpur) and Rajasthan (Karoli, Bundi, Kotah, Dudu, Chaksu and Dausa). Wool shorn in Madhya Pradesh is sold earlier in the year (January, February), than wool sold in Uttar Pradesh (March, April) or in Rajasthan (May, June). Most of the wool shorn in these three provinces is transported to Beawar in the state it is purchased. At Beawar wool is cleaned and graded.

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[32]On the average, a flock of a hundred sheep yields between 125 to 160 kilograms of wool every year. The final figure also depends greatly on the breed of the sheep and the availability of fodder during the year.

The third task that must also be completed before shearing can begin is the final selection of a spot where the sheep can be sheared. To shear upto 5,000 sheep a party of 20 shearers needs about a week. This means that the farmer who is willing to provide the space to the raikas for shearing the sheep should be willing to put up with them for at least a week. There should be enough fodder and water for the sheep for a week in the vicinity of the place where the shearing is taking place. Water is needed not just for drinking and for the sheep, but also to wash the sheep. Different degrees of cleanliness of sheep provide different levels of returns to the shepherd[33]. A spot close to a motorable road is preferred since that will make the transportation of the wool easier. A covered space should be available for storing the sheared wool in case it rains. Finally, the sheared sheep are kept in a fenced corral like space which either should be present from before, or must be constructed before the shearing can begin[34]. The farmers are seldom paid in cash by the shepherds in exchange for the provision of space for shearing. The farmer's return is in the form of manure deposited by the sheep in his fields where they are folded in the night.

The trader with whom a tentative price was negotiated for the wool arrives at the site of the shearing while the shearing is in progress.

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[33]Mr. Zabar Singh Udawat, Marketing Assistant, Wool Development Board, Jodhpur, quoted by Kavoori (1990:63).

[34]The sheep that are sheared are enclosed in the fenced corral like space and let out after they have been counted. This prevents double counting of the sheared sheep as also missing out any sheep that have been sheared.

After his arrival, a final price for the sheep is negotiated for the entire dang at the same time. It is the responsibility of the nambardar to negotiate the price for all the sheep. Whatever the price he agrees upon, other shepherds in the dang will abide by it. The final price for the sale of the wool is negotiated with the same trader with whom the earlier tentative agreement had been made. In exceptional circumstances, however, the nambardar and the trader may not be able to reach an agreement. In these cases, the nambardar will look for another trader. Such incidents happen only when the prices of wool, subject to volatile fluctuations, change drastically between the period when the price was first negotiated tentatively and its final settlement[35]. However, even when the price has changed drastically, usually the nambardar and the trader attempt to arrive at a solution that is acceptable to both.

Once the sheep have been sheared the wool is collected in sacks - each sack marked so as to distinguish between different ewars. The sacks are stored in a covered space. The trader arranges to transport the wool to the mandi. The final payment is made to the nambardar or

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[35]Usually, shepherds find it difficult to negotiate prices with different traders. Traditionally, most shepherds need ready cash. The trading pattern that has emerged in response to this need greatly disadvantages the shepherds (See FAIR, 1980). At the village level, most wool traders have an agent known as a "khatik". The khatik buys the wool from the shepherds in advance by paying Re. 1.00 per sheep. After making the down payment he marks the sheep whose wool is sold to him. Another agent who controls the trade in 20 to 30 villages, pays another Rs. 5.00 after six months. This entitles him to half the price of the wool from the sheep every six months. The other half is shared between the shepherd and the village khatik in the ration of 3:1. The shepherd is thus deprived of 62.5% of the income from the sale of wool simply in exchange for Rs. 6.00 per animal.

to some other representative of the shepherds sent by the nambardar, at the mandi.

While the shepherds cannot influence the price of wool, they can change the time for shearing the sheep during the migration depending on the prices. However, they have only limited flexibility in this regard owing to the level of coordination that is required to undertake the shearing at all. Their basic choice is to delay the shearing from March or April if the prices are low to May or June in the hope that prices will rise by then. They are also disadvantaged in receiving the full profits for their labor because few of them can afford to wait until their sheep have been sheared to receive the price of the wool. As a result many of them accept down payments from the khatik and receive only part of the profits. The presence of middlemen also reduces the share of profits to the shepherd - some percentage of the price at which wool is sold in the market go to the nambardar, agents of the merchant, and wool cleaners and graders.

Animal Sales:

Animal sales are a major source of income to the shepherds. For most shepherds they comprise the most important source of income. Two major types of sales of animals can be distinguished. Sale of mature stock take place in regular annual cycles[36]. These sales usually take place Between January and April. Sales of animals also take place to

[36]For the smallest flocks there may be no discernible cycle in the selling of mature sheep. Medium sized flocks may sell mature stock every three or even every two years. In flocks of 350 to 400 sheep an annual cycle of mature animal sales can be discerned.

meet short term cash needs. Usually these sales are of animals that are not fit. However, if the shepherd does not need money urgently, he will attempt to get the unfit sheep back in walking condition through medicine and by resting it in the course of the migration by carrying it on the back of a camel.

Sheep are sold to traders and their agents who specialize in buying sheep from migrant shepherds. The market works quite effectively in this regard. The traders themselves approach the different dangs at regular intervals to inquire whether any of the ewars wish to sell their sheep. Thus there is no need for any of the ewar mukhiyas to make trips to the market to sell their sheep. The traders belong for the most part to areas of Pali, Jaitaran, Bilara, and Sojat. They establish camps at major points along the migration routes of the shepherds. Some of the major sites for collection of sheep bought by traders are in Etawah, Dibiyapur, Agra, Kota, Karoli, Bundi, Nagda, Ratlam, and Shivpuri. From these points sheep are transported by trucks to major demand centers in Bombay, Delhi, Ahmedabad and other cities.

In making animals sales shepherds consider several factors. The ideal number of animals that raikas consider to be practical for making up an ewar, given the availability of labor from two shepherds, is between 350 and 500[37]. With the given level of labor that any ewar

[37]The average flock size of an ewar is 452 (see table III.4). However, the average flock size of the household units constituting an ewar is only 190. (For distribution of flock sizes of flocks constituting an ewar see table IV.1)

has, the mukhiya[38] of the ewar will attempt to maintain the total size of the flock in the ewar within this range. If in a given year, the number of lambings in the flock is low, and the size of the flock is small to begin with, the shepherd will attempt to reduce the sale of animals. The opposite is the case when the year has been good for the sheep and there has been a large number of successful lambings. This also implies that there should be a predictable relationship between the size of the flock and the proportion of lambs and adult sheep. This as well as the propositions regarding possible relationships between male/female proportions and herd size is examined below.

I first examine the relationship between the size of the flock and the ratio of male and female sheep in the flock. As table IV.2 shows, for a given flock size, shepherds attempt to maintain an optimal proportion of adult males and females by selling animals. In larger flocks, (those with more than 350 or more sheep) the proportion of males is quite low (Between 10% and 20%) and tends to vary only between a small range over time[39]. However, the number of males tends to be high just before they are culled (see table IV.3 for proportions between males and females if rams sold during the year are added to the total male adults figure).

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[38] In each ewar, the mukhiya makes the decisions regarding which animals are to be sold, the number of animals to be sold, and the time at which the animals should be sold. This is also true for ewars in which more than one household has come together to make up the ewar.

[39] In the tables on male to femaleproportions, only one of the flock no. 10 has a high male to female proportion (28% to 72%) . The reason is that this flock owner could not sell any of his sheep this year.

In medium sized flocks the proportion of males to females tends to be the same as in the larger flocks, but it fluctuates more widely between cullings (between 15% and 35%). For the smallest flocks, the proportion of males to females is the highest as also the variation of this proportion between cullings (Between 25% and 45%)[40]. This variation is easily explicable.

