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DISTRIBUTION OF DECISIONMAKING RESPONSIBILITIES AMONG RAIKAS:
COMMONS AS A RATIONAL RESPONSE TO PROBLEMS OF COMPLEXITY

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I. Objective of the Paper

The research on which this paper is based focused on migrant shepherds, the Raikas¹, in semi-arid Rajasthan. This paper analyzes decision making among the Raika shepherds while they migrate.

Through arriving at an understanding of decision-making amongst the shepherds, my research aims to accomplish two things.

1. Provide a support for the argument that the shepherd and herders make rational² decisions.
2. Show where external interventions by policy-makers and development agencies will be more fruitful and effective.³

In this paper, however, I am working only with part of my data and as such will primarily work towards the first aim of my research. To do this, ie. to show that shepherds make rational decisions, I take decisions undertaken by the shepherds as the basic unit in my analysis.

The making of reasonable decisions is the litmus test of

¹Raikas are a sheep-herding caste in the western state of Rajasthan in India. Most of them, in addition to sheep-herding, also engage in agriculture.

² See Ferguson (1982) for an argument against using either utilitarian (rational choice) or dualist (traditional vs. modern) approaches to understand livestock practices.

³ In this paper I do not deal with this objective of my research. However, the argument is simple. If the basis for shepherd decision-making is understood, as also its locus, it will be easier to determine where policies and programs should intervene for the greatest positive effect. This will be the subject of a second paper on the subject.

rationality. I argue in this paper that shepherds distribute decision-making responsibilities among different decision-making units in the "dung"⁴ on the basis of the suitability of each decision-making unit for making that particular decision. In doing so they voluntarily give up (delegate) power and authority to either an individual or a group which makes decisions on behalf of the entire collective - the dung. Their voluntary decision to vest authority in an individual or a small group⁵ provides a common good - the decision-making authority in the dung. It can be viewed as a contract which is made afresh each year at the beginning of their migration cycle, and dissolved at the end of the migration cycle.

Thus the common good discussed in this case is a rational response by shepherds to tackle the complexities of decision-making in an environment characterized by constant flux. But the fact that shepherds delegate the responsibility for decision-making and the power to enforce decisions to another (individual or group in the dung) should not lead us to expect that the delegation of power and responsibility is indiscriminate. In fact, there is a very definite and clear logic to the distribution of the decision-making responsibilities among the individual herder, the nambardar and the group of elders in the dung. It is this logic that my paper seeks to explicate.

⁴ The "dung" (hereafter written simply as dung), is pronounced with a soft "d", but otherwise in the same manner as dung in English. It refers to the mobile shepherd camp, usually comprised by 10 to 15 shepherd households and approximately 4,000 sheep.

⁵ In a given dung, the leader of the dung, the "nambardar", makes some of the decisions, and for other decisions a group of elders in the dung is responsible. See section IV.

Before I proceed with the body of the paper, it may be useful to emphasize the guiding assumption behind my analysis. While my analysis seeks to support a particular hypothesis, I proceed with the awareness that the analysis is subject to criticism, reinterpretation of data, and revision (Popper, 1963; 1965). This is only appropriate since the present analysis is a preliminary presentation of results derived from collected data.

II. Organization of the Paper

In the next section of the paper, I will provide a few salient facts about the raikas and their lifestyle as migrant shepherds. Section four of the paper will discuss the three different decision-making units in the dung and the advantages that each possesses for making decisions. In the fifth section, I will talk about the major types of decisions that must be made in a raika dung and reproduce a table (from my research) which provides information on actual distribution of decision-making responsibilities in thirty dungs of migrant shepherds in Rajasthan. Section six, coming just before the conclusion to the paper, analyzes the information in section five using a measure for evaluating ordinal data - specifically, a measure of prediction success (Hildebrand et al., 1977; Reynolds, 1984). Section seven concludes this brief essay.

III. Raikas: Farmers and Migrant Shepherds

Instead of trying to place the Raikas in a typology of pastoral nomadic forms found in other regions of the world, (Johnson, 1969; Dyson-Hudson, 1972; Swidler, 1972; Barth, 1961; Monod, 1975; Weissleder, 1978) I will concentrate on briefly sketching the Raikas as I observed them during my field research with them in the summer of

1990. The stylized facts in the sketch are based on interviews held with members of thirty dungs and the sketch bears no claims to being a representation of "the raika".

