
Pastoralism and Protected Area Management in Mongolia's Gobi Gurvansaikhan National Park

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ABSTRACT

The Gobi Gurvansaikhan National Park was established in south central Mongolia in 1993 and is used by over 1100 families with pastoralism as their main means of livelihood. Research conducted in 1998–2000 to analyse grazing management problems identified a number of issues and concerns, including a significant increase in the number of herders and the size of the herd; variations in herd size reflecting differences in wealth; problems with marketing of livestock or livestock products; declining stock movements because of transportation costs and loss of water sources; and significant competition and conflicts for grazing areas. The socio-economic problems associated with Mongolia's transition to a market system, coupled with the expansion of protected areas, mean that herders have to adapt to both the current economic system and changes in land use. Although some aspects of the development of the park can be seen as a positive influence on maintaining pastoral livelihoods in this area, the national goal of protecting 30 per cent of the country, doubling the area of Mongolia currently under protected area status, could have negative effects on pastoral livelihoods, unless ministry officials, protected area administrators and pastoralists can work effectively to solve resource problems.

INTRODUCTION

Mongolian pastoralists have a long tradition of using communal rangelands in a sustainable manner to produce a wide array of livestock products for subsistence and trade. The pastoral system is a semi-nomadic or transhumance system where pastoralists return to an established winter camp (although some herders have more than one winter camp). Mongolian pastoralists have not been 'true nomads' for millennia (Jagchid and Hyer, 1979). Mongolians are proud of their pastoral culture and their ability to subsist on their livestock even under extremely difficult environmental

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conditions. However, following the collapse of the command economy and the disbanding of collectives by 1992, the number of herding households increased dramatically since few other livelihood options existed. The increased numbers of herders and the subsequent increase in livestock have significant ramifications for the sustainability and biodiversity of these rangelands.¹

Another factor that could significantly impact common grazing lands is the creation of new protected areas and the restrictions on land use associated with Mongolia's Protected Areas Law of 1994. A relatively large area of Mongolia has been placed under protected area designation since 1992, and by late 2000, 20.5 million ha or about 13 per cent of the country was designated as protected areas (see Table 1). Some observers have raised concerns regarding additional constraints placed on herders by encroachment on customary grazing with the establishment of large protected areas (Agriteam Canada, 1997). For example, Khustain Nuruu Nature Reserve, established for the reintroduction of Przewalskii horse (*Equus przewalskii*), reduced total area available for herders in Altanbulag *sum*² and created conflicts associated with a loss of traditional winter and spring camps. The establishment of the Gobi B Ecological Reserve reduced winter grazing areas for local herders. No information was found on conflicts associated with removing domestic livestock from protected areas established before the 1990s. However, O'Gara (1988) in describing the success of the Khokh Serkhi Strictly Protected Area for conservation of wildlife reports that within five years of its 1977 establishment all pastoralists and their livestock

Table 1. Statistics on the Number and Size of Different Protected Areas in Mongolia

Type of Protected Area	Number		Area (1,000s hectares)		
	Pre-1992 ^a	1992–2000	Pre-1992	1992–2000	Total
Strictly Protected Areas	4	8	5,446.7	5,047.5	10,494.3
National Parks	1	13	77.3	8,133.3	8,133.4
Nature Reserves	4	12	122.2	1,732.2	1,854.4
Monuments	2	4	7.6	71.6	79.3
Total	11	39	5,653.9	14,781.5	20,561.4

Note: ^aIn the 1950s, 1960s, 1970s and 1980s the number of protected areas added were 2, 5, 3, and 0, respectively.

1. A number of papers examine various issues that relate to the transitional problems, including potential consequences for communal land use; see for example, Bruun and Odgaard (1996); Erdenebaatar (1996); Fernandez-Gimenez (1997); Goldstein and Beal (1994); Humphrey and Sneath (1999); Mearns (1993a, 1993b, 1996); Schmidt (1995); Swift and Mearns (1993).
2. A *sum* is a local government unit, or district, and a division of the *aimag*, or province.

had been removed. This was an area where competition between livestock and wild ungulates occurred (O'Gara, 1988) and thus it seems likely that displacement of pastoralists by protected area designation in Mongolia is not only a recent phenomenon but has occurred in the past.

There is little doubt that Mongolia will continue to expand the number of protected areas. The goal established by the Mongolian Parliament in 1992 was for 30 per cent of the nation to be placed under protected status (Chimed-Ochir, 1997). Enebish and Myagmarsuren (2000) also provide a time frame and list potential areas for protected designations that will meet the goal of 30 per cent of the total area of Mongolia protected by 2030. Because of the significant land area placed in protected area status and the potential for a much larger area to be placed under protected status, there is a need to understand how protected areas may affect communal land use.

