

IASOP

8/18/95
WORKSHOP IN POLITICAL THEORY
AND POLICY ANALYSIS
513 NORTH PARK
INDIANA UNIVERSITY
BLOOMINGTON, IN 47408-3895 U.S.A.

**Nationalisation and Privatisation of Arid
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Resources Management in
Western Rajasthan
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N. Shanmugaratnam

Centre for International Environment and Development Studies
Noragric
Agricultural University of Norway
5002 1432 Aas
Norway

Paper Presented at the Fifth Conference of
The International Association for the Study of Common Property
Reinventing The Commons
24-28 May 1995
Bodø
Norway

12/05/95 10:00 AM
SHANMUGARATNAM
NORAGRIC
AGRICULTURAL UNIVERSITY OF NORWAY
5002, 1432 AAS, NORWAY

Nationalisation and Privatisation of Arid Lands and the Dilemmas of Common Resources Management in Western Rajasthan, India¹

N. Shanmugaratnam

Centre for International Environment and Development Studies, Noragric
Agricultural University of Norway
5002, 1432 Aas, Norway

Abstract

Nationalisation of land and the creation of modern forms of private property for agricultural expansion along with rising population densities have caused continuous decline in availability of common resources and undermined possibilities for collective action. The failure of policy to provide appropriate environments to enable endogenous evolution of common resources management institutions in the changed circumstances has had far reaching effects on the sustainability of arid ecosystems and on the rural poor. This paper addresses these issues in the arid zone of Rajasthan, India. It places the Common Resource Management (CRM) Problem in a historical-institutional perspective and provides a microanalysis of the commons question in the arid zone. It concludes by highlighting the current dilemmas of CRM and possible directions for policy intervention.

Introduction

Arid and semi-arid areas of the earth occupy more than five billion hectares and are the habitat and source of livelihood for about a quarter of the world's population (UNEP 1992). Pastoralism has been the most dominant and sustainable form of land use in arid areas. Livestock production relied on utilisation of biomass from rangelands which were used as common resources (CRs). It continues to be a major type of resource use in arid areas to this day. However, development policies and demographic and technological changes have contributed to a trend of privatisation of land and agricultural expansion in many arid parts of the South. Availability of water for irrigation from underground sources or via diversion and damming of rivers has dramatised this trend in some areas. A direct result of these developments is the continuous shrinking of CRs in absolute and per capita terms in arid areas. The same factors have also contributed to the decay and breakdown of traditional common resources management (CRM) institutions. Land policies, including land reforms, have tended to be preoccupied with the institutionalisation of modern private property while neglecting the task of creating an enabling environment for the evolution of new CRM institutions (Shanmugaratnam et al 1992, Shanmugaratnam 1994). Under such conditions, rising livestock densities can lead to accelerated degradation of CRs.

¹Paper presented at the Fifth Annual Common Property Conference of the International Association for the Study of Common Property, 24-28 May 1995, Bodø, Norway

The present paper addresses the commons question in the arid zone of the state of Rajasthan in India.² The state was formed in 1949, after the independence of India, by the amalgamation of many disparate princely states which remained outside British India. It has experienced a series of State interventions which have altered the land use and tenurial systems with serious environmental consequences to both private property and common resources. Nationalisation and privatisation, the two main planks of land tenure policy in the state, have reduced the customary CRs to a fraction of what they were in the pre-reform period. One of the most obvious features of arid Rajasthan is its population density which at 80 per sq. km (1991) is among the highest for arid zones of the world. Within the arid zone, the population density ranges between the extremes of 9 in Jaisalmer in the most arid west and 264 in Jhunjunu in the less arid east where it approaches the national average of 267 persons per sq. km. In the 1981-91 inter-censal period, the arid zone's population grew at 2.58 per cent per annum which exceeded the growth rates of both the state (2.47 per cent) and the country (2.11 per cent) for the same period. The arid zone had 17.44 million people at the 1991 census. Its livestock populations have been growing too, though subject to fluctuations due to variations in weather, mainly rainfall. For instance, the zone's total livestock population (cattle, buffalo, sheep, goat, camel and others) grew at a compound rate of 2.26 per annum between 1977 and 1986 from 18.9 million to 23.12 million but then dropped to around 16.3 million in 1988 due to a severe drought in 1987/88. In the past decade, livestock density varied between 85 and 120 animals per 100 ha of land in the arid zone. Thus, in terms of both livestock and humans, arid Rajasthan is one of the most densely populated desert regions of the world. However, even more dramatic is its state-led agricultural transformation at the expense of CRs. This transformation, accomplished through major canal irrigation schemes, well and tube-well irrigation, and promotion of rainfed farming, has redrawn the land use map of the arid zone (Figure 1) and relegated traditional pastoralism to a marginal activity (Shanmugaratnam 1994).

The main objective of this paper is to highlight the institutional aspects of the CRM problem in the arid zone. The paper provides a historical review of the commons question in the study area and an analysis of local level data from two areas. It concludes by summing up the current dilemmas of CRM in the arid zone and offering some suggestions for institutional change. We begin with definitions and explanations of the key concepts used in this paper. A more detailed theoretical treatment of these concepts can be found in Shanmugaratnam (1994) and the sources referred to.

Definitions and Explanations of the Key Concepts

We use CRs as a generic term to include two broad categories of resource regimes: Common Property Resources (CPRs) and Open Access Resources (OARs). A CPR is one in which individuals belonging to a clearly defined group hold rights by virtue of their membership to that group. Corollary to this is that those who are excluded accept their exclusion and respect the property

²This paper is extracted from a larger study on the natural resources management problem of the arid zone of Rajasthan (Shanmugaratnam 1994).

rights in a CPR. An individual loses the right to the CPR once he/she ceases to be a member of the group. Furthermore, the common property rights cannot be freely traded in the market. CPR implies that the resource users constitute a community with a consciousness of interdependence as the basis and spirit defining the practical rules to co-ordinate resource utilisation. The existence of such a co-operative ethic along with the rules provides the assurance mechanism against free riding. Each individual member has a higher incentive to cooperate than to pursue an individualist strategy and if anyone tries to do so, the communal rules and ethic can be effectively invoked to prevent or contain such behaviour. This has come to be addressed as the "assurance problem" in analytical literature on common property (Runge 1981, 1984). "Cooperative institutional rules" as noted by Runge (1981), "are endogenous adaptive responses to the problem of uncertainty about the expected actions of others." Thus from a management perspective, CPR implies more than formal property rights as assurance mechanisms for the members, and the acceptance of the status quo by non-members are indispensable for the sustainability of the resource. Moreover, assurance mechanisms for CPR management do not exist in isolation from the structures of distribution of privately owned resources and power and their legitimacy. This dimension, which is addressed in the present paper, has been ignored by Runge and others who tend to see collective action problems mainly in terms of cooperation among rational economic agents as understood in neoclassical theory. In the real world, the assurance problem has its class (and, in India, caste) underpinnings. Existing assurance mechanisms come under strain and may even completely breakdown as inequalities among resource users increase along with the expansion of the market sphere. The same conditions make it extremely difficult and costly to create lasting cooperative arrangements for CRM. In such a situation, a socially fair land reform may become a necessary condition to create an enabling environment for CRM institution building (Shanmugaratnam 1994).