Migration in raika nomadic pastoralism⁶ begins after monsoons are over and the raikas have harvested their fields. While most raikas own both animals (sheep, goats, camels and in some instances donkeys) and land, the larger landowning raikas do not migrate and the raikas who do migrate, usually own at least 50 to 75 sheep.

The basic social unit during migration is the dung. Each dung has 10 to 15 "households". A "household" consists of five to seven persons (men, women and children) who need not necessarily be from a single village household, (or even one village) but who are generally affinally or agnatically related. On an average, the 10 to 15 households in the dung own among them 3,500 to 5,000 sheep, 25 to 60 camels, 200 to 300 goats, and 3 to 5 dogs⁷. While sheep and goats are reared for wool and meat, camels are used for transporting baggage and for limited riding purposes.

Starting their migration in October and November from the drier western districts of Rajasthan, the Raikas travel east both in a northerly and southerly direction towards the states of Haryana, Uttar

⁶ See Dyson-Hudson (1972) for a critique of the use of the term nomadism or nomadic pastoralism. However, the grounds on which he criticizes the use of the term (that the term makes environmental factors primary for explaining the spatial mobility of livestock rearers) seem to be absent in the case of Raikas. For the raikas spatial mobility is indeed an attempt to take advantage of differences in availability of pasture and water across time and space.

⁷ Each household, together with its complement of animals is called an "ewar". The same term is used to describe the flock of sheep and goats. The difference in meaning depends on the context. The data given is based on fieldwork.

Pradesh, Madhya Pradesh and Gujarat. They spend approximately three to five months before they reach their destination in these states. After spending a month or so in villages in these states, they then begin the homeward journey with the approach of the monsoons. The return journey is often completed by a different route and is much faster since the raikas want to reach home before monsoons actually arrive (so that they can till their own lands); and yet they do not want to begin the return journey without any rain at all in the area they will be crossing on their return since then their animals may starve for lack of pasture. Throughout their migration they opportunistically seek forage for sheep in fallow private fields - irrigated or dry farmed, government owned forest and pasture lands, road sides, and village owned common lands. They return to their own villages by the end of June to middle of July.

Membership to the dung is fluid and changes from year to year. However, admission to the dung presupposes acquaintance or kin relationships with persons who have already been members of a given dung. Usually a dung is identified by the name of the leader of the dung - the nambardar - or by the name of the nambardar's village.

For the five to seven persons in the ewar there is a clear division of responsibilities. Two to three persons are in charge of grazing the 400 to 600 sheep owned by the household. The head of the household is called "mukhiya". One person cooks for the members of the household, one persons takes care of the young lambs which may have just been born, and usually another person grazes camels and is responsible for maintaining the contacts of the households with their village homes.

Daily life in the dung is fairly harsh. The shepherds rise before day break and take their sheep for grazing. They return after three to

four hours and have their breakfast which by this time would have been cooked. Before they return, the person in charge of grazing the camels leaves with the camels. After the shepherds have had their breakfast cum 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 camping location for the day. Often the young lambs are also transported on camel back. They reach the camp for the day in two to seven hours of walking, depending on the distance of the new camp from the old and set camp for the new day. The shepherds return a little after sunset and then the evening meals are cooked.

IV. Decision-makers in the Dung

Each dung is headed by a leader - the nambardar - who is responsible for taking decisions on a variety of issues relating to migration pattern, dealings with outsiders, and purchase and sale of supplies and pastoral products. The nambardar has a second-in-command who is called the Kamdar who assumes the duties of the nambardar when the nambardar is sick or absent. In addition to the nambardar, there is an informal council of elders in each dung which makes decisions and helps in decision-making in situations of crisis or situations without precedent. There is of course the "mukhiya", or the head of a household, who makes decisions on most matters pertaining to the ewar. Since the kamdar is functionally equivalent to the nambardar, I assume in the paper that there are only three loci of decision-making in any given dung. In the paper, I will refer to them collectively as decision-making units.

