A COLLECTION OF PAPERS FROM GUJARAT AND RAJASTHAN

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PASTORALISM IN WESTERN INDIA FROM A COMPARATIVE PERSPECTIVE: SOME COMMENTS

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INTRODUCTION

Discussions about pastoralism tend to be dominated by concepts and models derived from African contexts and, to a lesser degree, the Middle East. The cultural, socio-economic, and even ecological framework of pastoralism in India is quite different, to the extent that categories commonly applied elsewhere are not automatically appropriate. This became evident during an earlier exchange in the PDN Newsletter as to whether the Raika pastoralists of Rajasthan should be regarded as nomadic or sedentary (March 1992 and December 1992). Hopefully, the following comments will clarify some potentially confusing aspects of Indian pastoralism for those unacquainted with the region.

CASTE VERSUS TRIBAL OR ETHNIC GROUP

In Africa and the Middle East, nomadic pastoralists tend to represent distinct ethnic groups; usually they are organised along tribal lines. By contrast, in India pastoralists are not ethnically different from the sedentary population but there are certain castes whose traditional occupation is regarded as pastoralism. In Western India, these are the Rebaris/Raikas, Ahirs, Bharwads, Charans, and Gujars. However, many members of these castes, often a majority, follow non-pastoral occupations. In addition, people belonging to castes not regarded as pastoral, pursue pastoral occupations (Sopher, 1975). Pastoralism in India is thus more appropriately regarded as an occupational specialisation that represents one of many economic activities pursued within the village context, a category on a par with farming, trading, weaving, goldsmithing, etc. In many cases, pastoral castes do not only own livestock, but also look after and pasture the animals belonging to other village members, acting as hired herders.

INDIAN PASTORALISTS MIGRATE, BUT ARE THEY NOMADS?

At least for geographers one of the defining criteria for ‘nomadism’ is the possession of a mobile type of habitation, such as a tent or yurt. Indian pastoralists have neither of these. Instead they have permanent dwellings, usually clustered at the edge of villages, or in close vicinity thereof. When they go on migration, they do not employ any mobile habitations, but sleep in the open (Agrawal 1992).

As a rule, only some members of a family migrate, while most of them remain in the villages. Among the sheep herding Raikas of Rajasthan, a migrating group, or *dang*, is composed of able-bodied men accompanied by the

number of women that is essential for cooking and milk processing. On the other hand, the Rajputs, who are regarded as 'non-traditional pastoralists' in Rajasthan, adhere to stricter standards of sexual segregation and women do not go on migration. Groups of camel pastoralists on migration are composed only of men, presumably because there are no tasks such as milk processing that need to be carried out by women, as camel milk is not processed.

TREND TOWARDS INCREASED NOMADISATION

In most countries, nomadic pastoralism is on the decline, because of government interventions and a myriad of other factors restricting mobility. Rajasthan may be one of the few areas where the opposite is the case. The number of people and sheep flocks on migration is increasing. In the arid extreme west, people have always been semi-nomadic, leaving their homes during periods of water and fodder shortages that occur regularly at certain times of the year. However, it is a rather recent development for pastoralists from relatively fertile, semi-humid areas, such as Rajasthan's Pali district, to undertake migrations over long distances. This change is partly caused by the reduced availability of grazing in the immediate vicinity of villages; but also, as Kavoori (1992) pointed out, by 'pull factors', i.e. the opening up of grazing opportunities on the stubble of newly irrigated fields in neighbouring states, especially Haryana.

This newly created niche has motivated so-called 'non-traditional' pastoralists to take up migratory sheep pastoralism, especially members of the Rajput, the traditional land-owning caste (Kavoori, 1992). Their socially- and politically-superior position would appear to endow them with an advantage in gaining access to grazing opportunities and negotiating with officials, in comparison with the traditional pastoralists who are less well connected.

MARKET VERSUS SUBSISTENCE ORIENTATION

In discussions about pastoral economics it is often emphasised that pastoralists are heavily subsistence oriented. However, the main rationale of Rajasthan's pastoral economy is to produce for the market. This applies to sheep breeding and especially to camel production which is geared entirely towards raising male animals for sale as draught animals. The food potential of camels is almost entirely ignored (Köhler-Rollefson 1992).

CULTURAL RESTRICTIONS ON MEAT CONSUMPTION AND PRODUCTION

Many or most of India's pastoralists are vegetarians and are opposed to the slaughtering of animals. This applies not only to Hindu pastoral groups, such as the Raikas/Rebaris, but also to non-Hindus, including the Sindhi Muslims in

Rajasthan and the buffalo breeding Muslim Gujjars of Uttar Pradesh (Kaushal 1992). Taboos against the slaughter of sheep appear to be more flexible since large numbers are exported to Arabian countries for meat, although some Rebaris refuse to sell sheep for slaughter. But in the case of cattle and camels the restrictions are more or less absolute. A tangible obstacle to raising the profitability of cattle and camel breeding, these cultural factors need to be taken into account in development plans.

INTEGRATION WITH CROP CULTIVATION

In Rajasthan, pastoralism and crop cultivation have traditionally been integrated and synergistic (Srivastava, 1991). Land owners appreciated the manure provided by herds spending the night on their harvested fields and compensated pastoralists in cash or in kind. However, in recent years this relationship has become unbalanced. Increased frequency of double-cropping due to irrigation, reforestation projects, and alienation of village grazing grounds have eliminated many pasturing opportunities, and the availability of chemical fertilisers has made manure to some extent redundant. During the last couple of years, hostilities between farmers and pastoralists, as well as between competing animal herders groups, have escalated, culminating in a tragic incident in Kotah last August where nine Raikas lost their lives in an ambush by members of a different caste.

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GOATS AND GRASSES IN WESTERN RAJASTHAN: INTERPRETING CHANGE

Paul Robbins

INTRODUCTION

The fragile arid zone of Western Rajasthan has experienced a dramatic shift in subsistence patterns in the last twenty years. Long the location for breeding and marketing large stock (cattle and camels), the livestock demography has been turned upside-down in recent years with small stock (sheep and goats) coming to dominate household strategies. Planners in government ministries and range scientists decry the dramatic changes, warning that this plague of grazers and browsers will quickly 'desertify' the region.

However, the move into small stock, especially goats should be seen as an adaptation by the rural poor to utilise ecological and institutional interstices while other opportunities for stable income and access to protein continue to decline. Examining regional trends and household strategies in the arid districts of Jaisalmer, Barmer, and Jodhpur sheds some light on these changes[1].

CHANGING LIVESTOCK DEMOGRAPHY

A quick look at the change in state-wide populations of goats, sheep and cattle over 15 years gives a picture of the major trends in the area (see Table 1).

Table 1: Livestock populations in Rajasthan state[2]

	1977	1992	Change since 1977
Cattle	12 896 299	11 595 865	-1 300 434 (-10.08%)
Sheep	9 937 918	12 168 174	+2 230 256 (+22.44%)
Goats	12 306 918	15 062 589	+2 755 671 (+22.39%)

[1]This paper is based on field research conducted between November 1993 and March 1994 with the support of the United States Educational Foundation in India and the National Foundation of America. The study focused upon changes in the institutional/rule structures governing village community lands and the resultant changes in available browse, graze, fuelwood, and other minor products. 24 villages were surveyed in the Jodhpur, Barmer, and Jaisalmer districts of Western Rajasthan. Interviews with the local herders/farmers were used to construct a picture of herding strategies, of changes in the availability of graze and browse, and of institutional compliance or resistance to imposed rules. Transects laid in fallow, pasture and other common lands were employed to assess the number and cover of various species of trees, annuals and perennial grasses.

[2]Source: Department of Animal Husbandry, Jaipur.

The devastating famine of 1987 decimated livestock populations (especially small stock) bringing 1988 populations down to their 1983 and sometimes 1977 levels. Sheep and goat populations are experiencing fast population growth despite heavy losses between 1983 and 1988 (around -26% and -19% respectively). Their rapid recovery gives some idea of the trajectory of future growth. The cattle population is dropping both in absolute terms and relative to other livestock species.

Looking west however, a different regional patten emerges in the arid zone statistics (see Table 2).

Table 2: Livestock populations in Western Region (Barmer, Jaisalmer, Jodhpur)[3]

	1977	1992	Change since 1977
Cattle	1 045 223	954 295	-90 928 (-8.70%)
Sheep	2 551 753	2 462 297	-89 456 (-3.50%)
Goats	2 302 134	2 869 031	+566 897 (+22.39%)

Here the losses in sheep population numbers have yet to fully recover while the population of goats has recovered quickly and continues to boom. By looking at the very different niches these species occupy in local and regional economies and ecologies, the growth of the goat population can be better understood.

WHO IS RAISING GOATS?

Sheep and goats have come to significantly outnumber larger stock, especially in the most arid western part of the state. Sheep rearing continues to be a specialised strategy being raised predominantly by pastoral Sindhi, Raika, and Rajput castes. In study villages located in Barmer and Jaisalmer, around 50% of the sheep population was held in herds of 40 or more animals, while 46% of the households held no sheep at all. Many of these sheep pastoralists do not live in the most arid districts of Western Rajasthan, residing instead in Pali and other districts in central Rajasthan.

Goats in contrast are herded by most households in the area. Around 50% of the goats in the study villages were held in herds of 15 or less with only 8% of the households holding no goats at all.

Sheep are not only raised for meat (Rathore 1993) but are also at the centre of a large regional and national wool economy. The migratory adaptation used

[3]Source: Department of Animal Husbandry, Jaipur.

by specialist pastoral communities involves their connection to reliable wool markets in distant communities. Smaller producers in the study villages, with only a few sheep, often sell their wool to semi-itinerant neighbours who resell it later. The grazing of large flocks usually requires out-migration during the driest part of the year to neighbouring states where fallow fields in Haryana and state controlled 'forest' and 'wasteland' in Madhya Pradesh provide good grazing and where the animals are shorn and the wool sold (Agrawal 1992). Both grazing and marketing take a large number of sheep out of the regional economy and ecology for more than half the year.

Goats on the other hand, are full-time residents of the desert. While pastoralist specialists do herd goats or hold them in mixed sheep and goat flocks, they are more commonly raised in small numbers by the large, comparatively sedentary populations of agropastoral groups and communities of the Thar desert. This accounts for their large and growing population and suggests that it is the goat that has come to occupy the pivotal position in the Western Region's economy and ecology. It is essential then, to understand what has motivated desert families to turn to the goat in such large numbers in recent years.

WHY GOATS?

Generally, the goat occupies a crucial position in most household economies in the region. Every household depends upon goats for their daily milk supply despite the low yields recorded under the extensive systems practised throughout the region. Households report only 2 to 3 litres daily in the kidding season. Nevertheless, this production is highly efficient considering the low or negligible inputs of capital and labour in the household goat enterprise (Sagar and Ahujar 1993). Children do much of the goat herding or goats herd themselves in and around the village during the day. Only large holders (>15 animals) reported the use of any kind of preventative veterinary care.

Furthermore, through steady cash sales of animals for meat, goats provide economic stability and investment with a high rate of reproductive return; most she-goats kid at least once a year. The market for animal sales is good and access is easy with middlemen (*Beopari*) coming even to the remotest villages on a continuous basis. This is especially significant in a region where failures in monsoon rainfall are common and agricultural production is highly risky.

More specific causes for the rapid growth of the goat population are the result of:

1) changes in the regional ecology,
2) alterations of the local land-use institutions, and
3) the explosion of regional and national demand for meat.