A CR is considered an OAR when there is no effective restriction on entry. An open access situation can result when a CR is not governed by a property regime (and its use not mediated by assurance mechanisms). In developing countries, more often than not, state property resources have become de facto private or open access resources due to the state's failure to enforce property rights because of high transaction costs, corruption of enforcement agencies, and/or political reasons. Uncertainty caused by the absence of assurance mechanisms encourages individual strategies of appropriation. This is theoretically illustrated by the well known prisoners' dilemma game. However, a strict dominance of individual strategies in CR exploitation is constrained by the effects of non-separable externalities on private costs (Runge 1981).³

It is important to note that the CRs that concern us here (rangelands, forests, village ponds and wells and canal irrigation water) are renewable common-

³ The implausibility of separable individual cost functions in grazing a common pasture has been shown by Runge (1981). The externality created by each individual user impacts on the cost functions of all individual users in multiplicative ways. The existence of non-separable externalities is a reflection of interdependence and raises the question of reducing uncertainty via assurance mechanisms.

pool resources which are distinguished from pure public goods by their property of subtractability (Ostrom 1990, Taylor 1987).⁴ That is, each user of the resource reduces its total availability to others by that quantity appropriated by him or her less the amount that is replenished through biological or other means of regeneration at a given time. When the rate of appropriation persistently exceeds the rate of replenishment, the resource can be exhausted. The subtractability of common-pool resources poses a major challenge for organising assurance mechanisms that ensured a fair distribution of the resource without impairing its sustainability. As noted by Ostrom (1990), in the absence of "a fair orderly and efficient method of allocating resource units, local appropriators have little motivation to contribute to the continued provision of the resource system."

Location of Rajasthan and its Arid Zone and Some biophysical Parameters

The Indian state of Rajasthan, occupying an area of 342, 214 km², is situated on the western sub-tropical margin of the sub-continent. The arid zone of Rajasthan lies between the 100 mm isohyet in the north-west and the 450 mm isohyet in the east in the Thar desert (Krishnan 1977). Most analysts treat the 500 mm isohyet as the upper limit for demarcating the arid zone. Occupying an area of 208751 km², and 61 per cent of the total area of the state, the arid zone consists of eleven districts. The mean annual rainfall varies from 164 mm in Jaisalmer to 490 mm in Pali. The rainfall is not only meagre but highly unevenly distributed with 83 to 95 per cent being received in the south-west monsoon season between July and September. It is also subject to high interannual variations. The length of the dry season varies between nine and eleven months. The low and uncertain rainfall, high incidence of drought (53-58 percent) and sandy soils of the arid zone make it a high risk area for agriculture. However, rainfed and irrigated agriculture has expanded over the years and currently more than 60 per cent of the total area of the arid zone has come under agricultural use. Of the net sown area 15-20 per cent is irrigated.⁵

Pre-reform Land Tenure

Land tenure in the princely states of Rajputana, as Rajasthan was then known, was characterised by the dominance of intermediaries to whom the kings assigned land in return to military and other services and subject to payment of a fixed tribute.⁶ These intermediaries in turn rented out most of the lands in their possession to tenants. The predominant group of intermediaries was known as *Jagirdars* who controlled 60-70 per cent of the State's land. Most of the other lands came directly under the Crown (*Khalsa*) and other intermediary

⁴ A common-pool resource is "a natural or man-made resource system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use. ... Resource systems are best thought of as stock variables that are capable under favorable conditions, of producing a maximum quantity of a flow variable without harming the stock or the resource system itself." (Ostrom 1990).

⁵ See Shanmugaratnam (1994) for further details of biophysical conditions and land use.

⁶ The historical material used in this section comes mainly from Dool Singh (1964) and Pande (1986). Additional sources include Jodha (1970 and 1977) and Mathur and Mathur (1990).

institutions like *Zamindari and Biswedari*. The *Jagirdars* (and other intermediaries) extracted surpluses from their tenants in the form of farm produce as well as labour services. The rent paid ranged between 12 and 50 per cent of the harvest. However, only a small part of the surplus thus extracted was paid as tribute to the king by the *Jagirdars*. Even though the ownership of *Jagir* lands rested with the king, the *Jagirdars* behaved like landlords in practice. They kept a part of the land (*Khudkasht*) for their own cultivation. Farming was extensive with mixed cropping, agro-forestry systems and crop-fallow rotations playing important roles (Jodha 1988). The extent of irrigated cultivation was negligible. However, traditional water harvesting practices were adopted to conserve moisture. Crop and livestock production were interdependent with greater emphasis on total biomass rather than grain output alone. The producers' concern with total biomass output derived from the multiple objectives of production such as fuelwood, fencing and thatching material, raw material for mats and baskets, fodder for animals and food grains for the people. In the more arid parts of western Rajasthan (Jaisalmer, Barmer, Bikaner, and Ganganagar before it became a major irrigated farming area), livestock keeping was the more dominant activity. Livestock keepers transhumed with their herds seasonally. Their strategies rested on reciprocal ties between communities who needed to seasonally move in search of pasture and water for their herds.

The *Jagirdars* were also the custodians of commonly used resources like village grazing lands, forests and ponds. A part of the CRs, known as *Oran*, belonged to temples and religious organisations. These lands adjoined places of worship. The CRs formed an integral part of the resource base within the *jagirdari* system. The *Jagirdars* had a vested interest in maintaining the CRs under their control without letting them seriously degrade as the entire revenue from commonly used resources accrued to them. However, their style of managing CRs was an extension of the exploitative, patron-client relations of the *jagirdari* land tenure that governed farm lands.

