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# Nomadization in Rajasthan, India: Migration, Institutions, and Economy

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*Despite a global trend toward settlement, the incidence of pastoral nomadism is on the rise in the* Marwar *region of Rajasthan, India. Typical explanations for this change use models of population pressure; increasing herds and decreasing pasture are held to blame. This explanation, however intuitive, is unsatisfactory. Instead, changing institutional and economic patterns are creating new contexts for strategic movement. Bottlenecks in the yearly resource calendar, caused by the disintegration of obligatory social relationships, force migrations during periods of scarcity. Changes in the volume and pattern of the meat and wool markets have also created opportunities for migrating pastoralists. Producers increase their access to markets and the reproductive rate of their herd through long, annual, migration. While nomadism is a general adaptation to changes in the socioeconomic conditions of the region, differential resource endowments account for the range of strategies; wealthy herders have opportunities not enjoyed by more marginal producers.*

**KEY WORDS:** Nomadism; institutions; Rajasthan; pastoralism; migration.

## INTRODUCTION

In his postindependence survey of the grasslands of India, Whyte (1957) reported of long-distance pastoral migration from the Marwar region of Western Rajasthan that "the problem is not so acute" and that "migration occurs only during famine years." He further explained that this movement of animals was most often predicated by water shortages in the home villages of pastoralists. By 1994, long-distance migration by pastoral specialists as well as by many nonspecialist livestock holders had become an accepted annual reality. The herding strategy of the region had turned from semi-sedentary to semi-

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itinerant. The driving causes behind this movement had changed as well from lack of dry-season water resources to acute shortages in fodder. The result is a regional livestock population increasingly on the move, sometimes turning to year-round nomadism to meet demands for seasonal pasturage. While much of the global herd is becoming sedentary (Salzman, 1980; Gilles and Gefu, 1990), Marwars' is becoming nomadic.

The most common explanations for this change, that common property grazing resources have disappeared and that the regional herd has experienced unprecedented growth, are insufficient explanations for these changes. Many villages have seen declines in the livestock population over this period and the western region continues to be an area endowed with extensive pasturage. The fundamental question remains: what would motivate a largely sedentary agropastoral population to increasingly embrace itinerancy despite the obvious costs in time, labor, resources, and physical danger? The answer touches upon several broad and significant themes including the relationship of economy to ecology through institutional formation (Polanyi, 1944, 1957; Halperin, 1994) and the causes and origins of nomadism itself within a broader agricultural context (Lees and Bates, 1974; Galvin, 1987; Khazanov, 1994, pp. 85–118).

Based upon research conducted in villages of the region during the 1993 and 1994 migration season, I offer here an institutional and economic explanation for such an unlikely change. I will argue that the transition into migratory strategies has developed from the decline of key village social institutions managing pasture and forest land, the profits reaped from intensification in an increasingly capitalized market, and the benefits of migration, in the form of *increased* reproductive capacity in the herd.

I suggest that these changes have created growing "positive" and "negative" forces that act on pastoral producers. Negative factors refer to local conditions forcing movement into distant socioecological regions. Specifically, the change from a traditional regime of pasture availability to a transitional one has reduced access to available graze and browse for many marginal animal raisers and has forced migration. Positive factors refer to changes in the broader economic and ecological context that serve as inducements to migration. Specifically, the growth of markets for animal products and the availability of distant fallow grazing sites has resulted in migration, especially for more affluent and powerful animal raisers. These forces alter the adaptive vocabulary of the region, cause changes in strategic decision-making, and determine the timing and spacing of herd movement. By declining to address these factors, previous explanations of pastoral transition fail to adequately explain the phenomenon of nomadization. Further, in ignoring institutions and economy, demographic explanations elide the process of economic differentiation that is closely linked to the investments and returns of large-scale migration.

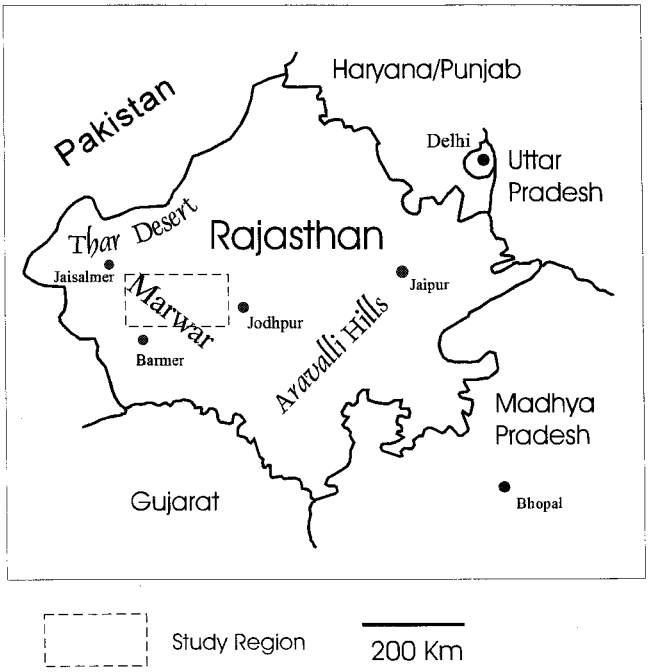


**Fig. 1.** The study area in Rajasthan.

## THE QUESTION OF NOMADISM

### Regional Conditions

Marwar, shown in Fig. 1, spans several modern administrative districts in Rajasthan. The traditional region spills north, south, and west across India's independence-era border with Pakistan (Bhalla, 1992; Lodrick, 1994). Lying in the eastern range of the Thar desert, the region is similar to many arid and semi-arid regions. The yearly monsoon reaches Rajasthan between July and September and marks the growing season for subsistence crops as well as pasture grasses. Traditionally the animal-breeding center of northern India, the dominance of livestock in villages and households is significant. Herding, especially of large stock, is an historically specialized practice (Köhler-Rollefson, 1992a, 1992b; Agrawal, 1993), recently giving way to an increase in small stock raising for even the most marginal households (Robbins, 1994).