4.1 Factors influencing decision-making

A large number of factors influence decisions taken by the shepherds. Beginning from the point when a group of shepherds may request a person to be the nambardar⁸ for a given annual migration (before the migration begins) to the point when the shepherds make the decision to disperse and go to their villages when returning from the east (when the migration ends), the dung is confronted with an extraordinary variety of situations, many of which require that decisions be taken. Since the shepherds often move through new areas, the situations that confront them involve interactions with new persons. Since the shepherds do not have property rights over the resources they need in these areas for survival (their own as well as of their sheep) (water, browsing and grazing rights, fuel-wood, and often the right to move through private fields) they have to negotiate with villagers to procure their needs. The uncertainty in the social environment of the dung is exacerbated by the unpredictable physical and climatic variations. The most significant uncertainty is about rainfall which also affects the availability of vegetation and forage for sheep, often within the space of a day's march.

The conditions outlined above necessitate the taking of effective decisions. Not just any of the decision-making units, randomly selected, will make the best decision for a situation that the dung may

⁸The position of a nambardar may be hereditary or he may be chosen through selection by a number of shepherds who want him to form a dung. It is true that many raika families are composed entirely of persons who are nambardars. However, to inherit the mantle of a nambardar, his offspring has no choice but to perform well, else, over time the ewars in his dung will drift to other dungs and he will be left without any dung to lead.

face in its migration. This means that the responsibility for making decisions in a given situation must be distributed with an eye to the strengths and weaknesses of the decision-making unit.

As I already remarked, the individual mukhiyas in a dung, voluntarily allow the nambardar and the council of elders in the dung to take decisions on their behalf⁹. I hypothesized that the reason for this can be found in the greater suitability of the nambardar and the council of elders to take certain types of decisions. Thus, the mukhiyas will keep under their own domain those decision-situations and tasks where the nambardar and the council of elders has no relative advantage over the mukhiya in reaching a decision.

4.2 Factors influencing the suitability of a decision-making unit

There are three factors¹⁰ which influence the suitability of a decision-making unit to take decisions in a given situation for the dung/ewar. The first is the amount of information that the decision-maker has in relation to that required for making the decision. The second is the number of people who will be positively or adversely affected by the decision involved. The third is possibility of higher

⁹An argument can be made that the individual herders have little option but to allow the nambardar or the council of elders to take decisions on their behalf. Therefore the existing distribution of decision-making reflects power relationships between the nambardar and the individual herders rather than a rational distribution of responsibilities based on suitability of decision-making units as may be achieved in an "ideal situation". The argument certainly has its merit. However, it is undermined by the fact that the herders can choose to leave dungs headed by particular nambardars, and that they can choose their own nambardars for an annual migration. Thus herders can express their preferences by exit, or by voice - by choosing another nambardar (see Hirschman, 1979)

¹⁰ See Dyson-Hudson (1972: 33-39) for an extensive list of factors relevant to pastoral mobility. The discussion in this section of the paper is at a more abstract level.

benefits if the decision were taken for the entire dung rather than for individual households. Keeping in mind these three factors, the following general rules can be formulated.

The mukhiya of an ewar is the most suitable for making decisions when he is the best informed regarding the situation (as he will be about matters pertaining to his ewar); when the number of people affected by the decision is only within his ewar; and when there is no possibility of higher benefits even if a collective decision for the entire dung is taken. We will see this pattern reflected in the actual decisions taken by the shepherds.

The nambardar is in general better informed than individual herders when it comes to matters relating to the entire dung. Such matters include the choice of the migration route, knowledge of the settled population along the route and bureaucratic rules, interactions with traders. Therefore he will be more suitable than the mukhiyas of individual camps for making decisions pertaining to the entire dung - whether they relate to migration, relationships with settled populations, bureaucracy or the judicial system, or settlements of disputes within the dung. This will be especially true if the decision will result in higher benefits for the entire dung. In such a situation, even if the nambardar and the mukhiya of a dung are equally well informed about a situation, it makes sense for the nambardar to make the decision for the dung rather than the mukhiya.