The Mongolian Law on Special Protected Areas (MLSPA) establishes four types of protected area designations: Strictly Protected Areas, National Parks, Nature Reserves, and Natural and Historical Monuments.³ The Protected Area Division within the Ministry of Nature and Environment is charged with managing all protected areas. Strictly Protected Areas (SPAs) are the most restrictive category of protected area and 'consist of areas taken under special protection upon consideration of the preservation status of the original condition and features of the natural zones, in order to represent specific traits of the zones and scientific importance, and to ensure environmental balance' (Wingard, 1996). The SPAs are divided into the Pristine, Conservation, and Limited Use Zones. The Pristine Zone is the core area and most restrictive in uses and is most similar to IUCN Category Ia — Strict Nature Reserve (IUCN, 1994). The Conservation Zone, designed to protect the ecological integrity of an ecosystem, is similar to the IUCN Category II — National Park. The Limited Use Zone is the least restrictive zone and is comparable to IUCN Category VI — Managed Resource Protected Area (Wingard and Odgerel, 2001).

National Parks (NPs) are designated for areas where natural conditions are relatively intact and which have historic, cultural, scientific, educational, and ecological importance. NPs are to be divided into a Special Use Zone, a Travel and Tourism Zone, and a Limited Use Zone. The Special Use Zone is the core area and has the greatest restrictions on use and is equivalent to IUCN Category II — Protected Area classification (IUCN, 1994). However, livestock grazing is allowed in Special Use Zones with the proper permit, permits apparently being granted only under certain conditions such as heavy snowfall (Wingard and Odgerel, 2001). Both the Travel and Tourism Zone and the Limited Use Zone allow livestock grazing. The

3. The MLSPA also establishes subcategories that provide for different levels of protection and potential use for each type of protected area and provides the establishment of buffer zones around the Strictly Protected Areas and the National Parks (Wingard and Odgerel, 2001).

Travel and Tourism Zone is similar to IUCN Category VI — Managed Resource Protected Area. The Limited Use Zone has the least number of restrictions and there is no regulation of grazing beyond restrictions found on other Mongolian lands that are not under protected area status (Wingard and Odgerel, 2001).

Nature Reserves (NRs) and Natural and Historical Monuments (NHMs) are areas designated to protect either a natural, historical or cultural resource. Nature Reserves are areas taken under state special protection for the conservation, preservation, and restoration of certain natural features and natural resources and are similar to IUCN Category IV — Habitat Species Management Area. Nature Reserves may be categorized as ecological, biological, paleontological or geological reserves. The law states that traditional household activities are allowed in NRs if they do not have a negative impact on the natural feature (Wingard, 1996). Natural and Historical Monuments are under special protection for the purpose of preserving the heritage of natural and unique formations as well as historical and cultural traces in their natural states and are equal to IUCN Category III classification system of protected areas (IUCN, 1994).

Before 1978 there were eleven protected areas totalling 5.6 million ha (Table 1). Only four out of eleven of the protected areas were SPAs; however, these comprised 98 per cent of the total area in protected status. From 1992 to 2000 an additional thirty-nine areas totalling 14.8 million ha were given protected area status. SPAs still comprise the greatest area (10.4 million ha) or 51 per cent of the total area in protected area status. National Parks increased most dramatically between 1991 and 2000 and now comprise 39 per cent of total area in protected area status. Presently there are sixteen NRs and six NHMs encompassing 1.8 million ha and 79,305 ha, respectively (see Table 1). Since each protected designation has its own restrictions concerning human use, the impact on communal use could vary greatly. In areas where large protected areas have been established, there is a need to understand how land use laws associated with the protected areas could potentially influence traditional land use. The objective of this article is to detail changes in pastoral livestock management that have occurred in one of these protected areas, Gobi Gurvansaikhan National Park, since its establishment. We describe changes in livestock and herder populations for the *sums* of the park and for Omnogobi *aimag*; we describe differences in herd size and herders' perceptions of resources; we examine mobility and camp locations, herders' historical use of the park, and livelihood changes. We also address a number of livestock management and resource issues that influence pastoral livelihoods and park management. Our findings reveal that the issues and concerns identified by pastoralists living in Gobi Gurvansaikhan National Park are not associated with the development of the park. In fact, we believe the development of the park has had no negative influence on the lives of these pastoralists. However, the socio-economic changes occurring in Mongolia

during the 1990s have dramatically impacted on people's livelihoods and have altered land use, overshadowing any potential impact of the park.