The region follows the customary division of the population into endogamous semiprofessional communities, traditionally known as *jati* (or caste).[2] Land reform, economic transition, and political change in India has, to a degree, reduced the professional differences between caste groups. Even so, many specialists, especially pastoralists (*raika* and *sindhi*) continue to dominate traditional trades. Raika communities in particular, continue to dominate in traditional camel raising, and increasingly in goat and sheep production (Srivastava, 1991; Köhler-Rollefson, 1992a). Traditional village elites (*rajputs* and *brahmins*) retain contemporary status as class elites having larger land and capital holdings on average (Omvedt, 1978). Small and middle-holding agropastoral groups make up a bulk of the rural population while the balance of households consist of the poorest and most marginal agropastoralists.

## EXPLAINING INCREASED MOBILITY

That the livestock population of western Rajasthan is increasingly on the move is already well-known. Prasad (1994) carefully documented the increasing number of long-range cases of migration, especially during the 1980s. Köhler-Rollefson (1993, 1994) emphasized the recent character of long-range migration for pastoral raikas. Agrawal (1992, 1993, 1994a) showed the carefully evolved systems of decision-making that make risk-averse itinerant pastoralism possible in the region. The work of Kavoori (1990), though focusing on the region east and north of Marwar, points to the entrance of new elite groups, especially rajputs, into migratory pastoral practice. This work also reveals the increasing trend of many pastoralists to year-round migration, a practice unheard of in Whyte's (1957) time.

The people of Marwar have long been well-adapted to mobility and have always had extensive institutional and knowledge systems to facilitate movement (Agrawal, 1993). Crisis migrations continue to occur during periodic monsoon failures. These are sometimes driven by the absence of water, though the large-scale electrification of the region and the concomitant rise of tubewells and storage tanks has reduced the water stress. Fodder shortages are sited by producers as the most common motivation for these movements. Regardless of cause, annual migration of the sort currently being conducted was traditionally rarely practiced in the region

[2]Caste/*jati* is often overvalued as a category of social analysis, especially by foreign investigators (Srinivas, 1994; Appadurai, 1986). The debate over the appropriate role of caste in social and ecological explanation is, however, beyond the scope of this analysis.

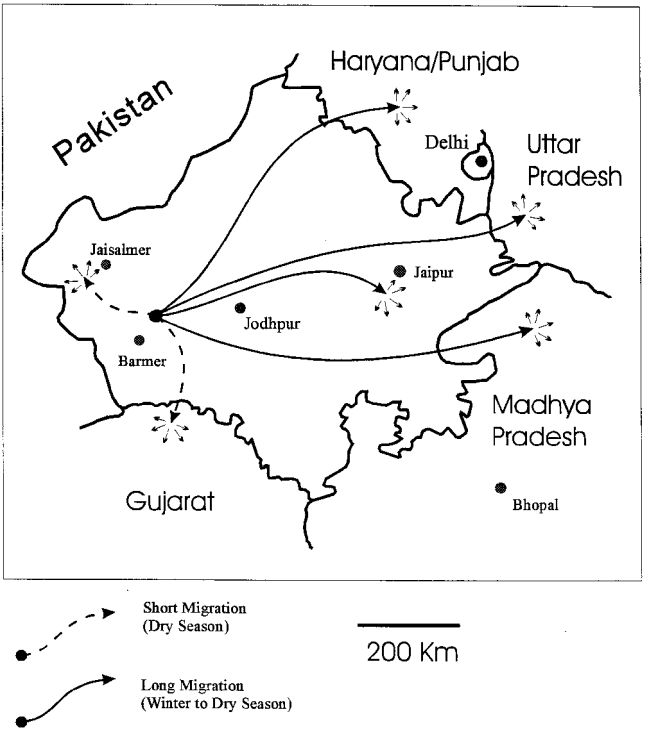


**Fig. 2.** Paths of migration.

(Bose, 1975; Khazanov, 1994). The rise of a perennial system of movement marks a significant change in regional production and village life. The adaptation of nomadism has been extended from drought response to a more comprehensive adaptive strategy.

The paths of these migration are multiple. Some are short dry-season movements remaining within the region or crossing nearby borders into Gujarat. Others cycle out toward centers of intensified agricultural production in Uttar Pradesh and Eastern Rajasthan (Fig. 2; following Agrawal, 1993; Prasad, 1994; and interviews with herders). While these longer migrations do not take herders to significantly different altitudes or across mountains, the variations between the home and migration destinations are different enough to cause the migration to resemble Johnson's (1969, pp. 171–173) "Vertical Constricted Oscillatory" pattern; herders travel along established paths directly to the destination region, there breaking into smaller movements between farms and fields at the other end.

**Table I.** Change in Grazing Land Coverage

| | Change (1955–1974) | | Change (1974–1994) | |
|---|---|---|---|---|
| | Hectares/village | Percent | Hectares/village | Percent |
| Common pasture[a] | −801 | −26.6 | −187 | −8.5 |
| All grazing land[b] | −671 | −19.9 | 41 | 1.5 |

[a] These lands include official grazing land (*gocher*), sacred forest land (*oran*), as well as large areas designated as waste land (*padat*).
[b] Includes *gocher*,, *oran*,, and *padat* land as well as long-fallow used for collective community grazing.

In much of the literature, explanations for these trends are straightforward; the quantity of grazing land is decreasing while the number of animals is increasing. Under a general squeeze, livestock holders are posited to be turning to short and long migrations to keep the herd alive (Kumar and Bhandari, 1993; Prasad, 1994). This common-sense, population-pressure model is a powerful one, though with limited applicability here.

The decline of Rajasthan's village commons is well-documented. The quantity and quality of grazing land can be inferred from census statistics for the region and repeated studies show the loss of important pasture resources (Jodha, 1986; Salzman, 1986; Prasad, 1994). Expanded cropping and encroachment have clearly reduced graze in the region. Yet these analyses obscure other important trends. Land use/cover statistics from a sample of village records in 28 villages between 1955 and 1994 reveals an important periodicity to the trend (Table I).