Land Reforms and the Commons

The state government embarked on a series of land reform exercises from the time of formation of the state in 1949. The main objectives of the land reforms were to provide greater security to tenants and abolish traditional intermediaries and big landlordism, and to redistribute land to the landless including the "Scheduled castes" (SC) and "Scheduled tribes" (ST) who had been denied the right to own land in the old order. The land reforms were a product of a conjuncture of democratic politics and clamour from below for social justice in post-colonial India. Its main thrust was creation of modern private landed property but with some degree of distributive justice. Accompanying this thrust was the nationalisation of traditional CRs which were largely defined as wastelands, a continuation of a colonial practice. A part of the CRs thus nationalised was distributed to village *Panchayats* (elected local government bodies) as common grazing lands. Another part was distributed to landless persons while the balance remained state property. However, the formulation and implementation of the reforms were not smooth exercises. At every stage, they were directly and indirectly challenged by the landed

aristocracy which enjoyed tremendous political influence in the State. As a result, the contents of the reforms were changed to accommodate the interests of the landed groups while their implementation became protracted. Furthermore, all the policy interventions of the past aimed at land reforms have failed to address issues concerning management of private property and common resources. These points are briefly examined below.

In 1949, the Rajasthan Protection of Tenants Act was promulgated with the aim of safeguarding tenants against eviction (Pande 1986). At the same time a Committee appointed by the Union government recommended the abolition of the *jagirdari* system.⁷ The Rajasthan Land Reforms and Resumption of Jagirs Act was passed in 1952 but challenged by *Jagirdars* who succeeded in securing a Stay Order from the High Court. The Act was amended and became operational in 1954 (Singh 1964). It liberally provided for compensation for the *Jagirdars* by granting heritable rights to their *Khudkasht* lands as tenants and in cash for the income lost due to the abolition of the *jagirdari* system. Some *Jagirdars* were able to retain up to fifty percent of the *jagir* land as *Khudkasht*. All of them grabbed the best lands for themselves often by ejecting their tenants cultivating irrigated *jagir* lands. "The act of resumption" noted Pande (1986), "was made advantageously a gradual process and not an adverse and sudden thunderstorm for the *Jagirdars*." A similar reform was introduced in 1959 to abolish the *Zamindari* and *Biswedari* systems. The *Zamindars* and *Biswedars* successfully resorted to the same tactics as the *Jagirdars*. Members of the former royal families continued to own large areas of land. All these showed the political influence enjoyed by the landed aristocracy.

The Rajasthan Tenancy Act was passed in 1955 with the object of providing a unified law to deal with land tenure. With the passage of this Act, all the previous tenancy laws were repealed. (Mathur and Mathur 1990). The Act was amended several times to incorporate new land reforms including the reform of 1959 referred to above. An amendment was introduced in 1960 to impose ceilings on land ownership and appropriate the surplus lands for redistribution to landless farmers. The prescribed ceiling varied, depending on land quality, from 9 to 92 ha and 12 to 136 ha for a family of five persons in eastern and western Rajasthan respectively.⁸ The implementation of this major reform began only in 1963 as the legal process of enactment took more than two years, and became protracted over several years. The landed groups in Rajasthan took advantage of the initial delay to act ahead of the law to evade ceiling enforcement by transfer and sale of parts of their properties. As a result, the surplus appropriated was less than the estimated 810,000 ha (Singh 1964). The abolition of intermediaries, ceilings on land ownership and the recognition of

⁷ Report of the Rajasthan-Madhya Bharat Jagir Enquiry Committee 1949.

⁸ The ceiling was fixed in terms of Standard Acres as follows. 30 Standard Acres (12.15 ha) for a family of five members or less. For each additional member, the ceiling is extended by five Standard Acres up to a maximum of sixty Standard Acres or 24.3 hectares. A Standard Acre was defined as the area capable of yielding 10 mounds of wheat or the equivalent of any other normal crop. (Singh 1964). This standardisation was expected to capture the qualitative variations of land including the effects of irrigation wherever available at the time of expropriation.

the rights of the landless and depressed communities were not only long over due but socially progressive measures as well. However, for reasons already stated, the surplus land declared by land owners in the whole State up to 1975 was a meagre 312,000 ha. The Tenancy Act was amended several times to enable a more effective enforcement of ceilings and redistribution. Yet the landed groups greatly succeeded in retaining the best lands and evading the ceilings enforcement. Consequently, the land available for redistribution was not only smaller in extent but also poorer in quality than expected.

Since its promulgation in 1955, the Rajasthan Tenancy Act had gone through forty one amendments up to the end of 1989 (Mathur and Mathur 1990). However, none of them dealt with the questions of land use and natural resources management in Rajasthan. On the other hand, the general thrust of land legislation and policies has been to discourage traditional land management practices like fallowing and to encourage indiscriminate conversion of uncultivated land into farm land.⁹ The negative impact of the reforms on the CRs of arid zone and other parts of the State has been far reaching in terms of property rights, assurance, management and availability.

The *jagirdars* succeeded in privatising some of the best common lands they controlled by declaring them as *Khudkasht*. In addition, the nationalised CRs became a reserve of land for redistribution to landless persons, and allocation for construction of common utilities like schools, government dispensaries and cattle sheds, and on lease for private commercial purposes like dairy farms and brick making. The abolition of the *jagirdari* system left an institutional void as far as the management of the CRs was concerned. The situation was compounded by the people's inability to comprehend the new legal status of former common lands. Common pasture land was being re-defined by the law in an apparently simple but operationally problematic way. "Pasture land" according to The Rajasthan Tenancy Act, 1955, "shall mean land used for the grazing of the cattle of a village or recorded in settlement records as such at the commencement of this Act or thereafter reserved as such in accordance with rules framed by the State Government."¹⁰ In practice, problems arose due to competing claims from former *jagirdars*, absence of satisfactory records where a dispute arose, and the not so uncommon collusion between administrative officials and the local dominant interests.¹¹ In many instances village pastures

⁹ A basic flaw in official thinking was highlighted by Jodha in 1970 and 1977 with reference to the Rajasthan Agricultural Lands Utilisation Act 1954. The Act authorised the District Collector to prohibit the fallowing of crop lands and provided for punishing those who failed to cultivate their land by a fine. Though this provision was never enforced, Jodha noted that the "law itself illustrates the government's ignorance of the nature of the problem of the arid lands." (Jodha 1977).