Changes in the regional ecology

The biota of both community and private land is changing throughout Western Rajasthan. Below average rainfall has been accompanied by high overall growth of the animal and human populations. In the decade from 1980 to 1989, the state of Rajasthan experienced nine years of below average rainfall with the western districts of Barmer, Jodhpur and Jaisalmer experiencing nine, eight and seven years of below average rainfall respectively (Government of Rajasthan 1989). Some of the years represent critical famines in which the monsoon rains faltered or (as in the case of 1987) failed altogether. Along with the growing numbers of goats and sheep cited previously, Rajasthan experienced a 28.5% rate of population growth with the western districts equalling or far surpassing this figure (Pitaliya 1993). This growing population is turning to livestock to meet household needs but is also putting additional pressure on grazing lands through fuel collection and tree felling.

Pressure on grazing lands has resulted in significant changes in fodder quantity and quality. In study villages, 16 tree, shrub, or grass species were reported as disappearing or as having vanished in the last 10 to 20 years. Of these, almost all were palatable species that made fair or good grazing/browse for all animal species (cattle, goats, sheep and camels). This is especially true of *dhaman* (*Cenchrus ciliaris* and *C. setigerus*) and *sevan* (*Lasiurus sindicus*) grasses which were uniformly described as declining in all of the study villages. These tufted perennial species provide some of the best and traditionally most reliable sources of fodder for cattle. As these and other species become harder to find in the dry grazing areas, the need and expense of supplemental fodder for large stock rises. Of the 47 species[4] which dominate pastures and fallow land in the study area, 20 are palatable to cattle, while 30 are palatable to sheep, and 37 to goats. It is unclear whether these changes in availability and quality of grazing represent a short-term response to recent aridity or a longer-term change but whichever, has clearly favoured goats over cattle in the past few years.

Alterations to the local land-use institutions

Of equal or greater importance, are the institutional changes that have led to systems less friendly to the raising of large stock. The well documented decline of community resources throughout the state (Jodha 1986, 1985) includes the disappearance of a considerable amount of permanent pasture land. Linked to this overall quantitative decline in grazing land, existing common spaces have experienced a high degree of contestation by a number of different authorities. State-sanctioned panchayats (village governing bodies), traditional village

[4]Trees, shrubs, perennial and annual grasses.

committees, non-governmental organisations and the State Forest Department all claim various areas of village and state ‘common’ land, each implementing and enforcing differing rule-systems for grazing and fodder cutting. These changes and intrusions have often led to enclosure or total institutional failure as the older systems are erased by overlaying systems. Under these conditions, the concentrated and reliable supplies of fodder (like traditionally harvested *sevan* grasses) are threatened by a cacophony of rule systems and authority claims over village lands. Animals which can pick their way through the fractured landscapes and find forage within and between these spaces will continue to thrive under the changing conditions. Goats slip through fence-lines, make their way to unclaimed lands and follow gullies to isolated grazing; they are institutionally adaptive animals.

Additionally almost all the villages in the study area have experienced the intensification of agriculture associated with the spread of tubewell irrigation. Here, the fallow cycle is shortened with an increasing area under continuous cropping and two or three crops a year are not unusual.

For large ruminants, one of the most steady and reliable sources of fodder grasses i.e. fallow land, is decreasing throughout the region. Traditionally, one crop was sown annually for the brief 3 to 4 months during and after the monsoon rains. At least half of the land and sometimes much more, was left fallow not only to rest the soil but in order to produce a wide variety of annual and perennial grasses which rapidly regenerated in one or two years on the rested land. These grasses were typically cut for fodder and the land was then opened to the community for grazing.

As fallow land decreases, the chief source of free fodder becomes unavailable; the producer must either increase investment in the livestock operation by purchasing fodder, or turn to grazing and browsing livestock on other, less reliable, sources.

The explosion of regional and national demand for meat

Changes in land use go a long way in explaining the relative replacement of large stock by small stock, but these factors do not by themselves explain the tremendous overall growth in small stock populations, which must also be attributed to the rapid expansion of meat markets throughout the country.

The raising of goats for meat has a long history in predominantly Hindu Rajasthan. Turn of the century administrative documents briefly describe the well-established trade in both goat and sheep meat (Rajputana Gazetteers 1908). Munshi Hardayal Singh’s census of Marwari castes (Singh 1894) documents the various castes traditionally involved in the meat trade and the practice of meat-eating amongst Muslims as well as low caste Hindu groups. Meat production and consumption continues to thrive throughout the state. Today animals are

handled for slaughter by both Hindu Khatiks and Muslim Kassai castes (Rathore 1993). Muslims and upper-caste Rajputs continue to eat meat. Furthermore, despite the process of sanskritisation which historically turns lower castes away from inauspicious practices like the eating of meat in order to gain higher status, meat is eaten by many Hindu castes throughout the study area and the demand for meat continues to grow rapidly in Rajasthan. Meat production increased from 17.29 thousand tonnes in 1986 to 25.50 thousand tonnes in 1993. This is a 47% increase in less than a decade[5].

Perhaps more importantly, changing cultural and social practices in urban India are dramatically driving up the demand for meat. Meat is a politically- and socially-contentious issue in India, especially in the light of the recent rise of Hindu fundamentalism. As such, meat production is not supported, subsidised or taxed by the government. Statistics are therefore difficult to find but some 3 286 000 goats (from a total population of approximately 14 million) were recorded as having been exported from the state in 1990-1991 (Rathore 1993).

Goat herders in the arid areas are aware of increased demand. All families raising goats in the study area report that they make regular sales within the village or to travelling *Beopari* middlemen throughout the year. The market has been described as favouring the herder and good prices are usually available for most small holders (Rathore 1993) except during drought years when desperation sales allow the buyer to set the price. Even then, goat sales are one of the few avenues of access to capital. In good years and bad, goats provide the steadiest, most reliable source of income for non-specialist households in the region.

IMPLICATIONS AND CONCLUSIONS

The rapidly growing goat numbers in Western Rajasthan certainly contribute to land degradation and transformation of the environment. However, the logic of goat raising is unquestionable from the marginal herder/farmers' point of view considering the increasingly constricted options available in the desert regions. Herders and farmers, by investing in goats, are responding to future uncertainty in traditional production systems and lack of control over grazing resources. Up until now, the remedial and development measures taken by the government and some NGO's in forestry, irrigation and local industry have side-stepped pastoral production. As long as this remains the case, the present trajectory is the most reasonable and logical one for local producers to follow. Goat keeping is an adaptation to economic, institutional and environmental circumstances and goats

[5]Source: Department of Animal Husbandry, Jaipur. This statistic reflects tonnage of all the species produced for meat in the state. Of this a considerable majority of meat passing through slaughter houses is goat meat (Source: Interviews with Health Officers, Jodhpur).

are likely to continue to be one of the desert's most knowledgeable and efficient residents.

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GUJARAT AND RAJASTHAN

D.V. Rangnekar

An attempt is made in this note to give a brief account of observations gathered on pastoralists, as part of the development activities of BAIF (Bharatiya Agro Industries Foundation), an NGO involved in rural development in five states of India. In many cases, the outcome of development efforts is well below expectations and pastoral communities are often blamed for failures that occur. Illiteracy, ignorance, resistance to change, traditionality etc. are often given as the causes of failure, and pastoralists are frequently branded as parasites on society.

To counter this negativity, it was necessary for BAIF to learn about the culture, way of life, production systems and objectives of pastoralists in Gujarat and Rajasthan before engaging in development work in this area. Repeated informal discussions enabled the gathering of considerable amounts of information and development of a good understanding between the development workers and pastoralists. The approach employed emphasised that the development agent was the student and the pastoralists were the teachers. No rapid methods were used since information and understanding can not be gathered from pastoral groups in haste. Pastoral communities in Gujarat and Rajasthan do not like inquisitiveness (of strangers) till rapport and credibility are established (Rangenekar 1993).

Observations were gathered mainly on Rabaris, Bharwads and Gujars. In Gujarat more cattle are owned by pastoralists than by the farming community, who keep more buffaloes than cattle. Some pastoral groups consider themselves as associates of the Hindu God, Lord Krishna, and most of their folk songs and dances are based on cattle and references to Lord Krishna. There are songs which are sung while grazing and tending the cattle, while cleaning and doing other domestic chores and poems which describe the characters of good cows, aspects of good cattle husbandry and management. Cattle are central to pastoral life. Most cattle are kept to be sold as bullocks and milk is secondary. Dung is also important but its importance has usually been ignored by outsiders.

Migration is in search of markets for bullocks and other animal products (ghee, wool, hair) as well as in search of fresh pastures for livestock. Pastoralists appear to have good relations with farmers along their migration routes. Migration routes are well established and in our experience it is possible to locate families during the migration (which is in summer) through their clan chief. The villages and farmers' fields where the pastoralists make their halts are decided in advance. The animals receive fodder and in turn fertilise the fields. Farmers also pay pastoralists for herding services and the pastoralists hire out individual trees from farmers to use the pods and leaves as fodder for their livestock. In some areas irrigation and intensive, commercial crops are disrupting

this traditional system but in other areas there is increasing demand for the herding and penning of animals on farmers' land. On the whole, while relations between pastoralists and farmers in their native villages are not good, relations between pastoralists and farmers in villages on migrations routes are cordial. The migration system of the pastoralists is a good example of interaction between farmers and pastoralists and illustrates the complementarity of the two systems and communities.

Pastoralists are very knowledgeable about livestock, their behaviour, feeding habits and production characteristics, and the methods used in selection of breeding stock are comparable with those recommended by animal scientists. In selection of breeding stock, past calving or kidding percentages, dam's milk yields, sister's milk yields and body confirmation are studied. Individuals that we talked to were especially particular in selection of bulls and gathered breeding information on other herds in the surrounding areas. Goat breeders were also at pains to study flocks and pay attention to the milk production of related goats and other characteristics such as ears and wattles. Again, many households were found to be especially particular in sire selection. Breeding was also planned according to available feed resources and in semi-arid areas bucks are removed at certain times so as to avoid kidding before the summer (Rangnekar 1992).

The pastoralists are a good source of information about animal feeds largely unknown to the farming community. They have identified several trees, bushes, grasses and weeds which benefit milk yields, fat percentages in the milk and improve reproduction (Rangenekar 1991, Rangnekar 1992).

Many of the pastoralists in the BAIF project are not resistant to change and have taken to farming and become agropastoralists. Many families have adopted cross-breeds, fodder production and are starting buffalo breeding in the light of increased demand. In some areas, due to feed shortages, there is a tendency to increase the numbers of small ruminants kept and reduce the numbers of large ruminants.

However overall, about a third of families in contact with BAIF showed preference for the *status quo* and felt that higher producing systems are risky and involve too much work to be worthwhile, and some families felt the reliability of service support was insufficient to allow changes in their pastoral system. I surmise that the '*status quo* families' earn enough for a suitable living (as perceived by these families), prefer assured subsistence to risky high productivity, or else we do not have acceptable alternative systems of a sustainable nature. It is felt that some of these cases may be taken as a challenge by development and research workers, while in other cases we should 'leave them alone'.

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WOMEN PASTORALISTS, INDIGENOUS KNOWLEDGE AND LIVESTOCK PRODUCTION IN NORTHERN GUJARAT

Sangeeta Rangnekar

The contribution of pastoralist women in livestock production has not received the attention it deserves (even by the Pastoral Development Network) and women as a source of information on livestock production, have been ignored. They not only remain the 'hidden hands' of production but also a neglected source of indigenous knowledge. This note attempts to highlight a few salient aspects relating to work sharing, decision making, knowledge and perceptions of women from the pastoral community. These studies were undertaken in selected districts of North Gujarat.