In a situation where neither the mukhiyas nor the nambardar have very good information on the issue, where people from more than just one ewar are involved, and the possibility of an adverse impact because of the decision is high, the council of elders is likely to be involved

in the decision-making. This will serve two purposes - it will first, enlarge the base of decision-making so that no one person will suffer the guilt for a wrong decision. Second, it will also prevent the nambardar from using the situation to his own advantage if the council of elders is there to monitor him in situations of uncertainty.

V. Major Types of Decisions

In this section I present the data I collected from thirty shepherd camps (dungs), on the areas in which decision-making is important during migration. There are six such areas of decision-making¹¹. This classification is based on a common-sense view of the life in the migrant shepherd camps of Raikas. Within each class there are further issues¹².

1. Dung Formation and dissolution
2. Migration
3. Matters relating to the ewar
4. Matters relating to the dung as a whole
5. Sales of pastoral products

6. Dealing with outsiders

I will briefly explain what each issue area implies. Dung formation and dissolution refers to the fact that the dungs are formed anew each year after the mukhiyas request a nambardar to undertake with them the annual migration. At the end of the migration cycle for the year, the mukhiyas separate and go back to their individual villages.

The important decisions relating to migration are the direction of the migration, the timing of the migration, and the daily question of where the camp should be set. In this respect, the raikas are different from many other pastoralists. The raikas are constantly on the move,

¹¹The list of the areas of decision-making is primarily empirically based.

¹²A detailed list of issues in each area is given in appendix one.

seldom camping in any one spot for more than a couple of days. Thus a decision on issues regarding camp location has to be taken every day.

In the third class of decisions are issues relating to the ewars - the households - comprising the dung. For each ewar, the mukhiya undertakes the decisions, even when the members of the ewar come from different villages and do not correspond to a settled household in a village. At a mini scale, the giving up of authority by the ewar members to the mukhiya replicates the similar action undertaken by the mukhiyas for the nambardar. In both situations, the objective is more effective functioning of the ewar, or the dung - ie. the larger unit of social organization.

For sale of products, it is again the nambardar who undertakes decisions most of the time. This includes decision-making on sales of sheep, wool, and the shearing of sheep. However, the three factors I mentioned (see page 8) - information availability, number of people involved and scale economies - compete closely in this issue area for distribution of decision responsibilities.

The last issue area - relations with outsiders (including the government, legal system and the settled population) poses the greatest uncertainty for the shepherds. At the same time, wrong decisions in this issue area can lead to the dung finding itself in grave trouble. It is not surprising therefore that the decision-making responsibilities are often shared between the nambardar and the council of elders. Indeed, it is in this issue area that the council of elders is most often asked to play a role in decision-making, especially when it comes to dealing with the legal system.

VI. Analysis of Decisions

In the following table, (see next page) I provide the data on the decisions made by the different decision-making units classified according to issue area. The three notes following the table, explain the manner in which the data in the table is presented. (The first two notes are also useful for the second table.) The figure in bracket next to the issue area refers to the number of issues in that area that the shepherds were asked a question on. The figures in each cell indicate the number of times a particular decision-making unit was mentioned as the actual decision-maker for a given issue by the respondent.

TABLE 1
Aggregate Decisions-Making Data by Issue Area

<u>Issue Area</u>	<u>Decision-Making Unit</u>			
	Mukhias	Nambardar	Council	Total
Dung Formation/Dissolution(2)	45	13	—	58
Migration (7)	1	188	21	210
Ewar Related matters (13)	334	43	2	379
Dung related matters (17)	36	383	72	491
Sale of Pastoral Products(10)	69	162	69	300
Dealing with Outsiders (9)	8	182	76	266
Total (58)	493	971	240	1704

Note: 1) The total does not add to 1740 (30 responses for each question on decision-making) because in 36 cases the respondents could not give a classifiable response or answered "don't know".

2) The figures in the cells should be interpreted in the following manner. The 45 and 13 in the first two cells in the first row imply that for the two questions on dung formation/dissolution, there were a total of 58 valid responses. Of these, 45 said that the mukhiyas made the decision in this issue area and 13 said that the nambardar made the decision for forming/ dissolving the dung. Two responses were invalid. Since two questions each were asked of thirty respondents, the total adds up to sixty.