¹⁰ Section 5 (28). See Mathur and Mathur (1990) for the tenancy law of Rajasthan and all its amendments upto 1989.

¹¹ Village spokesmen could seek legal redressal from the civil courts if the village's claim to the charagah was not accepted by the local authority. However, valid records were not available in all such cases and revenue administration officials who were in charge were not always sympathetic. There was no guarantee of actual restoration of the claimed charagah even after obtaining a favourable court order as the implementation was in the hands of the revenue administration. Observes Rita Brara in her well researched study on rights in common pastures

(*gochar* or *charagah* in local usage) were demarcated by officials on the basis of 0. 17 ha (half a *bigha*) of pasture land per head of cattle. Once the *charagah* was thus demarcated the balance between private and *charagah* lands was counted as 'uncultivated' and taken over by the state.¹² (Brara 1987).

Evidently, the official approach to demarcation of village commons was not based on an informed consideration of arid rangelands' biomass production or villagers' needs. The thumb rule of half a *bigha* per head of cattle was arbitrary not only because it offered too little but also due to its failure to take into account the small ruminants. In sum, the land reforms and the legal, administrative procedures and the power politics they entailed in implementation adversely affected the CRs in three ways with the poorer sections of the village suffering the most. First, they created a scarcity of formally recognised grazing lands (*charagah* or *gochar*). Second, they left these lands without a satisfactorily functioning management institution though in law they belonged to the Village (*Gram*)*Panchayat*. Third, the nationalised lands classified as forests and uncultivated (to which belonged large tracts of 'Culturable Waste' locally referred to as *padath*) had no local level management institutions. The factors responsible for the first have been discussed above. The net losers were those livestock-keepers who gained very little from land distribution, particularly those who received no land or not enough land of good quality to compensate for the loss of grazing resources. We discuss the problems of the village commons (sometimes referred to in the text as *gochar* or *charagah*) which formally qualifies to be a CPR.

Village Commons and the Assurance Problem

Common Resources Management in Pre-reform Times

As stated above, the *jagirdari* style of managing the village commons was an extension of the patron-client relations that characterised agricultural land tenure. They charged grazing taxes and imposed penalties on herd owners who violated the grazing rules¹³ but reinvested only a small portion of the revenue in CRs. However, they used their authority to enforce certain conservation measures which ensured considerable stability to the CRs. The relatively low

in western Rajasthan: "The legacy of the revenue machinery was quite formidable both in obfuscating the issue in a manner that enabled it to extend its jurisdiction over customarily determined pasturage rights and through collusion with dominant interests at the local level." (Brara1987).

¹² As an example, we may cite the following case recorded by Brara in the village of Banai in Sikar district. The village had a total of 128 bighas of common grazing lands prior to 1955 when the village was surveyed by the authorities for reform implementation. After the survey when the *charagah* was demarcated on the basis of half a *bigha* per large animal the common grazing land shrank by more than 43% to 72 bighas. The small ruminants in the village were not taken into account. The balance land along with an additional 35 bighas covering a cemetery and a 'sacred grove' was entered as 'Unoccupied land' which was later encroached mostly by village notables.

¹³ There were dozens of different types of levies/taxes charged by *jagirdars* and other intermediaries from users of land and water resources. The number of levies/taxes (*laag-baag*) on resource users varied from 50 to 150 in different areas. (Singh (1979) cited in Jodha,1987)

population and livestock densities were important enabling factors in this regard. Jodha (1989) identifies a number of practices that characterised the traditional CRs management system. He groups them into four sets of indicators as shown below:

i) Indicators of private cost of using CRs: Grazing tax (*ghas mari*), Priority grazing fee, Livestock-related levies (*laag baag*), Compulsory labour contribution for desilting ponds (*begar*), penalties for disregarding grazing regulations.

ii) Indicators of regulated use of CRs: Evenly scattered water-points, Rotational grazing around water-points, Periodical closure of parts of CRs, Periodical restriction on entry of certain animal species (e.g. cattle/sheep), watchman (*kanwaria*) with authority to enforce regulations.

iii) Indicators of revenue earning: Auction of dung collection rights from CRs, Auction of top-feed from CRs, Auction/sale of wood from CRs, penalties for breaking grazing regulations, Taxes and levies from users of CRs.

iv) Indicators of investment in CRs: Periodic desilting of ponds, Payment to watchman, Maintenance of community bulls, Support to scouts to survey water and fodder situation on migration routes during drought.

These practices ensured considerable stability to the grazing ecosystems. They helped conserve perennial grass species and trees and ensured the maintenance of water-points so as to enable rotational grazing (Jodha 1987). The traditional system of CR-use regulation, however, was authoritarian in nature and rested on rent extraction as the prime motive on the part of the *Jagirdars* or other intermediaries who controlled the resources. Moreover, under the traditional system the best pastures were earmarked for the animals owned by the landlords. The assurance problem was solved by the *jagirdar* imposing heavy private costs on graziers who broke the rules., i.e. by containing the free-rider problem through use of authoritarian means to which local resource-users had given their assent. The assurance mechanism was, perhaps, strengthened by the relatively high degree of stability of the traditional patron-client relationship which ensured the client (tenant) continuity of access to rangeland, albeit as a powerless client. It cannot be considered a community resource management system as the bulk of the CRs was controlled by individuals who privatised most of the revenue and set the rules to be abided by the graziers. This does not imply that the resource users did not belong to cohesive communities. They did but they were collectively and individually subordinated to the authority of the *Jagirdars*.

Post-reforms Village Commons

The *Panchayati Raj* system, which became the de jure manager of the *gochar* was introduced by the Indian government in 1959 with the idea of decentralising development, although *Panchayats* were already in existence as formal bodies. A *Panchayat* normally covered a group of villages, the territory being called a *Panchayat Circle* which in most instances coincided with one or

more Patwar circles.¹⁴ Various studies in the past three decades have shown that the *Panchayats* in Rajasthan have failed to develop management systems for the pastures belonging to them. The Study Team appointed by the government of Rajasthan (GOR) in 1964 found that "people in general are not satisfied with the management of grazing lands by the *Panchayats*." The Team also reported that grazing lands had not been properly demarcated and that "encroachments on grazing land have posed a serious problem." (GOR 1964). Based on extensive village surveys at different times, Jodha (1977, 1985, 1987, 1989), showed that the transfer of the commons to the *Panchayat* did not lead to the evolution of a community-based or any other system of management.