STUDY AREA

The field study on which this article is based was centred in the Gobi Gurvansaikhan National Park in Omnogobi *aimag* (province). This 2.2 million ha park was established in late 1993⁴ following recommendations by the World Wildlife Fund and Mongolian conservationists associated with its unique habitats and wildlife populations. The park's landscape is extremely varied which results in a high diversity of flowering plants and wildlife, and it is an area that has been used by nomadic herders and their livestock for thousands of years. The park is dominated by semi-desert steppe but also contains alpine meadows, mountain steppe, mountain shrub, semi-desert shrub, and desert shrub (for a description of the rangelands see Bedunah and Schmidt, 2000). Elevation varies from 1,000 m to 2,835 m and the numerous mountain ranges (eastern extension of the Altai Mountains) influence environmental conditions dramatically. Dalanzadgad, on the eastern edge of the park, receives an annual average of 131 mm of precipitation, but Gurvantes, the most western *sum* centre that is located just south of the park, averages only 55 mm of precipitation. In the mountains precipitation increases and probably averages over 200 mm per year in some of the higher mountains. Winters are cold, but spring is generally dry and windy and dust storms are common. Summers are hot and relatively wet. On average two-thirds of the precipitation occurs between June and August. Temperature extremes range from 40 °C to minus 42 °C.

The park's rangelands, dominated by low and highly variable rainfall conditions both spatially and temporally, greatly influence the herders' movements and responses to changing conditions. This type of climate results in a 'non-equilibrium ecological system'⁵ where factors such as rainfall timing and rainfall amounts have a greater impact on vegetation than livestock numbers. In other words, there is a weak coupling of plant-herbivore interactions (Behnke and Scoones, 1993; Ellis and Swift, 1988). Although the park is dominated by 'non-equilibrium ecological systems' the higher elevation areas (mountain steppe) would be classified as 'equilibrium

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4. In 1993 the area received protected status and officially became a National Conservation Park in 1995. In 2000 the park was increased in size by 523,000 ha for a total area of 2.7 million ha and now includes a portion of Bayankhongor *aimag* (Enebish and Myagmarsuren, 2000). However, the majority of the research for this paper was conducted in 1998-99 and includes only areas of the park in Omnogobi *aimag*.
 5. Also see Scoones (1999) for an overview of non-equilibrium dynamics and how this new paradigm offers opportunities for interactions between social and natural sciences.

systems' where plant community attributes are significantly impacted by animal density-dependent feedback controls. It should also be stressed that ecological systems are complex and exhibit a continuum between equilibrium and non-equilibrium characteristics and that livestock can have significant impact on vegetation attributes even in areas considered to be dominated by 'non-equilibrium dynamics' (Fernandez-Gimenez and Allen-Diaz, 1999). Approximately one-third of the park, principally its western portion, is desert and much of this area is very sparsely inhabited. The Protected Area Bureau determined the area of each *sum* in the park and estimated that the park had 1.7 million ha of usable pasture (78 per cent of the park) in 1997. Usable pasture was determined as all areas other than roads, sand dunes or sandy areas with high erosion potential, and saxaul (*Haloxylon ammodendron*) forests. Apparently, saxaul forests were excluded from estimations of usable pasture to protect soils from erosion and because of the diversity of habitats for wildlife in these areas.

There are several nationally and globally threatened and endangered species within the park (Reading et al., 1999a). Wild ungulates and predators may directly impact on pastoralists by competing for forage or preying on livestock. The most common wild ungulates in the park are argali (*Ovis ammon*), ibex (*Capra sibirica*), goitred gazelle (*Gazella subgutturosa*) and Mongolian gazelle (*Procapra gutturosa*). The park has relatively large populations of grey wolf (*Canis lupus*), snow leopard (*Uncia uncia*), lynx (*Lynx lynx*) and five species of eagles (*Aquila* sp.) that are potential predators on livestock (Reading et al., 1999a). A number of rare plant species (Shirrevdamba, 1997) that could be negatively affected by human activities have been identified in the park. Some of these species, for example *Amygdalus mongolica*, *Juniperus sabina*, *Potaninia mongolica*, *Incarvillea potaninii*, *Caryopteris mongolia*, and *Populus diversifolia*, are either utilized extensively by livestock or by herders for fuel wood (or by both), which may result in a significant decrease of these species without proper management.