While the overall decline from independence to the present is 988 ha per village, most of that change occurred *prior* to 1974. Decline in the quantity of pasturage between 1974 and 1994 has dramatically decelerated in the region. At the same time, the average coverage per village of land in long fallow (5 years or longer) has increased by 358 ha between 1955 and 1994. This land, usually covered with rich perennial grasses, is grazed in common and provides a crucial winter resource. Grazing land decline has slowed in the last 20 years while grassy fallow has increased. Yet this is precisely the period Prasad (1994) and others report as having the greatest increase in nomadization. The relationship between pasture availability and livestock support is not, of course, linear. It is possible that the postindependence decline of pasturage surpassed a "threshold" or had a delayed effect on migratory strategy. Even so, the ongoing acceleration of migration in the region is occurring in an increasingly stabilized resource regime. The "common property decline" argument is necessary but insufficient for explaining the increasing mobility.

Similarly, the decline in quality of community lands throughout the region is an unconvincing explanation for the increase in itinerancy. Though rarely assessed in any systematic manner, reports of degradation and desertification are common.[3] Certainly under unrestricted, heavy grazing, desert lands lose important cover (Kumar and Bhandari, 1992). Where pressure on grazing and browsing lands is high, this decline in productivity has led to significant changes in pastoral adaptations in nearby Gujarat (Cincotta and Pangare, 1994).

At the same time, however, many community lands continue to produce important annual and perennial species in abundance (Kanodia and Patil, 1983). In many cases, these "waste" areas remain the source for the most significant graze and browse species (Brara, 1992). Fallow lands continue to be dominated by important perennial grasses, while village forests (*orans*) are havens for important browse. The western region remains the target area for migration by outsiders in search of dry-season fodder.[4] Of all the regions of Rajasthan, Marwar remains endowed with grazing and browsing resources.

The increase in the regional herd size also has limited explanatory power; the livestock population of the region[5] has varied greatly over time (Fig. 3). The large drops in population during the early 1970s and late 1980s coincide with serious droughts in which the monsoons failed. Outmigrations of animals occurred during these crises but interviews with producers, marketers, and butchers suggests an explosion in slaughter and die-offs. The rapid increase in animal populations in the period after crises follows rational management strategies in semi-arid contexts (Dahl and Hjort, 1976). The region has thus experienced the kind of wide and natural variability typical of production under uncertain conditions (Behnke and Scoones, 1993).

The overall population has remained relatively stable throughout the period with total animal units lower in 1994 than 1961. A general trend away from large stock and into sheep and goats is evident.[6] Interviews with producers reveal that the choice of small stock over large stock was made, in part, to facilitate migration (Robbins, 1994). The question therefore becomes whether changes in animal demography are, in fact, a consequence rather than a cause of migration. The size and characteristics of the regional herd, while linked to drought crisis and migration, are insufficient to account for increased nomadism.

[3]In particular, desertification research, though often conducted in isolated locations, claims a general degradation of Rajasthani pasturage (UNESCO, 1980; Sinha, 1993).

[4]Based on personal communication with western region herders and farmers (1994).

[5]Department of Animal Husbandry, Jaipur. Figures for Barmer, Jaisalmer, and Jodhpur districts. Animal units compiled following FAO methods and Chouhan (1988) where Cattle = 1.0, Goats and Sheep = 0.15.

[6]While the environmental demands and impacts of these species can be considerably different, the marginal conditions under which cattle are raised in the Rajasthani context makes them reasonably comparable, excepting total weight of fodder demands.

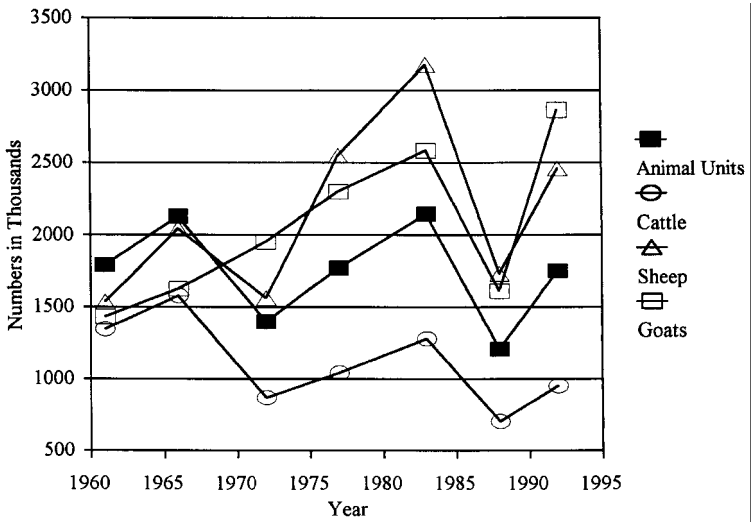


**Fig. 3.** Livestock population since 1960.

Human populations have also grown dramatically during the post-independence period, with a 3.3% rate of growth between 1981–1991 in the western region (Pitalya, 1993). To the degree that this growth has accelerated institutional and ecological change, as will be discussed below, it has had an indirect impact on migratory strategy. As direct competitors for resources, however, human populations and animal populations have little overlap. This is especially true for the migrating sheep and goat populations whose browsing strategy relies on armed and toxic plants of little direct value to humans.

In sum, the recent increase in movement for livestock holders cannot be adequately explained through the traditional combination of common property and population arguments. To better understand the forces driving nomadization in the region, it is necessary to examine the ecological character of village community landscapes across the year and assess more carefully the pressures on both specialist and nonspecialist producers. The institutional and economic characteristics of this ecology must also be better understood. Finally, the benefits of migration must be explored in order to account for increasing itinerancy.

The mobility of herders is driven both by negative and positive factors. Negative factors include the rearrangement and dissolution of rule, bargain, and authority systems governing village landscapes. Positive factors include the benefits of migration to the intensified agricultural regions of eastern Rajasthan and neighboring states. These are realized in the increased reproductive capacity of mobile herds when managed with sufficient resources.