Jodha has been most candid in criticising the *Panchayats* for being drawn into electoral politics and factionalism which worked against community interests and sustainable management of CRs. While conceding the socially exploitative nature of the traditional system of CRM, he maintained that it helped to ecologically sustain the grazing resource base including the water points. He charged that the *Panchayats* "neither have technical competence nor political and administrative strength to introduce any measure to regulate stocking rates, grazing rights, rotational grazing rights etc. A study revealed that not a single *Panchayat* had taken up any step to manage or develop village pastures." Jodha (1977). An illustration of this is provided by Jodha in a later study with reference to the states of a village pasture at two points in time, 1945/47 under the *jagirdari* system and 1963/65 when it belonged to the village *Panchayat*: 'Over four plots totalling 40 ha the number of cartloads of timber declined from 43 to 4, of top-feed from 85 to 27, of fuelwood from 52 to 14, and of cut grass from 110 to 45. The sale of dung and gum from *babok* and *indok* trees ceased altogether.' (Jodha 1987).

Our own fieldwork, based on visits to sites and interviews with more than 60 farmers and local residents in Nagaur and Jaisalmer districts in January 1991, showed that the *Panchayat* as an institution lacked community structures including assurance mechanisms for managing the village commons. The assurance problem remained serious and unaddressed by *Panchayat* leaders as well as the government. In the *jagirdari* system of CRM rules were defined and enforced by an authoritarianism which derived its legitimacy from the age-old caste-class structures of power and ideology. The rules worked and they could be enforced at low cost to the *jagirdars*. The resource users might have been coerced to contribute labour for the maintenance of CRs and to follow the rules. On the other hand, the assurance provided by the authoritarian system did serve as an incentive to cooperate. The land reforms abolished the authoritarian management regime by changing the property relations but failed to provide a policy environment that stimulated an endogenous development of viable alternative CRM institutions. Instead, the government chose to assign the responsibility to the *Panchayats*. The sustainability of village commons came to be affected by the deficiencies of the land reforms and policies and the

¹⁴ For details of history and organisation of Panchayats in Rajasthan see Report of the Study Team on Panchayati Raj, 1964. Panchayat and Development Department, Government of Rajasthan 1964.

Panchayat as an institution, and by class-specific and other social factors that complicated the assurance problem.

The *Panchayat* Circle is often too big as a spatial and social unit to enable the development of community structures to manage village commons. However, there are other problems of a more fundamental nature. *Panchayats* did not seem to be functioning in a way that fostered group formation and local institution building for NRM. Local political factionalism gets internalised into the *Panchayats* through the existing electoral system and competition for leadership positions. In the 11 villages visited by us (six in Nagaur and five in Jaisalmer), the *Panchayats* seemed to be effective in preventing encroachment into the common grazing land. The leaders also claimed that the trees, the *khejiri* in particular, were being well protected and that graziers from outside except those transhuming through the area were effectively excluded from using the *gochar*. However, the degraded state of the commons, as evidenced by the non-stabilised sand dunes and extremely low density of trees, showed that there had not been any management for ages. All of the three *Panchayat* leaders interviewed said that the pastures in their areas were degraded. They perceived degradation in terms of poor growth of grass, spread of sand dunes and death of trees. They all attributed the degradation to rising animal populations. None of them spoke of any serious institutional problems. They believed that the *Panchayat* was the right local body to be in charge of management of the village commons. Lack of land to extend the commons and of money to invest in a regeneration programme through tree planting and enclosure were the two main constraints mentioned by them.

The only revenue that accrues to the *Panchayat* from the commons is the proceeds from sale of fodder. This has declined over the years due to loss of trees and the failure of the *Panchayats* to establish trees in the commons. *Panchayats* do plant trees but the survival rate is very low and subsequent establishment of the seedlings requires watering and protection from grazing animals, both of which they have not been able to provide. Scarcity of common lands and low revenue and the consequent financial constraint are important problems indeed. However, they have to be seen in proper perspective as outcomes of the failures of policy to provide for a more reasonable re-allocation of lands to the village commons based on claims of local communities, and an environment for evolution of local institutions for CRM. In the old system, the *jagirdar* privatised most of the revenue from CRs and reinvested only a small part of it. In the new system, there is not enough revenue even to plant trees and tend them until they are established. The reform failed to ensure the continuation of local revenue generation for the collective maintenance and development of the commons. It has been estimated that before the land reform, in Nagaur, a household paid Rs. 41 per annum (at 1976/77 prices) for using the commons in addition to a grazing tax of Rs. 1.25 per animal. Such private costs were reduced to zero after the reform. (Jodha 1987). This might have benefited the poor in the short-run but later they suffered more than the rich due to degradation of the commons as the rich enjoyed a higher degree of self-sufficiency in fodder and fuelwood because of their private resource endowments.

The most critical period as regards availability of pasture and fodder is from mid-June to September when there are no rains in the arid zone, even though fodder scarcity is present throughout the year. The big ruminants are more severely affected than the small by the lack of pasture during this period. This constraint has become more severe with time due to degradation of the CRs and rising livestock densities, with the latter reinforcing the former. The inability of resource-poor livestock owners to find fodder for their big ruminants during the long dry period is one of the causes of their dispossession. On the other hand, the resource-rich are able to produce in part or full the fodder needed to sustain their big ruminants during this period on their private lands. They also have the money to buy from the market the supplementary feed needed. With fodder scarcity becoming a permanent problem, farmers resort to privatisation of crop residues which have traditionally been utilised as a common resource. It has become common to delay opening the farms after harvest so that the owners' livestock graze the bulk of the crop residues. Another consequence of fodder scarcity is increased frequency of coppicing privately owned fodder trees like *khejiri*. For example, *khejiri* trees that are lopped in winter are sometimes lopped again in summer before they have sufficiently regenerated (Brara 1987). Such unsustainable harvesting of fodder is likely to become more widespread, as farm size declines due to intergenerational sub-division and the demand for fodder continues to rise, to the detriment of the existing stock of fodder-tree resources.