More than 1,100 herding households and over 200,000 head of livestock used the park during the time of study. Pastoralists have multiple species herds and often have all 'five types' of Mongolian livestock: camels, cattle and/or yak (approximately 1,100 yak live in the park and are found almost entirely in the Zuun Saikhan and Dund Saikhan mountains), horses, sheep and goats. A primary concern of park managers is to ensure pastoralists' livelihoods while preserving biodiversity and the other resource values of the park. Our study area is Gobi Gurvansaikhan National Park, but we included some areas adjacent to the park, since pastoralists do not consider park boundaries when managing their livestock. We also utilized statistics on livestock numbers and human population for those *sums* located in the park, Bayandalai, Dalanzadgad, Bulgan, Gurvantes, Sevrei, Khangkhongor, and Khurmen, and for Omnogobi *aimag* to determine if trends appeared similar.

Methodology

Field research occurred in July–August 1998, August 1999, and September–October 2000, and included interviews with pastoralists, rapid rural appraisal with small groups of herders, and field reconnaissance of pasture conditions. In 1998, we interviewed seventy-seven households. The interview process was informal, but included a list of forty questions that we asked each household. The major objectives were to determine herders' perspectives on grazing land conditions, their concerns about changes in their lives in general, and more specifically their concerns about herding in the park. We asked questions concerning herd structure, movement of livestock, condition and desirability of winter camps, livestock products produced, marketing of livestock and livestock products, risk management, water resource use, length of time in the park, length of time herding, depredation of livestock by wildlife, number of livestock managed before the disbanding of the *negdels* (livestock collectives), co-operation with other herders, and grazing management concerns. The interviews also provided information on pastoralists' knowledge of the park, including park zonation, wildlife concerns (predation, competition between wildlife and domestic livestock, and concerns regarding decreasing wildlife), and other uses of resources in the park. Interviews were conducted by project staff, as well as by park administration personnel who were often acquainted with the herders. Herding families selected for interviews were chosen by selecting a *ger* (felt tent used by herders) or a number of *gers* in a particular area. Two herding families were retirees and had relatively few animals (a mean of 100 sheep units) and these were not included in analysis of animal units. In only one case did a herder appear antagonistic or defensive during the interview. In general, herders seemed co-operative or even eager to be interviewed and we believed they tried to supply accurate information.

In August 1999, we randomly selected ten households in an area of the park in Bulgan *sum* to re-evaluate grazing conditions and determine changes in households for this area. In September and October 2000 small groups of herders (three to ten families) were interviewed using a rapid rural appraisal approach. The main objectives of these interviews were to determine attitudes for future planning, but they also helped evaluate perceptions we gained from the interviews in 1998.

Locations of herders' *gers* were recorded on topographic maps and with a global positioning system (GPS). The park staff had previously completed a census of herding households and recorded winter and summer camp locations. From this information we calculated the average area available per *ger* location for three broad areas within the park. The three areas included (1) all areas east of Sevrei *sum*, (2) Sevrei *sum*, and (3) those areas west of Sevrei *sum*, but not west of the western edge of Nemegt Mountain (west of 100.5° longitude). Areas west of Nemegt Mountain are sparsely populated because of extreme desert conditions. Frequency of camps in close

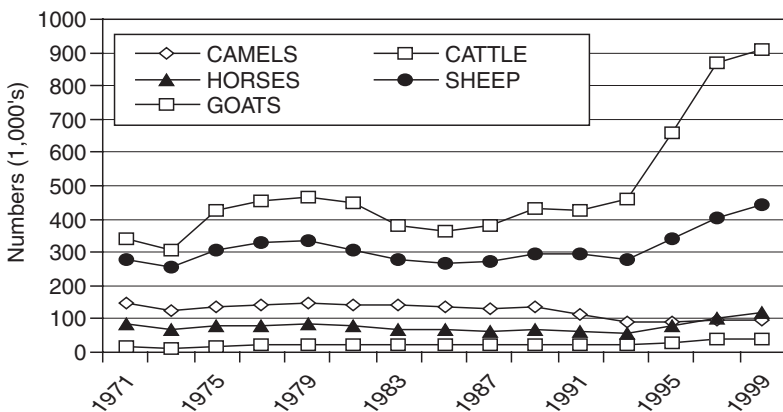
proximity to both summer and winter camps was also determined in the park area east of *Sevrei sum*. The number of camps found in close proximity (from 0.5 km to 4 km) of the selected winter and summer camps was determined by randomly selecting a camp location and then determining the number of surrounding winter and summer camps.