**Table II.** Landscape Types in Marwari Villages

| Landscape | Land use/cover characteristics | Authority |
|---|---|---|
| Council pasture (*gocher*) | Pasture: perennial herbs and annual grasses | Gram panchayat council |
| Fallow (*charagah*) | Pasture: high perennial grass cover | Land owner: elders and community |
| Stone/gravel (*murad*) | Pasture: predominantly annual grasses | None |
| Sacred grove (*oran*) | Forest: usually indigenous species | Divine authority: village elders |

## NEGATIVE FACTORS: INSTITUTIONAL CHANGE

The traditional Marwari village is a patchwork of distinct landscape types recognized in the lexicon of local producers. Many of these have distinct ecological signatures and differing levels of herbaceous production. Recent changes in village politics and economics have altered the institutions governing these lands. The resulting pattern of resource availability drives changes in migration strategy.

### Subsistence Landscapes of Institutional Authority

Twenty-eight villages were sampled in the study region to determine the range of institutional landscape types.[7] While every village did not contain all types, most contained several, each governing discrete village spaces. These landscapes are here distinguished here by their environmental characteristic[8] and governing authority (Table II).

*Council Pastures (Gram Panchayat Gochers):* Many village grazing lands were formally recognized and put under the rule of democratically elected community councils (Panchayats) through provisions in the Rajasthan Panchayat Rules of 1955 during the implementation of "Democratic Decentralization" in the late 1950s and early 1960s. In these lands, the cutting

[7]These were established through focus group interviews, surveys, and ongoing observation and conversation with agropastoral producers from a range of caste and class communities. The survey resulted in common institutional landscape types, each with its own rules, authority, and systems of power and enforcement.

[8]To establish ecological characteristics, 34 sites were established in three villages, stratified to represent the five most common institutional forms. These were sampled during both the dry (March) and wet (September) season. Intercept of herbaceous species was measured along randomly laid 100-m transects to determine cover while alternating quadrats were used to determine percentage frequency of woody trees and shrubs (following Shankanarayan and Satvanarayan, 1964).

of trees and extraction of fodder (except through grazing) is restricted. The ambiguity of the rule, authority, and accountability of village councils in Western Rajasthan is well documented (Bjorkman and Chaturvedi, 1994). Council decisions are not well respected and often not well followed. In most villages, the Panchayats are viewed as being dominated by village caste elites and men. Marginal caste communities and women often subvert their authority by ignoring the rules. As a result, cutting of trees and removal of fodder grasses is common. Herds from within and outside the village graze and browse in these areas. The net effect is a landscape dominated by annual herbs and seasonal perennial grasses.

*Community Fallow:* In community fallow, technically private property becomes available for use by the community. This includes "current" fallow, where fields cultivated with *bajra* (pearl millet), and *til* (sesame) are opened to the community after the harvest for the grazing of stubble. This category also includes large areas of "long-fallow " where land is set aside for as many as 8–10 years or longer. The land is thrown open to the entire community for common grazing after the harvest of crops and grasses. In this area, barring other villagers from grazing the land after harvest traditionally risks punishment from village authorities. The land is not opened at the owners pleasure but rather under a socially enforced obligation. These lands are closed during the rainy season to maximize the development of perennial grasses, especially *sevan* (*Lasiuris sindicus*), which are harvested like crops for the private owners' use. The land is then opened to the community. The result is a rich cover of perennial grass species.

*Stony and Gravel Lands (Murad):* Stony and gravel lands are usually seen by outside observers as useless or wasteland. In fact, these lands do produce a spread of graze, including the annual grasses *Aristida adscensionis* and *funiculata,* and *Cenchrus biflorus.* These become available during a brief window during the rains and are especially important when fallows are closed in the growing season.

*Village Sacred Forests (Orans):* Many villages in Western Rajasthan have some kind of sacred grove or *oran*. The term *oran* derives from the Sanskrit word *Araniya* ("forest"), although actual tree cover, size, and productivity vary greatly in these lands. Orans are held by, and dedicated to, a local Hindu deity or Muslim *pir* (saint or spirit). They are not usually lands associated with or belonging to a temple or mosque, however. The presence of the deity is usually only marked by a small shrine. These areas vary in size from small patches of grass or trees to enormous areas which engulf several villages. The official status of orans is confused and varies greatly. The largest and best-known oras in the region have only a fraction of their total area recognized in official records.

Rules in orans are characterized by strong regulations against tree-cutting. Other minor forest products may or may not fall under cutting restrictions, although generally fruits and even bark, are exempted from these restrictions. Grasses may be grazed but generally not cut and removed. Lopping of tree leaves for fodder is generally prohibited although browsing animals are allowed to eat from lower branches. It is, therefore, the act of cutting itself which is restricted rather than the use or extraction of any particular resource.

While many accounts emphasize only the threat of divine retribution, observation and discussion reveal that several mutually reinforcing pressures keep trees standing in orans. Cautionary tales of divine punishment by blinding and paralysis are common throughout the western region as they are in the central areas of Rajasthan and elsewhere (Gadgil and Vartak, 1975, 1976, 1981; Gold and Gujar, 1989). The lands also fall under the authority of traditional village councils of elders. Secular warnings against cutting rival those related to divine retribution in almost all villages. Fines and public humiliation are commonly sited as punishments for transgression of the rules. The result is a less dense cover of herbaceous species (especially perennial grasses) than community fallows or enclosures but a richer cover of indigenous browse like *Prosopis cineraria* (*khejri*) and *Ziziphus nummularia* (*bordi*) trees.

### *Spatial/Temporal Distribution of Resources*

Every Marwari village does not traditionally contain all of these differing landscapes, though many do. Each village is thus a patchwork of varying environments. Orans with indigenous tree cover stand next to more open stony or village council (*gocher*) lands ringed by extensive long-fallow pasturage. This spatial distribution of grazing resources creates a context for circulating resource extraction, where producers move their herds through the village, utilizing varying environments at different times.[9] This pattern is further outlined by the temporal distribution of resources in the landscapes, spread across the course of a year (Fig. 4).[10]

[9]Cover/frequency figures, derived from the landscape assessment described above, were translated into a range of graze/browse categories for each area as follows: >40% cover/frequency = good; 20–40% cover/frequency = fair; 1–20% cover/frequency = poor; 0% cover/frequency or closed = none. The results were interpolated between sample times and supplemented with interviews of producers using the resource.