One of the basic requirements for regeneration of grazing and fodder resources and sustaining biomass production in the commons in the prevailing situation is water. But land policies and reforms have totally disregarded this and only promoted the privatisation of groundwater resources which are potentially CRs too (Shanmugaratnam 1994). Communal tubewells and ponds for the development of the commons have not been considered by policy makers as an aspect of livestock development in the arid zone. This failure is conspicuous in the light of the ecological and socio-economic reasons that make rangeland and livestock development the most appropriate choice for a major part of the arid zone.¹⁵

From an NRM perspective the *Panchayati* system is a weakly organised body which is not rooted in basic building blocks at the local level. This makes it a top-down system both in appearance and working style. The style is excessively top-down when the leaders are unreformed members of the former rural aristocracy. The formalism of the *Panchayati* Raj and the dominance of the traditional power elites in its offices tend to present it to the local communities as an extended arm of the government rather than as "an embodiment of local aspirations" (Brara 1987). While the mandate of the *Panchayat* precludes an

¹⁵It is demonstrable that a combination of trees and high yielding grass can be cultivated on a *gochar* with irrigation provided by a tubewell. The water requirement for this would be only a fraction of that being used cash crops in the arid zone. Such a production system can be sustained indefinitely without high risks of toxicity even where the ground-water is not fully free of salts (as in some parts of the arid zone) if a satisfactory management system is in place. These ideas were expressed by researchers as well as local people in the arid zone.

authoritarian¹⁶ approach to CRM, its 'governmentalisation' appears to have rendered it incapable of fostering endogenous development of cooperative bodies. The assurance problem, in the mean time, has become more complex with the rich and the poor becoming disinterested in the sustainability of the commons due to different reasons.

In many parts of the arid zone, due to degradation and diminution in size, the *gochars* are no more the main source of pasture and fodder even for those who accumulate only or mainly in livestock. The typical situation is captured by Gupta's study in Jodhpur:

"The landed class, in view of its access to fodder from private land, did not feel vulnerable even if the commons were degraded. On the other hand, those whose wealth lay in livestock found that the commons provided a very small share of their total grazing requirements. The lack of cooperation to protect the commons emerged for different reasons." (Gupta 1986).

Degradation of the CRs has contributed to the changing species composition in favour of small ruminants. However, this trend has its class aspects too. As noted by Jodha (1987), "processes which lead to land degradation also lead to a redistribution of resources to the disadvantage of the poor." The class status of a livestock keeper is reflected in the size and species composition of the herd owned. The rich invest more in cattle and buffaloes than in small ruminants while the latter are the major component of herds owned by the poor. In general, except in the most arid areas like Jaisalmer where privatisation of land is relatively low, the distribution of livestock ownership tends to correspond to that of land holdings. Given their high degree of self-sufficiency in fodder, the larger-farm owners tend to be disinterested in management of the commons. The poor, given the predominance of browsers in their herds, rely on widely dispersed sources of pasture and, as a result, need to be mobile. For them, the availability of open access browsing resources in a wider geographic area is helpful to their current survival strategies, even though it implied resource degradation in the longer run and as a result greater vulnerability of the poor to drought and deprivation. Yet, a geographic broadening of their sources of biomass is so crucial for the poor to manage risks inherent in herding in an arid area. This may make them disinterested in protecting the village commons, over which they have little or no control, as their immediate biomass needs are likely to be met better by opportunist strategies of tapping the CRs (mostly of the open access type) in various parts of the arid zone and beyond.

Noncooperation gets reinforced when power is the only factor that settles the question of priority of access and distribution of common grazing resources as it often happens. This situation is illustrated by the following account from an

¹⁶ A Panchayat leader in Degana, Nagaur, coming from a former jagirdar family, remarked while discussing the degradation of the village commons: "If I had the power I would punish those who overgraze the *gochar*.."

official report on a pasture and sheep development programme in a Jodhpur village:

"In the village there is tough competition between cattle versus sheep for grazing. Because of lower socioeconomic status of the sheep breeders, most of the grazing facilities in the community grazing lands are utilised by the cattle breeders for their cattle and buffaloes. Sheep population is forced to the rocky and most unproductive areas and the *Gochars* and other productive pastures are allotted to them after they have been consumed by the cattle." (Jodhpur Team cited in Gupta 1986).

The rich-poor dichotomy is one of the factors that has complicated the assurance problem, indeed. This implies that the prevailing property and power relations may constitute a serious structural obstacle to the evolution and functioning of CPR management systems.

Privatisation of Land and Distribution of Livestock Wealth - An analysis of some local level data

The privatisation of land over the years has been associated with a redistribution of livestock wealth, particularly cattle and buffaloes, according to private land-water resource endowments. However, there are differences in this relationship between areas with high levels of privatisation and those where most of the land still belongs to the state and village commons. In general, farm size and number of animals owned (expressed in Livestock Units) are positively correlated in areas where most of the land has been privatised. In the more extremely arid areas like Jaisalmer, where privatisation is relatively low in terms of the share of the total area, farm size and herd size do not seem to have any significant positive association.

Table: 1 Correlation Matrix for Farm Size and Livestock Units Owned in Degana. (1 livestock unit=1 big ruminant=10 small ruminants)

Variable	Y1	Y2	Y3	Y4	Y5
Farm Size (FS) (Y1)	1.000	0.893	0.560	0.731	0.154
FS adjusted for irrigation* (Y2)		1.000	0.495	0.8141	-0.024
Livestock Units (Y3)			1.000	0.7577	0.7893
Big Ruminants (Y4)				1.000	0.1974
Small Ruminants (Y5)					1.000

* The area with access to irrigation was multiplied by a factor of 2 on the assumption that it supplies approximately twice the amount supplied by an equal extent without irrigation. Source: Field Survey (January 1992).

Table 1 above shows the correlation coefficients for a sample of 30 households from five villages in Degana (Nagaur district) where most of the land is privately owned and farming enjoys higher priority than livestock keeping. Moreover, in all these villages, the *gochar and padath* lands are very small in extent and degraded. The relationship between farm size and livestock units undergoes notable alterations when the former is adjusted for irrigation which is available on 40 per cent of the farms in the sample. In general, the larger the farm size the larger is the number of units of big ruminants. This association becomes stronger (rising from 0.73 to 0.81) when farm size is adjusted for irrigation. On the other hand, the correlation coefficient for farm size and the units of small ruminants is not significant (0.15) and turns negative (-0.02) when adjusted for irrigation. The association between farm size and total livestock units gets weaker too with irrigation.