All shepherds must maintain a minimum number of males in their flocks for crossing with the female. Beyond this minimum number they attempt to increase the number of females to the maximum so as to increase the size of their flock at the fastest possible rate. In the larger flocks this imperative can be played out fully because the flock-owner can make ends meet just from the sale of wool. If absolutely necessary, they can sell a few sheep and get by. However, the smaller shepherds in order to survive, must also sell sheep regularly. Therefore they need a larger proportion of adult males[41] in the flock at most times simply to survive - by selling sheep when they need cash.

To some extent the same logic also operates when we consider the proportion of lambs to adults in a flock. Smaller flocks should have

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[40]In all cases, the highest proportion of males to females is seen just before the flock is culled. Naturally, the lowest proportion is seen just after culling. In the tables above, only one flock in the small flock size group has a low male to female proportion - 18% to 82%. The main reason is that the flock owner was able to sell a proportionately higher number of sheep this year than general. Usually someone owning a hundred sheep sells 6-8 sheep. This year, owner of flock no. 2 sold 12 sheep.

[41]Sale of adult females makes neither economic sense nor is it an acceptable practise among the raikas because of religious taboos.

the highest proportion of lambs to adults so that their flock can grow at the fastest pace. However, since smaller flockowners need to be able to sell adult males, (because lambs would fetch very low prices) the proportion of lambs in the flock is not as high as one would expect. At the same time, the flock-owner must have lambs in order to be able to sell any sheep at all. Therefore the trend in the proportion between adults and lambs is less clear than between adult males and females (see table IV.4).

As we see, on the whole, smaller flocks have a higher proportion of lambs to adults than larger flocks. However, the figures provided above must be explained further. These figures provide a snapshot picture of the proportions in different flocks in the months of April to June. By these months most of the ewar mukhiyas have already sold those of the rams that were ready for culling. If we add the number of rams that were sold during the year to the flock, we will obtain a different picture regarding the number of adults relative to lambs[42]. Table IV.5 provides another glimpse of the proportions of lambs and adults in different sized flocks by showing what the position would have been if none of the flocks had sold any rams in the year.

The inclusion of the rams sold, in calculating the proportion of adults and lambs in a flock does not change the conclusion very much that the larger flocks have a lower proportion of lambs in the the

[42]In table IV. 4, for flocks with less than 350 sheep the proportion of lambs before and after culling is 28.2% and 30.4%. For flocks with 350 sheep or more, the corresponding figures for lamb proportions are 21% and 22.4%.

flock than the smaller ones. However the variation between different sized flocks becomes less extreme.

The proportion of male and female lambs is more or less even. This is as might be expected because at birth there is no reason for there to be a higher proportion of males or females in the flock. However, simply by laws of statistics, we should see a higher variation in the proportion of male and female lambs in smaller flocks (see table IV. 6).

The table makes clear that while the sex proportions of the lambs are more or less equal at birth, and there is certainly no clear trend in lamb sex proportions related to size, the shepherds manipulate the ratio between male and feamle lambs through sales and gifts to increase the proportion of ewes in the flock as a whole. In addition to manipulating the age and sex composition of the flock against the size of the flock, raikas also attempt to use animal sales to respond to adverse climatic and natural variations. Of course, the most important strategic response to climatic variations and resultant variations in fodder availability is mobility, severe adverse conditions also prompt the shepherd to respond through higher levels of animal sales. Animal sales of this kind are better known as distress sales. However, in the conditions under which these sales take place, if the shepherd did not sell large parts of his flock, a lot of his animals would simply die - representing a total loss[43]. It

[43]Clearly, this argument in no way attempts to minimize the severity of the loss to the shepherd resulting from distress sales of animals.

is interesting in this context to note that even in highly adverse years, most flock owners are able to prevent their flock size from falling below a certain minimum[44]. At these times, the reduced size flock comprises basically prize rams and adult females.

Sheep Folding:

Income received from folding sheep in fields of farmers forms in important, but generally unrecognized, part of the total income of the raikas. Part of the reason is that the income from this activity goes into a general fund for the entire dang. Several joint expenses for the dang are met from this fund. At the end of the migration cycle, whatever balance remains in the fund (positive or negative) is shared equally by the different ewars. Since the income is not received by each ewar individually, it is easier to ignore this income. Another reason that may be responsible for ignoring this source of income is an intuitive impression that little after all can be earned through selling manure. However, the initial impression must either be substantiated or revised.

Not all farmers pay anything to the dangs for folding the sheep in their fields for the night. On the average, the nambardar in a dang is able to negotiate some returns from farmers in exchange for folding the sheep in their fields for 20% to 35% of the days that the raikas

[44]According to Kavoori (1990:22) this minimum is a flock size ranging between 50 and 100 sheep. This range is to some extent also dependent on the breed of sheep - For the hardier Marwari sheep the range may be somewhat higher. (As reported by my respondents - fieldwork conducted between March and June, 1990).

are on the move. The amount paid by the farmers depends on the number of dangs that are in the area, nearness of the sowing season, whether the farmer has irrigated fields or not, the number of sheep in the dang, and the number of farmers that want to fold sheep in their fields. In general farmers are more willing to pay the shepherds for the manure of the sheep in Haryana than in Uttar Pradesh or Madhya Pradesh. The actual amount received by the dang ranges between Rs. 30.00 to Rs. 200.00 for a night. In many cases, the raikas receive grains (wheat or millets) instead of cash. The average amount of grain that they get varies between 20 to 40 kilos of wheat or 25 to 50 kilos of millets[45]. The table below gives an illustration of the amount made by five dangs through folding sheep in fields.

Most ewars earn between Rs. 600 and 900 each through sale of sheep manure to farmers (see table IV.7). In magnitude, this amount scarcely rivals the returns from either wool sales or from sale of animals. It can be thought of more as supplementary income. But for families whose average earnings a year (net of expenses) are less than Rs. 5000 on the average, Rs. 600.00 is no sum to be scoffed at. Obviously, the shepherds do not get this amount at the end of the migration cycle from the common kitty because several common expenses of the dang are borne out of these returns but unless this amount was available for the dang from sale of manure, it would have to be contributed by each shepherd individually and would have to come out of sales of other goods. This will reduce the final surplus of most flocks substantially

[45]The price of wheat and millets is approximately Rs. 2.00 and Rs. 1.75 per kg.

since returns from manure sale are as high as 25% of the final surplus in some cases (as for flock 4).

IV.2 Expenses incurred on Sheep Rearing

Against the income from wool, animal sales, and sheep manure must be balanced the expenses incurred by the shepherd for arriving at any estimates regarding the viability of migrant sheep herding. There are two categories in which I divide the expenses incurred by the ewar - those incurred by each ewar individually and those incurred collectively with the rest of the ewars in the dang. Of these, the major amount is incurred individually by the ewars. Individual expenses are incurred on sheep (feed and supplements, grazing, medicines, transportation[46], shearing[47],) and on labor (salary for the gwala, consumption expenditure on ewar members, transportation, entertainment). Expenses necessary for gathering information (usually this task is performed by the nambardar), entertaining guests, payment of fines, and on bribing officials, are met by the dang collectively and the accounts for this are settled at the end of the migration cycle.

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[46] Transportation of the flock by trucks is still a very rare phenomenon and occurs only in circumstances where the survival of the flock without using transportation will be impossible owing to the non-availability of grazing within walking distance for the flock. Kavoori (1990) deals with it. However, none of the shepherds I interviewed had transported their sheep and I do not discuss it as an item of expenditure in this note.

[47] Expenses incurred on shearing have already discussed in the previous section and I will not deal with them in this section.

Feed and Grazing:

For the most part sheep browse and nibble on grasses growing in fallow fields, on government land and on village community land. For none of these do the raikas have to pay any fees. However, fodder is not available uniformly over the different migration months and for some of the months (primarily during the winter months) raika shepherds supplement the fodder available naturally, with different kinds of feed to the sheep in the evening. Such supplementary feed is also often bought for the pregnant sheep.