[10]Note that the vertical size of each institutional type was held constant. This represents an idealized and proportional distribution of institutional types.

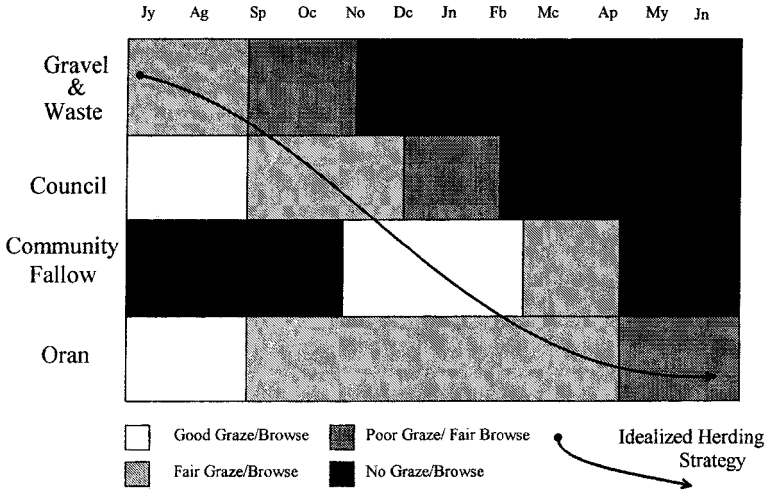


**Fig. 4.** Quality of graze and browse across good rainfall year.

## Subsistence Practices Across Time and Space

This spatial and temporal distribution of resources encourages a mobile and stratified use of village landscapes. Early in the growing season, with the onset of the monsoons, grazing and browsing is focused on the stony wastes and degraded village council lands where annuals become abundant and there are few restrictions. The fallow fields, while producing perennials during these early months are closed to the village. An oran, if present in a village, may or may not be heavily used at this time. With the obligatory opening of the fallows, extraction shifts to the rich perennial fields. When these are exhausted, the oran becomes available with poor graze but adequate browse of woody species.

This idealized trajectory across village resources (Fig. 4) does not reflect the differential use of land determined by groups with differing resource endowments. Large holders with large quantities of stored fodder are less dependent on marginal sources like village council lands and orans. Similarly, groups with relatively fewer livestock, especially those with only goats, can assemble a yearly grazing and browsing schedule that is less ordered. Large holding livestock herders, however, with relatively little land are very much dependent on the heterogeneity of village landscapes. Pastoral *sindhi* and *raika* require the use of all village lands that are available.

No matter what their particular resource endowment, village residents holding livestock traditionally exhausted all local fodder resources before considering migration. Most Marwari villages had sufficient holdings of productive graze and browse to prevent fodder-driven migration. Livestock holders uniformly reported that their fathers and grandfathers rarely conducted long-distance migration except in the face of acute drought. The heterogeneity of community lands therefore made mobility a last-resort option. Changes in the character of village politics and institutions governing these lands was to change this arrangement dramatically.

## Transformation of Institutions

The rule systems that maintained this heterogeneity of the resource base and monitored the rules and timing of use have altered the availability of graze and browse resources in recent years. While the net quantity of pasturage has declined, it is the loss of key lands and resources, valuable at specific points in the production calendar, that have had the most drastic effects on migration strategy. These lands have been lost to producers through a twofold process of conflict in institutional recognition and transformation of reciprocity systems. Regionally-defined rule systems are breaking down while village-wide structures of exchange are being commodified and contractualized. The results are bottlenecks in resource availability and an increased push toward migration.

The reasons for institutional disintegration are several and overlapping. As seen in the growing body of work on institutional form and change, traditional structures of rule and authority are vulnerable to pressures from poorly conceived development policy (Chambers *et al.,* 1989), population and market changes (Thomson *et al.,* 1992), and the imposition of colonial and postcolonial legal structures (Brara, 1987; Chakravarty-Kaul, 1996). In Marwar, the institutional transition owes a little to each of these regional forces. An agriculturally-centered development strategy devalues the protection of traditional Rajasthani pasturage (Brara, 1992). Irrigation and cropping is favored over pastoral development. This results in a destabilization of village systems that prize and protect grazing and browsing lands. While the swift growth of population in the region has been shown elsewhere to be disconnected from institutional decline (Jodha, 1985), indirect pressures from human population growth continue unabated. It is likely that the demand for agricultural land and the induced intensification resulting from shorter fallow times has led to a decline in the rules protecting fallow lands. Even more prominent, however, are changes in the regional and national market that have increased the value of agricultural cash crops. The resulting increase in

land values also likely contributes to the shortening of fallows and increasing pressure on fallow grazing rights (following Jodha, 1986). Most significantly, the intervention of state power and environmental authority, such as the State Forest Department, severs and dismantles local environmental institutions in favor of bureaucratic ones. While in some Indian contexts, social forestry, community irrigation development, and other institutional compromises have achieved some level of success (Wade, 1987; Agarwal and Narain, 1989), no extant experiments exist in the Marwar region.[11]

The transformation and dismantling of local institutions is best represented in changes to village forests. The village oran, one of the most important and robust of village institutions, represents a class of land management systems dependent on social sanction and the patterns of authority structured into traditional village politics. Local, cohesive systems of control, like the oran, are difficult for central and regional authorities to recognize, as documented in a wide-range of common property literature (Ostrom, 1990; Bromley, 1992). Where they are present or persist, they are often ignored by the state and replaced or overlain by more central forms of control. This has led directly to the decline of the oran and other, "invisible" systems of management. Orans do not appear in state, district, or tehsil (regional subdistrict) records at all. Their disappearance, especially during the period from 1974 to the present, is swallowed in census data. While common property coverage has stabilized in general, as explained previously, certain classes of community property, including the oran, are in steep decline. Though invisible in the state census, this decline does appear in local village records. For the 28 villages surveyed, these records show an average of 198 ha (nearly 2 $km^2$) of oran per village was lost during the period between 1955 and 1994. At the same time, the coverage of Forest Department controlled enclosures and Gram Panchayat gochers expanded 45 and 25 ha per village, respectively.

