ECONOMIC REFORM AND THE CHINESE COMMONS: A TALE OF THREE VILLAGES

Tony J. Banks[1]

A paper presented at the 8th Biennial Conference of the International Association for the Study of Common Property, Bloomington, Indiana, 31 May – 4 June 2000.

ABSTRACT

The fundamental purpose of this paper is to explain the emergence and persistence (or otherwise) of groups for common pool resource (CPR) management during a period of economic system reform. Since the late 1970's, China has embarked on a series of policy and institutional reforms that have increased the role of the market and decreased the role of the state in many spheres of economic life. This is most manifest in the rural sector, where the family-based household contract responsibility system has been established in the place of the command-oriented commune system. However, communities often play a significant role in the management of natural resources, including common pool resources (CPRs), and this paper aims to explain the emergence and persistence (or otherwise) of group cooperation for the management of CPRs.

Utilizing a comparative case study approach, the paper first describes the different institutional arrangements for common pool resources (CPRs) that have evolved in three pastoral villages in China since the de-establishment of the communes in the early 1980s. The three case study villages are all located within the same county in northern Xinjiang-Uighur Autonomous Region but differ in terms of their resource endowments, ethnicity and/or degree of settlement. They include a mountain-based Mongolian village and two plateau-based Kazak villages, one of which is semi-nomadic and the other recently 'settled'.

Institutional arrangements were found to vary widely, according to both the village and seasonal type of pasture. This was especially so with respect to the emergence and persistence (or otherwise) of group tenure and herding arrangements. Depending on the community and season, group arrangements ranged from being non-existent, to distinctly on the demise, to still prevalent.

The remainder of the paper is devoted to explaining these inter-community and inter-seasonal differences. This is done through the application of elements of new institutional economics with due sensitivity to the role of culture and the state. It is argued that one of the principal factors accounting for group arrangements is the existence of potential economies of size with respect to herding labour. A related

[1] DPhil Candidate, Institute of Development Studies, University of Sussex, Brighton, United Kingdom; Lecturer, Department of Applied and International Economics, Massey University, Palmerston North, New Zealand. Tel .0064-6-350-5799 ext.2659; fax 0064-6-350-5660; e-mail T.J.Banks@massey.ac.nz

factor is the costs and benefits of monitoring and enforcing boundaries, which varies according to season. Finally, the rapid shift in the settled village from kin-based herding encampments to the employment of transient waged herders is explained and implications for future CPR management drawn.

The paper is based on five months fieldwork undertaken in the case study villages from July – November 1998. Field methodology included both rapid rural appraisal and a semi-structured survey of a random sample of 30% of the households in each village.

INTRODUCTION

Since the late 1970s, the Chinese government has embarked on a program of economic reforms that have essentially reduced the role of the state in the economy and increased the role of the market. The reforms were initiated in the rural sector, with the dismantling of the command-oriented commune system and the institution of the household responsibility system. Under the latter, farm management decisions were devolved to the household level and use rights to land contracted to individual households. Peasant enthusiasm for the new system is evident in its rapid spread even before it had received, in 1983, official ideological endorsement (Lin, 1996:132-133).
In the pastoral villages of China, the introduction of the new system entailed the distribution, in ownership, of former commune livestock to individual households and the allocation of use rights to both fodder and pasture to individual households. By 1985 the household responsibility system had been formally adopted throughout China.

Although the household responsibility system firmly established the household farm as the basis of Chinese agriculture, collective action at the village level is a continuing phenomenon (Lin, 1996: 136-138). Village governments and informal groups of households provide the institutional basis for collective action. In the arable villages of China, group agricultural input supply and product marketing arrangements have been ‘induced’ by opportunities for capturing economies of size. Mandatory labor contribution schemes for irrigation system maintenance are motivated by the need to minimize externalities.

Relatively little research attention appears to have been given to collective action with respect to the management of village common pool resources (CPRs) in China. This is especially noticeable with respect to China's pastures, which account for some 40% of its total territory. Pastoral tenure policy emphasizes the establishment of individual household tenure. The prevailing interpretation of government officials and researchers is that, to the extent that household tenure hasn't been achieved, which is great, there are virtually no institutional arrangements for the management of pastures (Wang, 1995; Tuoman, 1993; National Research Council, 1992; Longworth, 1990). Thus it is widely believed that a classic 'tragedy of the commons' situation, of privately owned livestock grazing on 'common' land, exists. But the prevailing interpretation is questionable on two accounts. Firstly, because China's pastoral regions are very diverse in terms of culture, natural resources and local economy, any universal description (and prescription) relating to institutional arrangements has to be treated with caution. Secondly, the interpretation is weak in the sense that it hasn't been greatly informed by empirical village-level studies. Thus the first purpose of this paper is to illuminate institutional arrangements in a relatively remote part of northwest China, using a village case study approach.

The second purpose of this paper is to explain the observed emergence and persistence (or otherwise) of group tenure arrangements. This first requires an examination of the role of the state, specifically the degree to which group tenure was, to use a phrase coined by Burmeister (1987), a form of 'directed [institutional] innovation'. It appears that the state did direct the establishment of group tenure arrangements in 1985. However, state pastoral tenure policy, both in its making and implementation, has been significantly influenced by pastoral society (see Banks, 1999). Furthermore, *de facto* institutional arrangements, if not *de jure* ones, are essentially socially embedded phenomenon (Ostrom, 1990; Hanna and Munasinghe, 1995; Baland and Platteau, 1996). The Kazaks are the dominant pastoralists in Xinjiang. Traditional pastoral Kazak society was based on patrilineal descent groups, the smallest of which were the *aul* or herding encampments that were typically comprised of about 6-10 households (Hudson: 1938:24-25). The households in an *aul* cooperated closely in both social and economic spheres and shared the same pasture.

Thus there is a need to examine the extent to which contemporary group tenure is merely a manifestation of prevailing patterns of social norms and organization.

Even if group tenure arrangements are a directed innovation and/or socially embedded, this doesn't preclude them from having an underlying economic rationale. Group tenure arrangements, or more generally, common property, may represent a lower-cost institutional arrangement than other alternatives (Runge, 1986:624-625). The transaction costs associated with pastoral households' matching of livestock to feed resources, realization of economies of size with respect to herding labor, and management of environmental risk could be lower in the case of group versus individual tenure arrangements (Eggertsson, 1990; Stevenson, 1991; Lane and Moorehead, 1995). This is especially pertinent to regions, such as pastoral China, where market-based options are limited and relatively costly because of the nascent state of markets for land-use rights, herding labor, fodder and stock insurance. Also contributing to the 'cost-competitiveness' of group tenure arrangements is their social embeddedness, which implies the presence of trust and reputation mechanisms and thus lowers the cost of collective action (Granovetter and Swedberg, 1992).