Livestock management is more evenly shared between men and women from pastoral communities compared with tribal and farming communities. However the care of newly born and very young animals is always women's responsibility (Rangenekar and Rangenekar 1992) and women look after the newly-born and growing animals in ways not so different from the care of their own children. Another aspect mainly handled by women is making feed mixtures and feeding livestock. Milking, administering medicine and watering are evenly shared between pastoralist men and women in northern Gujarat (Rangnekar 1992a).

The majority of pastoralist women are illiterate, but have considerable experience and knowledge about livestock, their management, production characteristics, and feeding behaviour and accordingly they make feed mixtures, choose fodders, gather or store bush and tree products for feeding to livestock.

In semi-saline and saline areas of North Gujarat, *Cressa tritica* is a common weed, found in winter wheat or barley. Women, working as paid labour weeding on the larger farms, gather, crush and store *Cressa tritica* for feeding. *Cressa tritica* is washed with water before feeding as women are aware of the salts on their leaves. Rouppia grass is found particularly in water-logged areas and is also gathered for animal feed. Women gather pods of trees like *Acacia* and *Prosopis* species and cook and feed them to livestock and are aware of the nutritional value of this material.

Many pastoralist women were found to be aware of indigenous medicines and use them effectively for ailments like mastitis, tympanites, diarrhoea and for ulcers caused by foot and mouth disease. Most women have identified ingredients like cotton seed, cotton seed cake and rice bran that are beneficial for milch animals, and make their own mixtures.

Women have a strong attachment to their livestock – as do their menfolk. The strong linkage of livestock, particularly cows, to the culture is evident from the fact that the majority of the lyrics of their folk songs sung during celebrations, marriage and religious functions, are based on livestock. Each family marks out cows which will be sent with each daughter whenever she is married. These invariably become favoured animals of the young bride and are important as a source of milk and fuel for the family, provide manure for the farm, as well as being a source of income.

There is a need to sensitise research and development workers to understand women's roles and women's perceptions about livestock production and take due cognisance of their knowledge and experience when planning programmes. There is a lack of training and extension support designed to suit women pastoralists. Change in livestock production systems can only be brought about through the involvement of women and through improving their awareness and skills.

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POPULATION GROWTH, AGRICULTURAL CHANGE, AND NATURAL RESOURCE TRANSITION:
Pastoralism Amidst the Agricultural Economy of Gujarat

Richard P. Cincotta and Ganesh Pangare

INTRODUCTION

Dr Amrita Patel, Managing Director of India's National Dairy Development Board (NDDB), stated in her keynote address[6] that 'in the coming decade, it is the goal of NDDB that all livestock be removed from degraded *gauchar* (common) lands, to convert small producer dairy herds to completely stall-fed enterprises'. These words express the hopes of an environmentally-conscious leader of cooperative dairy development who understands that village common lands in India, needed desperately for rural water catchment and firewood production, are currently unable to sustain the intense grazing pressures to which most are submitted. Unfortunately, in the state of Gujarat, the very heart of Indian dairy cooperative success, there is presently little hope of reducing grazing pressure on commons, regardless of NDDB's efforts to promote composite feeds and zero grazing. Reduced to a fraction of their former area, and depleted of their most palatable vegetation, Gujarat's common lands are utilised by small ruminant pastoralists who can neither afford commercial feeds, nor can aspire to productive dairying. Nonetheless, these pastoralists, and their goats, sheep, and the manure they produce, are vital to the state's agricultural economy.

How did a pastoral production system arise focused primarily on wastes, rather than products? It is our thesis that it evolved among pastoral groups in the context of rural human population growth and agricultural change. Thus, the objectives of this paper are to introduce the reader to the topic of pastoral adaptation in Gujarat, and to provide a conceptual model of aspects of its evolution. To address these objectives, we offer a 'Boserupian' theory of human population growth and natural resource change, characterise the principal patterns of migratory pastoral production in Gujarat, and comment on the future for pastoral development given the state of theoretical and empirical knowledge.

CHANGE IN RURAL GUJARAT

By global standards, Gujarat is densely populated (210 people/km^2) and its rural population, which was 66% of the state figure in 1991, has increased by >15% over the past decade. Although when measured in gross cropped area per rural inhabitant, Gujarat remains among the least densely populated of Indian states,

[6]At the Indian National Conference of Composite Feed Producers held December 1991 in Anand, Gujarat.

this parameter of agricultural intensity decreased rapidly, by 30% (to 0.54 ha/rural inhabitant) from 1961 to 1980 (Vosti and Lipton 1991). In fact, the figure will continue to decline as rural population grows and cropped area levels off.

In Gujarat, agricultural expansion has been hastened by the dissolution of common land, a political response to both inequity and high rural human population density. In the 1950s and 1960s, under a wave of state government-supported land reforms known as the Bhoodan Movement (see Chen 1991), village common lands were ceded principally to low caste landless residents (many of whom later lost that land, see Jodha 1989). Initiatives to subdivide and redistribute existing farmland were generally avoided as rural density was already high, and agricultural holdings were already relatively small (Jodha 1989). In Saurashtra, the south central region of Gujarat, the vast majority of village common land was converted to (generally marginal) cropland, and permanent pastures were reduced to less than 20% (7.5% of registered land area) of its level at independence (Abdi 1992). Within a decade, pastoral populations, who were obtaining the totality of their animals' diets from rangeland forage during most of the year, came to depend on agricultural residues and short agricultural fallow for livestock feed (Gadgil and Guha 1992).

THEORY: CONCEPTUALISING PASTORAL CHANGE IN GUJARAT

The history of pastoral adaptation in Gujarat provides evidence of an 'untold' complement to Boserup's theory of human population growth and agricultural change. At the core of Boserup's theory (Boserup 1965) is the assumption that any uncultivated arable land, whether at early stages of plant succession following recent cultivation or covered in natural vegetation at late stages of succession, should be regarded as 'fallow': land upon which there is a natural positive accumulation and storage of nutrients for plant growth. Boserup's theory of agricultural change proposes that increases in local rural population density eventually force agricultural households to adopt regimes of shortened fallows (i.e. higher frequencies of cropping and higher ratios of cultivated to uncultivated land) which stimulate an increased use of production-augmenting agricultural technologies.

The history of Gujarati pastoralism suggests the need for a complementary theory focused on the natural resource user, rather than the farmer. Such a theory proposes that as short-rotation farming takes over forest and fallow land, rural producers relying on natural resources, such as pastoralists (but also wood-cutters, hunters and various natural resource gatherers), are also forced to reduce the length of their 'fallow' period by harvesting renewable natural resources from a rapidly decreasing land base at an escalating frequency (see Fig.1).

Fig. 1: **An intuitive successional model of land-use change (after Boserup 1965). As agriculture intensifies, from swidden farming (1a) to demarcated holdings completely occupied by continuous cropping (to 1b, and then 1c), land reserved for natural resource harvesting (i.e., grazing, wood cutting, gathering, hunting) is eliminated. Simultaneously, intensification leaves farmers with insufficient fallow to dedicate to necessary environmental services, including nutrient import and cycling, both facilitated by livestock. If common grazing land remains intact after continuous cropping is assumed, livestock can import nutrients from afar.**

Whereas economists may assume that pastoralists would switch to cropping with the loss of accessible forest and rangeland, in this complementary theory we propose a non-equilibrium solution. A variety of socio-economic forces exist that maintain modes of natural resource production or slow occupational transition. These include:

- the transition costs of switching from one set of knowledge and skills to another;
- religious and cultural traditions that tie households to their mode of natural resource production; and
- institutionalised impediments to transition such as obstacles to acquisition of land title and credit.

Thus, pastoralists, whose population and demand for resources are also growing, must eventually adjust their production practices to deal with the increased risk of forage shortage as available rangelands shrink, and the ratio of livestock to forage vegetation increases (i.e. as 'grazing fallow' decreases, using Boserup's terminology). In fact, forage scarcities increase in frequency of occurrence as the amount of forage consumption by livestock surpasses the natural thresholds of local ecosystems, promoting a spiral of change that:

- reduces litter accumulation;
- alters surface-soil structure and plant composition;
- reduces the presence of leafy, high-quality forage plants and promotes plants that sequester nutrients in armed and toxic parts;
- reduces total plant cover; and
- can eventually lead to soil loss (see Archer and Smeins 1991, see Thurow 1991).

Pastoral responses to decline in natural forage sources may then manifest themselves as:

1) changes in herd migration patterns (see e.g. Leybourne et al. 1993, Cincotta et al. 1992);
2) increased utilisation of small ruminants, which are selective feeders capable of adapting to armed and toxic forage plants (see Provenza and Balph 1990, see Provenza and Cincotta 1993);
3) entrance into rural or urban labour markets (e.g., Chen 1991);
4) increased utilisation of forage available on agricultural lands (crop residues and fallow weeds), i.e. agropastoralism (Leybourne et al. 1993); or
5) by combining, to some degree, these responses (Cincotta and Pangare 1993).

In Boserup's theory of agricultural change, both technological enhancements of cropping practices and the escalating demand for farm labour per land area, are driven directly by a reduced ability to take advantage of the natural restorative processes of long-fallows i.e. carbon (C) and nitrogen (N) fixation, and plant material decomposition. In an ecological sense, the resultant intensified cropping translates to more rapid consumption of soil nutrients from the available pool, and a demand for elevated rates of nutrient cycling (especially of N) or nutrient import. Thus, rural population growth indirectly creates a demand for livestock as rapid cyclers of nutrients (Powell and Williams 1992, Powell and Ikpe 1992, Cincotta and Pangare 1992). At least initially, intensified cropping supplies both an abundance of seasonal crop residues and a demand for manure, the nexus for agropastoral relationships that allow pastoralists to successfully raise livestock (including milch animals) even as the natural grazing land area per livestock unit decreases. Notably, this demand can also be met through methods of nutrient import, such as mulching of natural materials or application of industrially-produced chemical fertilisers.

Meanwhile population growth both rural and urban, drives up demand for animal products per unit land area, especially when assisted by dairy sector development and transport. Technologically intensified milk-production, such as that practised with improved dairy breeds of cattle and buffalo, produces an elevated demand for digestible forage energy and nutrients (high forage quality) per ruminant animal (see Van Soest 1982). At this juncture in agricultural change, the development of farmer-owned, large-ruminant milk production takes on a separate theoretical significance: it undermines agropastoral production relations. With improved dairy cattle, farmers can turn high profits by feeding on-farm fodder and high quality residues (e.g. groundnut leaves) to their own livestock. Pastoralists, their common forage resources quantitatively depleted, their access to forage now limited by customary and institutionalised tenurial exclusion from cultivated land, are left to bargain for low-quality (relatively low rumen digestibility, low N content) crop residues as the only remaining locally-abundant source of rumen-fermentable carbohydrates. However, this supply of vegetable carbon must be supplemented with nitrogen for ruminant digestion, growth, and production and the only accessible source of nitrogenous forages for pastoralists' animals remains on common grazing lands. Where common grazing land is scarce, and difficult to manage because of a large number of users who maintain customary access, residual overgrazed vegetation types tend to be dominated by thorny, sprawling, and toxic species resistant to grazing.

Faced with such a lack of production options, agropastoralists are left with three strategies for utilising their knowledge of livestock:

1) sell their services as livestock keepers for farmer-owned herds;
2) buy imported high quality feed (which must be continuously available at prices that provide a sufficient margin of milk profit); and
3) switch to small ruminant (goat, sheep) production.