The imposition of these enclosures over traditional grazing land is linked to caste-based politics and struggle. As reported by Agrawal (1994), enclosure is sometimes encouraged or tolerated by communities with fewer demands for grazing and minor forest products. The loss of key resources is most acutely felt by pastoral specialists and marginal producers. These impositions also result in long-term land cover changes through the loss of perennial grasses and indigenous tree species to the plantation of exogenous shrubs. Thus the loss of key resources to external authorities is intimately linked to upheavals in local systems of obligation and reciprocity.

[11]Imposed experiments in pastoral cooperatives in the region (Johnson, 1989; resulted in broad failure.

The net result of this struggle over recognition and authority is the loss of oran lands and other areas under local control. While the decline of total coverage of community property has leveled off in recent years, the decline of the rule systems that govern these lands and the change in the diverse coverage within them has thus continued to transform village landscapes. This decline is particularly acute during the dry season, when oran and other browsing resource landscapes become important reserves, especially for large herd managers and marginal households. This loss of resources causes negative pressures on otherwise sedentary herders. Large herd keepers, faced with increasing seasonal pressure, choose migration. Small and marginal producers, with few land resources of their own, experience bottlenecks in production. They too choose dry-season migrations, if only as a last resort. This collapse of dry-season graze availability is coupled with the breakdown of traditional systems of reciprocity governing fallow lands at other times of the year.

## Breakdown of Reciprocity

The traditional relations of reciprocity that define the community fallow, as outlined above, have changed greatly in the last decade. The relationship between landowners and the community, traditionally defined by mutual obligation, has become increasingly contractual and capitalized. At the same time, the electrification of villages and the increase in intensive irrigated agriculture has reduced or eliminated fallowing in some lands. While this trend is only nascent in western Rajasthan, it portends significant pressures on the reciprocity systems built into fallow land grazing. In particular, there has been a move toward the increased exclusion of some of the community from the use of fallow land during the winter and dry-season. Where small herders and marginal communities were previously free to use winter fallow resources, now exclusive bargains are struck between large landholders and specialist herders.

Marginal producers and the lowest status communities are denied access to fallow lands. They shift grazing and browsing pressure to the already declining community orans. Overused and quickly shrinking, these village forests become sparse and barren during the dry season. Where resources become especially scarce during the dry season, migration becomes an option for even marginal producers.

In sum, the net decline of grazing resources has slowed to a halt in recent decades while institutional systems that govern these lands continue to undergo transformation. The loss of community orans and dry season graze has led to the migration of large holders. The exclusion of many groups from contractual grazing has led to the migration of marginal animal holders. Institutional change has caused bottlenecks in the resource base and reformed migratory strategy.

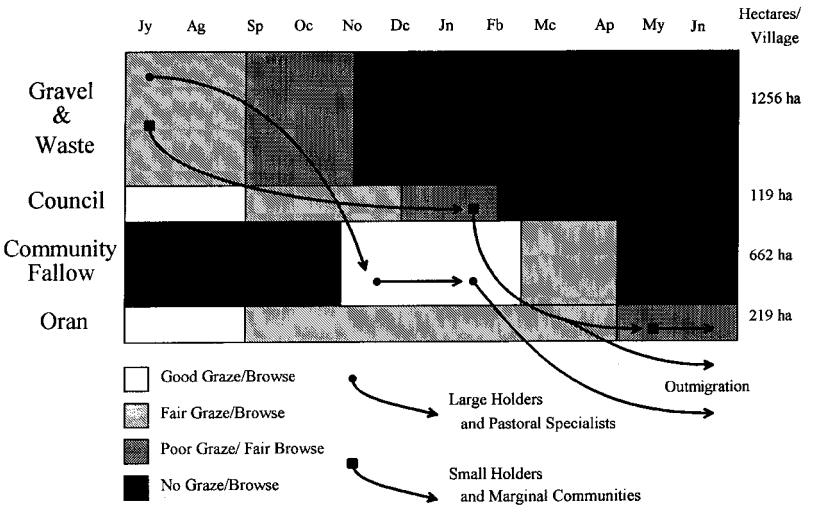


**Fig. 5.** Herding and migration strategies varying across the year by community.

## Resource Bottlenecks

The coverage of land by institutional type and migration strategies for varying groups are shown in Fig. 5.[12] This shows the actual distribution of resources under the current institutional configuration. Under the current coverage of institutional types and given the increased contractualization of fallow resource use, the trajectories of resource use change considerably. In particular, the markedly different options available to excluded communities and to those with the resources for long migrations becomes more evident. Dry-season migrations develop from the resource push of dissolving institutional relations. These migrations are undertaken both by large herders and by producers with relatively fewer land and animal holdings. The bottlenecks in seasonal resource availability force movements on many herds. These movements, significant part of the nomadization of the region, are increasingly common in western villages.

[12]The coverage of land by institutional type was determined through a sample of 28 villages. These were stratified to represent a range of small and large villages, in central and remote areas, both on and off main lines of communication. Note that the vertical axis is proportional to the current coverage of that institutional type.

## POSITIVE PRESSURES: ECONOMIC OPPORTUNITY

These negative institutional factors account for much of the increase in recent migrations, especially the shorter-duration, dry-season movements. The longer migrations, conducted from early winter through the dry season, are driven in part by these seasonal negative forces, but also by the growing benefits of migration. Transitions in the meat and wool economy result in positive incentives for wealthy producers. As the livestock economy has become increasingly capitalized, marginal profits have become slimmer and the demand for maximal herd production has increased.[13] By migrating, herders increase the reproductive potential of their sheep and goat herds and adapt to the changing market.

### The Meat and Wool Economy

Growth of livestock production and consumption throughout India is ongoing. Dairy production has been carefully supported by the state through the introduction of cooperative processing and marketing (Ravenholt, 1966; Alvi, 1989). This has resulted in the stabilization of prices and the moderation of price growth in urban markets (Jain, 1986). In western Rajasthan, the benefits of cooperative extension have not been enjoyed, but the depression of milk prices proceeds. Rural producers at the edge of the "milkshed" are being eclipsed by urban dairies. These trends in the dairy economy have pushed Marwari producers into the wool and meat trade.