The major supplementary feeds are flours of different grains such as bajra (pearl millet), jau (barley), and gawar (a kind of legume seed). The flour may be made into a dough or may be fed to the sheep raw. Jaggery, oil and turmeric mixed with flour are other substances fed as supplementary feed. Oil is fed to female sheep for two weeks after lambing. Each ewe is given about 20 mls of oil every alternate day. Weaker ewes are given oil every day. If the shepherd anticipates a difficult lambing for an ewe, it may be fed oil even before the lambing to ease the strain of lambing for the animal. The ewe are fed the oil slowly so that they can digest it well. Turmeric is also fed to sheep with buttermilk to improve milk production. Goats are fed on leaves of Khejri (Prosopis Cineraria) which is cut from trees growing in fields. Depending on the size of the tree, anywhere between Rs. 5 to 30 may be paid for the tree. Fifteen goats can be fed once on the fodder from a small tree.

There are two situations in which shepherds pay cash for grazing sheep. Dangs engaged in permanent migration graze their sheep in

forest areas during the monsoon months (and sometimes also during winter) since all private fields are under crops at this time and the fodder available in community lands is hardly sufficient even for the village animals. Fees for grazing animals in forest areas differ even within Rajasthan in different forest ranges. On the average however grazing fees are around Rs. 0.50 per sheep for the monsoon season in Rajasthan forests. In Madhya Pradesh forests shepherds earlier had to pay Rs. 1.00 for a sheep. However, currently grazing fees have been raised to Rs. 10.00 per sheep. As a result, most shepherds try to get by through paying bribes to the forest officials. After the shepherds have paid the fee for grazing their animals in the forest areas, they are given a pass to the effect. Passes are provided to each ewar separately.

Another occasion when shepherds pay for grazing their flocks is when they reserve harvested fields of green grams from farmers in Haryana and Uttar Pradesh. They reserve fields for periods of about a month and pay approximately Rs. 50.00 for a hundred sheep.

There are, of course, variations in the amount spent on grazing and supplementary feed. Such variation depends on the wealth and status of a shepherd, the breed of sheep, the general availability of feed in a given year, the differences in the availability of fodder in different states within the same year, and individual managerial capacities of different herders. The data I have collected is only for the year 1989-90 (in general considered by the shepherds to be a more or less normal year) and as such must be treated with some caution.

Medicines:

Both indigenous substances considered to possess medicinal value, as well as western medicines, are given to sheep. I have already talked of the way in which oil and turmeric are used to improve milk yields and to ease the strain of child-bearing. Two other substances often used are salt and alum. They are both said to improve sheep's resistance to diseases. Salt is fed to the sheep for about a week every year and alum is fed twice in a year - in fall and spring. Approximately Rs. 100.00 are spent on these two substances every year for a hundred sheep.

Western medicines for the sheep are purchased when indigenous substances fail to have any effect. Vaccines, injections, tonics, anti-biotics, and anti-diarrhoeal and deworming medicines are the most important. They are purchased in the open market from private traders and also procured from the government. Two of the major medicines used are Penacor - with which each sheep is injected twice a year; and Terramycin which is an anti-biotic, used for any major disease or for cuts etc. that the sheep may suffer from. Penacor is available from the governemnt at subsidized rates (Rs. 10.00 for a 100 injections, whereas in the open market it costs Rs. 110.00 for a 100 injections). Terramycin injections cost a rupee each and are available only in the market.

Gwala:

Not all ewars employ gwalas and not all of the gwalas employed are paid salaries[48]. But in cases where gwalas are paid salaries, this forms a major part of the expenditure incurred on the herd. Whether a gwala is paid a salary and how much he is paid depends on his kin relationship with the members of the ewar (especially with the mukhiya) and on whether he brings any sheep with him into the ewar. If the gwala does not bring any sheep in the ewar for the migration cycle, he is paid anywhere between Rs. 2,200.00 to Rs. 3,500.00 depending on this age and skill. Ewar mukhiyas prefer to have a younger gwala because he can be paid a smaller amount as salary. In addition to the salary, the gwala is fed by the ewar and provided with a set of clothes. Gwalas bringing around a hundred sheep are not paid any cash but are provided with food and clothes. Gwalas bringing less than fifty sheep are paid between Rs. 1000.00 and 2000.00 in addition to food and clothes while those bringing between 50 and 100 sheep are paid less than a thousand rupees. The exact amount a gwala receives also depends finally on idiographic variables related to kinship and the negotiating skills of the gwala and the ewar mukhiya.

Finally it may be mentioned that although gwalas are theoretically hired to only help the ewar mukhiya graze the sheep, in practice they often serve to do all kinds of odd jobs around the camp - including cooking, packing or taking care of the new born lambs.

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[48]Seven of the thirteen flocks on which I have information, employed gwalas. However, only three of the flocks hiring gwalas were the same size as the ewar. So four of the flocks would only need to pay part of the salary of the gwala. (In total I came in contact with 69 flocks. Of these eight flocks were the same size as the ewar. Four of these eight also hired gwalas.)

consumption Expenditure:

Much of the expenditure incurred on consumption is on food. When women are present in the dang, three meals are eaten - one in the morning just before the shepherds take the sheep for grazing, the second a packed lunch during the day when the shepherds are grazing the sheep and the last in the evening or in the night. When women have left the dangs (as is the case in most dangs once the journey to return home begins) shepherds attempt to make do with just two meals to save time. The meals consist of unleavened bread made out of coarse grains (millets), onions, red or green chillies, and in the case of evening meals, either a lentil soup or some vegetable dish. Tea is made several times using sheep milk and camel milk is drunk fresh, without being heated. In fact sheep milk forms an important part of the raika diet and raika women use the milk to make butter, buttermilk, yoghurt, and clarified butter. v

While diet is similar for most raika households during migration, irrespective of their wealth or status, tobacco and opium are consumed for the most part by the better off raikas. Consumption of both tobacco and opium is seen as morally bad; at another level they are seen as an important element in the customary welcome provided to any visitor to the camp. In a strange mixture of unreconciled contradictory attitudes, raikas excuse in themselves smoking and drinking opium, yet appreciate abstinence in others as morally superior behavior. If we limit ourselves to looking just at the effects of tobacco and opium on the household economy, raikas who

consume opium and smoke tobacco can spend upto Rs. 100.00 on these every month. Apart from food, tea, tobacco and opium, medicines are the only other item of regular consumption expenditure. Raikas treat most common ailments today through western medicines available over the counter. Not much money is spent on this however.

Transportation:

Raika ewars maintain regular contact with their village households and make trips back and forth between the dang and the village as often as once every two months. Most of the shepherds however, travel to their village homes once or twice during the migration cycle. Anyone wishing to go back to the village must obtain permission from the nambardar before he leaves the dang because his leaving the mobile dang and joining it back requires some level of coordination. The nambardar will tell the shepherd where he must return and on what date. Only the nambardar has a rough idea of the distance and direction that the dang will travel during the period the shepherd is away from the dang. On the day the shepherd is to return from his journey home, the nambardar will send another member of the dang to the point at which the shepherd had been told to come. Usually the meeting place is a train or a bus station. From here, both the persons will return to the dang. A station is a useful meeting point because it is easy to locate and at the same time, if the dang changes its travelling plans in the period that a shepherd is away, he can be easily recognized in a train station.

Joint Expenses:

The nambardar in the dang, often undertakes reconnaissance missions to gather information regarding precipitation and vegetation availability. Such journeys are of two types. Journeys over short distances and lasting approximately two to three hours, and longer journeys which take upto three or four days and may involve travelling over hundreds of miles. Nambardars undertake shorter journeys on horse or camel back almost every day in the morning. They travel five to twenty miles ahead of the dang and gather information on the state of vegetation over the proposed route. They look at the state of water availability at the usual water-points and find out if the farmers whom they are acquainted with are present in their villages. They talk with the farmers and see if the farmers will be willing to let them camp for the day in their fields. Since raika dangs move almost every day, such reconnaissance missions are invaluable in getting advance information which will help the movement of the dang.