The latter strategy is viable because small ruminants are well suited for the grazing conditions of degraded commons. Goats and sheep are selective feeders, and thus capable of learning to choose nutritious vegetation among an array of defensive plant parts (Provenza and Balph 1990). These behavioral traits are more conducive to animal survival, health, and production on degraded grazing land than are the bulk feeding capabilities of larger ruminants (cattle, buffalo). This theory suggests that, with quality biomass production confined principally to croplands, with common land degraded, and subsidised chemical fertilisers available, farmers can clearly obtain the economic 'upper hand' in the latter stages of rural land conversion.

EMPIRICAL EVIDENCE: REVIEWING PASTORAL PRODUCTION IN GUJARAT

Remnant grassland pastoralism in the Banni

The Banni Grassland in Kachchh District (Fig. 2), an area less than 2500 km^2, is Gujarat's only remaining semi-arid natural grassland, representing a very small remnant of what was once an expansive rangeland production system.

Fig. 2. Map of Gujarat, in western India, showing its four regions.

Although the Banni is administratively protected as grazing land, soils are poorly drained and saline, and thus are generally beyond the margin of profitable crop production. Whereas the introduction of cooperative dairy development is responsible for major improvements in milk production and collection, infrastructure and services in the 46 Banni villages remain poor (Bharara 1993). Flooding during the monsoon isolates the Banni from mainland Gujarat.

The principal inhabitants of the Banni (population about 20 000 in 1987) belong to Sindhi Muslim and Rebari communities engaged in raising and breeding large ruminants (cattle and buffalo). About 10% of households herd non-lactating cattle and buffalos owned by non-residents. These livestock are

brought into Kachchh from several regions: from surrounding farming villages in Kachchh, from Rajasthan to the north, and from as far away as Bombay.

Since the 1950s, the Banni has experienced major changes that have largely degraded the quantity, composition and productive potential of its plant populations, having serious repercussions on livestock production. While significant proportions of the Banni were reported to be covered in open savanna in the 1950s, most native trees, and associated native shrubs, forbs and grasses, have disappeared. The compounding influence of climate, grazing, and the introduction of non-native plants have wrought irreversible changes to its plant composition. Loss of plant cover, deteriorated soil structure, and the construction of check dams in Kachchh, used to control flooding and provide drinking water, have curtailed the natural movement of detritus and silt that periodically brought fertility to the Banni (Saxena 1993). Sea water ingress has affected the coastal areas, resulting in loss of vegetation and the abandonment of six villages (Bharara 1993). During 1960-61, following a drought which left pastoralists low on forage and promoted a lack of stability on Banni soils, government foresters introduced mesquite (*Prosopis juliflora*) which spread throughout Kachchh District via the ingestion of its fruit (a pod) by cattle, and the distribution of its scarified seed in faeces. While government forage balance sheets often indicate that Kachchh produces a surplus of forage, Singh et al. (1993) suggest that rangeland forage supply is usually overestimated due to failures to correct for degradation within native vegetation types over the past three decades.

During a 1983 census, there were 9600 cattle and 17 800 buffalos grazing the Banni. In good rainfall years, it has been estimated that over 20 000 small ruminants, principally sheep, are brought into this region from Rajasthan to graze, as well (Bharara 1993). During four consecutive years of regional drought, from 1986-89, large numbers of cattle and migrating small ruminants virtually eliminated many of the scattered pockets of vegetation that remained in Banni. However, the prolonged length of the drought finally resulted in massive livestock die-offs and a general out-migration of cattle during that period (often to South Gujarat, distances of up to 800km; Bharara 1993). Whereas native grasses comprised 8% of ground cover (5 t/ha dried forage) before the drought period (Saxena 1993); studies show that these same species have yet to recover, constituting only 1.5-3.5% of ground cover (0.5 t/ha).

Today, livestock production on the Banni is principally maintained by free grazing among depleted sources of grasses, sedges, and forbs, on the leaves of *Suaeda fruticosa* (a native salt-tolerant tree species), and on the pods and seeds of *Prosopis juliflora* which pastoralists often collect and boil before feeding. During and following the monsoon seasons, livestock are grazed within the Banni, moving between man-made wells and tanks in which freshwater has been trapped during the rains. During the dry season, cattle are moved outside Kachchh District.

Agropastoralism in Gujarat

Galaty's (1992) fear of the impending 'nightmare of landless pastoralism' has, over the past four decades, become a fact of life for Bharwad and Rebari peoples, the principal ethnic/caste groups involved in Gujarati pastoralism. The Bharwads, the largest pastoral group in Gujarat, have historically been associated with grazing grasslands and savannas in Saurashtra, a relatively dry region of the state (400-1000mm annual rainfall). However, with the demise of open grazing land as advancements have been made in dryland agricultural techniques, tube-well technologies, and dam irrigation, these people have (largely since national independence, 1947) settled into hundreds of rural villages throughout north and south Gujarat, the prime agricultural regions of the state.

State land-distribution policies have, in general, negatively affected pastoral access to land. Today, the only remaining common property grazing lands surrounding most villages of Saurashtra are river banks below flood line, hedges that surround fields, the sides of public roads and paths, and severely eroded shrub land.

Studies of Bharwad pastoralists (Cincotta and Pangare 1993, Rangnekar 1993, Chen 1991) are illustrative of the changing condition of pastoral production in Gujarat. In interviews with village Bharwads and farmers in villages near Rajkot District in Saurashtra (Cincotta and Pangare in press) respondents suggested that the increased consumption of high-quality crop residue by farmer-owned improved dairy cattle has drastically decreased the supply of nutritious fodder on the local market. This demand has increased local feed prices, making it virtually impossible for village marginal farmers and landless pastoralists to operate in the dairy business. While some Saurashtran pastoral groups appear to traditionally favour sheep husbandry e.g. Motabhai Bharwads, others have adapted to a recent dependence on low quality farm residues by shifting herd composition towards sheep and goats, and marketing manure and wool: animal products that are less nutritionally demanding than milk.

Analyses of economic returns from crop residues suggests that a farmer's benefits from these by-products can be optimised through a mixed strategy (Cincotta and Pangare in press) i.e. by feeding the most digestible, most protein-rich forages to on-farm dairy cattle, and leaving low quality residues for pastoral small ruminants (Fig. 3). Although cooperative dairy managers have tended to believe that additional milch cattle could be maintained at low levels of production if farmers used their 'free source' of low quality residues for feed (Aneja pers. comm.), they failed to account for the fact that low-digestibility feed suppresses forage intake per ruminant animal, as well as production per unit intake. In fact, farm households can best use the increased capacity of the

Fig. 3:
Modelled economic returns for farmer strategies of crop-residue use in Sarapdad, Rajkot District, Gujarat (after Cincotta and Pangare, *in press*). Graphs show values of strategies inclusive of opportunity costs, expressed in Indian Rupees (Rs.) per kg feed. Values of strategies are calculated along a feed gradient of both digestible energy (DE) and crude protein (CP), which have been increased simultaneously. Farmers have the option (shown in 3a) to either feed on-farm residue to their own milk cow, or to trade the residue to small ruminant pastoralists for manure, and purchase good quality residues (groundnut hay) for their milk cows. The relationships between components of the on-farm fed dairy strategy and agropastoral strategy (3b) suggest reasons why the strategies show different returns at opposite ends of the forage quality gradient.

'animal production capital' (i.e. the improved dairy cattle in which they have recently invested) by providing these animals with high quality feeds, even when feed must be purchased at relatively high prices. It is most profitable to feed low quality residues, such as wheat and millet straws, to pastoral herds in return for manure, a practice that will likely continue to be profitable as fertiliser subsidies are cut in India. Wherever pastoralists reside, either in permanent village residences or in temporary camps, small ruminants are corralled, manure is collected at central distribution points and traded to farmers by the cartload. Farmers also hire pastoralists to confine pastoral small ruminants within small areas of cropland over night, in order to concentrate faeces and urine on their cropland[7]. Temporary enclosures of steel rods and rope net, designed specifically for this purpose, are now becoming widely used.

Pastoralists generally trade goat and sheep manure to farmers for a variety of commodities and privileges, in nearly every possible combination (Kavoori no date). Returns from manure include payments in cut crop residue feeds; access to standing residues, fallow weeds and water sources; foodstuffs for human consumption; and cash. In South Gujarat, informants described negotiations between Bharwads and a *panchayat* (local government) in which the *panchayat* offered a group of Bharwads common land on which to build houses at the edge of a village, conditional upon the payment of an annual rent in manure. In Rajkot District, Bharwads sell their own labour for forage and cash, although Bharwads of other areas are often reluctant to participate in the agricultural labour market (see Chen 1991). Although we observed several Bharwad families who contributed milk to the local cooperative, these producers complained of low returns. Small ruminant milk production, both because of the low overall quality of available feed and the low dairy fat production (a parameter upon which milk is priced by cooperatives, George 1985) characteristic of native breeds (around 3% milk fat), is not particularly profitable (Cincotta and Pangare 1993); though certainly an important subsistence product (see Ahuja and Rathore 1987).

As is the case in other agropastoral systems, there is a net export of nitrogen (N) from common sources onto cropland (Powell and Williams 1992). Because of the low crude protein (CP) content of the straws (<4.5%) that make up 30-40% of the small ruminant diet in this system, we estimate that around 80% of the digestible N necessary to maintain these animals (assuming 6-8% dietary CP for rumen maintenance) originates from grazing rather than residue feeds. In a study area near Sarapdad, in Rajkot District, Cincotta and Pangare (in press)

[7]Similar relationships exist between farmers and pastoralists in many regions of India. On cropland in Maharashtra, we have personally observed Dungar pastoralists retaining about three hundred sheep and goats within rope enclosures of 10 by 5 metres.

found Bharwad pastoralists keeping small ruminants within pens until late in the morning, between 9.30 and 10.30am, to return in the early evening, around 6.00pm (~**8** hours). Interviewed pastoralists explained that they were trying to capture the most they could from the faecal output of their sheep, without negatively affecting herd reproduction and health. Thus, assuming constant faecal output, at least 67% of faecal N is destined for cropland[8].

Although small ruminant pastoralists in this position seem precariously dependent on their ability to trade manure for crop residue, the proliferation of irrigation schemes and increase in cropping frequency have actually augmented demand for manure in Gujarat (Rangnekar 1993). A survey of Bharwads in Rajkot District suggested that larger herds, generally those of over 100 animals (see Fig. 4), are regularly taken on migration during dry seasons of normal

Fig. 4: Size distribution of migrant and non-migrant small ruminant herds among a group of Bharwad pastoralists in a rain-fed agricultural area in Saurashtra. Larger herds (>100 animals) appear more likely to migrate during the dry season (after Cincotta and Pangare *in press*).

[8] In addition there is the faecal and urine N deposited on cropland while grazing crop fallow and when penned in fields overnight. The frequency of these activities varies seasonally and between pastoral herds.

rainfall years (Cincotta and Pangare 1992a, in press). According to interviewed pastoralists, households with large herds migrate from dry season village residences to irrigation projects in the north in response to:

1) the economy of scale inherent in manuring irrigated cropland, a service remunerated on a per animal basis; and
2) the diseconomies of scale involved in remaining in a non-irrigated village, where herders must provide scarce forage and water using a fixed household labour supply.

On average, the local veterinarian's survey showed that around 25% of pastoralist-owned sheep and goats migrated to irrigated areas during the dry season.