Wool and meat markets, largely ignored by planners, have grown far more swiftly and anarchically. Rajasthani wool, though it produces a course, "carpet-grade," represents 66.9% of the national wool clip and sales (Joshi, 1987). Sale prices for wool rose rapidly through the 1970s and 1980s (GOI, 1990). Meat production and prices rose even more dramatically during the same period. In Rajasthan, meat production increased from 3395 tons in 1980 to 6557 tons in 1986, nearly doubling in half a decade.[14] Urban demand went unabated through the period and meat prices responded with growth far outstripping those of milk (Fig. 6; Chandhok, 1978; GOI, 1990).

[13]This is not to argue that cash exchange and livestock product markets are in any way new to the region. Indeed the traditional character of the pastoral economy is market-based (Chaudhuri, 1990). Rather, the economic shift of the recent period has been marked by a process of *capital accumulation* and/or *marginalization* in which some producers are better positioned to extract value from their own work and the work of others while other producers are pushed to the edges of production and reproduction (Marx, 1967; Blaikie and Brookfeld, 1987).

[14]Department of Animal Husbandry, Jaipur (1994).

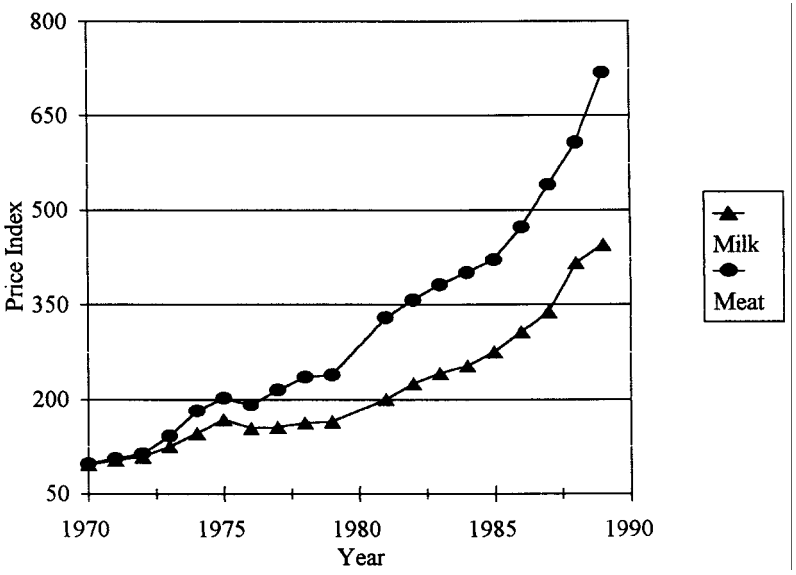


**Fig. 6.** Relative price indices (1970 = 100).

While milk supplies are provided by traditionally sedentary cattle herds, the demand for meat is met through the increased production of migrating animals: sheep and goats. The increase in meat and wool receipts has made large, mobile, herd production viable. In these markets, however, most of the price increase has been absorbed by the growing number of middlemen who buy village small stock. These *beopari* market meat animals to butchers in public *bakra mandis* (animal markets) in urban areas. Their mark-up varies but reflects between 19–30% of the final sale price (Rathore, 1993). While animal sales have created a new avenue for cash in village households, the margin of profit for the producer is, therefore, limited (Robbins, 1994). Sales made from the village are often for immediate, "emergency" cash. These livestock sales are an economic adaptation but, as is often the case, are also a signal of stress in the pastoral system (Galaty and Johnson, 1990).

To capture any of the rising market values for meat and wool, producers must maximize large herd production and avoid sales to extractive middlemen. Migration, therefore, becomes an option to maximize returns. Animal and wool sales are often made on the "out-leg," in and around urban markets (Agrawal, 1993, 1994a, forthcoming). This allows a larger slice of the product value and more direct access to urban markets. Further, as practiced by wealthy pastoralists, migration results in increased herd reproduction.

**Table III.** Comparative Reproductivity

| | Mean reproductive rate[a] | Variance |
|---|---|---|
| Non-migrants | 0.53 | 0.04 |
| Migrants | 0.87 | 0.02 |

[a] Lambs per ewe during the winter 1993 season.

## The Reproductive Benefits of Migration

Migration, when conducted in a non-drought year, by pastoralists of moderate and good means, is a carefully timed and orchestrated event. According to a sample of 37 large-herd holders (with more than 100 animals), the arrangements require significant capital in advance; the destinations are usually intensively cultivated regions of Eastern Rajasthan, Haryana, or Uttar Pradesh (as shown in Fig. 2); arrangements for fallow-season grazing on wheat stubble are usually made in advance; truck transport may be arranged for either the outgoing or ingoing leg of the trip.

Ecologically, this destination and timing proves beneficial. An increased quality of graze and browse prevails in the higher-moisture regimes and irrigated-land fallows of the east. The improved diet, according to herders, results in healthier animals and a higher chance of reproduction and twinning. This notion is corroborated by reproductive rates for a sample of herds. The sample of 37 large herders (with herds of > 100 animals) from three villages in the study region was surveyed to determine herd size, lambings during the 1993 winter season, whether or not migration was conducted, and reasons for migration. The reproductive rates of herds migrating during the 1993 season were compared with those of herds that did not (Table III).

In theory, a ewe may reproduce twice annually, beginning around its second year of life. In reality, such an ideal (100% reproductivity) is never realized; a herd of Marwari ewes might experience a high 90% reproductivity under excellent farm conditions (Acharya, 1982). As is clear in Table III, migrants experience nearly this level of reproduction.