PASTORALISM IN ALTAY

The general area in which the study has been conducted is Altay Prefecture in northern Xinjiang Uighur Autonomous Region (hereafter referred to as Altay and Xinjiang respectively). Pastoralism still forms an important source of livelihood in Altay, with the pastoral population constituting some 22% of its total population of 550,000 people[2]. Most pastoral communities are Kazak by ethnicity, with their descendants having migrated east from present-day Kazakhstan as early as the mid-eighteenth century. Despite a rapid increase in the Han population since 1949, Kazaks still account for some 50% of Altay's total population[3]. Pastoralism is the

[2] Statistics Division, Altay Prefecture, 1995 data.
[3] The Han population increased from 1,000 to 237,000 between 1949 and 1995, with their proportion of the total population increasing from 2% to 43% over the same period (Statistics Division, Altay Prefecture).

predominant form of land use, with pasture accounting for some 81% of Altay's total area, whereas cropland only accounts for 2%[4].

Pastures are used on a seasonal basis. The typical migratory pattern is between summer pastures in the Altay mountains, and winter pasture in the expansive Junggar Basin. Typically, a village's summer and winter pastures lie about 160 kilometres apart. Spring-autumn pasture lies in the foothills and gently sloping lands in-between. Villages have their winter-bases along the natural flood plains of the region's two major rivers or within newly developed pastoral settlement areas, where their natural cutting land or 'artificial pasture' is also located. Pastoral household settlement constitutes the core of the state's current pastoral development strategy. Settlement entails the construction of irrigated land for pastoral households, on which they grow artificial pasture, fodder and food crops. By the end of 1997, over 60% of the pastoral households in Altay had been 'settled'[5]. World Food Programme (WFP) Project 2817, which lasted from 1988 to 1994, was responsible for the settlement of over half of these. Settlement has generally reduced the demands on, and duration of use of, winter pasture. But the livestock of most settled households still utilize summer and spring-autumn pasture, if not winter pasture as well. Less than 1% of all pasture is fenced, with natural cutting land and irrigated 'artificial pasture' accounting for the major proportion of this[6].

Though summer pasture is the smallest in terms of area, accounting for only 14% of Altay's total pasture, it is also the most productive, being about four times more productive than the much larger winter and spring-autumn pastures (Zhang, 1992:114-115). This is partly related to differences in rainfall, with the Altay mountains receiving on average 600mm or more of rainfall per annum, whereas the lower regions where spring-autumn and winter pasture are located generally receive less than 150mm of rainfall per annum (Peng and An, 1996:3). The critical feed constraint for pastoralists is winter and early spring, a constraint that pastoral household settlement is designed to help alleviate. Grazing pressure on all pastures has increased considerably over the last half century, with livestock numbers and sheep-

[4] Land Division, Altay Prefecture. Figures based on a 1991 land-use survey.
[5] Animal Husbandry Bureau (AHB), Altay Prefecture.
[6] AHB, Altay Prefecture.

equivalents rising some seven and six-fold respectively between 1949 and 1997[7]. Pastoral households are not the only owners of livestock, with agricultural households now accounting for 28% of Altay's total 4.4 million livestock[8]. Pasture degradation has been an increasing problem, particularly in spring-autumn pasture, where urban populations and agricultural settlements also tend to be concentrated.

THE CASE STUDY VILLAGES

The three case study villages are located within Buerqin County, Altay Prefecture. All three villages existed as production brigades prior to the dismantling of the communes in 1984. Two of the villages, Ak Tubeq and Sarkum, are Kazak by ethnicity, whereas the third, Kom, is predominantly Mongolian. The case study villages share some similarities and some differences in terms of their resource endowments and seasonal utilization patterns. Ak Tubeq and Sarkum both have their winter base (where large livestock winter over) in the Junggar Basin and widely-dispersed seasonal pastures. Their summer pastures lie about 90 kilometers to the north of their winter bases, and their spring-autumn pastures lie in between. Their winter pastures (for small livestock) lie about 60 kilometers to the south of their winter bases.

The principal difference between Ak Tubeq and Sarkum lies in their degree of settlement. Ak Tubeq has yet to be settled. Its winter base is located on the natural flood plain of the Ertix River, amongst its natural cutting land, and it has no artificial pasture or cropland. Sarkum, in contrast, was completely settled, over 1989-94, as part of the aforementioned WFP Project 2817, and has artificial pasture and cropland in addition to its traditional natural cutting land along the Ertix. Sarkum's settlement has impacted on its traditional resource utilization pattern, with many households switching to an early lambing season and consequently bringing back their small livestock from winter pasture to their winter bases as early as January, rather than March as in the past.

[7] Based on data from AHB, Altay Prefecture.

The resource endowments and seasonal resource utilization pattern of Kom are fundamentally different to those of Ak Tubeq and Sarkum. Kom's winter base lies in the Altay mountains, not the Junggar Basin. In effect it only has spring-autumn and summer pasture, with heavy snowfall over winter necessitating the housing and feeding of livestock indoors for at least four months of the year. Distances between households' winter bases, in the valley floors, and summer pastures in the surrounding mountains, don't exceed 25 kilometers, or more than a day's journey. A significant number of households (38% of sample households), particularly the poor ones with small herds, let their livestock graze within the vicinity of their winter bases throughout the summer.

Given that animal husbandry is still the major source of livelihoods in all three case study villages, livestock numbers provide a good indicator of wealth (see Table 1 below). Sarkum is the wealthiest in terms of livestock per household and person. Ak Tubeq has similar numbers of livestock per household as Sarkum but, because its mean household population is larger, it has 20% fewer livestock on a per person basis. Commune livestock were originally distributed in ownership to households in 1985, on the basis of household population and the number of males over eighteen years old. Data on the mean number of commune livestock received per person in 1985 (Table 1) indicates that Sarkum was the wealthiest village even prior to its settlement from 1989[9]. Thus settlement may not be such a determinant factor in accounting for its present wealth. There is a clear correlation between the case study villages' mean numbers of livestock per person and official estimates of their mean household income per person (see Table 1). The large range in the sizes of household herds in all three villages is indicative that livestock and wealth are unevenly distributed.

The choice of Ak Tubeq and Sarkum as case studies enables a degree of literal replication, given their basic similarity in terms of ethnicity, resource endowments and utilization patterns, and wealth. Because of the villages' different settlement status, the choice also facilitates an examination of the impact of settlement (or 'modernization') on institutional arrangements for resource management. Kom is fundamentally different to both Ak Tubeq and Sarkum in terms of all the above-

[8] AHB, Altay Prefecture, June 1997 data, excluding pigs and donkeys.

mentioned factors. Thus any or all of these factors could potentially explain any observed differences in Kom's institutional arrangements.

TABLE 1

BACKGROUND DATA ON CASE STUDY VILLAGES

	Ak Tubeq	**Sarkum**	**Kom**
Demographics (June 1998)			
Total population	1532	1045	951
Number of households	264	218	187
Mean household population	5.8	4.8	5.1
Mean livestock per household (June 1998)			
Large	23	21	16
Small	109	116	7
Total	132	137	23
Mean livestock per person (June 1998)			
Large	4	4	3
Small	19	24	1
Total	23	28	4
Mean number of commune livestock distributed per person (1985) [a]			
Large	1	2	2
Small	13	19	0 [b]
Total	14	21	2
Mean pastoral household income per person (1997)	Y1657	Y1955	<Y899 [c]
Range of livestock per household (June 1998)[d]	28 - 655	22 – 442	4 - 168

Sources: Official village and township data, unless otherwise specified.