Other Pastoral Systems in Gujarat

Certain Gujarati pastoral populations, including local populations of Bharwads (Salzman 1988[9]) and Rebaris (Seth 1990[10]) have depended, sometimes completely, on forest grazing. Renewed interest in forest protection, afforestation and conservation of wildlife habitat has made it difficult for these pastoralists to maintain their livelihood. Many pastoralists who depended upon these few remaining forests have been resettled, granted title to revenue lands, and have taken to farming on afforesting village common lands. Nonetheless, grazing of afforested plots and reserve forests, especially by migrating pastoralists, is still considered to be a significant impediment to the sustainable management of remnant forests in Gujarat.

In Gir Forest, a forest remnant containing the last known population of Asian lions, local Rebaris have raised buffalo (which herders claim to be the only livestock capable of defending themselves against these predators). In the interest of protecting forest regrowth and the re-establishment of native herbivorous wildlife, the Forest Department has attempted to settle Rebaris on surrounding deforested lands. The Aga Khan Rural Support Project (India) has provided sustained technical assistance and training to the resettled pastoral community in agriculture, intensive livestock production, water catchment, and tree planting (Seth 1990).

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[9]Salzman analysed a case of voluntary settlement of landless Bharwad cattle-keepers who took up residence in Surat, South Gujarat, and whose settlement was facilitated by their organisation as a cooperative dairy society supplying milk to Surat Milk-Producers Union, Ltd. (Sumul).

[10]Seth describes a case where Maldharis within the Gir Forest (a wildlife sanctuary) in Saurashtra were persuaded to relocate outside the forest boundary and take up farming activities. Their conversion to farmers, and their management and reclamation of community property was aided by a community-based self-help programme supported by the Aga Khan Rural Support Group, India (AKRSP-I).

Another group, the Banjara pastoralists, who principally herd donkeys, are most often associated with urban construction sites, where they rent their animals and herding services to haul building materials. Banjaras set up campsites along roadsides and on vacant lots within urban areas from which they rent their labour and that of their donkeys. Although there is little data available concerning Banjara pastoralists (D.V. Rangnekar 1993, S. Rangnekar 1993), it is worth noting that these pastoralists reside, at least intermittently, in nearly every urban centre in Gujarat. While the Banjara are principally donkey herders, families generally keep small herds of goats, cattle and buffalo for subsistence. Donkey herds are principally herded by adult women.

SUMMARY

In this analysis we have assumed that, to realistically consider the future of Gujarati pastoralism, one must work within a theoretical framework. To this end, we have asserted that a) Boserup's model of population growth and agricultural succession provides insight into empirical patterns of pastoral change under conditions of agricultural expansion, and b) it is most useful when the observational focus of the theory is switched from the farmer to the natural resource user. In this analysis, we have called attention to several differences between classical expectations of the theory when farmers are the principal focus, and expectations generated when pastoral interests and on-farm livestock intensification are considered. The differences are:

1) agricultural expansion generally constrains pastoralists to confine grazing (at least seasonally) to a smaller, more intensely-utilised set of vegetation;
2) privatisation of the commons by farmers precipitates a loss of pastoral control over the ecosystem capital (land, water sources, and vegetation) that provided inputs and options to their production system;
3) technological intensification of livestock production, which shunts the highest quality forages to on-farm livestock, further restricts pastoral access to forage nutrients.

Such differences are the result of:

1) the marginalised social and political position of pastoralists;
2) pastoral adaptability in the face of narrowing production options and lack of control over forage sources; and
3) the positive feedback process that impedes the ability of vegetation and soils in natural resource ecosystems to renew themselves as 'fallowed grassland' and pastoral livestock populations continue to survive and grow in an agricultural economy.

Whereas a decision tree is commonly generated to plot the path of options accessible to a decision-maker, our presentation of this graphical device is an historical dichotomous key (Fig. 5): the points of articulation representing

Fig. 5: Decision tree describing the historical evolution of constraints that have been imposed upon pastoralism, and the strategic adaptations to livestock raising within those constraints (after Cincotta and Pangare *in press*).

constraints in control over resources and capital that circumscribe systems of livestock production in Gujarat. An increasing number of pastoralists are, quite rapidly, being confined to the lower extremes of this decision tree, where constraints on resources are most numerous and difficult to alleviate.

The decision tree begins by acknowledging the historic conversion of common land to agriculture (Fig. 5, Decision 1) during this century. Grassland and forest pastoralism still exist in Gujarat, but only in the Banni Grasslands of Kachchh (Bharara 1987, 1993, Saxena 1993) and among small groups of forest graziers. Yet even these systems rely on crop residues during some parts of the dry season (Singh et al. 1993).

The next tier of constraints (Decision 2) is associated with the availability of an adequate and continuous supply of high quality forage for milk production, from grazing, on-farm or commercial sources. Deprived of high quality forage, milk production decreases rapidly and non-linearly because low forage quality results in both a decreased supply of nutrients per kg ingested, and suppresses total feed intake. However, (following the path of Decision 3 and 4) pastoralists have previously been able to use combinations of grazing and low quality residues to raise strong, slow growing bullocks (especially of the Kankrej breed) to be marketed for pulling and ploughing. While bullock raising continues among some ethnic/caste groups in Gujarat, especially in Kachchh (Mittal 1993), demand for high quality traction animals has substantially decreased with farm mechanisation (see Chen 1991).

For those pastoralists who cannot obtain continuous affordable supplies of good quality forage, small ruminant production is the only remaining pastoral option. Seasonal migration appears to be an economically viable activity for households with large herds (Decision 5), whereas smaller herds (Decision 6) are likely to be maintained in the local area unless drought forces migration (e.g. during the latter years of the 1986-89 drought). In Gujarat, future remittances and caste political protection for trade may prevent the loss of ownership of herds by pastoralists (especially during drought) and prevent the wholesale conversion to the herding of livestock for absentee owners, a trend seen among sub-Saharan and North African pastoral households (e.g., Galaty 1992, Little 1987, Utah State University 1986), as well as in the Banni Grasslands.

Of course, this simple graphical theory cannot explain the evolution of the many production scenarios manifested among pastoral communities in Gujarat, especially those influenced by the rapid growth of urban centres and industry. Banjara donkey pastoralists have historically worked their animals in trade and construction, and many will remain associated with small building sites and excavations. In addition, pastoral milk cooperatives are being successfully organised near urban centres around the purchase of affordable, manufactured, composite feeds (Salzman 1989), prepared largely from agribusiness industrial

residue such as cotton-seed meal. Perhaps more profound will be the long-term effects on village livestock husbandry by remittances from pastoral household members drawn to manufacturing jobs in the many urban centres of Gujarat.

However, the effect of the emergence of agricultural production for Gujarat's industries on pastoral livestock systems is also difficult to determine. Large scale shifts toward oil seed production and other non-food crops that leave crop residues that are unpalatable to livestock (such as tobacco) are predicted (Phansalkar and Pandey 1991), while percentages of area under the traditional food grains, jowar and bajra millet, have been drastically reduced (>65% in Saurashtra since independence).

Conclusion

In closing, we submit that the example of pastoral production systems in Gujarat is a general model for the evolution of similar systems that lie within the margin of technically-driven agricultural expansion, where there are impediments and lags to transitions, i.e. out-migration and non-pastoral employment. This model predicts the persistence of pastoral systems geared toward outputs that are not highly demanding of nutrients, such as manure and wool. The continued existence of commercially-viable, extensive livestock systems that are milk and meat-oriented (rather than manure-oriented) will depend largely on their ability to:

1) maintain grazing land beyond the political dominion of potential agricultural and urban users (e.g., Juul 1992);
2) limit their own human population or the population given use-rights to that resource; and
3) closely manage the frequency, timing, and location of livestock grazing; or
4) secure political or economic leverage over supplementary, good quality feeds and residues.

Examples where graziers have succeeded with a common land agenda, or have created successful institutions to do so, are few. Even in the US, where graziers (western ranchers) were instrumental in creating a system of institutionalised grazing access to federal rangelands under rules that limit users and control animal use (Liebecap 1981), the political priorities of environmental and urban constituencies are rapidly displacing those of the grazier.

The populations of most developing countries, which are rapidly urbanising, are predicted to more than double their 1992 levels and some will triple before 2025 according to the UN Population Divisions medium projection. The enormous pressures to increase intensive food production and to expand crop land (Brown 1994), to harvest water and provide recreation, will undoubtedly impinge upon pastoralists who are now near the margin of crop production defined by rainfall, temperature and soil conditions. For the pastoralist, the

world community has learned too late the connections between natural resource dependent livelihoods and the most fundamental problems of sustainability: land use politics, population growth, and economic growth and change.

What can social and natural scientists whose careers are invested in pastoral systems do about this trend? Probably very little. Ultimately, the production relationships of many pastoral peoples in energy and land-poor societies will be similar to that of pastoralists throughout Gujarat: their livelihood will be sustained through servicing agricultural systems as agents for rapid nutrient cycling and nutrient transport. Should we not, then, apply our energies to this problem? In the final tally, we believe that the concept of a sustainable, highly productive pastoralism is likely to prove as meaningless as most developing country governments already believe it is.

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I DON'T NEED IT, BUT YOU CAN'T HAVE IT: POLITICS ON THE COMMONS

Arun Agrawal

INTRODUCTION

For much of the past several decades two opposed positions have dominated the writings on natural resource use. Many analysts have advocated substantial government intervention and direction in the management of natural resources (Hardin 1978, Ophuls 1973, and WCED 1987). Such partisanship is predicated on two beliefs: 1) that resources such as forests, fisheries, pastures, or underground water, bear important resemblances to public goods; and 2) that deregulated markets are not the best mechanism to achieve efficient outcomes where public goods are concerned. Centralised direction, according to this perspective, will help regulate people's behaviour and prevent over-exploitation of resources.

A second perspective accepts the public goods nature of natural resources, but draws precisely the opposite lessons for resource management in the face of the collective irrationality of the market (Demsetz 1967, Smith 1981, Welch 1983). The solution lies, proponents of the second perspective assert, not in attempting to remedy market failure by directing human behaviour through centralised rules, but in privatising resources and letting the 'invisible hand' shape outcomes into desired forms. The inefficiencies inherent in state intervention and bureaucratic centralisation can only be justified, if then, on grounds of national security or law and order.

In contrast to these two dominant paradigms to which resource managers and academics alike often subscribe, a significant minority has emerged in the past decade. These theorists analyse the possible role that local communities can play in the efficient and equitable management of natural resources. Drawing on the writings of the new institutionalists, and highlighting the role of institutional arrangements and rules devised by local communities, they suggest that successful resource management crucially hinges on institutions, that the dichotomy of public and private does not exhaust the possible forms that successful institutions can assume, and that communities are perfectly capable of creating and sustaining such institutions of resource use. In support of their arguments they have documented hundreds, if not thousands, of cases of successful and sustainable resource management by local, indigenous communities (Berkes 1989, Bromley 1992, McCay and Acheson 1987, McKean 1992, NRC 1986, and Ostrom 1990).

The arguments advanced by the proponents of communitarian management of resources have greatly advanced our understanding of the nature of resource

management problems. In addition, their research has provided a much needed balance by demonstrating the existence of alternatives to the heated arguments between the advocates of private property rights and central government intervention. In the context of increasing doubts about centrally sponsored development, and a growing faith in the environmental and development community about the relevance of decentralised, participatory strategies, their ideas seem to be gradually finding wider acceptance.