These comparative rates of reproduction, though based on a limited sample, are highly suggestive. They are supported by both folk-knowledge of animal reproduction and by studies of reproduction in regional breeds. It is the availability of key nutrients at important times that is central to these successful lambings. The "flushing" of ewes with fodder containing higher available nutrients results in increased reproductivity and twinning (Acharya, 1990). Typically, this flushing occurs after the onset of rains during the summer breeding season. The same effect can be created, however, during the winter/spring migration season when nutritional availability enters a declining stage. The flushing of migrating animals, especially the leaner ewes, with higher nutrient fodder gives them a reproductive

advantage over animals fed on local field stubble and arid-region grasses. Wheat chaff (*Triticum aestivum*) is a superior graze to the millet chaff (*Pennisetum typhoideum*) of Marwar, especially with regard to available protein (GOI, 1969). Additionally, protein-rich grasses including *jharania* (*Digitari adscendens*) and *dub* (*Cynodon dactylon*) grow in and around the fringes of intensified field agriculture in Uttar Pradesh and Haryana during the dry season. These provide higher nutrient value than even the best Marwari wild fodders like *sevan* grass, whose available nutrients decline during this season (Chakravarty *et al.,* 1970; More and Sahni, 1980). The increased availability of crude protein regulates estrus, produces a higher ovulation rate, and, therefore, results in superior reproductive rates for migrants (Acharya, 1982).

Significantly, these reproductive benefits can only accrue to capital-rich producers and do not apply to marginal pastoralists driven to migration by fodder shortages. In a survey of three mixed-caste villages,[15] 5% of the households held 30% of the sheep while 74% of the households held less than 15 animals (Robbins, 1994). These differences in holdings do not always coincide with land-holdings and overall wealth, but do reflect generally different degrees of access to capital. They also represent significantly different abilities to migrate. The reason for this is threefold. Transportation, capital outlays, and community connections at distant sites are all often available to only wealthier and politically well-placed herders.

In the first case, the reproductive benefits of long-range migration are usually achieved through the use of automotive transportation for the animals on at least one leg of their migration journey. Stress on animal health is thereby minimized. The costs of truck transportation are reported to be too high for annual transit for poorer households. Without some automotive inputs into migration, the reproductive benefits of movement would likely be offset by increased animal attrition.

Similarly, the other capital outlays required for migration, including medicine, supplies, bribes, and food, all eat into the marginal profits from sales of animals and animal products. This kind of investment capital is not generally available to more marginal producers. A range of agropastoral producers do fall between the categories of wealthy and marginal and have some access to capital and migration. These producers benefit from economies of scale through animal-lending strategies and community consolidation of herds typically practiced in migration (Agrawal, 1994a, forthcoming). Even so, the availability of sufficient capital to enable migration and to maximize returns was not commonly reported. Many poorer households, *raika* and *sindhi* specialists included, reported increasing difficulty in raising the necessary funds to join group migrations.

[15]Based on village records prepared for the 1992 livestock census.

Finally, the political power required to successfully negotiate with farmers at the outside leg of the journey is not common to all agropastoralists in the region. Nontraditional herders, especially caste elites, benefit from political and social authority in negotiations with landowners (Köhler-Rollefson, 1993). Marginal and lower caste communities experience the reverse effect. Even where transportation and capital may be available, long migrations are feasible for the well positioned only.

This reality underlines the fact that while migration decisions are a form of individual household adaptation, they occur within institutionalized systems of control and exchange. Both "locational" decisions (like migration) and "appropriational" practices (like grazing bargains) are embedded within these institutional frameworks (Halperin, 1994). Producers make adaptive decisions to move and exchange but within normative contexts of power and authority.

Thus, while economic and institutional negative forces are acting on all producers, positive benefits are enjoyed by few. With a significant edge in reproduction, migrants gain important benefits through the outlay of time, capital, and labor required for the arrangement of yearly migration. This underlines the attraction of migratory pastoralism to nontraditional caste communities like *rajputs* and *jats* who can afford the input capital demands. Thus the positive factors in migration have led to an increasing economic differentiation within pastoral communities and between pastoralists and traditional village elites who have only recently diversified into herding. The resulting stratification broadly follows national trends in capital accumulation and raises questions about the long-term social and ecological sustainability of pastoral practice. This is not to suggest that nomadism itself is unsustainable; 40 years of research convincingly argues otherwise (Khazanov, 1994). Rather, the question becomes *who* is seizing the benefits of nomadism and *who* is forcibly migrating into the marginal interstices of the pastoral economy.

## CONCLUSIONS

Population pressure models poorly explain the increasing shift into seminomadic practices recently adopted by pastoralists in western Rajasthan. The transformation of institutions and economics brought about through the intensification of the agricultural landscape better explains this adaptive trend; the capitalization of agropastoralism has had unforeseen implications.

This penetration of capital into the pastoral economy of Marwar follows many global trends, including the shift to commodity production and the decline of cooperative institutional relations of production in favor of contractual exchange (Watts, 1984, 1992). In the process, marginal producers are pushed into itinerancy during bottleneck periods. Simultaneously, wealthy producers exploit mobility for the increase in reproductivity and the improved access to markets. Producer adaptations have thereby followed the unexpected path toward mobility.

These adaptations are, of course, quite different from one another. The negative forces acting on marginal producers promise little more than increased effort and risk to maintain limited production levels in small herds. The positive factors acting on more powerful groups result in increased production where sufficient resources are available. Mobility is not a single adaptive behavior; it is a measured response by producers in very different socioeconomic situations.

More generally, these results suggest several broad conclusions. First, it is evident that an approach to cultural economics that includes a concern with institutional or "appropriational" movements (following Halperin, 1994) fills a gap in analysis of production systems in transition. Future work on agropastoral change will benefit from a continued engagement with institutions. Second, the results underline that nomadism can develop in conditions of settled agropastoralism through a mixture of market and institutional pressures. This supports theories concerning the development of nomadism that claim the development of markets (Galvin, 1987) and the rise of intensive agriculture (Lees and Bates, 1974) drove the entrance of pastoralists into itinerancy.

It is possible that this trend toward migration is only a temporary solution to the contradictory growth of livestock markets in an agricultural economy with insufficient infrastructure. Even so, these trends reflect robust pastoral practices and are a reminder that itinerant solutions have not yet been surrendered in arid environments. Indeed, the intensification of pastoralism in Marwar, as predicted more generally (Galaty and Johnson, 1990), has led to the development of novel strategies. The adaptive character of pastoral production is notable; nomadism has found a new niche.

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