The longer journeys are undertaken using public transport. More journeys are made on the return journey when grazing becomes highly dependent on the occurrence of advance monsoon showers. In these journeys the nambardar attempts to learn more about the rainfall and presence of vegetation than about farmers or watering points. Several nambardars may join each other before undertaking these journeys. Information gathered on these journeys aids decision-making regarding the general direction of the movement of the dang. Expenses incurred on the longer journeys are shared by the dang members collectively.

Medicines needed for the sheep are purchased from the market as well as procured from the government. Usually, such medicines are available only in cities. Again it is the nambardar who goes to the city for buying the medicines, sometimes taking another member of the dang with him. Expenses on these journeys are also borne by the dang collectively.

Food is cooked collectively on all festive occasions - such as for Holi, Diwali, Akha Teej, Prasaadi, Raakhee, Shivratri, Gangaur[49] and so forth. For all of the festivals, shepherds buy stores using cash from the joint fund of the dang. To buy the stores, the nambardar sends three or four members of the dang, ensuring that different people are sent for different festivals and not the same group of people each time. Most of the food cooked on these occasions is fairly rich. A lot of sugar, clarified butter and different kinds of flours are used in cooking. Thus food is cooked jointly for the entire dang on five to eight occasions during a year. If at this time, there are other dangs nearby, the members of the dangs visit each other. The expenses on these joint celebrations can run quite high, upto Rs. 200.00 each time for the entire dang. These expenses are also shared equally among all the ewars.

Welcoming and taking care of guests visiting the dang is also the collective responsibility of the dang, discharged by the nambardar. Food for the guest is cooked at the nambardar's camp. The nambardar can also ask different ewar mukhiyas to provide part of the food

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[49] Each of these is celebrated by hindus all over India.

necessary to feed guests. Thus some ewar mukhiyas will be given the responsibility of providing the bread for the guests, some will be asked to provide vegetables or lentils, and other to provide the sheets and bedding in the night for the guest. If the food for the guest is cooked by the nambardar's ewar, the ingredients for the meal come from stores used to cook food for festive occasions. Meals cooked for guests are somewhat more lavish than the usual fare consumed by the raikas. Expenses on guests are also shared equally by the ewars.

Finally, all expenses incurred on payment of fines and on bribes are shared equally by the members of the dang. Fines may be required for trespassing, for paying off irate villagers in whose fields sheep may have grazed, or to government officials. Often fights with farmers on different issues may be settled through the payment of a fine. While fines are only an irregular source of expenditure, payment of bribes to government officials are a pervasive element of cash drain on the economy of the mobile raika dang. Bribes are necessary to procure subsidized medicines, to secure permission to graze in forest areas[50], or to cross state borders. In all these cases, the negotiations are left to the nambardar who pays the bribe out of the general fund. In cases involving high amounts a number of elders in the dang may be involved in the deliberations[51]. All expenditure on

[50]Few raikas can afford to pay the grazing fees levied by the government before passes for grazing are issued. They attempt instead to bribe forest officials and graze their animals in exchange. Often however, they have to pay bribes to several officers before the period of grazing in the forests ends.

[51]Such instances may occur when the police is called in to settle fights with farmers.

fines and bribes are met collectively. The occurrence of the instances when payments of fines and bribes may be necessitated is irregular and unpredictable even if it is becoming increasingly frequent. Table IV.8 details the amounts spent jointly by each flock.

As is obvious, fines and bribes are the largest item of expenditure among expenses incurred jointly by the dang members. Most of the smaller flocks have fairly low levels of collectively incurred expenses because in the dang, the total amount spent collectively is divided equally among the different ewars, and within the ewar, the mukhiya of the ewar distributes expenses equally among the flocks that constitute the ewar. The flocks that constitute an ewar all by themselves incur the highest amounts as collective expensiture. These are ewar No. 13, 11, 10 and 9. The average joint expenditure for these flocks is Rs. 629; The same figure for the flocks that are only a part of another ewar is Rs. 280.

IV.3 Flock Economics

Until now, in this section I have provided a general background using which the data which follows on income and expenses of different flocks can be appreciated. This sub-section deals with the actual returns and expenses that each flock I interviewed incurred during its migration.

Stock Sales:

Table IV.9 shows the returns from sale of animals for each flock. The average return for each flock is Rs. 8,177.00. However, there are

large variations across flocks in the returns from stock sales - from Rs. 420 (the lowest figure for any flock) to Rs. 21,020. For the smaller flocks (less than 350 sheep), the average returns from stock sales are just Rs. 5,371. For the larger flocks the average returns are more than twice as much - Rs. 12,666.

Wool Shearing:

Although raikas shear their sheep two, and some even three, times, I am presenting the returns from shearing for only one shearing which takes place during the migration period. Not all of the dangs sold the wool by weight and the figures given in table IV.10 are for each kilo of wool or for each sheep, as the case may have been. Average returns from wool sales are Rs. 6,014 for a flock. The variation in the case of wool sales (lowest returns are Rs. 1,705; highest are Rs. 11,880) is much lower than varioations in returns from stock sales.

The next table (Table IV.11) gives the total income of each flock from sheep folding, and wool and animal sales. As we can see, on the average, the highest proportion of returns is from stock sales being 56% of the total returns during migration. This is nearly half as much again as returns from wool sales.

Tables Iv.12 to IV.14 provide basic information on expenses incurred by each flock. In table IV.8 I showed expenses incurred jointly by each flock. Table IV.12 provides estimates on expenses over feed and grazing, medicines for sheep, and shearing cost. Table IV.13

gives the figures for transportation and consumption expenses and the salary paid to the gwala in case a gwala is hired by the flock. The figures in this table are expenses incurred by different flocks on labor. Consumption expenses are primarily a function of the length of time for which the dang is migrating and the number of people in the flock. The salary of the gwalas is split evenly by the flocks in an ewar if the number of flocks in an ewar is more than one. All expenses are consolidated together and presented in table IV.14.

After this entire discussion, we are now in a position to say whether the migrating shepherds are simply subsisting, or if they are making a profit on their enterprise. The last table this section (table IV.15) shows the income and expenditure statements for all the flocks as well as the average surplus that a shepherd has been able to gather per sheep in the flock.

The clearest conclusion emerging from the data is that for most flocks animal sales are essential for staying out of the red. The only two flocks which do not have a surplus of income over expenditure are the ones that were unable to sell mature animals during the year (flcoks 3 and 10). All the flocks which were able to sell some mature animals during the year, are out of the red. Further, smaller flocks have a much harder time maing ends meet. Among the flocks with less than 200 sheep, the **highest** per sheep return is Rs. 14.5 and this is in the case of a flock that was able to sell more than average number of rams during the year. Among flocks having more than 350 sheep, the **lowest** per sheep return (if we ignore the flock that was unable to sell any rams) is Rs. 18.5. Even when we take the two cases of flocks

that were unable to sell any rams during the year, the deficit in the case of the smaller flock is much higher - Rs. 24.1 per sheep for the flock with 110 sheep in contrast to Rs. 6.1 for the flock with 380 sheep. It seems reasonable to argue that larger flocks, unless a major disease strikes the sheep, are safely above the subsistence margin.

V. RAIKA DECISION-MAKING

In the previous four sections of this report, I looked at some of the basic features of raika migrant life. I introduced the raikas, examined their social organization during migration and presented some basic economic statistics on 13 flocks. This section of the report looks at the distribution of decisionmaking responsibilities in raika dangs. In doing so, it aims at understanding the reasons behind the distribution of decision-making. According to most researchers on pastoral communities, the everyday decisions of herders are governed by informal and formal rules. However, detailed studies on the principles governing the multiplicity of rules, and the decisions taken by herders based on these rules, are few and far between. This lacuna in pastoral studies has contributed in no small measure to popular myths of irrationality and irregularity among pastoralists (Niamir, 1990) . Such misconceptions are especially prevalent among many (thankfully not all) policy-makers and government officials. My thesis is that contrary to popular notions of the irrationality of the herder, there are clearly identifiable and easily explicable principles on the basis of which decision-making responsibilities are distributed among raika herders.