SUMMARY OF RESULTS

Livestock and Herder Population Trends

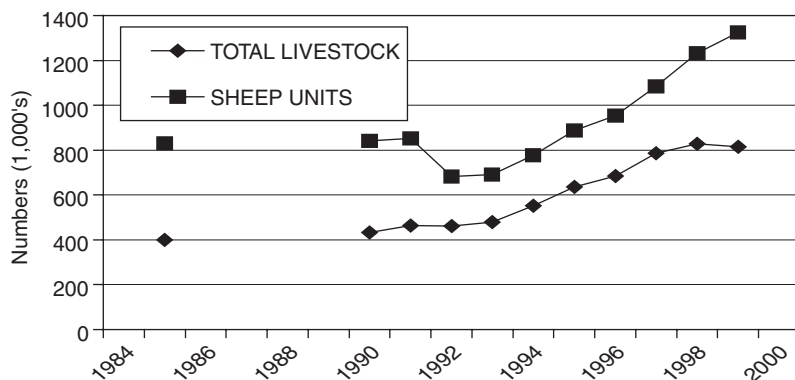
Total livestock numbers and livestock on a sheep unit basis⁶ increased dramatically for Omnogobi *aimag* and park *sums* since the disbanding of the *negdels* and privatization of livestock (see Figures 1 and 2). Between 1991 and 1992 there was a slight decrease in total livestock numbers and a large decrease in livestock based on sheep units. This was the period of dramatic change as the *negdels* (livestock collectives) lost support from the central government and the process of privatization of livestock occurred (see Fernandez-Gimenez, 1997; Goldstein and Beall, 1994). From 1993 to 1999 total livestock and sheep units increased by an average 12 per cent annually. An examination of the total livestock population for Omnogobi *aimag* (1971–99) and for park *sums* (1985–99) shows that the current

Figure 1. Livestock Numbers (1971–99) for Omnogovi Aimag, Mongolia (Aimag Statistical Report, 1999)



6. A sheep unit is a traditional Mongolian method of placing different types of livestock on a forage equivalency basis, where camel = 5 sheep, cattle = 6 sheep, horse = 7 sheep, and goat = 0.9 sheep.

Figure 2. Total Livestock and Sheep Units^a (1985, 1990–98) for Sums Located Partially in Gobi Gurvansaikhan National Park, Mongolia



Note: ^aSheep unit calculations, used to place livestock numbers on forage equivalency basis, were: camel = 5 sheep, cattle = 6 sheep, horse = 7 sheep, and goat = 0.9 sheep.

livestock populations are approximately 150 per cent and 190 per cent higher, respectively than for any period pre-1993, with the greatest annual increases in the mid and late 1990s. The livestock population based on sheep units for the park *sum* has increased by 157 per cent since 1990. It is difficult to determine the accuracy of these livestock statistics. Livestock statistics during Socialist times are generally considered reliable, but apparently there is concern regarding the accuracy of livestock numbers covering the last few years. Kennett (2000) reported that recent livestock numbers are likely to be 25 per cent greater than reported, since herders underestimate animal numbers to avoid taxes. Thus, there is little doubt that since the *negdels* were disbanded and livestock privatized livestock numbers have dramatically increased and the actual livestock numbers may be greater than actually reported.

Not all types of livestock have increased. Camels have actually shown a decline in Omnogobi *aimag* and in the *sums* of the park. Cattle, horses, sheep and goats have all increased since 1990. The rate of change has been the greatest for goats (230 per cent) and the park administration has stressed a concern regarding the large increase in goats, because of the perception that goats cause greater resource damage. Also, Mongolian livestock specialists consider the optimum mix of sheep and goats is 2:1 for risk management (goats are generally more susceptible to losses in cold and/or wet conditions than sheep); yet, in the park this ratio is reversed with more than double the number of goats compared to sheep. Horses and cattle have