[a] Based on the number of commune livestock received by the sampled households in 1985, or their patrilineal predecessor in the case of new households formed since, according to official data.
[b] All of Kom's sheep and goats were privately owned during the commune period.
[c] Data for Kom-Khanas township, which is comprised of Kom and Khanas village. The latter's income is higher than Kom's because of the revenue it derives from tourism.
[d] Based on survey data (Ak Tubeq and Kom) and official village data (Sarkum)

[9] This is assuming that there were no significant asymmetries between the villages in the late commune period in terms of the ratio of privately-owned to commune-owned livestock.

KEY CHARACTERISTICS OF PASTORAL TENURE

Stable and clearly defined village boundaries

The allocation of pasture and cutting land at the village level has remained remarkably stable over time. Some village elders recall using essentially the same pasture today that they used even in the pre-commune period. When communes were dismantled in 1984 and their former production brigades were transformed into administrative villages, pasture allocation at the village level remained essentially the same. There have been few changes in any of the case study villages since, the most significant one being Sarkum's loss of a sizeable portion of its spring-autumn pasture to WFP Project 2817 in 1989. The boundaries of all the seasonal pastures of the case study villages are clearly defined, usually by natural formations such as streams and forests. Their location is common knowledge amongst pastoralists and they are also formally recorded on the county's grassland allocation maps.

Community protection of pastures

Village boundaries tend to be well monitored and enforced. During the season of use, pastoralists, particularly those with pasture close to their village's boundaries, are able to monitor and enforce village boundaries with little effort. The greatest potential threat is the out-of-season use of village spring-autumn and winter pastures[10] by pastoralists or agriculturists from other villages. However, villages have derived a simple but effective way of dealing with such threats. They pay one or several of their households to remain in such pastures all year round to 'protect' them from encroachment[11]. The protection of village pasture is not an issue for Kom, given its remote northern location. The only place where the borders of Kom's pastures adjoin the pastures of other villages is in summer pasture. Here the rule (discussed below) of allowing large livestock to wander across boundaries and the practice of herding small

[10] Climate and location prevent the out-of-season use of summer pasture.
[11] Personal communication with Ak Tubeq herdsmen, Sarterek, 6 September 1998 and 3 November 1998; Ak Tubeq's 'grassland protector' household, Sauer, 8 September 1998; Sarkum herdsmen, Qeherstaw, 8 November 1998; and Sarkum's 'grassland protector' household, Sauer, 13 November 1998.

livestock within boundaries was generally adhered to by both Kom herders and their neighbors from other villages.

Regulation of seasonal movements

For all three case study villages, general time-bands for the movement of livestock between different major seasonal pastures have been set by the Buerqin County Animal Husbandry Bureau (AHB) in conjunction with district governments. This ensures inter-village and intra-village coordination in the utilization of the county's pastures. However, village committees have some discretionary power to vary movement times in accordance with weather conditions. A village committee typically comprises of a Communist Party secretary, the village leader and (sometimes) one or more deputy village leaders. In each major village pasture, during its season of use, a leader or deputy leader is typically present and provides governance in the field[12]. In Kom no such arrangements are necessary, because of the close proximity of all pastures, including summer pasture, to the village.

The most critical, and closely monitored and enforced, seasonal movement is the departure of livestock from their winter base during spring. Their timely departure is required for the protection of village cutting lands and croplands, with are unfenced[13]. The timing of other movements between pastures is generally dependent on weather and snow conditions and ultimately governed by the leader in the field. There is

[12] In the case of Ak Tubeq, there is a CP secretary, a village leader and two deputy leaders. Two of them stay in Ak Tubeq during summertime to supervise the cutting of hay and the building of animal shelters. The two other leaders go to summer pasture to provide leadership there. During winter, at least one of them stays in Ak Tubeq, one in Koksin and one in Sauer, thus covering the winter base and major winter pastures (personal communication with Communist Party secretary, Ak Tubeq, 29 October 1999). Sarkum's Communist Party secretary, village leader and deputy village leaders similarly organize themselves. The secretary and leader generally stay in Sarkum all year round, whilst the deputy leader follows the herders to summer pasture and then winter pasture. (personal communication with Communist Party secretary and other village committee members, Sarkum, 27 October 1999).

[13] Some households in all three villages stay over at their winter base during summer. Some 10-12 households stay over in Ak Tubeq, a much large number stay over in Sarkum (to tend to cropland) and a significant proportion also stay over in Kom. However, these households are typically only allowed to retain a few riding horses, milking cows and sheep or goats for meat. All the rest of their livestock must be taken to summer pasture. Some Ak Tubeq households, particularly elderly ones, reside in spring-autumn pasture over summer on a similar basis (personal communication with herdsmen, Ak Tubeq, 5 September 1998; Communist Party leader, committee members and herdsmen, Sarkum, 27 October 1998; grassland management representative, Sarkum village, 26 October 1998; and direct observation).

village-wide coordination in movements, the most noticeable exception being the timing of the shift of Sarkum's herders from winter pasture back to Sarkum. This ranges from early January to late March, depending on whether or not the household has switched to an early lambing season[14].

Village leaders are ultimately responsible for monitoring and enforcing rules regarding the timing of movements. Some allowance is made for exceptional family circumstances, such as sickness or death, but otherwise village leaders will warn non-complying households and, if this is not successful, impose fines on them[15]. However, household compliance to movement regulations is very high anyway . In Ak Tubeq, only 3-4 of the 261 households incur a fine each year[16], and the number of cases are likewise low in Sarkum[17] and Kom[18] as well. Pastoralists noted that it was virtually impossible for a household to move its livestock without being detected by its neighbors or other villagers. The ease of monitoring movement rules, coupled with the threat of social sanctions, probably contributes to the high degree of household compliance.

Community arbitration of disputes

Another role of village leaders is the arbitration of disputes. In all three case study communities, disputes between households or groups of households over use rights to cutting land or pasture are uncommon[19]. When a dispute does occur, and the parties involved can not themselves resolve the matter, village leaders will mediate. Given

[14] Personal communication with grassland management representative, Sarkum village, 26 October 1998.

[15] In Ak Tubeq, violating households incur a fine of 1Y per day for every large livestock and 0.5Y per day for every small livestock (personal communication with Communist Party leader, Ak Tubeq village, 29 October 1998). In Sarkum, a fine of one sheep per 100 sheep per day is imposed (personal communication with Communist Party leader, committee members and herdsmen, Sarkum, 27 October 1998; and grassland management representative, Sarkum village, 26 October 1998). In Kom, fines are also based on the number of animals in violation (personal communication with former village leader, Kom village, 1 October 1998).