The strategy I follow to argue my thesis is very simple. I have identified three loci of decision-making in raika dangs and a large number of different types of decisions that raika shepherds must and

do make in order to migrate with their animals. I postulate that a small group of easily understandable factors can help us predict which of the large number of decisions will be made by a particular decision-making unit. The basic reason why one decision-maker will prevail over another in the taking of a decision is that such a distribution of decision-making will provide greater economic benefits to the shepherds in a dang. I then compare empirical data on who **actually makes** the decisions, with the theoretical predictions as to who **should be making** the decisions. To the extent that the data conforms to the predictions, my thesis that raikas take decisions according to economically rational criteria is valid.

My analysis relies on simple non-parametric statistical tools. Clearly a more refined analysis incorporating the influence of political and cultural factors on decision-making is possible and desirable. However, I propose my analysis using only economic factors simply as a first cut at the problem of understanding decision-making among raika shepherds. I will show that even such a rough analysis as this can yield useful insights and make valuable points. In addition, the data in this section on the location of specific decision-making responsibilities among the raikas can help attempts to aid herder survival strategies through external interventions. To illustrate, if the decisions to purchase medicines are made by the leaders of different flocks, policies which aim at increasing the use of sheep vaccines among raikas will accomplish more by targetting the flocks leaders rather than the nambardar who is the head of the entire dang.

'4 The making of reasonable decisions is the litmus test of rationality. To promote the making of reasonable decisions, responsibilities for making different kind of decisions are vested in different decision-making units in the dang. The distribution of responsibilities among different decision-makers, based on their suitability for making better economic decisions, requires some shepherds to necessarily give up/delegate power and authority to either another shepherd or another group of shepehrds. In general, the ordinary shepherd members in a dang give up/delegate powers to take some types of decisions to the nambardar or to a council of elder shepherds in the dang. They retain for themselves the right to make other groups of decisions. Before we discuss why this particular division of responsibilities obtains, it will be useful to draw some conclusions relevant for the present argument from information presented earlier in the report.

We have already seen why migration is important for the raikas. Survival of their sheep, and viability of their household economy depends on their regular migration into regions of greater forage availability for their sheep. Grazing areas within and around their villages are simply insufficient to provide adequate nourishment for their animals. Purchase of feed for the sheep from the market is prohibitively expensive. Given that they must migrate, the obvious question is whether they should migrate individually or in groups.

Collective migration of the shepherds over long distances in groups scores over individual mobility in several respects. It allows for division of labor, greater security against thieves or in altercations

with outsiders, and economies of scale. Against these advantages must be weighed possible disadvantages cropping up owing to higher costs of decision-making for a larger group in which the interests of members may diverge; possibilities of altercations within the group, and the need for greater coordination. However, just one of the advantages of collective mobility I mentioned earlier - greater security against thieves and in possible conflicts with outsiders - is sufficient to outweigh all the disadvantages I enumerated against migrating in groups. The system of watch developed by the raikas and the coming together of the entire dang (and of members from other dangs if they are present in the area) in case of conflicts with outsiders are mechanisms that ensure greater security during migration. To deal with disadvantages, the raikas have developed a sophisticated system of division of responsibilities within the dang. Through this, they achieve lower costs of decision-making, enhance coordination, and also deal with possible intra-group conflicts[52].

A second important background factor is the constant change in the environment that raikas engage with. Climatic conditions in semi-arid regions in Rajasthan are characterized primarily by uncertainty and unpredictability. The timing, duration, amount, intensity and distribution of rainfall vary and are difficult to gauge across small

[52]That collective migration is indeed more advantaeous than individual level mobility is also empirically supported. In a study of more than fifteen migrant shepherd groups by Johnson (1969), not a single shepherd group follows the practice of individual flock (based migration when the migration is over long distances. This is true whether we look at groups such as the Kurds, the Ruwala, the Basseri, the Bakhtiari and the Pashtuns in Asia, or at the Kababish, the Said Atba, the Arbaa or the Chaamba in N. Africa.

as well as large space and time intervals. Additionally, the migrant shepherds[1] environment is even more uncertain owing to their mobility. And mobility introduces a crucial second parameter in addition to climate which contributes to the overall flux in the environment of the shepherd - uncertainty of social interactions. The shepherds constantly meet and have to deal with new persons. Only for some of the villages through which the shepherds pass do they have information regarding the villagers. It is only in these few situations that they can anticipate with any degree of certainty whether they will have problems. Another possible reason for problems is that they have no formal property rights over the resources they need to survive in the areas they are passing through. They have to depend on the goodwill of the villagers or have to negotiate with the villagers to procure their needs. While they can hope not to have problems in the areas that they migrate through, problems can always crop up. Indeed, their system of keeping watch through the night is based on the idea of always being prepared for possible problems. Given the possibility that unforseen problems can come up at any time, the raikas must at least decide in advance who (with the support of the rest of the members in the group) will deal with such problems, even if they can't decide how the problems will be dealt with.

Decision-making and its distribution emerge as the key issues that must be attended to effectively if the dang is to migrate as a viable social and economic unit. Fluctuations in the environment and coordination of the dang mean that not just any randomly selected member will make the best decision for a situation that the dang may

face during the migration. Therefore responsibility for making a particular type of decision must be distributed with an eye to the strengths and weaknesses of the decision-making unit.

In my study I looked at 60 issues[53] that members of different raika dangs identified as important for continued efficient functioning of a dang. I have divided these into 6 major issue areas. They are dang formation and dissolution, migration, ewar management, dang management, Market interactions, and external relations. Within the major groupings, there are minor categories based on functional similarities among decision issues. Two caveats are in order here. The list of issues is possibly not exhaustive, especially if other shepherd groups are examined. However, I trust that for the raikas almost all important issues have been covered. This is because the identification of issues is based primarily on what shepherds themselves felt the major issues and tasks during migration are - hence on the behavioral self-image of the shepherds. Second, it may be possible to improve my classification of the different issue areas, especially if other theoretical issues are under focus - such as household economics of the shepherds, their relations with settled populations, and so forth.

V.I Loci of decision-making

Three major centers of decision-making exist in shepherd dangs. Of these, the nambardar makes decisions on a large variety of issues

[53]See appendix 2 for a consolidated list of decision issues identified by the shepherds.

relating to migration patterns, dealings with outsiders, purchase of supplies, and sale of pastoral products. The second-in-command of the nambardar is called "kamdar". The kamdar assumes the duties of the nambardar when he is sick or away from the dang. Since the duties of the kamdar are the same as those of the nambardar, I will not treat him as a different locus of decision-making, especially because his office is only infrequently called into play. Usually he plays a role as a member of the council of elders in the dang. The council usually comprises five or six of the older and more experienced persons in the dang. It makes decisions in crisis situations or situations for which few precedents are present in the memory of the shepherds in the dang. Finally, of course, there is the mukhiya of the ewar who decides on most matters related to the functioning of the ewar. The distribution of tasks within the household is his responsibility. (This is true even for the cases where the ewar is composed of several distinct flocks and village households). The mukhiya in the ewar is not necessarily the eldest person in the ewar. Usually he is a person who has higher status than the others in the ewar. Status itself may depend on age, but equally possibly on number of sheep owned, wealth, previous leadership opportunities, experience in migration, or even kin relationships with other well-known raikas. No women are nambardar of the dang, or even the mukhiya of an ewar.

V.2 Major types of decisions

In this section I will talk about the major areas in which decision-making is necessary during migration. I have constructed six

different categories of decision-making. I will discuss each of these briefly.

1. Dang formation and dissolution:

This contains two major decisions - selection of the nambardar before the beginning of the migration and the breakup of the dang at the end of the migration cycle. Decisions for both are the domain of the mukhiyas of the ewar. In general, a few mukhiyas ask somebody in whom they have faith to be the nambardar for a particular migration cycle. Often, of course, a given dang continues with the same nambardar and has the same composition of ewars that it had in a previous year. In these cases, the nambardar may initiate the process of dang formation by sending messages to the different ewar heads to assemble in a mutually convenient location. But it is also often the case that when mukhiyas want to choose a new nambardar they approach an experienced person to accept the responsibility. New members to the dang can also be introduced by any existing member of the dang. Usually only male members introduce new persons.