shown the next largest increase in numbers since 1990 averaging a 175 per cent increase while sheep numbers increased by 149 per cent. We believe the major factors responsible for the rapid increase in livestock are associated with an increase in the number of herding households and a reduction in off-take or slaughter of livestock. Between 1992 and 1997 the number of households in the park's *sums* increased from 5,240 to 6,548. At the same time, there was a small decrease in the human population for these *sums* (since 1992) and a relatively large reduction in the population of Dalanzadgad (*aimag* centre and largest town) as people returned to pastoralism and the countryside from the towns (see Figure 3). This same trend (until 1999) is also seen in rural and urban households for Omnogobi *aimag* (see Table 2) and is not related to policies regarding the establishment of the park. The large increase in the number of herding families is a result of few other opportunities for making a living, as revealed in the interview process, and directly related to changes in the national economy following the collapse of the Soviet Union and the reduction of subsidies from the Soviet Union (see Swift and Mearns, 1993). This situation has been documented in other studies and papers for Mongolia (Agriteam Canada, 1997; Fernandez-Gimenez, 1997; Goldstein and Beall, 1994). However, there is evidence that there has been a recent shift 'back' from rural to urban households in 1999–2000 for Omnogobi *aimag* (Table 2). We were told this was associated with households that had lost their livestock because of disasters or inexperience or they had received too few livestock to maintain a herd and moved back to urban areas to find work.

Figure 3. Changes in Total Human Population and for Sums Located Partially in Gobi Gurvansaikh National Park, Mongolia

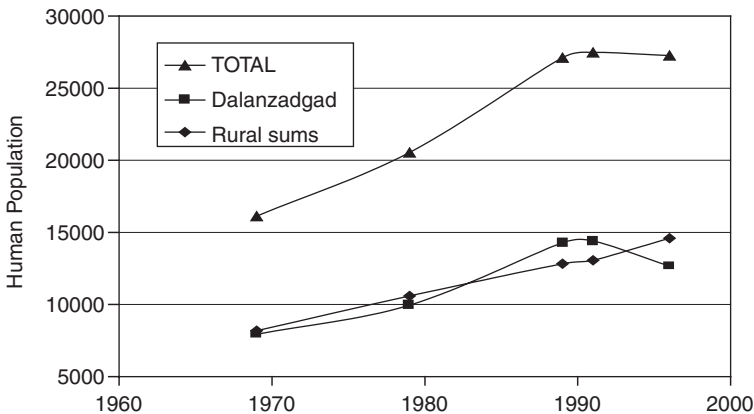


Table 2. Total Number (1,000s) of Households Categorized as Urban and Rural Households for the Omnogobi Aimag, 1963–2000

Category	1963	1969	1979	1989	1990	1991	1992	1993	1994	1995	1999	2000
Urban	0.7	1.4	2.1	3.3	3.3	3.8	4.2	3.8	2.9	2.2	4.8	4.7
Rural	5.1	5.1	5.2	6.2	6.3	7.3	7.7	7.4	7.7	8.5	6.4	6.8
Total	5.8	6.5	7.3	9.5	9.6	11.1	11.9	11.2	10.6	10.7	11.3	11.4

It should be stressed that the slight reduction in human population in Omnogobi *aimag* during the mid-1990s occurred after a relatively long period of rapidly increasing human population. In Omnogobi *aimag* there was a 2.1 fold increase in population between 1956 and 1989. Humphrey (1978) in reviewing the demographics of Mongolia found that most of the increase in human population (a 2.3 fold increase between 1918 and 1976) was absorbed by the growth of towns and thus stated the steppes were no more crowded in the mid-1970s than they were fifty years earlier. Thus, the change in population from urban to rural in the early 1990s is associated with a large increase in people directly using rangelands. A median age of 19.6 years old with 24.4 per cent of the human population between five and fifteen years old in Omnogobi *aimag* in 1996 is a further concern. These trends in the human population point to a significant increase in rangeland use and a greater potential for resource damage if other employment opportunities are not found.

Herd Size, Marketing and Perceptions of Resources

The average herd size was 367 animals or 630 sheep units, but ranged from 42 animals to 1,697 animals and 51 to 2,316 sheep units (see Table 3). All but one of the interviewed families had private animals and 9 per cent also herded animals for another entity (such as the Bulgan Research Institute operated by the Agricultural University, schools, and hospitals). The number of animals a pastoral family owns is a major determinant of its ability to survive and to accumulate wealth. Bruun (1996) suggested a herd size of 100 animals as a viable herd size, but the minimum viable herd will vary according to the herder's perceptions and according to ecological and economic aspects (see Swift and Erdenebaatar, this issue). Of the families interviewed 8 per cent had fewer than 100 animals, but one of these families also herded livestock for another owner. At the other end of the scale, 10 per cent owned over 600 head of livestock. Obviously, there were significant differences in livestock wealth and some herders were very poor with little means of being able to improve their situation. These large differences in wealth, and the extreme poverty of some, are new problems for Mongolia since its transition to a market economy. How these factors will influence