[16] Personal communication with Communist Party leader, Ak Tubeq village, 29 October 1998.

[17] Personal communication with Communist Party leader, committee members and herdsmen, Sarkum, 27 October 1998; and personal communication with grassland management representative, Sarkum village, 26 October 1998.

[18] Personal communication with former village leader, Kom village, 1 October 1998, and direct observation.

[19] Personal communication with Communist Party leader, Ak Tubeq, 29 October 1999; village leaders and herdsmen, Sarkum, 27 October 1998; and former village leader, Kom, 2 October 1998. Collaborated during household interviews.

that their mediation nearly always leads to the satisfactory resolution of disputes, pastoralists' recourse to more formal arbitration processes provided for by law, such as the presentation of the case to the local AHB or People's Court, is very rare.

Individual household tenure in cutting land

Usufruct rights to cutting lands were informally distributed to households in 1985, the same year that livestock were distributed. Cutting land was allocated according to household livestock numbers (and thus, implicitly, household population and the number of males aged 18 years or older). Each household's cutting land tended to be contiguous, forming just one parcel, except in the case of Kom, where households sometimes received two to three different parcels. During Sarkum's settlement between 1989 and 1994, irrigated plots of land were assigned to households according to the number of males over the age of eighteen that they had in 1989.

Household boundaries in cutting land in both Ak Tubeq and Kom have essentially remained the same since 1985, with the proviso that new families since 1985 have usually shared, or received a share of, the cutting land of the husband's parents[20]. Tenure in Sarkum's irrigated project land has also remained stable[21] but there have been periodic re-allocations of the village's original cutting land along the Ertix River, principally in favor of households that were settled on poor land[22]. Boundaries in cutting lands are clearly demarcated by natural or man-made formations, such as stands of trees, large rocks or ditches. In Sarkum's settlement area, irrigation ditches clearly define household boundaries.

Group tenure in pasture

When communes were de-established in 1985, usufruct rights to pasture in Ak Tubeq and Sarkum were assigned to small groups of households. Under the instruction of

[20] Personal communication with animal husbandry representative, Kom village, 22 July 1998; and household interviews.
[21] Any males eighteen years or older in 1989, when the project started, were entitled to a five-hectare bloc under Project 2817. Parents retained usufruct rights to this land until such time that their sons married (personal communication with district officials, Hosteck, 8 September 1998).
[22] Personal communication with Animal Husbandry Bureau and other officials, Hosteck, 8 September 1998; and Sarkum grassland tax person, Hosteck, 27 October 1998.

the production brigade and village leaders, the households organized themselves into groups to receive usufruct rights to pasture. In Ak Tubeq, 44 pasture groups emerged from its 214 households[23] and in Sarkum, 27 pasture groups[24] emerged from its 104 households[25]. Each group was allocated a parcel in every major seasonal pasture. Some basic data on these 'pasture groups' is presented in Table 2 below. The groups formed in Ak Tubeq in 1985 were generally larger than those formed in Sarkum. There was a strong kinship basis to the groups, with 89% and 90% of sample households in Ak Tubeq and Sarkum respectively being related to all or some of the other households in their group. Furthermore, the nature of the kin relationship was usually very immediate.

TABLE 2

PASTURE GROUPS

	No. of households in group		**Kinship relationship of sampled households to other group households**			**% of original groups that have subdivided**
	Range	Mean	All related	Some related	None related	
Ak Tubeq						
- 1985	3 – 6	4.6	74%	15%	11%	
- 1998	3 – 12	6.0				6%
Sarkum						
- 1985	1 – 5	2.7	84%	6%	10%	
- 1998	1 – 8	3.2				36%

Source: survey data

In Kom village, no pasture groups were formed to receive usufruct rights to pasture. Usufruct rights to pasture were initially ambiguous but informal tenure based on proximity to household cutting land and prior use rapidly developed. For example, many of the households allocated cutting land far from Kom village proper built their houses in close proximity to the cutting land and utilized summer pasture at the top of the nearest mountains. Sometimes small numbers of households, often related and neighbors in the valley floors below, shared the same mountain pastures. However, the composition of these 'groups' and the delineation of their boundaries was more a product of the rugged and forested terrain than any conscious effort at pasture group

[23] Grassland records, Ak Tubeq.
[24] Personal communication with the grassland management representative, Sarkum, 26 October 1998.
[25] Personal communication with the accountant, Sarkum, 24 October 1998.

formation. The lack of premeditated pasture groups in Kom clearly distinguishes it from the case of Ak Tubeq and Sarkum.

The groups that were established in Ak Tubeq and Sarkum in 1985 in order to receive usufruct rights to pasture have persisted to varying degrees. This persistence is most notable in the case of Ak Tubeq where, between 1985 and 1998, the total number of pasture groups in Ak Tubeq only increased from 44 to 48[26]. This was due to the subdivision of several of the larger groups. Over the same period, the upper range and mean number of households in the groups (see Table 2) has increased due to new households constituted since 1985. These new households follow patri-local residence patterns and thus become automatic members of their patriarch's group. Group membership has remained stable across the different seasonal pastures.

Pasture groups in Sarkum have persisted to a lesser degree. In part this relates to changing resource endowments and demands associated with settlement. A sizeable portion of spring-autumn pasture was lost, leading to the opening up of all the remaining spring-autumn pasture to the whole village and the virtual dissolution of pasture groups in spring. There have also been reduced demands on winter pasture, which is now allocated on an annual basis by village leaders in accordance with group or household needs[27]. Thus boundaries in winter pasture are re-delineated each year. Pasture groups have been the most stable and persistent in summer pasture. But even in summer pasture, the number of grassland allocation groups increased from 27 to 42 between 1985 and 1998, largely as a result of the subdivision of many of the original groups. Over one third of sample households belonged to groups that had subdivided sometime during this period (compared with 6% in Ak Tubeq's case, see Table 2). Many of the subdivisions coincided with the issuing of Grassland Use Certificates in 1989. The groups usually subdivided along close kin lines with, for example, the families of a father and his married sons staying together but more distantly related families separating to form their own groups[28]. The upper range and mean number of

[26] Personal communication with accountant, village leaders and grassland tax collector, Ak Tubeq, 30 October 1998.
[27] Village leaders in Sarkum have, since 1993, formally been granted the right to allocate pasture and natural cutting land, to enable greater responsiveness to changing demands induced by settlement (Personal communication with Communist Party leader, committee members and herdsmen, Sarkum, 27 October 1998; and interviews with pastoral households).
[28] Personal communication with village leader, Sarkum, 9 October 1999.

households in the groups (see Table 2) has nevertheless increased due to population growth.