3) This is a highly aggregated table of shepherd responses.

As mentioned in section 2, I am using the proportional-reduction-in-error measure to test whether the three rules for decision-making

mentioned in section 4 make sense or not (see page 9 and 10). The measure varies between -1 and +1. It is useful in evaluating the prediction rules because it indicates the extent of reduction in error by using the prediction rules from a situation where no prediction rules were used for evaluating the data.

In Table 1 we have six issues on which shepherds make decisions. Based on the factors which influence shepherd decision-making (mentioned in section 4) I make the following predictions:¹³

1. Dung formation and Ewar related Issues → Mukhiyas
2. Migration, dung related and
Pastoral product sale related issues → Nambardar
3. Issues about dealing with outsiders → Nambardar/
Council

The prediction hypotheses are easily interpretable. Thus the first hypothesis states that for dung formation and ewar related issues, the Mukhiyas of ewars will take decisions. The three prediction rules stated above yielded a value of .591 for the proportional-reduction-in-error measure (see Hildebrand et al. for the mechanics of deriving this measure). The prediction led to approximately a 60% reduction in error. Had there been no observed error, the measure would have been one. The interpretation of the reduction in error measure is straightforward. It compares the actually observed errors with a benchmark of expected errors which could have been expected without knowledge of the independent variable state. The benchmark prediction makes no use of the information available about the predicted variable; and does not change with changes in category definition or ordering as long as such changes do not affect the prediction being evaluated.

¹³ Let the statement $X \rightarrow Y$ mean if X then predict Y or X tends to be a sufficient condition for Y (see Hildebrand et al., 1977).

The predictive accuracy of the measure can be improved if we consider the data available in table 1 in greater detail and consider which decision-making unit will be operant for each separate decision. (In the prediction rules above, I only looked at aggregated sets of decision issues rather than each separate decision). In this paper, I do not attempt that task¹⁴. However, for one set of issues - decision-making on ewar related issues, I provide the value of the proportional-reduction-in-error measure as an illustration of the above point. The point of using the predictive rules was simply to illustrate that even when only very rough prediction rules are used, a clear rationality behind the decision-making responsibility distribution among the raikas can be discerned (As shown by the proportional-reduction-in-error measure).

TABLE 2

<u>Decision</u>	<u>Decision Making Unit</u>			Total
	Mukhiya	Nambardar	Council	
Separation of sheep in morning	30	—	—	30
Grazing and watering sheep	30	—	—	30
Grazing and Watering Camels	3	27	—	30
Milking sheep and camels	30	—	—	30
Cooking	30	—	—	30
Gathering water, fuelwood	30	—	—	30
Buying food supplies	29	—	—	29
Breaking camp	28	02	—	30
Setting Camp	27	03	—	30
Taking care of young sheep	30	—	—	30
Keeping accounts for ewar	26	04	—	30
Setting order for watch in night	22	06	02	30
Amount of money paid to hired help	19	01	—	20
Total	334	43	02	379

¹⁴ See Dyson-Hudson (1972: 47) in support of the argument that it is the variation in individual patterns that provides the greatest insights rather than the examination of the modal behavior. While I do illustrate this in the example following the footnote, the preceding discussion is premised on the belief that insights are possible through the discussion of variation from and adherence to hypothesized patterns.

The prediction rules for this table are fairly simple. There are two of them. They are as follows:

watering camels	-> nambardar
All other ewar related matters	-> mukhiya

The second rule corresponds to the idea that all ewar related matters are best decided upon by the mukhiya since he has the most information for deciding upon them and because his decisions will affect only a small number of people - ie. his own ewar. The first rule assigns the responsibility for grazing camels to the nambardar from the fact there are benefits to be had by letting the nambardar decide on who would graze camels. Each ewar has only a few camels - two to four. But a single individual can graze upto 25 camels. Therefore, considerable amounts of time and effort can be saved if all the camels in the dung are grazed by three or four persons, who are assigned the task in turn by some authority in the dung. The obvious person who can exercise this authority is the nambardar.

For this prediction rule set, value of the proportional-reduction-in-error measure works out to .691. A similar reworking and fine-tuning of the different aggregate issue categories is clearly possible.