Table 3. Number of Households ($N = 73$) grouped according to Number of Livestock (total animals and sheep units) in Gobi Gurvansaikhan National Park, Mongolia (1998)

Livestock	Livestock Numbers							
	<100	100–199	200–299	300–399	400–599	600–799	800–999	>1000
Total	6	16	11	13	19	3	3	2
Sheep Units ^a	1	5	10	8	20	10	8	11

Note: ^aSheep unit calculations, used to place livestock numbers on forage equivalency basis, were: camel = 5 sheep, cattle = 6 sheep, horse = 7 sheep, and goat = 0.9 sheep.

park managers in their attempt to allow livestock use and preserve resource values is unknown, but increasing differentiation in household wealth and herd size will likely lead to highly differentiated herder resource exploitation objectives/strategies and thus make park management a more complex and difficult task.

Pastoralists were dissatisfied with the trading opportunities and/or low prices for their goods, and they were apparently well aware of the price of livestock products in Ulaanbaatar from radio reports. Bartering with traders in the park was the exclusive trading method for 56 per cent of the respondents. Others traded in the *aimag* or *sum* centre, Ulaanbaatar, or at and across the Chinese border, but also commonly bartered with traders in the park. A few families also voiced an apparent lack of desire to market livestock. The lack of interest in marketing animals was apparently associated with cultural desires to keep animals for a long time to fatten them and a reluctance to send animals to slaughter (also see Bruun, 1996). The lack of markets for livestock and apparent lack of interest in marketing animals is a large concern because of the highly variable, non-equilibrium environment of much of the park. The pastoralists need mechanisms either to sell animals during low forage years or to relocate to other areas so significant damage will not occur to the livestock populations, vegetation and other resources. Also, the lack of markets will result in animal numbers increasing until a drought year or winter storms, which will result in high livestock mortality with subsequent severe risks to the livelihoods of herding families. In fact, this situation has since occurred in many areas of the country over several subsequent winters, with livestock losses in Mongolia estimated at over 5 million head.

A number of other resource concerns, especially associated with wildlife, were evident from interviews. Many herders stressed problems with depredation from predators, especially wolves, and most herders thought wolf populations were increasing. There was a consistent perception by herders that argali and snowcock populations have decreased. Several herders remarked that springs had dried or water volumes had decreased and that

the vegetation was not as high or thick as it was in the past. Also, on several occasions herders mentioned that it rained much harder now than in the past, which could be associated with a loss of vegetation cover, especially in the mountain steppe environments. We witnessed several intense thunderstorms where we believe more water was lost from upland sites as runoff than infiltrated. It is our opinion that these problems are being exacerbated by the grazing situation. However, most herders (56 per cent) rated pasture quality as good in 1998, while 28 per cent rated pasture quality as poor and 15 per cent as fair. Only 1 per cent rated the pasture quality as excellent. It was obvious that in the herder's view pasture quality was based predominantly on vegetation growth (wet or dry year).

Mobility and Camp Locations

Only 16 per cent of the households interviewed in 1998 stated that the distance between their winter and summer camp was greater than 20 km (see Table 4). The distance between winter and summer camps was no more than 5 km for 33 per cent of respondents with the majority of herding families (64 per cent) moving their base camps only one to two times. Some families (8 per cent) had become sedentary (no change in base camp during the last few years), while only 29 per cent moved base camps three or more times a year. Subsequent interviews in 1999 and 2000 also revealed that herders were concerned about a lack of movement. Several families stressed the difficulty of moving camps, the expense of hiring transportation, and the lack of water as reasons for not moving camps. The lack of movement of livestock is a concern and has been reported for other areas of Mongolia following the change from a command to a market economy (Agriteam Canada, 1997; Fernandez-Gimenez, 1997; Sheehy, 1996). Former *negdel* herders were quick to comment that during *negdel* times herders were told when and where to move, and previously the *negdel* supplied transportation and developed and maintained the water supply. A lack of water sources concentrates herders and their animals around water sources and restricts movement. Since the collapse of the command economy there has

Table 4. Number of Herders ($N=73$) classified by Distance (km) between Winter and Summer Camps for Gobi Gurvansaikhan National Park, Mongolia (1998)

Response	Distance between Winter and Summer Camps						Totals
	<3 km	3-5 km	6-10 km	11-15 km	16-20 km	>20 km	
Number	11	13	12	16	9	12	73
Percentage	15.0	17.8	16.4	21.9	12.3	16.4	100

been a significant⁷ reduction in functioning mechanical wells and a slight reduction in the number of hand wells. Manual wells are shallow wells where water is extracted using a rope and bucket and although there are many hand wells, they are much more labour intensive for obtaining water.