Subversion of grassland use contract system

A major legislative step towards the introduction of more formal and defined rights to pastures was the Xinjiang's government 1989 Rangeland 'Sub-Law', which represented a regional interpretation of the 1985 National Rangeland Law. The regional Sub-Law has been further elaborated in a series of regulations issued since 1989[29]. The formal legislative and regulatory framework provides for the contracting of use rights to pasture, with emphasis on the household as the basic unit of contract. Stability in the allocation of pasture has also been emphasized. Use rights are inheritable and in 1996 new regulations increased the term of contract from 30 to 50 years. Pastoral households formed after 1985 are expected to share the cutting land and pasture belonging to the patriarch.

The major instruments for the implementation of policy have been grassland use certificates, introduced in the case study villages in 1989, and grassland use contracts, introduced in 1995. Grassland use certificates contain a sketch map showing the location of each household's cutting land by way of reference to the users of neighboring parcels and natural landmarks. The location of household's summer, spring-autumn and winter pasture are also given in the certificates, but in a general and vague way. The grassland use certificates in effect simply formalized the existing tenure situation.

Grassland use contracts essentially complement grassland use certificates. The grassland use contract is more specific than the grassland use certificate, setting out the area of different seasonal pastures that had been assigned to the household. However, they do not specifically define individual household pasture boundaries[30]. Thus the issuance of grassland use contracts to households did not, as central policy makers intended, lead to the establishment of individual household tenure, formal or otherwise. The primary purpose of the government in hypothetically calculating the

[29] For a more extensive description of the legal and regulatory framework see Banks, 1999.

area of each seasonal pasture used by households is to allow the derivation of grassland use fees, which are calculated on a per mu basis and vary according to the seasonal type of pasture. The intended purpose of these fees is to provide the Animal Husbandry Bureau with capital for investment in grassland construction. The contracts also specify the maximum stocking rates for the seasonal pastures assigned to households and clearly state that households must ensure that grassland productivity is sustained or improved over time.

Fuzzy boundaries

Informal rules in all three case study villages allow the temporary herding of livestock, big and small, over other villages' and groups' pastures during movements between seasonal pastures[31] or in order to access watering points[32]. More generally, it is usually acceptable for large livestock to graze freely irrespective of village or group pasture boundaries. Large livestock are not usually herded but cows in particular tend to stay within the vicinity of the herding household's yurt or house anyway. Thus the use of a village's or group's pasture by large livestock belonging to another village or group tends to be concentrated in border areas and operate on an implicit reciprocal basis. This contrasts with the case of small livestock, which tend to be herded, or at least regularly watched, throughout the day, and brought back to the herder's residence at night. Neglected sheep and goats can be stolen, attacked by wolves, or simply go missing. The extent to which small livestock are herded within village and group boundaries varies according to the season and this is discussed further below.

Seasonal variations

In cutting lands, there is a seasonal 'switching' of tenure regimes[33]. Household cutting lands serve both as a source of hay and also as winter pasture for their large

---

[31] This happens especially with spring-autumn pasture, given its location between winter and summer pasture.

[32] For example, pastoralists from Katay village have to cross Ak Tubeq's spring-autumn pastures of Sarterek and Tongke on a daily basis in order to water their livestock in the creek located within their pasture (personal communication with herders and direct observation, Sarterek, Ak Tubeq, 3 November 1998).

[33] Sources include personal communication with villages leaders, semi-structured interviews with pastoral households, and direct observation.

livestock. During spring and summer, individual boundaries in cutting land are strictly observed but from autumn, once hay is cut and households' large livestock return, there is a switch in tenure to 'limited' open access grazing[34]. Access is limited in the sense that households only allow their livestock to freely graze within the general vicinity of their winter houses. Grazing is most restricted in Sarkum, where irrigation channels surrounding a household's plot provide physical, though not impenetrable, barriers to livestock movement, and households generally ensure that their large livestock don't venture far beyond these.

The degree to which small livestock are herded within group or individual household boundaries varies significantly across different seasonal pastures[35]. In summer pasture, small livestock are generally herded within such boundaries, though with some 'mixing' taking place in the vicinity of border areas. In the major spring-autumn pastures of Ak Tubeq, although group boundaries are delineated and well known, they are totally ignored. A form of 'internal' open access prevails, with only village boundaries being adhered to. In Sarkum's spring-late autumn/winter pasture of Qeherstaw, a seasonal 'switching' of tenure arrangements takes place. In spring, a form of internal open access prevails. All pastoralists in Sarkum are entitled to use the pasture and no internal boundaries are observed. In late autumn and early winter, however, only those groups or households with winter pasture allocated in Qeherstaw are allowed to use it, and internal boundaries are monitored and enforced.

Group and household boundaries in winter pasture are strictly adhered to. Even the reciprocal sharing of pasture in boundary areas is not common. Furthermore, not only is grazing confined within group or household boundaries, but even within these boundaries grazing is regulated to a degree not encountered in other seasonal pastures. This is to minimize the mushing up of snow and subsequent icing over of pasture. By the beginning of February, when most winter pasture has been depleted and some

[34] Personal communication with grassland tax person, Kom, 4 August 1998; and interviews with pastoral households;
[35] This section is based on a mixture of personal communication with village leaders, interviews with pastoral households and direct observation.

households (particularly from settled villages such as Sarkum) have vacated winter pasture, both village and group/individual boundaries are less adhered to[36].

Finally, there is one other dimension to internal boundaries that needs to be noted. Regardless of the degree to which boundaries are observed with respect to grazing, they are nearly always observed with respect to the location of a herder's dwelling. There are two major types of dwelling: yurts and brick (mud or fired) houses. Yurts are used in summer pasture, brick houses are used in winter pasture and both are used in spring-autumn pasture. There is a widely accepted norm that herders should not locate their dwellings within the boundaries, whether they be group or household, of others. Furthermore, in the case of group tenure, households are expected to locate their yurts in exactly the same place year after year. Although this norm restricts the grazing of large livestock to within the general vicinity of a herders' group or household pasture, it doesn't necessarily confine the grazing of small livestock. In the spring-autumn pastures of Ak Tubeq, for example, some herders daily graze their small livestock three or four kilometers from their residence and group's pastures.

Diverse herding arrangements

Households make a variety of arrangements for the herding of their small livestock. These range from households directly herding their own livestock, to ones involving relatives, to the contracting of commercial herders from outside of the village. The herding arrangements of sample households for small livestock are given by village and seasonal pasture in Table 3. Three common characteristics across different villages and seasonal pastures are evident. Firstly, the household herding of its own livestock, and only its own livestock (category 1.1), is not a standard arrangement in any of the case study villages. The incidence of this arrangement varies from a low 8.2% in the case of Sarkum's summer pasture, to (an atypical) 46% in the case of Ak Tubeq's spring pasture[37]. The relatively low incidence of such arrangements is not

[36] Personal communication with Ak Tubeq herders, Sauer, 8 September 1998; and Sarkum grassland protector household, Sauer, 13 November 1998.

[37] The high spring figure for Ak Tubeq reflects high household demand for herding labor during the critical lambing season. The relatively high incidence of household herding of only one's own livestock in Kom's summer pasture (38.1%) is probably related to the spatially disparate nature of its summer pasture coupled with summer pasture's proximity to households' winter bases.

consistent with the grassland contract system, which is premised on the basis of individual households herding their own livestock on their own pastures.