This paper, while accepting the main thrust of the arguments advanced by students of common property, seeks to point out a major oversight in the work of many theorists of this persuasion. Except for some notable exceptions, these theorists ignore local politics. The community institutions they describe seem to be harmonious ideals, untouched by such human frailties as are embodied in hierarchical structures, political machinations, and jealous behaviour. In ignoring the politics inherent in the formation and functioning of all institutions that allocate resources, and in championing the cause of community institutions, common property theorists have fallen prey to the same mistake committed by early neo-institutional writers such as Alchian (1950, 1973), Barzel (1977, 1989), Cheung (1970), Demsetz (1967), Furubotn and Pejovich (1974), de Alessi(1980, 1983), and North (1980). These early writers argued that more efficient (read private) property rights will come about as the value of a resource increases. They thus ignored the role of politics in creating institutions as well as in deterring the creation of new institutions. Many theorists of the commons similarly valorise the ‘little community’ to the point where it seems that life in these communities is untouched by political manoeuvres; that local populations know best; and that there would be no victims if only the state stopped intervening into local contexts. Such a view simplifies the complexity of interactions among different groups at the local level. By implication it pits the state against the local community, investing the state with a monolithic rationality, intentionality and structure. Worse, it sees the actions of local resource users as occurring primarily in reaction to external influences.

This paper examines politics and its role in the formation of institutions around the ‘commons’. A number of property rights theorists, of course, have pointed out the relevance of political considerations in considering institutional origins and resource allocation (Bates 1988, 1989, Libecap 1989, North 1990). The following argument, however, goes beyond much of the existing literature by describing how distributional struggles between rival factions can lead to new institutional arrangements that leave *every faction worse off* as compared to outcomes under earlier arrangements. More broadly, the paper describes the interlaced elements in the relationships within local communities, and how different state institutions permeate communities to provide both an arena and the resources which mark local political struggles.

The setting for the study is a village in semi-arid Rajasthan in India. The actors are settled farmers and their caste factions. I analyse the process of institution formation in Patawal village[11] with respect to the struggles among local factions over distribution of fodder and fuel wood from the village common, the *oran*.[12] This account of the factional struggles in the village hints at the ubiquity of resistance to existing inequalities in the distribution of power and resources. It also underlines the limits of 'everyday resistance' (Colburn 1989, Genovese 1974, Scott 1985, 1990).

The argument in the paper proceeds through the following steps. I first introduce the village and its two major factions - the landholders and the animal owners. The second part of the paper examines the extent to which political activity in Patawal is and has been influenced by state policies. Finally, using the information on the village and the relative autonomy of local politics, I discuss how distributional struggles contribute to institutional change in Patawal. Institutional change can be viewed as an attempt by political actors to consolidate their existing power, an investment into the future. I suggest that different factions, when they compete over the same resource, attempt to change institutions but not necessarily to increase their benefits. Rather, a particular faction may be willing to change institutional arrangements so as to increase its *share* relative to other factions - even if the new institutions were to reduce the *absolute amount* available to all factions, including the group that initiated the change.

THE VILLAGE AND ITS FACTIONS

Patawal is located close to the district administrative headquarters,[13] the city of Jodhpur. Situated in the drier, flatter part of the district, the landscape of Patawal is disturbed only by *nadis*, tanks dug in the village common to conserve rainwater for drinking during the dry season. Water from the tanks and from an old well are crucial to the villagers, especially during the dry season when the government pipeline for drinking water is often broken by migrating shepherds.

The village common, the *oran*, occupies 225ha, approximately a quarter of the cultivated area. Most of it is located close to the main settlement of the

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[11]The real name of the village has been disguised.

[12]The word *oran* (also *Auran*) derives from the Sanskrit word *Aranya* which literally means forest or wilderness. *Orans* are sacred groves of trees, often set aside during the feudal period in Rajasthan for religious purposes (see next section). Villagers still regard trees on the *oran* with some religious significance. However, today for the most part, *oran* simply denotes common land with trees and some grass cover on it.

[13]A district is an administrative division in India. Each district comprises approximately one thousand villages and has an average population of two million.

village. The common is an administrative as well as an ecological unit. Orans have existed for longer than people can recall. (Brara 1987). The *oran* also is distinguishable from cultivated fields by its surface which has not been ploughed for centuries, and by the relatively higher density of trees and shrubs. For many villagers and their animals, the common and its vegetation represent sources of important benefits. Its small trees provide fuelwood and fodder; its grasses, fodder for cattle and sheep. Some lower caste villagers also use some grasses for making ropes, bedding and cushions for their furniture.

The village contains 212 upper and lower caste families (see Table 1). Between 1981 and 1988, the number of households increased by almost 25% (verbal communication from the village *patwari*).

Table 1: Caste distribution of livestock ownership in Patawal

Caste	Number of Families[1]	Cattle[2]	Sheep/Goats[2]	Camel[2]
Raika	57 (27)	22 (0.4)	2870 (50)	66 (1.2)
Meghwal	38 (18)	24 (0.6)	55 (1.5)	NA
Patel	27 (13)	49 (1.8)	18 (0.7)	NA
Bhil	24 (11)	8 (0.3)	152 (6.3)	4 (0.2)
Charan	14 (7)	42 (3.0)	97 (7.0)	1
Sargara	12 (6)	5 (0.4)	21 (1.8)	NA
Brahman	4 (2)	9 (2.3)	3 (0.7)	NA
Rajput	3 (1)	8 (2.7)	NA	NA
Others	33 (16)	39 (1.2)	22 (0.7)	NA
Total	212			

The two more numerous castes, *raikas* and *meghwals* (both of whom are scheduled castes),[14] make up nearly half of the village population. *Brahmins, rajputs and charans*, the upper castes, form just 10% of the population. The *patels* are primarily an agricultural caste and count themselves among the upper castes. Numerically they are the largest of the higher castes. Over the last thirty years they have succeeded in assuming a significant position in local politics. The factional struggles that I recount and analyse, took place between the *patels, rajputs, charans* and *brahmins* on the one hand, and the *raikas* on the other.

[14]Scheduled castes are so called because they are listed in the Indian Constitution as oppressed and disadvantaged castes. The Indian state has undertaken to target specific programs - e.g. affirmative action, job reservations - to improve their socio-economic status.

The *raikas* are chiefly animal owners. This, apart from their lower caste status, separates them from the *patels, charans, rajputs* and the *brahmins*. As Tables 1 and 2 show, there is a large difference in the animal- and land-owning patterns between the *raikas* and the higher caste groups. Let us first consider Table 1 again. It reveals divisions between *raikas* and other castes in the species of animals owned. We see that *raikas* own almost 90% of the sheep and more than 90% of the camels in the village. Yet, they form only 27% of the population. Cattle holding in the village is somewhat more evenly spread out among the different castes. The four higher castes (*charans, brahmins, patels and rajputs*) together own just about 50% of the cattle in the village. They form 23% of the village population.

The landholding pattern is highly skewed in favour of the four higher castes (see Table 2). The *charans* and the *patels* have the highest per household landholding figure in the village: 10.2ha per family.[15] The rest of the village households own 3.3ha of land on the average. The *raikas* possess just 2.1ha of land per household.

Of the various castes in the village, the *sargaras*, the *bhils* and the *meghwals* occupy the lower position in the caste hierarchy. After 40 years of Indian independence, their economic status remains congruent with their social position. They hold a little more land on the average than the *raikas*. On the other hand, they possess very few animals. Caste inequalities in land and animal holdings are further accentuated by the fact that just a few families in each caste hold most of the land and animals of that caste. For example, just 20% of the *raika* families own more than 50% of the camels and sheep in the village. Similarly, less than 10% of the upper caste households own more than 50% of the land and cattle held by the upper caste families.[16]

The inequalities between the upper caste families and the *raikas*, in terms of their land and animal holdings, have an important effect in polarising the interests of the two groups, especially when it comes to harvesting benefits from the commons. To understand how the unequal division of land and animals affects the interests of village caste groups in the village common, the *oran*, we need to look at the economic activities of the villagers.

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[15]I use household and family interchangeably in this work.

[16]The same pattern of inequalities in landholding is revealed if we consider the village as a whole. The bottom fifty percent of the households own less than 15% of the cultivated land in the village. But the top 20% own fifty-six percent of the cultivated land in the village.

Table 2: Land Distribution according to Caste Groups in Patawal

Caste	Area Owned (ha)	Households No. (ha)	Per Family Holding
Raikas	120	57	2.1
Meghwal	170	38	4.5
Patel	264	27	9.8
Bhil	40	24	1.7
Charan	155	14	11.1
Sargara	3	12	1.9
Brahmin	34	4	8.5
Rajput	10	3	3.3
Others	167	33	5.0
Outsiders	73	12	6.1
Total	1056	212	5.0

Source: Patwari Records, 1987.

Most families in the village rely on agriculture. Almost all households possess and cultivate some land. The major crops in Patawal - millets, fodder crops, legumes, and some oilseeds, are cultivated during the summer monsoon. To take advantage of every bit of available moisture after the first showers have fallen, farmers use tractors instead of bullock-drawn ploughs since tractors are much faster. Once crops are sown, they mature quickly, within eighty to ninety days. For the rest of the year, all fields in Patawal lie fallow.

None of the fields in the village are enclosed. Although cultivated fields are private property, they become common property for the purposes of grazing during the fallow period (there are thus two types of commons in Patawal, the *oran* and the post-monsoon fallow). The treatment of fallow as common is not a phenomenon particular to Patawal. Most villages in the dry regions of India lack irrigation and have only one cropping season. Therefore it makes sense to treat privately-owned fallow as common in the post-monsoon period when no crops are standing in the fields (see Dahlman 1980 and McCloskey 1990). Because of open access after the harvest, fallow becomes an important source of fodder for both the upper and lower castes. It does not seem that the lower castes benefit more from the fallow than do the upper castes (but see Jodha 1987, 1988). Almost all caste groups in the village maintain cattle. Further, the cattle owned by different caste groups roughly match the proportion of land owned by that group. Inequalities in cattle ownership parallel landholding inequalities (see Tables 1 and 2). The grazing patterns for the cattle and other

village animals demonstrate that open access to the *fallow* for grazing confers no extra benefits on any caste group in the village.

Most villagers graze their animals on the open fallow from November to May. In this period, chiefly cattle are present in the village because the *raikas*, who own almost all the sheep and camels in the village, leave for their annual migration cycle. Of the few sheep that are left behind in the village, many browse on the vegetation on the *oran* rather than on the crop stubble in the fields. Cattle, on the other hand, seldom graze on the *oran* after the monsoons because the vegetation quickly deteriorates to an extent that makes it unsuitable for cattle. As the fodder available to the cattle from the crop stubble in the fields declines with the approach of summer, more and more cattle are fed from private fodder stocks. Families that do not have sufficient stocks usually purchase fodder from neighbours and neighbouring villages.

With the onset of the monsoons, the private fields are sown with crops and closed to grazing. Some of the cattle, then, begin to graze in the *oran*.[17] A few farmers set aside a part of their land for pasturage, but only a minority have surplus land to set aside for pasture. Therefore a large proportion of the households rely on the vegetation in the *oran* during the monsoon months to feed cattle. While both higher and lower castes rely on the *oran*, upper caste families can also feed their animals from private fodder stocks and crop residues.

The *raikas* return from their migration just around the beginning of the monsoons. At this time the sheep population of the village increases enormously. The same situation is replicated in other villages around Patawal since the *raikas* of these villages also return from their migration cycle at the same time. Almost all their sheep browse on village commons. As a villager described it, in the monsoon months, the *oran* is so filled with sheep that it resembles ‘the back of a flea-ridden dog.’