In the normal course of events, the breakup of the dang occurs after the migration cycle is complete. Different ewars leave the dang on the return journey at the point that they joined up with the dang. However, ewars can also leave the dang earlier. If there has been adequate rainfall in the village of a particular ewar member, he may leave the dang sooner than other members and return home. Another possibility, relatively rare, is for dissatisfied members in the dang to leave before the cycle is over. Although such acts are rare, the

fact that members have the choice to do so acts as a healthy restraint on hasty, thoughtless, or arbitrary decisions by the nambardar which will affect all ewars in the dang.

The decision to choose a nambardar, it may be pointed out, is one issue area in which decision-making has political rather than economic imperatives. However, the political choice has a clear economic rationale. If the mukhiyas do not have the freedom to choose a nambardar or leave one dang and join another, and are thereby saddled with a leader for all future migrations, then there is no reason that the nambardar will act in a fashion that will promote the interests of different dang members. If all ewars have to perforce follow his directions, he has little incentive to act in their interests. At best he will be simply careless. At worst, exploitative.

Migration:

The raikas are constantly on the move. They camp in a new location almost everyday, seldom staying in any single camp-site for more than two days. In fact, on their return journeys, they can camp even twice in one day. Once during the mid-day when the afternoon sun may get too hot and the second time for the evening. The mid-day stop is called "Jhaala" and sometimes, the shepherds will cook a meal at this time. Usually, they make tea, drink some milk and rest, waiting for the sun to get less hot. For most issues relating to migration, the nambardar makes decisions. The information needed for these decisions is not always easily available, especially information about the villagers in the area, but these are decisions of a fairly routine nature.

In addition, the nambardars spend a large amount of time and effort (nearly two to three hours every day) gathering information to make migration decisions more efficient. They undertake scouting trips almost everyday on camel or horse back, and for longer term migration decisions, also undertake reconnaissance trips at longer intervals. Previous experience and freshly gathered information make their decisions are reasonably well informed. Most importantly, leaving these general decisions upto the nambardar also frees the other shepherds to concentrate on matters that directly relate to the everyday management of the flock. The major sub-groups of decisions that I analyze in the group of decisions falling under migration are those connected with the direction of travel, the timing of migration, the distance to be covered, and the setting of the camp.

Ewar Management:

Two sub-classes of decision-making can be distinguished in this group - household decisions about cooking, setting and breaking camp etc. and decisions about managing the flock - grazing, watering, accounting and so forth. Most of the housekeeping work of cooking and related tasks are done by the women in the ewar when they are there. Tasks related to managing the sheep are carried out by shepherds within the ewar, of which the mukhiya may or may not be one. However, the decisions on all these actions in the ewar - who will do which tasks, when the tasks should be carried out, whether the tasks have been accomplished in an appropriate manner - are all ultimately the province of the mukhiya. Of course, many of these activities are

completely routine and require little direction or guidance from the mukhiya once the migration cycle is well under way. All he may have to do is to ask that the evening meal be cooked, or that camp be broken, or wake the shepherds in the morning to take the sheep for grazing. But it is he who decided to begin with on which people in the ewar are best suited to grazing sheep, or camel, or cooking or account-keeping and so forth.

Dang Management:

Given that the nambardar is selected by shepherds to lead the dang, it is but natural that he should be making most of the decisions about managing the dang. The various issues in the area of dang management can be divided into three sub areas. These are management of people; collectively carried out tasks; and, security of the camp. By management of people, I refer to issues such as dispute arbitration, appointing different shepherds for doing work related to the collective (such as purchase of medicines for animals or maintenance of accounts for the dang), and keeping track of shepherds leaving and joining the dang. The actual carrying out of tasks related to the collective such as cooking on festive occasions, taking care of visitors and interacting with them, supervision of expenses from the common fund in the dang, may be assigned to ordinary shepherds members if the dang. The basic decision about who (including the nambardar himself) should carry out these tasks, when they should be carried out and how they are to be done, are all decided upon by the nambardar. Making arrangements for improving security in the camp and ensuring

that these arrangements are adhered to, again lie within the province of the nanmbardar's decision-making authority.

Market Interactions:

Decisions in the arena of market interactions are taken by the nambardar for the most part, especially so when these interactions concern arrangements for selling pastoralists' products. The major decisions in this area are about sale of wool and sheep, and on sheep shearing. However, the three factors determining who will make decisions (see section V.3), compete closely in this major issue area.

External Relations:

This last issue area poses the greatest level of uncertainty for the shepherds. Decisions here involve relations with government officials, with the legal system, and with the settled population. Together with low information availability on issues falling in this area, shepherds also face an additional complication - the stakes are very high. While the shepherds make decisions in this area only irregularly and infrequently, wrong decisions can land the entire dang into grave trouble especially when interactions with government officials and the legal system are involved. Wrong decisions when dealing with settled populations can lead to high monetary losses or major fights. Right decisions on the other hand promise no major benefits beyond continued survival. Given the high stakes and the asymmetry between returns and losses, information sharing and collective decision-making in this area is the norm. Of the twelve

issues I identified in this area, on four decisions are made and the tasks carried out collectively, for another two, decisions are made collectively; and for three of the other six, although the nambardar makes the final decision, others in the dang are closely involved in giving advice to the namabrdar on what should be done.

V.3 Factors influencing the suitability of a decision-making unit

We have looked at the three different decision-making units in the dang and the strengths and weaknesses of each. We have also looked at the functional categories in which I have classified different types of decisions. I will now discuss the general factors which determine the suitability of one decision-making unit over another to take a particular type of decision. There are three factors that influence the suitability of a decision-making unit in any given situation. The first is the amount of information that the decision-maker has regarding the particular situation. The second is the number of people who will be positively or adversely affected by the consequences of a desision. Finally, is the possibility of higher benefits through economies of scale when a decision is made for the entire dang rather than for just a single ewar. Based on these three factors, we can determine which authority will make decisions for a given issue. For the three decision-making authorities in the dang, I formulate the following general rules about when they will exercise the prerogative of making a decision.

When the information needed to make a decision is of a routine nature and easily available, and the number of people affected by the

decision are only those within an ewar, the mukhiya of the ewar will generally make the decision. The mukhiya of an ewar is the best person for making decisions on matters pertaining to the ewar. For most such decisions, the number of people who affected by his decisions is small since the decision applies only to the members of his ewar. At the same time, he will usually be better informed than anyone else in the dang about his own ewar. When we analyze the data on decisions taken, we will see that there is very little interference in the authority of the mukhiya to make decisions for the ewar. When there is any interference, there is solid economic reasoning behind it. Thus only when there is reasonable certainty that labor or cash can be saved through assigning a particular decision to other decisionraakers in the dang (typically the nambardar) is there interference in matters relating to the ewar.

When the information needed to make a decision is easily available and when a large number of people in different ewars will be affected by the decision the nambardar will generally make the decision. The nambardar is better informed than any other herder when it comes to matters relating to the entire dang or issues relating to the areas through which the dang moves. Such matters can include purchase of goods, sale of pastoral products, choice of the migration route, deling with bureaucratic rules, and interactions with traders and with outsiders. (Thus he will be more suited than individual mukhiyas or flock owners to make decisions on these issues). In situations where both the nambardar and the mukhiya have equal information, and the decision that is made involves the entire dang and may mean higher

benefits for the dang, it will make more sense for the nambardar to make the decision for the dang rather than the mukhiya.

When information on decisions to be made is not easily available, but the decisions are of a routine nature (that is, they need to be made often and there is relatively little that is at stake), the nambardar will again usually make the decision. In these situations, guesses about the necessary information can be made without too much being risked if the guess is wrong. This decision rule also points to something else, namely, that sometimes it is necessary that somebody make the decision. It is not important who decides; just that the decision is made.