VII. Conclusion

I argued in this paper that the logic of decision-making-responsibility-distribution among the raikas can be seen as a rational response to complexities of decision-making. The raikas, over time, have chosen to have a mix of decision-making mechanisms in their dungs. These mechanisms correspond to what can be called a common or a collective good - the locus of authority centered in the nambardar, or the council of elders - brought into being by voluntary contributions

of obedience by the different herders. At the same time, for decisions which do not require intervention by the nambardar, the raikas retain decision-making power for the flock (the ewar) within the hands of the individual shepherd. Additionally, through showing that the raikas rationally divide decision-making responsibilities among different competing decision-making units, I have tried to argue that the raika shepherds are rational decision-makers.

Appendix I

	Not know	Mukhia	Nambar	Council
1. Dung Formation and Dissolution				
- Selecting the nambardar	2	17	11	-
- Leaving the Dung	-	28	2	-
2. Migration				
- General direction/ route to travel	-	-	26	04
- Which state to go to	-	-	24	06
- When to start the migration	-	-	30	00
- When to start the return from east to villages	-	1	19	10
- Distance to travel each day	-	-	30	00
- Which village to go to each day	-	-	30	00
- Where camp should be set each day	-	-	29	01
3. Matters relating to the Ewar				
- Separation of sheep in the morning	-	30	00	00
- Grazing and watering sheep every day	-	30	00	00
- Grazing and watering camels	-	13	17	00
- Milking sheep and camels	-	30	00	00
- Cooking	-	30	00	00
- Gathering water, fuelwood for cooking	-	30	00	00
- Buying supplies for cooking	1	29	00	00
- Breaking camp	-	28	02	00
- Setting camp	-	27	03	00
- Taking care of young sheep	-	30	00	00
- Keeping accounts for the ewar	1	26	04	00
- Order in which people will keep watch during night	-	12	16	02
- Amount of money to be paid to gwala	10	19	1	00

4. Matters relating to the Dung as a whole

- Undertake scouting trips to find out about the weather/ forage	-	-	28	02
- Prescribe order for setting camp for night-	-	4	20	06
- Arbitrate disputes among group members	-	-	14	16
- Fine guards for dereliction of duty	-	-	21	09
- Give permission to person leaving the dung for work	-	3	24	03
- Appoint people for going out of dung for work	-	-	29	01
- Send person to receive those returning to dung	-	4	25	01
- Sending people to get food for cooking on festivals	-	-	28	02
- Cooking food together on festivals	-	2	26	02
- Who will cook for guests	2	3	24	01
- Who will guests stay for the night	1	2	27	00
- Talk with visitors	-	6	21	03
- Who will go to buy medicines	-	12	16	02
- Maintain accounts for the common fund	-	-	26	04
- Maintaining the common fund (undertake expenses and income)	-	-	28	02
- Whether to join up with another ewar	-	-	24	06
- Whether to become permanent migrants instead of annual migrants	16	-	02	12

5. Sale of Pastoral products

- When to call sheep merchants	-	-	10	20
- When to call wool shearers	-	-	12	18
- When to call wool merchants	-	-	07	23
- Who to sell wool to	-	2	26	02
- Who to sell sheep to	-	12	18	00
- Rate at which wool will be sold	-	-	27	03
- Rate at which sheep will be sold	-	28	02	00
- Rate at which sheep will be sheared	-	0	28	02
- How many sheep to sell	-	27	02	01
- How much wool to sell	-	-	30	-

6. Dealing with Outsiders

- handle disputes with settled population	-	-	17	13
- Go for recovering stolen sheep	ALL	GO		
- How much to pay as fine for mistake in fighting with settled population	-	-	03	27
- Where to fold sheep	-	-	28	02
- Become friendly with local population	-	-	25	05
- Get passes for grazing animals from forest officials	-	3	21	06
- Bribe forest officials	04	5	21	00
- Make reports to police	-	-	27	03
- how much to pay as bribes to police	-	-	28	02
- appoint lawyers for a case	}			
- Collect money for fighting case)	All are involved		
- Go for hearings of the case	}			

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