The relationship between farm size and livestock units owned presents a different picture in Jaisalmer, an area in which privatisation of land is limited and the CRs (the State land in particular) and markets together account for a major part of the pasture and fodder consumed by the livestock. Animal production and waged-labour are the mainstay of the rural household economy in these villages.¹⁷ The extreme aridity and the very low prospects of irrigation development in the area rule out farming as a means to accumulate wealth. On the other hand, the risk and uncertainty induced by recurring droughts notwithstanding, accumulating in livestock wealth is a more feasible and attractive option. There is room for this form of accumulation through opportunist strategies that exploit the inter-drought periods and through reliance on animal-feed markets.

Table: 2 Sample Means of Some Basic Variables

Variable	Degana	Jaisalmer
Sample size (Households -Hh)	30	34
Mean Farm size (Ha)	7.4 (9.14*)	7
Mean Livestock Units/Hh	6.6 (100)	10.8 (100)
- Big ruminants/Hh	4 (61%)	5.0 (46%)
- Smallruminants/Hh	2.6 (39%)	5.8 (54%)
Range of CRs/Hh in the study-villages (Ha)	0.13-0.63	21-106
Mean	0.35	80

* Adjusted for irrigation.

Source: Field Survey (January 1992)

The correlation coefficient for farm size and livestock units is weakly negative (-0.0223) for a sample of 34 households from five villages. None of the farms in the sample had access to irrigation. Two of the 34 households reported zero farm size. One of them owned 60 heads of cattle, the largest herd in our entire

¹⁷ The levels of off-farm employment among the households in our samples are: Jaisalmer 94% and Degana 53%.

sample, and the other with 105 small ruminants and a camel belonged to the above-average category of livestock owners. When these two households were excluded from the sample, the correlation coefficient was weakly positive (0.2218). The conclusion is that farm size and herd size are not significantly correlated in Jaisalmer. The mean values of some of the relevant variables for the two areas are given in Table: 2. The figures show that the average herd size per household in Jaisalmer is more than 1.6 times that of Degana even though the mean farm size is slightly bigger in the latter. Degana's average private land endowment is more than 30 per cent bigger than that of Jaisalmer when farm size is adjusted for irrigation. The table is also indicative of the relative importance of the local CRs for livestock-keeping in the two areas.

Table: 3 Extent of Biomass Dependence of Households on Various Sources (Per cent) in Jaisalmer and Degana.

Biomass	Sources of supply and the share of households' demand met by them.				
	Market	PPR	Gochar	State Land	Others
(Jaisalmer) (34 hhs)					
Fuelwood	25.44	27.05	7.06	40.44	-
Pasture	-	7.35	23.4	69.3	-
Fodder	51.47	38.52	2.65	7.35	-
Dung-F*	6.47	64.12	22.1	7.35	-
Dung-M@	0	0	0	0	-
(Degana) (30 Hhs)					
Fuelwood	2.33	87	6.33	0	4.33
Pasture	-	29.50	44.5	17.33	8.67
Fodder	15.5	74.50	0	0	10.0
Dung-F	1	75.2	14	10	-
Dung-M	19.7	80.34	0	0	-

* Dung for fuel; @ Dung for manure.

Note: The percentages for the two samples were calculated according to figures given by respondents. State land includes *Padath* and government forest.

Source: Field Survey (January 1992)

The dependence of the households on private property resources (PPRs), CRs and markets for biomass in the two survey-areas is shown in Table 3. The figures show that, overall, state land is more important than *gochar* as a supplier of all categories of biomass except dung for fuel in Jaisalmer. State land is also a bigger source than private land for fuelwood and pasture. In Degana, the private farm is the biggest source of all types of biomass except pasture, and the *gochar* is more important than state land. The figures also reveal higher dependence of Jaisalmer households on markets for biomass. In Jaisalmer, state lands and market are the major sources of biomass fed for livestock even though the contribution of PPRs to fodder supply seems considerable. This explains the absence of a significant positive correlation between farm size and livestock units owned by the households in our

Jaisalmer sample. It is possible for a household to keep a herd of animals if a part of the demand for fodder can be supplied by the market. Indeed, as already mentioned, the owner of the largest herd in our sample did not own a farm. More than 75 per cent of his livestock-feed needs was purchased. The availability of cash through waged-employment for more than 90 per cent of the households in the sample enables many of them to purchase fodder from the market. In practice, about 68 per cent of the households did buy fodder to varying degrees. 38 per cent obtained more than 75 per cent of their fodder from the market.

Attitudes of Villagers Toward Privatisation of existing CRs

There are differences between the two study areas in people's attitude toward privatisation of CRs (Table 4). Privatisation was not favoured by most of the respondents in Degana whereas it was more favourably viewed in Jaisalmer. On the other hand, an overwhelming majority of the respondents in Jaisalmer were for conversion of state land into *gochar*, while those who were opposed to or undecided about it amounted 50 per cent in Degana.

Table: 4 Villagers' Attitude Toward Property Regime Changes in Jaisalmer and Degana

Property regime	Frequency of responses		
	Yes	No	Undecided
(Jaisalmer)			
1. Privatisation of			
- Gochar	13 (38.23)	8 (23.53)	13 (38.23)
- Padath	21 (61.76)	10 (29.41)	3 (8.82)
2. Conversion of state forest to gochar	25 (73.53)	5 (14.71)	4 (11.76)
(Degana)			
1. Privatisation of			
- Gochar	-	30 (100)	-
- Padath	3 (10)	20 (66.66)	7 (23.3)
2. Conversion of State forest to gochar	15 (50)	3 (10)	12 (40)

Source: Field Survey (January 1992)

The question of privatisation of *padath* areas has remained highly politicised in the arid zone villages. The situation in Degana appears to be typical of areas where the redistribution of *padath* to the landless has left very little for common use as indicated by the extremely small extent of CRs per household (Table 2). Indeed, the extent of conversion of *padath* into private holdings is a reflection of the failure of the land reform to appropriate the expected surplus lands for redistribution. On the other hand, the landless in the village, among whom a substantial number are from scheduled castes, continue to aspire for land. Of the three persons who favoured privatisation of the *padath* among our Degana

respondents, two were landless and the third had the smallest holding in the sample, and all three were from scheduled castes. The *Panchayat* leaders and other local elites were vehemently opposed to redistribution of the existing *padath* to the landless, particularly to families from scheduled castes and tribes. During an interview one *sarpanch* (*Panchayat* leader) told us that about 25 per cent of the rural households in his *Panchayat* consisting of six villages in Degana were landless. But, the *sarpanch* said, "only 15 per cent are the real landless in the sense they belong to castes that have traditionally enjoyed the right to own land. The balance 10 per cent are from castes that never had such a right. They were bonded labourers but now they want land. They know that now they are entitled to receive government land but experience shows that they are not capable of keeping their land. They tend to sell it off and start being contract workers migrating to other parts of the state. It is people from an agricultural caste like *jat* who do not migrate and are used to cultivating their land." Similar sentiments were expressed by another *sarpanch* in Degana who also added that "in any case, there is no land in Degana for redistribution."¹⁸