In cases where neither the mukhiyas of the different ewars, nor the nambardar have sufficient information, where a large number of people or all the people in the dang may be affected, and where the possibility of an adverse impact because of the decision is high, the council of elders in the dang is likely to be involved in decision-making. This serves two purposes. First, it will prevent the responsibility for a wrong decision from being laid at the doors of any one individual. Second, the council of elders can act as a check on any individual who may try to manipulate uncertain situations to his own advantage.

It may be argued that the actual division of responsibilities for making decisions in the dang reflects power relationships in the dang between the nambardar and the individual herders rather than a rational distribution of responsibilities based on suitability of decision-making units. This would be true if the individual herders

had no recourse but to accept whatever decisions the nambardar made. However, in the normal course of events herders have at least two options open to them if they are not satisfied by the decisions taken by the nambardar. They can choose to leave dangs headed by particular nambardars; and for a new migration they can choose a different nambardar than the one they had in the current year[54]. The extent to which the nambardar can impose his will on the shepherds is thus limited by the shepherds' freedom to express their preferences through exit and voice (Hirschman, 1979).

V.4 Analysis of Decisions

The following table presents the data I collected on decision-making among raika dangs.

T A B L E V.I

(Aggregate decision-making data by issue area)

Issue Area	No. of Decns.	Decision-making Unit			
		Mukhiyas	Nambardar	Council	Total
Dang Formation/ Dissolution	(2)	49	9	-	58
Migration	(11)	1	265	48	314
Ewar Management	(13)	322	55	-	377
Dang Management	(16)	53	377	48	478
Market Interactions	(10)	71	171	58	300
External Relations	(8)	8	175	53	236
Total	(60)	504	1052	207	1763

[54] I will discuss this at greater length in the following section where I discuss the major decision groups.

The figures in the table can be interpreted as follows. The numbers in brackets after each issue area denote the number of decisions that I classified under that issue area. (See Appendix II for the enumberation of each decision). The numbers in each cell of the table indicate the number of times that a particular decision-making unit was mentioned by the respondent as the actual decision-maker for a particular type of decision issue. For each decision issue thirty respondents were asked as to which decision-making unit was the actual decision-maker. For 60 issues on which I questioned my respondents, there should be a total of 1800 responses (instead of 1763). However, 37 responses were either invalid or in those c ases the respondents did not answer.

To illustrate the explanation provided above, the first row can be interpreted as follows. There are two decision-issues under the general category of dang formation and dissolution. For these two decision-issues, there was a total of 58 valid responses. Of these 58 responses, the mukhiyas of ewars were mentioned as the decision-making unit in 49 instances and the nambardar was mentioned as the decision-maker in 9 instances. The table above consolidates responses by categories of decision-issues. In the course of the discussion in this section, I will discuss some of the issue areas at greater length.

The information in the table can be analysed in several different ways[55]. The basic question I attempt to answer in this section is:

[55]The following analysis relies heavily on the techniques discussed by Hildebrand et al. (1977) in "Analysis of Ordinal Data".

> If we know the characteristics associated with a set of issues for which decisions have to be made, and if we also know the strengths and weaknesses of different decision-making units, is it possible to make specific predictions regarding which decision-making units will decide on which issues?

Based on the discussion in the sub-section on decision-making units, types of decisions, and the factors determining the suitability of different decision-making units for decising on different issues, I make the following general predictions[56].

Decisions on ewar management will be taken by the mukhiyas of each ewar. Information on these is easily available, decisions affect only the members of a specific ewar, and economies of scale are seldom possible for intra-ewar issues.

Decisions on dang formation will also be taken by the mukhiyas because that is the only way in which mukhiyas can exercise any level of control over the nambardar.

Decisions on dang management will be made by the nambardar. While information on issues relating to dang management is also easily available to all, the decisions made affect a large number of people in the dang, and there are often economies of scale that can be obtained.

Decisions on migration and market interactions should also be taken by the nambardar. Information on issues in these areas is not easy to come by. However, decisions in these areas have to be made regularly.

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[56]Later in this section, I will discuss specific exceptions to the general decision-rules that I am now formulating.

In addition there are three other factors that make the nambardar more suitable than anyone else for makeing decisions on issues in these areas. He has greater information than anyone else in the dang on these issues. Decisions often affect all members of the dang, especially decisions on migration. There are definite economies of scale that can be had through delegating decision-making responsibilities to the nambardar. (However, as I said earlier, there are important exceptions to this rule, especially in the area of market interactions which we shall see later).

Decisions on external relations should be made by either the nambardar or the council. Information on these is not only difficult to come by, but decisions in this area also need to be made only infrequently. At the same time, the possibility of losses is high if the wrong decision is made.

The decision-rules in the previous paragraph can be summarized as below where we let the statement "X —> Y" mean, "if X then predict Y". (X corresponds to an independent variable and Y to a dependent variable).

1. Dang formation and ewar management —> Mukhiyas
2. Migration, Dang management and market interactions —> Nambardar
3. External Relations —> Nambardar/Council

To test how far the data in table V.1 conform to the hypothesized predictions we can employ several measures. One possibility is to treat all the cells of the table which do not conform to the prediction rules as errors cells and count the number of responses that lie in these cells (351 error responses). As a proportion of the

total responses, the number of error responses can give a crude measure of the reliability of the prediction rules (19.9% of the responses are error responses). However this is quite inadequate. Aggregating all the responses lying in error cells, tells us nothing about the distribution of the error responses. The total number of errors will be meaningful only when compared to an appropriate benchmark.

The prediction rules mentioned above employ information on the independent variables (Dang formation, migration and so forth) to state what the distribution of responses on the dependent variables (decision-making units) will be. We can evaluate the prediction success of these rules by calculating the reduction in error that is made possible when we make a prediction for each case with knowledge of its independent variable in contrast to predicting without such information[57]. This measure is called the Proportionate Reduction in Error. It varies between -1 and +1. Values of the measure between 0 and 1 indicate that the knowledge of the independent variables reduced the error in prediction: higher values indicating greater reduction in error. Correspondingly, values between 0 and -1 show that the prediction rules actually increased the error, indicating that the data does not validate the prediction rules that were constructed.

For the data in table V.I the expected number of errors without knowledge of the independent variables is 818.5. As we saw earlier,

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[57]For details on the exact procedure refer to Hildebrand et al. (1977).

the observed no. of errors is 351. The proportionate reduction in error is .571 for the three prediction rules[58].

If we examine each issue area in greater detail by looking at the individual issues in the set of issues comprising that area (see Appendix II), we immediately notice that while the decision making unit for any given area makes the decisions for most of the individual issues in that area, there are some major anomalies which require explanation. Under migration, the start of the return journey is decided by the nambardar and the council with approximately equal probability across different dangs; and for the issue of whether the dang members should become permanent migrants, the council decides in most cases where the question was applicable. For both these exceptions, the explanation is simple.

First of all the decision regarding initiation of the return journey is made only once during the migration cycle. Thus it is not a routine decision. Second, the information necessary for the decision is not available with any single individual, including the nambardar. For this decision the amount of fodder available in different villages from which flocks comprising the dang come, and the animal fodder balance in the same villages is very important because when the shepherds return to their villages there must be sufficient vegetation for their animals. For one, this implies that information available with different shepherds regarding animal fodder balance must be taken into account. It also implies, that given the situation of general low

[58]The calculation that gave this answer is (818.5-351)/818.5 = OR .571

availability of fodder in villages, most shepherds will prefer rains to have begun by the time they reach their villages. At the same time, different shepherds have differing amounts of cultivable land. Many of them will not like to miss the first monsoon showers since missing them will affect their income from agriculture. Thus information regarding needs of different shepherds to return home early also must be taken into account. A delicate balance needs be struck between an early and a late return - for which consultation with different council members is convenient since the council represents a broader interest group that just the nambardar and also has more information than him. Similarly, migrating permanently affects all ewars and therefore consultation with the council is necessary for taking decisions.