TABLE 3

HOUSEHOLD HERDING ARRANGEMENTS

Herder(s) of household livestock	**Summer**			**Aut.**	**Winter**		**Spring**
	AT	SAR	KOM	AT	AT	SAR	AT
1. Household (total):	49.4	26.2	47.2	36.0	36.0	29.4	56.4
1.1 only own livestock	*22.8*	*8.2*	*38.8*	*24.4*	*20.0*	*9.8*	*46.2*
1.2 related household(s) livestock too	*26.6*	*18.0*	*8.4*	*11.6*	*16.0*	*19.6*	*10.2*
2. Relatives	32.9	52.4	27.7	19.3	16.0	35.2	15.4
3. Household and relatives	12.7	4.9	5.5	42.4	44.0	17.6	25.6
4. Friends	5.1	0	11.1	2.6	4.0	0	2.6
5. Commercial labor	0	16.4	8.4	0	0	17.6	0
% households using summer pasture	100	98.4	62.1	98.7	94.9	82.3	98.7

Source: survey data

A second common characteristic of herding arrangements in the case study villages is their strong kinship basis. The percentage of households that utilize only their own labor and/or kin labor (adding categories 1, 2 and 3) range from a low of 82.2% in the case of Sarkum's winter pasture, to a high of 97.6% in the case of Ak Tubeq's autumn pasture. Furthermore, not only were households that cooperated with herding related, they were usually very closely related (along patrilineal lines). Given that this is also the case for pasture groups (see Table 2), there is a very strong overlap between members of group herding and tenure arrangements.

A final common feature of herding arrangements is the relatively low use of commercial labor. The use of such labor ranges from virtually nil in the case of Ak Tubeq to 16.4% and 21.5% in the case of Sarkum's summer and winter pastures respectively. There is a difference between commercial herders in Sarkum and Kom. In Sarkum, herders typically come from outside the village (or even district or county), are employed on the basis of a written contract, and do not simultaneously herd their own livestock. In Kom, in contrast, commercial herders are usually from the same village, are employed on the basis of an oral rather than written contract, and usually simultaneously herd their own livestock.

EXPAINIING PASTURE GROUPS

Considerable inter-village differences in pastoral tenure have been observed. The principal inter-village difference relates to the emergence and persistence or otherwise of pasture groups since decollectivization. In Ak Tubeq, pasture groups have persisted, in Sarkum they have diminished and in Kom they haven't emerged. There are also inter-seasonal differences in pastoral tenure, particularly in regard to the degree to which group pasture boundaries are monitored and enforced. The objective of this section is to tentatively explain these differences.

The role of the state

The state, as represented by the Xinjiang Animal Husbandry Bureau, has played a major role in initiating and defining the direction of pastoral tenure change in the case study villages. The AHB directed households in Ak Tubeq and Sarkum to form pasture groups in 1985 and then subsequently encouraged the subdivision of these groups in Sarkum in 1989. But the state has not been wholly determinant of actual pastoral tenure at the field level. The local state, charged with the implementation of pastoral tenure policy, has been somewhat responsive to the influence of pastoral society. Indeed, the legislative and regulatory framework encourages the local state to adopt policy in accordance with 'local conditions' and 'herding traditions and lifestyles'[38]. Furthermore, the state has no explanatory power with respect to the observed inter-seasonal differences in de facto pastoral tenure, given the uniformity of state policy and its implementation across the different seasonal pastures. Thus an understanding of the social and economic environment is pertinent to a more complete understanding of pastoral tenure.

The influence of pastoral society

Pastoral tenure change has been heavily mediated by existing patterns of social organization and social norms. The 1985 decision of the AHB to allocate pastures to groups rather than individual households was consistent with patterns of Kazak social

[38] Xinjiang Government Regulation No.88 (June 1996), Articles 5 and 15.

organization, which have traditionally been based on patrilineal descent groups. These groups cooperated in both social and economic spheres, and to some extent they still do. Contemporary forms of pasture group cooperation span activities such as the herding of animals, cutting of hay, cultivation of crops and seasonal movements (especially the loan of pack animals). The partial overlapping of pasture groups and herding arrangements is 'natural', given that group members share both the same pasture and (usually) close kinship ties as well. Patrilineal descent groups also provide aid to one another in the form of the gifting of consumption goods and cash. Although no specific data on patrilineal-based cooperation in the late commune period was collected, it is unlikely that it was weaker in 1985 than it is today, though it may have taken different forms.

Group rather than household tenure was also consistent with prevailing social norms, which underpinned such practices as the sharing of pastures with other households and the maintenance of fuzzy boundaries. That these social norms still persist are reflected in the responses of herders in Ak Tubeq when they were asked questions relating to the observation of group pasture boundaries. 'This is not cropland' and 'animals have four legs' were typical responses. Thus the implementation of policy has been mediated, if not subverted, by prevailing social norms and patterns of organization. This helps to explain why, despite the emphasis of the grassland contract system on the establishment of household tenure, the implementation of grassland contracts neither brought about the delineation of individual household boundaries nor the end of pasture groups.

The reasons for the diminishment of pasture groups in Sarkum may in large part be due to changes wrought by settlement. Changing resource endowments and utilization patterns induced by settlement have de-stabilized tenure in winter and spring-autumn pasture. As pasture groups were the same across different seasonal pastures, their demise in winter and spring-autumn pasture probably also indirectly contributed to their diminishment in summer pasture too, where they now only involve closely-related households. There has also been a simultaneous diminishment of inter-household cooperation in other spheres, particularly herding. Because group tenure and herding arrangements were traditionally linked, the decline in group tenure has contributed to a decline in herding cooperation as well. In the medium to long

term, not only are patterns of social organization changing in Sarkum, but so are underpinning social norms. The adoption of a more sedentary lifestyle in Sarkum, based on the cultivation of irrigated land, has undoubtedly started a process of socio-cultural change. Households can increasingly be expected to adopt a less 'pastoral' and more 'agriculturist' outlook, including with respect to tenure[39]. Thus traditional norms underpinning such practices as the sharing of pasture and flexible boundaries can expected to be gradually eroded in favor of new norms that sanction individualized tenure and fixed boundaries.

The economics of pasture groups

There are potential underlying economic rationales for the existence of pasture groups. Perhaps most significantly, pasture groups facilitate the realization of economies of size with respect to herding labor. In Ak Tubeq during summer and winter, and Sarkum during winter, a household's livestock are split up according to type and herded simultaneously in distant pastures. This enables the better matching of livestock to feed resources but is very demanding in terms of household herding labor requirements. Group herding arrangements can help alleviate this demand. A typical group herding arrangement involves a young family from the group and young males from other households in the group jointly herding all the group's small livestock together. The rest of the households take care of the large livestock in another pasture or at their winter base. A variation of this argument can also be applied to the case of Sarkum during summer. In this case, the demand on household labor arises not from the necessity of having to herd different livestock in different pastures (all livestock are herded in the same pasture) but from the need for households to simultaneously herd their livestock in summer pasture and manage their irrigated plots in Sarkum proper. Thus it is common to find the arrangement whereby some household herds the group's livestock in summer pasture and other households takes care of the group's land in Sarkum.