In some villages, the local elites have been taking steps to forestall any possibility of distribution of the *padath* to landless families, especially where the scheduled castes and tribes have been clamouring for land. The situation in one village in Degana is illustrative of the extent to which the local dominant groups (including *Panchayat* leaders) can go in order to prevent distribution of the *padath* to scheduled castes. In this village, the government had already distributed a part of the *padath* (about 25 ha) in 1980 to scheduled caste families. In 1990, there was a move to distribute an equal extent to some more families of the same castes. The local leaders and other land owning families opposed it ostensibly on the ground that the *padath* was needed to extend the *gochar* and to construct common facilities. They quickly moved into action by building a school and a house for a breeding bull on the *padath*. By these actions they had effectively prevented any future possibility of distribution of the land in question. The actions themselves appeared to be defensible in terms of the collective interests of the villagers but they were taken by a group among whom were land owners who had dodged the ceiling-conditions of the land reform laws, thereby preventing a fuller realisation of the reform's distributive objective. The same group has yet to show its interest in protecting and developing the *gochar* by sustained collective action.

The Dilemmas of CRM in the Arid Zone

In practical terms, the management problem of the *gochar* finds its expression through dilemmas generated by the history of the past four decades. Uncertainties emanating from the failure of the *Panchayat* as an institution to solve assurance problems and from the structures of unequal resource endowments and social statuses tend to reinforce the rationality of individual strategies to appropriate biomass from CRs, although such strategies are constrained by non-separable externalities. The result is resource degradation.

¹⁸ A local notable who shared the *sarpanch*'s view observed: "The landless, especially the SC and ST constitute a vote bank. Land distribution to these castes is a vote-catching tactic by politicians. The real reason is to get votes not to benefit the SC and ST."

Though it does not sound like a textbook case of the "tragedy of the commons", one may still be tempted to state the alternative solutions to the problem in the classical form: either privatise or impose a functioning institution for collective action! One may even invoke the argument that there seems to be a more defensible case for privatisation of the remaining CRs as privately owned land has generally fared better than the commons as a source of fodder and firewood. However, as shown by our historical account of the NRM problem in the arid zone, the situation is far too complex to be reduced to one of choosing between two sets of exogenously imposed property rights. Indeed, the "tragedy" is a consequence of nationalisation, privatisation and the failure of the externally imposed institution of commons management in the form of the *Panchayat*. It is not our point that privatisation or nationalisation in itself generates an undesirable environment for collective action in any situation. Rather, our point is that the policies that created state and private property rights and the resultant institutional changes failed to take account of the local needs for CRs and their sustainable management. There is not only a growing physical scarcity of CRs but, more importantly, a protracted absence of an institutional environment enabling collective action in the new circumstances brought forth by inadequate land reforms, commodification, uneven rural development, and rapid population growth.

At the village level, a household's dependence on the commons is inversely related to the degree of self-sufficiency it can achieve in biomass from its private resource endowments. Households with larger and irrigated private holdings, being highly independent of the *gochar* for biomass, are not likely to be motivated to commit themselves to collective action for managing the commons. Some of them seem to be more concerned about using the remaining *padath* for common utilities like a primary school or a clinic. The poor in general and those who are dependent on small ruminants (browsers) and waged-employment for their livelihood in particular may not be easily motivated to commit themselves to collective action to manage the village commons either. This is because they did not have any say in the management of the commons in the past and, where their herds are predominantly small ruminants, it would be more rational to rely on a broader and dispersed resource base. A spatially dispersed CR base is also a temporary way out of the negative private effects of non-separable externalities suffered within a local context. Of course, the long-run result of this is the extension of resource degradation over wider areas.

As things are, for either party, the opportunity cost of time appears to be too high to participate in collective resource management of a particular *gochar*. This is not to say that the village commons is unimportant to the poor. The point is, in their state of diminishing entitlements, the poor herders see the *gochar* as a part of dispersed sources of biomass which include *padath* and other public lands and accessible private fallow lands. In the present circumstances, they may prefer a more open access to these resources to meet their current survival needs. Can privatisation save these resources from further degradation without making the poor, or sections of them, worse off? The preceding analysis suggests that it cannot (also see Shanmugaratnam 1994). Nor is there any guarantee that privatisation will automatically lead to sustainable use of these lands. The remaining CRs are degraded to varying degrees and their soils

are not suited for farming. Redistribution of common and public lands will increase the number of marginal, unviable holdings with the risk that the poor recipients of such land will not be able to find the capital to invest in their rehabilitation even if they were to use their land for pasture and fodder production.

An alternative would be a policy to expand the existing *gochars* by annexing public land (*padath* and forest) to it and providing the resources and a decentralised institutional environment for the development and collective management of the expanded commons with irrigation facilities wherever feasible. Here we are back to the same old problem of assurance and institution building for CRM and the questions of legitimacy and transaction costs. Implicit in the institutional challenge is the question of how the poor for whom CRs are important to survive can be empowered to take the initiative for collective action through endogenous development of assurance mechanisms. A related question is whether or not the larger land owners should be formally excluded from access to expanded *gochars* in the future. Or, should they be subject to higher private costs for using the *gochar*. For an enlarged and developed *gochar*, within the prevailing local power relations, is likely to attract the larger land owners as it provides an opportunity to reduce expenditure in purchased fodder and to increase the herd size as well. The *Panchayat* structure and its leaders' style of work need to be brought into the ambit of institutional reform and decentralisation too. These are policy questions that cannot be resolved at the local level without governmental action at higher levels. The transaction costs of the whole new process are a crucial consideration as the costs of creating new institutions are high after a prolonged period of state interventions and other developments which undermined the cooperative ethic and encouraged short-term oriented resource use practices.

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