There exists a distinct difference in the extent to which the *raikas* and the higher caste groups rely on the *oran* and on private fallow for fodder. The upper castes own cattle which graze on the *oran* only for a short period during the year. For most of the time, the cattle are either fed from private sources, or on the private fallow which turns into common property after the harvest. The *raikas* on the other hand are sheep owners. They are absent from the village for the main part of the year, but return for approximately four months. In this

[17]During the monsoons, approximately 30% of the fodder needed for the cattle comes from the *oran* and the rest from private stocks of fodder. After the monsoons are over, cattle usually graze on the fallow and are stall fed. Pregnant and lactating cows are always stall-fed. In addition to the usual hay, they are also fed green fodder, some enriched cattle feed, and traditional medicines to improve milk yield (Household Survey, 1989-90).

period, the vegetation on the *oran* is crucial to the survival of their sheep and their household because they possess little land that could be spared.

Where benefits from the *oran* are concerned, unequal land and animal holdings *between* castes *polarise caste interests.* The *raikas* would like the common to be as large as possible so that their sheep can graze during the monsoons. Any reduction in the size of the *oran* directly reduces the fodder availability for their sheep. Other groups in the village, especially the richer landowners, are not strongly affected by reductions in the size of the *oran*. At the same time, as we shall see, inequalities of wealth and assets *within* a caste facilitate joint political action to improve the benefits for the entire caste. We will see that the events that led to institutional change were precipitated by the more powerful and influential members within the *raika* and the landowning castes.

Different factions in the village gain fodder from the commons (the fallow and *oran)* in proportionately different amounts. But fuelwood from the two types of common lands is harvested by village households relatively more equally. A large proportion, nearly 70%, of the fuel needed for cooking is gleaned from fallow once crops have been harvested. Almost all village households use twigs, branches and crop residues rather than wood logs. The women and female children of the household gather them from the *oran* and the fallow. But these are collected more often from the fallow than from the *oran*.

POLITICAL PROCESSES

Historically, Patawal was a part of the feudal state of Marwar. Erstwhile patterns of administration and land use profoundly influence the present day dynamics in the village. Local institutions, especially the informal village *panchayat* and the caste panchayats function on principles that date back three to four hundred years. To appreciate the autonomy of local institutions today, it is necessary to investigate their historical roots. The history of institutions of resource use trapped in the collective memory of the villagers inspires many of the rules that villagers use currently to conserve resources.[18]

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[18]One of the most intriguing rules used by villagers, for instance, requires individuals who break rules for using the common, to feed birds. To punish individuals who cut wood or grasses on the *oran*, the informal panchayats require them to stand in the village square and feed seeds/grains to birds. Although the rule has historical roots, many panchayats still follow it. In the current context the rule makes sense only as an act of altruism. Three facts, juxtaposed together, provide the rule with an economic rationale. One, birds often deposit undigested seeds in their droppings - thus birds are efficient seeders. Two, the *orans* date back to the feudal period when even petty lords controlled large areas, and many *orans* lay within their domain. Three, the lords would be concerned to protect and enhance vegetation all over their fief. An obvious inference from these three facts is that the rule for feeding

Three historical factors prove to be important in analysing how community resources are utilised in the village today: 1) that Patawal was part of the *khalsa* lands in the feudal state of *Marwar*;[19] 2)that local community institutions vigorously enforced social and economic decisions at the grassroots level; and 3) that traditional rules guided resource use on the commons.

Prior to Indian independence, the princely state of *Marwar* was administered feudally with the king at the top and a congeries of nobles called *jagirdars* (fiefholders) below him (Upadhayaya 1973). In principle, the nobles held their domains, the *jagir* lands, at the pleasure of the king, and had to fulfil several conditions to remain in office (Sharma 1977, Sharma 1972). In practice, however, they ruled as mini kings administering their fiefdoms without much hindrance by the centre. They appointed their own officers to collect revenues, to police the villages, and to dispense justice in their lands. On *khalsa* lands, however, the crown's decrees held sway, unmediated by the authority of local lords.

A large number of institutions influenced the social and economic life in the villages on *khalsa* lands. Informal panchayats and caste panchayats were two of the most important institutions that prescribed rules for social behaviour and guided the behaviour of villagers on resource use. Informal panchayats still persist in many villages, albeit in a somewhat attenuated form. In *Patawal* this informal body comprises ten elder and respected residents of the village. It settles minor disputes among villagers and presides over significant events.

The informal *panchayat* also manages the local common resources, something that again has historical roots. In most villages in Jodhpur state some land was reserved for communal grazing (Patwa 1989). All such land was controlled by the panchayats. They also possessed and managed other common resources. Some of these resources were naturally given (pastures, forests), some provided by the feudal lords (*orans, nadis*), and for others such as drinking water wells, the *panchayat* could undertake construction activities.

Jodha (1990) details some of the rules that regulated grazing access to the community grazing lands. According to him, scattering of watering points evenly in the grazing areas, deliberate rotation of grazing, periodic restriction on some types of animals, use of watchmen to prevent villagers from breaking rules, auction of rights to dung collection, top feed lopping, and restrictions over cutting wood were some of the more prominent ways in which villagers protected and conserved commons. Often the panchayats also levied user fees.

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birds was created by feudal lords to improve vegetation on the *orans*. Today, when commons are small, villagers do not necessarily gain the benefit of indirect seeding by feeding birds.

[19]Villages directly controlled by the crown were known as *Khalsa* villages. Villages granted to the nobles were called *jagir* villages.

The revenues gathered through user fees and taxes went to a village fund and were used for public purposes.

Orans were usually dedicated to a local deity which was supposed to protect the villagers and their animals. A number of rules regulated the use of *orans*. Over time, as the influence of the feudal state declined, many of the rules lost their force. This is the substance of a number of studies carried out by Anantram (1988), Brara (1987) and Jodha (1985). They argue that after India's independence in 1947, existing rules lost their force especially quickly. Jodha (1985: 255) studies two villages in Western Rajasthan and concludes that out of nineteen rules that villagers used for managing commons in the past, only two survive today. Anantram also contends that local panchayats have become less effective in implementing rules for conserving common resources. This study, however, shows that at least for Patawal, the erosion of community institutions has not proceeded apace. In the last fifteen years, the formal village council has attempted to resurrect the rules for utilising the commons. Its efforts have been crowned with some success.

The formal village council[20] is quite different from the informal *panchayat* discussed earlier. It constitutes one of the most obvious forms of state intervention in local political processes. Mandated and funded by the state, the council is an elected body that carries out developmental tasks in the village. It is a multi-village council and is responsible for welfare activities in Patawal and four other villages. Through more than 500 near unanimous resolutions in the past twelve years, the thirteen council members have voted to construct local schools, lobbied the government to provide drinking water to the villagers, and undertaken relief works during droughts.

The head of the council is called the *sarpanch*. Its twelve other members, each called a ward *panch*, are chiefly upper caste members (*patel, rajput, bishnoi*, and *charan*). Ten are elected and two nominated. The nominated members must come from disadvantaged or lower caste groups. All the elected ward *panches* except one - a *raika* - are from higher castes. The two nominated ward *panches* are a lower caste woman and a *meghwal*. The resolutions of the council have for the most part been unanimous, although this trend has changed a little in the past few years.

The mutual compromises that the upper castes have crafted to ensure cooperation include an understanding that on relief and construction works financed by the state government, the upper caste villagers will be the primary employees. The amounts involved are not trivial, exceeding Rs.15 000 in six of

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[20]From this point I will refer to the informal *panchayat* comprised by village elders as the 'informal *panchayat*'. The formal, legal, elected body of villagers, on the other hand, will be called the 'village council', or simply the 'council'.

the last ten years.[21] For the eighty or so upper caste families in the village, this represents fifteen to twenty days of employment in the summer, when agricultural work is non-existent.

Only fourteen of the 512 resolutions that the *panchayat* has passed concern the *oran*. Six aimed at converting part of the common into land for settlement. Two petitioned the government to remove encroachments. Three detailed sanctions for individuals who illegally harvested wood, and the remainder aimed at improving grass and tree cover. The last six resolutions occupied the centre stage in the political struggle which led to changes in the institutional arrangements guiding use of fodder and fuelwood from the *oran*.

CHANGE IN THE INSTITUTIONAL ARRANGEMENT

The vegetation cover on the common in Patawal is superior to that for the *orans* in most neighbouring villages. There are many more trees and they are less severely lopped. When asked the reason, villagers stated that trees are sacred objects, especially the *khejri* tree (*Prosopis cineraria)*. They should therefore be preserved, not cut. But they also admitted that prior to the concrete steps taken by the village council and the informal *panchayat* in Patawal the vegetation on the common was declining. Clearly, to make people translate their feelings of respect towards trees into protective behaviour, reinforcement is necessary. Reinforcement can adopt several forms: new protective rules, economic incentives, or strengthened norms. The village council undertook to protect vegetation by creating new, enforceable, rules.

Beginning from 1979, the council initiated resolutions that restricted the access of different villagers to the common. Although the new rules restricted the access of different caste groups equally, they more adversely affected those caste groups which depended on the common to a greater extent. These were the *raikas*. We saw in the first section that since they own sheep, and since sheep browse chiefly on the *oran*, restrictions on access to the *oran* would affect the *raikas* more than other groups. The political process whereby the village council accomplished its objective of restricting access to the common is interesting and instructive. The higher, land-owning castes combined with the *meghwals*; forced the *meghwals* to vote against the *raikas* in the local council elections; and used their dominance in the elected council to reduce the area of the *oran* and effectively reduce benefits from the common to the *raikas*.

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[21]These figures were extracted from the Panchayat's accounts. Daily wages for unskilled labour typically lay between Rs. 10.00 and 15.00 per day in 1980. Thus Rs. 15,000 created about twelve hundred days of employment in the village. (Twenty-nine rupees equal a dollar).

In 1979 the council passed a resolution which banned villagers from cutting green wood from tree species such as *ber* (*Zizyphus nummularia* and *Zizyphus mauritania*) and *khejri*. This was not a unique incident. Several similar resolutions had earlier been debated on some occasions. There was, however, one difference this time. Coupled with the passage of the resolution to restrict villagers from cutting wood, council members debated whether part of the *oran* should be fenced to prevent animals from entering it. The debates in the *panchayat* assumed a new meaning in 1979 because of certain developments that took place in the civil and revenue courts of the state, and because around this time the state government began to consider a new forest bill. The sequence of these developments can be briefly described.[22]

The Rajasthan Tenancy Act (1955) and the Allotment of Land for Agricultural Purposes Rules, (1970), specify that certain village lands cannot be converted into agricultural land. Pasture lands, lands covered by water, lands reserved for village forests and lands earmarked for purposes of public utility fall under the provisions of these two statutes. These statutes safeguarded the interests of animal owners in Rajasthan by ensuring that grazing lands for their sheep will not be privatised into agricultural land. A series of court decisions between 1961 and 1977 further strengthened the principle that certain categories of land in the western dry districts of Rajasthan could not be used for agricultural purposes. In the case of Nanu Ram V. State of Rajasthan (1961), the Board of Revenue decided that 'grazing lands which were recorded as such ... were to be frozen as *charagah*[23] lands. In Ram Singh V. Parmoli (1971), the courts reversed the decision that grazing lands could not be diverted for agricultural purposes. But this reversal of the earlier decision did not apply to grazing lands in the semi-arid Western districts of Rajasthan. Therefore shepherds in districts such as Jodhpur, Barmer, Bikaner, Jaisalmer, and other western districts were still safe. In Durga Prasad V. Pannalal (1977), it was reiterated yet again that all lands in the villages that were unassessable for revenue were exempt from conversion into agricultural land. The *oran* in Patawal, recorded as community grazing land in land settlements prior to independence, was exempt from conversion into private cultivated land. Safe were the interests of the *raikas*.