[39] See Williams (1996a) for his discussion of sedentary versus nomadic 'environmental cultures' in Inner Mongolia.

Group tenure is obviously more preferable to household tenure in those situations where there are incentives for group herding arrangements. Household tenure would defy the realization of economies of size because it implies the herding of a household's livestock on its own pastures only. A clear correlation between group tenure and group herding can be found in the case study villages. In Ak Tubeq, group tenure is strongest in those pastures, winter and summer respectively, where group herding arrangements are also strongest. Where and when group tenure is weakest, in spring-autumn pasture during spring, group herding practice is also relatively rare. The lack of group herding in spring arises because households prefer to use their own herding labor during the critical lambing season. In Sarkum, both group tenure and group herding arrangements have been more stable and more common in summer pasture versus other seasonal pastures.

But an equally important factor has been the increased demands on household and village labor as a result of settlement. Settled households need to manage, or at least make provision for the management of, their artificial pasture and cropland throughout the summer months. They are unwilling to entrust this task with anyone but themselves or close kin. Thus it is not uncommon to find two (or more) closely related households that specialize over summer, with one herding livestock in summer pasture whilst the other manages both households' irrigated parcels. Other households deal with this problem through contracting non-village herding labor for the herding of their livestock in summer pasture, which then allows them to stay over in Sarkum and tend their artificial pasture and cropland. It is instructive to note that the reverse doesn't happen: households don't take their livestock to summer pasture and contract someone else to look after their irrigated land. Aside from a social preference for staying in Sarkum, such a phenomenon may be explained by the relatively greater difficulty of monitoring labor effort in cultivation versus herding activities.

There are economies of size to be realized even in the case of commercial herding arrangements, which have been on the ascendancy in Sarkum. A commercial herder can typically herd around 350-500 livestock, or about 3-4 households', without any significant increase in the risk of livestock losses. Because the herder is paid on a per livestock basis, he has the incentive to herd more than the number of livestock that a

typical household owns. In summer pasture tenure is relatively fixed and so commercial herders typically herd the livestock of households belonging to the same group, or perhaps neighboring groups. In winter pasture, where tenure is very flexible from year to year, commercial herders have relatively more freedom in the choice of households that they work for. Even, then, however, closely related households often have a preference for employing the same commercial herder, perhaps as a way of minimizing transaction costs, especially monitoring costs.

The rise of commercial herding in Sarkum is an interesting phenomenon in itself. About one in six and one in five of households in Sarkum employ commercial herders in summer and winter pasture respectively. This is up from zero a decade ago. In herding arrangements that involve close kin or friends, there is a high level of trust between participating households and monitoring and enforcement costs are consequentially low. In contrast, commercial herding arrangements are very rarely socially embedded. Herders are often from outside the village, even the county, and it is rare for a household to employ the same herder for more than one or two seasons. In lieu of trust, there is a written contract between the parties, setting out terms for remuneration and compensation for livestock losses. The contract is usually endorsed by the village leader. Although written contracts were a 'directed institutional innovation', having been introduced into Sarkum in a government propaganda drive in the late 1980s, their popularity in the village since settlement is indicative of household demand for more flexible herding arrangements.

As discussed in the previous section on pastoral tenure, there are inter-seasonal differences in the monitoring and enforcement of group pasture boundaries, particularly in the case of small livestock. Group boundaries are most strictly monitored and enforced in cutting land (during summer) and winter pasture and least monitored and enforced in spring-autumn pasture. Summer pasture lies somewhere in between. These variations can in part be explained by relative resource scarcity. Feed is more scarce over winter than summer, thus inducing stricter monitoring and enforcement of boundaries in cutting land and winter pasture.

In spring-autumn pasture, group boundaries, if they exist, are not monitored or enforced at all and an internal 'open access' situation prevails. Several location-

specific characteristics of spring-autumn pasture may account for the prevalence of open access. Firstly, its location between winter and summer pasture lends it to being used on a transitional basis only. In the case of Ak Tubeq, for example, households move through three spring-autumn pastures on their way to summer pasture (and again on their return journey). The pastures are typically used for only short duration and are sometimes subject to transitional use by households from other villages as well. Another relevant dimension of spring-autumn pasture is its relative lack of watering points. This encourages the transitional use (on a daily basis) of a group's pasture by the livestock of other households of the same village or other villages. Finally, the quality of pasture appears to be more variable (on a spatial basis) within spring-autumn pasture than summer and winter pasture. Open access could simply be a social mechanism for ensuring equitable access by households and groups to pasture.

The special case of Kom

It will be recalled that pasture groups have generally not emerged in Kom. One reason for this is that the state didn't encourage their formation. Another related reason could be differences in the social organization of Mongolian versus Kazak communities, particularly the greater autonomy of Mongolian households. However, the principal reason appears to be the specific nature of Kom's resource endowments and the implications this has for herding arrangements. In Kom different types of livestock are simultaneously grazed in the same pasture rather than, as in the case of Ak Tubeq during summer and winter, in distant pastures. This means that Kom households face relatively fewer demands on herding labor than their counterparts in the other villages. Furthermore, although Kom households, like their counterparts in Sarkum, still have the dual responsibility of cultivating crops and herding livestock over summer, this is much easier to manage in Kom, where cropland and summer pasture is only hours (rather than over a week's travel) apart. Thus group herding arrangements tend to be very rare in Kom. The group tenure arrangements that have evolved in Kom are more incidental rather than utilitarian in nature. They simply involve a group of usually related households sharing the same general summer pasture.

CONCLUSIONS

Several conclusions regarding institutional change and pastoral tenure can be drawn from this study. Firstly, reasons for the persistence of group tenure are multi-faceted. Although national and provincial pastoral tenure policy favors the establishment of household tenure, it has been interpreted and implemented in such a way as to facilitate the continuation of group tenure. This provides an interesting example of the 'social mediation' of policy making and implementation processes at both the provincial and local levels respectively. Secondly, group tenure is socially embedded. Group tenure arrangements have a strong kinship basis and overlap with other spheres of inter-household social and economic cooperation. More generally, social norms support the practice of the inter-household sharing of pastures and maintenance of 'fuzzy boundaries' associated with group tenure. Thirdly, there appears to be a strong economic rationale for the continuation of group tenure. Group tenure facilitates group herding, which in turn enables the realization of economies of size with respect to herding labor.

Inter-seasonal variations in the monitoring and enforcement of boundaries can also be partially explained through recourse to economics. Boundaries to cutting land, during the summer season, and winter pasture are closely monitored and enforced, as feed is scarcest over winter. In summer pasture, where there is abundant feed, boundaries are less strictly monitored and enforced. In spring-autumn pasture a restricted open access situation prevails, in part because of its location in a transitional zone. Access is still restricted both seasonally and in terms of the exclusion of non-village members. The finding that open access only prevails in one of three seasonal pastures, and even then it is restricted, needs to be emphasized as it challenges the prevailing interpretation of Chinese pastoral tenure as a completely open access situation.