If we examine the list of issues in ewar management, we find that the mukhiya in the ewar makes all the decisions under household management. However, under flock management, there are two issues over which the nambardar rather than the mukhiya makes decisions. First is the issue of how many people from a given ewar will graze and water camels and the second is the issue of the order in which ewar members will keep watch during the night (see table V.2 below). This intreference in the right of the mukhiya to make decisions about ewar related matters can be explained by examining the two issues in depth.

T A B L E V.2
(List of decision issues: Ewar Management)

Decision Areas/issues	Mukhiya	Nambardar	Council
Ewar Management			
Household decisions:			
-Cooking	30	-	-
-Gathering water/fuelwood	30	-	-
-Buying supplies for cooking	29	-	-
-Breaking camp	28	2	-
-Setting camp	27	3	-
Flock Management:			
-Separation of sheep in morning	30	-	-
-Grazing and watering sheep	30	-	-
-Grazing and watering camels	6	24	-
-Milking sheep and camels	30	-	-
-Taking care of young sheep	28	2	-
-Maintaining ewar accounts	28	2	-
-Order in which ewar members will keep night watch	5	23	-
-Gwala's salary	21	-	-
Total	322	55	-

We first look at the issue of grazing camels. Since camels and sheep have very different grazing habits, it makes sense for camels to be grazed separately from sheep. However, the average number of camels in an ewar is four (Table III.7). But two herders can graze between 30 and 50 camels. This means that real economies of scale can be obtained by collectively grazing all the camels from the different ewars in a dang. Instead of each mukhiya in an ewar assigning the task of grazing camels to one individual from the ewar, the nambardar can select ewars by rotation and ask them to contribute a smaller level of labor for grazing the camels than they would need to if each ewar had to contribute the labor of one person every day for grazing camels.

Through the nambardar coordinating the selection of camel herders, the dang can benefit from scale economies. If we go by averages, there are 12 ewars and 46 camels in a dang. If the mukhiya assigns a person to graze camels every day from the ewar 12 people will be needed. But if the nambardar does the same task, at most 3 people will be needed each day. If we take the average consumption expenditure on a person to be Rs. 1200.00 for a migration cycle, the dang saves a total of approximately Rs. 10,800.00 or Rs. 900.00 per ewar. However, who can be spared for grazing the camels on any particular day is a decision that is taken by the mukhiya of the ewar (See the responses on dang management in part four of appendix II).

The reason why the nambardar decides on the order in which ewar members will keep watch during the night is that security is primarily the responsibility of the nambardar. Again the decision is routine (in the sense that it has to be taken every day) and the nambardar possessses greater familiarity with the route selected for migration; hence more information than anyone else about the area through which the dang moves. Thus it is he who advises the dang members on how careful they must be in different areas. Therefore although the decision on which ewar members should keep watch in which order is properly related to ewar management, the nambardar decides on this issue.

If we make prediction rules for the individual issues in this area they can be as below:

1. Watering and grazing camels —> Nambardar
2. Order for keeping nightwatch —> Nambardar
3. All other issues in ewar management —> Mukhiya

The Proportionate Reduction in Error measure for this table works out to 0.802.

A similar reworking and fine-tuning of the different issue areas is possible by looking at the individual issues which diverge from the norm of the issue area. I have already talked about the exception in the case of dang management. I will look at one more set of issues - market interactions - to illustrate my point. Also it is for this set of issues that the different factors influencing the suitability of decision-making units compete with each other to a great extent. (See table V.3).

T A B L E

(List of decision issues: Market Interactions)

Decision Areas/issues	Mukhiya	Nambardar	Council	Total
Market interactions				
-When to call sheep merchants	—	10	20	30
-When to call wool shearers	-	12	18	30
-When to call wool merchants	-	17	13	30
-Who to sell wool to	2	26	2	30
-Who to sell sheep to	14	16	-	30
-Rate for wool sale	-	27	3	30
-Rate for sheep sale	28	2	-	30
-Rate of sheep shearing	-	28	2	30
-How much wool to sell	-	30	—	30
-How many sheep to sell	27	3	—	30
Total 71 171	58	300		

We see that in this area of decision-making, nambardar's powers are the most severely curtailed since he shares decision-making with both the ewar mukhiyas and with the council of elders in the dang. All the decisions regarding the timing of dealing with merchants are shared

with the council and decisions about sheep sales (except the timing of calling merchants) are taken by ewar mukhiyas except which merchant sheep should be sold to. In the case of which merchant sheep should be sold to, the nambardar shares responsibilities for making decisions with the ewar mukhiya.

Decisions regarding the shearing of wool and sale of wool are made by the nambardar. The major reason is that he is the one person in the dang who is capable of coordinating the various tasks and operations which must all be carried out more or less simultaneously or in quick succession before sheep can be sheared and their wool sold (See section IV.1). Not only must the decision-making for wool shearing and sale be coordinated, there are large economies of scale if all sheep in the dang are sheared at the same time rather than if each ewar mukhiya gets his sheep sheared separately only going by his own convenience.

However, the sale of sheep does not have to be coordinated for the entire dang at the same time. Indeed, shepherds often sell even one sheep at a time. Sheep merchants come to the dang and buy sheep from the shepherds. Thus the ordinary shepherd does not have to rely on the nambardar for either calling the sheep merchants or coordinating the sale of the sheep. At the same time, the returns to the shepherds are much higher on the average from the sale of sheep than from the sale of wool. Since giving up the responsibility of sheep sale to the nambardar confers no extra benefits in terms of scale economies; since each flock owner can even sell sheep on his own; and since the amounts involved for each person are high, it makes sense that the decisions

for sheep sale regarding the rate as well as the number of sheep that will be sold, are taken by the ewar mukhiya. Also there is a greater possibility of loss if all the information about the differences between the sheep being sold is not taken into account at the time of the sale. Wool on the other hand is more homogenous as a commodity. Since the nambardar will not have as detailed information about the qualities of the sheep in each ewar as the ewar mukhiya himself, it also implies that the nambardar is disadvantaged in comparison to the mukhiyas regarding the information he possesses about sheep.

The nambardar shares the responsibilities for making decisions regarding the timing of calling merchants with the council because again the council represents a greater diversity of interests in the dang and has more information about when sheep will be ready for shearing, for sales, and when wool can be sold. If the nambardar does not listen to the council about when to call the merchants, the ewar mukhiyas can also refuse to sell their commodities. For the three decisions about the timing of calling merchants, the information that the nambardar has on the location and identity of different merchants can be combined with the information that the council memebrs have on the condition of sheep in the ewar to allow the best decisions to be made through sharing the responsibility of making decisions over these issues.

The prediction rules for this set of issues are as follows:

1. Decisions on timing of calling merchants/ shearers —>Council/nambardar
2. Other decisions regarding shearing and sale of wool (rate, which merchants —>Nambardar
3. Other decisions on sheep sale (rate, number) —>Mukhiya
4. Who to sell sheep to —>Nambardar/Mukhiya.

For these rules, the value of the Proportionate Reduction in Error measure works out to 0.887.

We see that working out the prediction rules for each issue or for a given issue area must be preceeded by familiarity with the decision issue. Slight differences in the nature of the decision will make one or the other decision-making unit the more appropriate locus of decision-making for that decision. Thus the Proportionate Reduction in Error measure cannot be applied blindly.

VI. CONCLUSION

The grazing strategies that the Raikas adopt convincingly show the ability of pastoralists to innovatively and successfully adapt their lifestyle and production strategies to changing environmental conditions - conditions that are changing against them; and which are changing for the worse as a result of state policies (increasing areas under irrigation, enclosures of land for providing sanctuaries to wildlife and so forth). Their decision-strategies show that there is little doubt that distribution of decision-making resopnsibilities in the dang is along easily understandable lines, dictated by factors which may well be used by an organization operating under market conditions. In light of this evidence there is little ground to argue that migrant shepherds are irrational, whimsical, or behave in a random manner.

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