However, in the late 1970s, a new forestry bill began to be considered by the government. This bill contained a provision through which common lands in a village could be enclosed so that the vegetation cover could improve. According to the provisions of this bill, once a formal *panchayat* in a village passed a

[22]I am indebted to Brara (1987) for the discussion in the following paragraph.

[23]*Charagah* literally means an 'area for grazing'.

resolution to enclose a part or whole of the village common, government forest departments or some other government agencies could fence the common and help the village council plant trees. In addition to fencing and planting the common land, the forest department would also provide the council with funds to hire a guard to protect from grazing the planted saplings.

The *raikas* in Patawal were (and are) completely against any enclosure of the *oran*. In the elections for selecting ward *panches* for the formal *panchayat* in 1982, they put up two candidates. They believed that once their candidates were elected, they could attempt to persuade the rest of the members of the *panchayat* to desist from enclosing the common lands. They could also go to meet higher level district authorities and as members of the *panchayat*, their word would carry greater weight.

A second factor was possibly more instrumental in orienting the *raikas* toward putting up their own candidates. The village council was and remains the conduit for much government largesse in the form of funds that the state disburses as development expenditures. The council uses its funds primarily to hire individuals belonging to the upper castes. The *raikas* hoped that by sending two candidates to the council they might get a share in the employment opportunities created each year. They had reason to entertain some hopes of success in the elections. Numerically, they are by far the largest caste group in Patawal. Although Patawal is a multi-village *panchayat*, they expected to get some support from the other lower caste groups in the village. These were the first elections in the village in which a lower caste group had threatened the unchallenged domination of the *panchayat* by the upper caste groups.

The hopes of the *raikas* proved illusory. The first effect that the *raika* candidates had on the upper castes was that it united the *patels*, *charans* and *rajputs* against the *raikas*. The threat to their monopoly on government funded jobs was sufficient to forge a front that ultimately succeeded in scotching the danger. Once united, the upper caste, landowning faction in the village, reacted predictably. It tried each of the four strategies prescribed by *chanakya*:[24] *Saama* (cajoling or persuasion); *daama* (bribes); *danda* (threats) and *bheda* (dividing the enemy), in negotiating with the *raikas* to prevent them from putting up any candidates. None worked.

Then the upper caste faction used a carrot and stick policy with the other major lower caste group, the *meghwals*, in the village. If the *meghwals* voted for the *raika* candidates, the upper caste group threatened, they (the *meghwals*) would never again receive employment on the farms of the *patels* and the

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[24]*Chanakya* was prime minister to the first Indian Emperor - *Chandra Gupta Maurya* who ruled from 323 to 300 B.C. As his advisor, *Chanakya* gained the reputation of being the greatest diplomat in Indian history. His reputation has not yet faded.

brahmins. When the election returns came in, only one of the two *raika* candidates had been elected.

Although the *raikas* had got their way, their attempt to enter the village council polarised the landowning castes against them. Over the course of the next five years, the council passed five resolutions that effectively restricted the access of villagers to the common and enclosed 30% of the *oran*. The *raika* representative in the *panchayat* duly voted against these five resolutions. Apart from indicating a voice of dissent, his vote had little other effect. The newly elected set of council members passed a resolution in 1982 which disallowed villagers from cutting trees on the common without first obtaining permission. Between 1982 and 1987, the council passed three resolutions through which it enclosed 70ha of the common. Trees have been planted on the enclosed land with the help of the forest department and the Centre for Arid Zone Research Institute (CAZRI) in Jodhpur. The area is enclosed by barbed wire and none of the village residents are allowed to graze sheep or cattle in this part of the common.

Finally, in the beginning of 1987, the village council passed a comprehensive resolution that fixed precise and graduated fines for offenses involving the cutting of wood on the *oran*. Where wood could be recovered from the offenders, the council handled the matter directly. In cases where wood could not be recovered, the council could call in the police. To enforce the rules it appointed a five member committee consisting of one ward *panch* and four prominent villagers. Members of this committee were not paid, nor were they supposed to act as guards. Their primary task, rather, was to arbitrate disputes among villagers over the use of the common. In the same meeting the council also specified that money collected as fines would be used for collective welfare within the villages. Further, the amount of fines in specific cases could be reduced at the discretion of the council. The informal *panchayat* plays an important role in enforcing rules and protecting the trees within the village boundary. It comprises one representative from each of the major castes in the village and two representatives each, from among the *patels* and the *charans*.

The relationship between the multi-village, formal-council and the informal *panchayat* is difficult to pinpoint exactly. There are no defined areas of authority and influence for the informal *panchayat* in Patawal. It has no legal standing and no formal powers of enforcement. Within the village, however, its word carries considerable weight. Since it is composed of the elder residents it is difficult to defy their decisions unless villagers want to cut themselves off from the village community life.

The informal *panchayat* meets regularly. The meetings serve two purposes. The *panchayat* reaffirms rules about cutting of trees in the *oran* and on private fields. At the same time, it usually also selects one or two guards for the village

(or confirms the existing guards in their position). The guard is entrusted with the dual function of preventing outsiders and villagers from cutting wood in the *oran* and in private fields. He is paid a salary by the village families collectively. While the formal multi-village council is officially responsible for auctioning dry trees from the *oran*, in practice it is the informal *panchayat* that oversees this task. It also retains the revenue from the sale of dry trees and uses the money for public purposes in the village.

The effect on different village groups of the rules that prevent them from cutting wood is similar. Few differences mark caste groups in their fuelwood consumption patterns (but see Jodha 1986, 1987). However, because the *raikas* and the landowning castes in the village differ substantially in the animals they possess, the rules restricting fodder use from the *oran* have adversely affected the *raikas*. Indeed, 30% of the *oran* was fenced precisely because the landowning groups dominating the formal village council knew that the new rules would affect the *raikas* unfavourably. The new institutional arrangement was created to show the *raikas* who was the boss in the village. The new arrangement, as one *raika* put it, also hit the shepherds where it would hurt the most - in their stomachs.

When 70ha of the *oran* land were fenced, the benefits to the upper landowning castes declined a little because during the monsoons some of their cattle graze on the *oran* (see Table 3). The reduction of benefits to the *raikas*, however, was comparatively much greater.

During the monsoon months, the vegetation in the village *oran* forms the only source of forage for the *raikas'* sheep. The fields which lie fallow during most of the year are planted with crops during the monsoons. The fencing of a large part of the *oran* has reduced substantially the benefits available to them from the commons in the village. Today, six more *raika* families have been forced into migration as a result of the fenced *oran*. The landowners in Patawal not only reduced the economic benefits to the shepherds, they also reduced the threat of future challenges in the *panchayat* by forcing many of the *raikas* to stay out of the village for longer periods and thus be even less of a force in the electoral politics in the village.

Fencing the common has reduced present benefits to all groups in the village. It has also not increased future streams of benefits from the *oran* to the villagers. The forest department planted most of the trees on the *oran*. Survival rates for trees are as low as 20%. After five years, survival rates of less than 5% are common[25] in other parts of the district where the forest department

[25]Indeed, in many parts of Rajasthan the forest department has stopped recording survival rates of trees because of its abysmal performance in protecting planted seedlings. The department only records the number of trees it planted as its performance indicator.

undertook plantation programs. The fenced part of the *oran* is distinguishable only because of the broken fencing that surrounds it; not because it has a higher vegetation cover. It seems clear then, that not only have present benefits to all groups declined in the village, proportionately more precipitously for the *raikas*, but also that none of the village factions can hope to reap greater benefits in the future.

Table 3: Grazing days lost as a result of fencing the common

Caste Group	Grazing days[1] available on the common		Days lost
	Before Fencing	After Fencing	
Higher castes (patel, charan brahmin, rajput)	8238 (171)[2]	5675 (118)	2562 (53)
Raikas	70897 (1243)	48840 (856)	22056 (387)
Lower Castes (bhil, sargara, meghwal)	7770 (105)	5342 (72)	2417 (32)

[1]One grazing day equals one livestock unit grazing for one day (Five sheep/goats = 1 livestock unit).
[2]Figures in brackets are grazing days for each household.

Assumptions:
1. During the monsoon months, the sheep graze on the *oran*.
2. During the monsoons, 70% of the fodder requirements for the cattle are met out of private stocks for all villagers
3. After the monsoons and harvest, sheep graze on the *oran* 25% of the time.
4. The fenced area of the common possesses, on the average, the same level of productivity as the unfenced area.

CONCLUSION

This paper set out to accomplish three tasks: 1) to show the importance of political struggles in the 'little community'; 2) to show that the formation of new community institutions, and the distribution of benefits through such institutions are strongly governed by political tensions; and 3) that for competing factions in a 'community' it is not the absolute level of benefits that is important in bringing about institutional change. Rather, rival groups compare each other's relative share of the benefits and react to bring about changes when their

existing shares are threatened. The changes they effect may actually reduce benefits to all factions. The story of the *raikas* and the land owning, upper castes in Patawal illustrates and confirms this statement. In so doing, it resonates with wider issues.

Much of the literature on local communities and peasants attempts to understand their societies primarily in relation to the state and the market. It is certainly true that the state and its policies greatly influence internal relationships within peasant groups. The possibility of reducing the grazing benefits to the *raikas* arose because of the presence of the village council, a structure introduced into the village politics by central fiat. The *raikas* attempted to alter the existing political balance in the village by seeking representation on the council because of the resources that the central government disburses through the same institution - the village council.

But the peasants, larger landowners, and livestock owners do not just react to policies and rules that central governments enact. The different groups in the village attempt to use the intrusions by the state to enhance the position of their own coalition in the ongoing and shifting struggles against other groups. State interventions create new spaces where older differences can be played out anew by constant re-testing and in fresh contests. The state interventions thus enable existing conflicts to take place on new terrains, rather than creating such conflicts. The landowning castes in the village were not content to simply defeat the attempt by the *raikas* to gain a place in the council. That would have been a simple enough matter. They also undertook, by enclosing the common, to reduce the future possibility of similar threats. By reducing the grazing available to the sheep in the village, they forced more of the *raikas* to migrate longer; indeed, they forced those *raikas* who had larger sheep-holdings and who were respected more to migrate longer. The absence of these more powerful sheep owners consolidates their gains in village politics.

The paper, in outlining the processes that factionalise and divide local ‘communities’, highlights local politics. For the rural resident, the nature and outcomes of local politics create a far greater impact on livelihood. Such politics exists independent of external interventions. As it always has, and will. State interventions, whether to develop or conserve, provide supports that can facilitate new coalitions, new alliances, new contests and new resistances. The enclosure, thus, must be seen, not simply as an attempt to preserve the vegetation on the common, but as one of the political weapons that could be used to settle, for the time being, an ongoing struggle for power and position.

The paper reveals the pervasive nature of challenges to persistent constellations of power and status. Subaltern groups, whatever the perceptions of those commanding resources, constantly attempt to modify the relations of power that structure their lives. At the same time it shows that resistance by itself is insufficient to alter existing inequalities. Without external support, or

extraordinary mobilisation and organisation, everyday resistance usually fails to transform the structural conditions that allocate costs and gains from local resources. Finally, the political processes and outcomes in Patawal accentuate argument that all attempts at conservation and development are ineluctably political.

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