Institutional change in Sarkum offers insights into how arrangements in other non-settled villages can be expected to evolve in the future. Changes in resource endowments and utilization patterns induced by settlement disturbed existing arrangements. Although group tenure arrangements have become smaller and less

stable, they are still the predominant pastoral tenure arrangement. The advent of commercial herders, who also strive to realize economies of size, has changed the nature of, but not undermined, 'group' tenure arrangements. Furthermore, the role of village government in the allocation of pasture, monitoring and enforcement of seasonal movements and dispute resolution has, if anything, been strengthened. Thus common property in Sarkum, in the broader sense of the community exercising control over the use of its natural resources, has survived both decollectivization and official settlement.

REFERENCES

Baland, J.-M. and Platteau, J.-P. (1996) *Halting Degradation of Natural Resources: Is There a Role for Rural Communities?* Oxford: FAO and Clarendon Press.

Banks, T.J. (1997) 'Pastoral Land Tenure Reform and Resource Management in Northern Xinjiang: a New Institutional Economics Approach', *Nomadic Peoples*, NS1(2):55-76.

Banks, T.J. (1999) 'State, Community and Common Property in Xinjiang: Synergy or Strife?', *Development Policy Review*, Vol.17(3):293-313.

Behnke, R.H. (1994) 'Natural Resource Management in Pastoral Africa', *Development Policy Review* 12:5-27.

Benson, L. and Svanberg, I. (1988) 'The Kazaks in Xinjiang' in L. Benson and I. Svanberg (eds) *The Kazaks of China: Essays on an Ethnic Minority*. Uppsala: Studia Multi-ethnica Upsaliensia.

Burmeister, L.L. (1987) 'The South Korean Green Revolution: Induced or Directed Innovation?' *Economic Development and Cultural Change* 35(4):767-790.

Cui, H. X., Zhang, J. L., and Asya (1996) 'Modifying Management Methods to Promote the Reform and Development of Grassland-based Animal Husbandry and Better Resource Use'. Urumqi: Grassland Research Institute.

Eggertsson, T. 1990, *Economic Behaviour and Institutions*. Cambridge: Cambridge University Press.

Goldstein, M. C. (1993) 'Change, Conflict and Continuity Among a Community of Nomadic Pastoralists' in R. Barnett and S. Akiner (eds) *Resistance and Reform in Tibet*. Bloomington: Indiana University Press.

Goldstein, M. C. and Beall, C. M. (1991) 'Change and Continuity in Nomadic Pastoralism on the Western Tibetan Plateau'. *Nomadic Peoples* 28:105-122.

Granovetter, M. and Swedberg, R. (1992) *The Sociology of Economics*. Boulder: Westview Press.

Hanna, S. and Munasinghe, M. (eds) (1995) Property Rights and the Environment: social and Ecological Issues. Washington D.C.: World Bank.

Hayami, Y. and Ruttan, V. W. (1990) 'Induced Innovation Model Of Agricultural Development' in C. K. Eicher and J. M. Staatz (eds) *Agricultural Development in the Third World* 2nd Edition. Baltimore: Johns Hopkins University Press.

Ho, P. (1999) *Development and Change* (forthcoming).

Ho, P. (1996) 'Ownership and Control in Chinese Rangeland Management Since Mao: the Case of Free-Riding in Ningxia', Pastoral Development Network 39c

(January): 1-24.
Hudson, A. E. (1938) *Kazak Social Structure*. New Haven: Yale University Press.
Humphrey, C. and Sneath, D. (1999) *The End of Nomadism? Pastoralism in the Post-Socialist Economies of Central Asia*. Raleigh: Duke University Press.
Lane, C. and Moorehead, R. (1995) 'New Directions in Rangeland Resource Tenure and Policy' in I. Scoones (ed) *Living with Uncertainty: New Directions in Pastoral Development in Africa*. London: Intermediate Technology Publications.
Li, and Duo, L. K. (1995) 'Preliminary Survey of the Grassland Payment Contract System', *Xinjiang Animal Husbandry Journal* 2:36-37.
Lin, J.Y., Cai, F. and Li, Z. (1996) *The China Miracle*. Hong Kong: Chinese University Press.
Longworth, J. W. (1993) C*hina's Pastoral Region: Sheep and Wool, Minority Nationalities, Rangeland Degradation and Sustainable Development*. Wallingford: CAB International.
Longworth, J. W. (ed) (1990) *The Wool Industry in China: Some Chinese Perspectives*. Mount Waverley: Inkata Press.
McKay, B. J. and Acheson, J. M. (eds) (1987) *The Question of the Commons: the Culture and Ecology of Communal Resouces*. Tuscon: University of Arizona Press.
Mearns, R. (1996) 'Community, Collective Action and Common Grazing: the Case of Post-Socialist Mongolia', *Journal of Development Studies* 32(3):297-339.
National Research Council (ed) (1992) *Grasslands and Grassland Sciences in Northern China*. Washington, D.C.: National Academy Press.
Ostrom, E. (1990) *Governing the Commons: the Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.
Runge, C.F. 1986, Common property and collective action in economic development, *World Development* 14(5): 623-635.
Scoones, I. (ed.) *Living with Uncertainty: New Directions in Pastoral Development in Africa*. London: Intermediate Technology Publications.
Stevenson, G. G. (1991) *Common Property Economics*. Cambridge: Cambridge University Press.
Su Li, T.B. and P. Xu (1997) 'Lessons and Experience from Altay Prefecture Regarding the Grassland Contract System', *Xinjiang Animal Husbandry Journal* 2:14-15.
Svanberg, I. (1988) 'The Nomadism of the Orta Uz Kazaks in Xinjiang 1911-1949' in L. Benson and I. Svanberg (eds) *The Kazaks of China: Essays on an Ethnic Minority*. Uppsala: Studia Multi-ethnica Upsaliensia.
Tuoman, C. (1993) 'The Current State of the Grasslands, Causes of Degradation and Countermeasures in Xinjiang', *Xinjiang Animal Husbandry Journal* 2.
Wang, R. (1995) 'The Practice of Grassland Tenureship to Strengthen Management and Construction of Grassland Resources', *Grasslands of China* 1:59-63.
Williams, D.M. (1996a) 'The Barbed Walls of China: a Contemporary Grassland Drama', *Journal of Asian Studies* 55(3):665-691.
Williams, D.M. (1996b) 'Grassland Enclosures: Catalyst of Land Degradation in Inner Mongolia', *Human Organization* 55(3):307-313.
Yu, Z., Sun, L., Yu, Z., Chang, F. and Batou (1996) 'A Preliminary Study on the Grassland Property Rights System in China', *Grasslands of China* 4:47-51.