It is difficult to establish if current mobility patterns are significantly different from traditional 'nomadic' patterns of this area before collectivization. Several general descriptions of traditional patterns were found that may apply (see Fernandez-Gimenez, 1997; Germeraad, 1996; Humphrey, 1978; Sneath 1999), but it is also likely that because of the high degree of variation ecologically and historically that no one description is completely applicable. We compared the current mobility situation to that found by Simukov in 1934 (see Sneath, 1999), because some of the area currently in the park is described by him. According to Simukov, the 'Gobi Type' of pastoral movement showed that most pastoralists moved only a short distance during the year. Average movements were 30–40 km, except when forced to go further by drought, in which case pastoralists travelled up to 150–200 km from their usual camps. Simukov also reported that in the southern part of this area the rich Gobi households had a relatively large radius of nomadic movement, but the poor did not and that the most mobile of the herders were those that kept horses, sheep and camels. Logically, families with fewer animals could stay in one area for a longer time because their animals would not deplete forage as rapidly. Our interviews support the premise that herders with large numbers of livestock move more frequently. However, there were herding households with many livestock that moved less than four times in a year. In one case a herding camp of three households (*khot ailice*) with more than 600 total livestock had moved only two times by late August and were planning for only one additional move before their winter camps. Our data (Table 4) also show that the distance between winter and summer camps was generally quite close, averaging only 12.5 km, and apparently significantly shorter than the traditional movement patterns reported by Simukov. Perhaps the longer traditional nomadic movement reported as the Gobi type by Simukov has been forgotten. Bazagur et al. (1993) state that under the thirty years of collectivization (1959–89) territorial organization and land management were ignored, resulting in substantial natural pasture degradation and a loss of traditional techniques. However, it is also possible that traditional livestock movement in this area has generally been of relatively shorter distances from mountains to mountain valleys. Simukov's 'Gobi type' was described as having high variability, by area and likely by year, and there were also 'mountain-Gobi households' that stayed all year in the mountains. Indeed, we found that most herders' camp movements were often short distances from mountain valleys to mountain

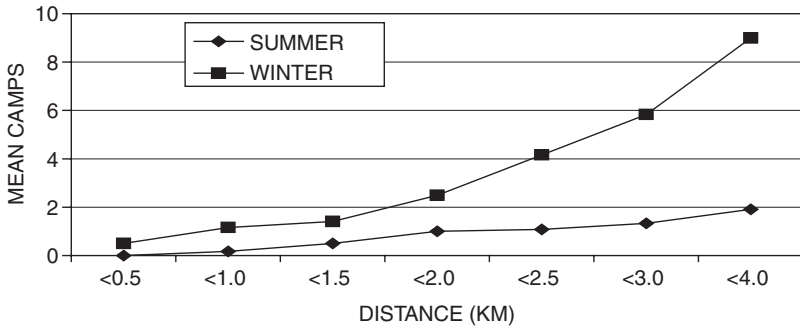
7. *Aimag* statistics show a 25 per cent reduction of mined wells, those with a concrete cover and simple pump, and a reduction of 50 per cent for 'bored' wells, drilled wells with diesel pumps.

slopes. For example, the Shavartai community, a group of thirty-one families, winter on the south aspect of the Dund Saikhan mountains and make their spring, summer, and fall camps in the mountain valley, averaging less than 10 km between winter and summer camps. Thus, we believe it is difficult to generalize regarding traditional movements in this area, but it is apparent that herders find it difficult to move camps and believe that more movement would be desirable. Almost all herders stressed that the reason for not moving camps was that transportation was not available or it was too costly, but a lack of water points was also another important reason given by herders for not moving camps.

Pastoralists voiced almost universal concern regarding problems for winter pastures and camps. Many herders commented about premature grazing around winter camps (some herders moved into winter areas too early in the fall) and some commented about summer grazing of winter camp areas. From our inspection of winter camps it was obvious that there were significant problems with 'trespass' grazing of winter pastures, but mostly associated with grazing by large stock (horses, cattle, and camels). This situation has also been observed in other studies (Agriteam Canada, 1997; Fernandez-Gimenez, 1997). As the population of pastoralist households and livestock increase, the probability of conflict would be expected to increase if 'grazing capacity' is limited. Grazing capacity here is used in a broad context, not only related to forage conditions, but also related to land-use management, water availability, and competition during critical periods. In order to determine how 'clumped' camps were, we selected fifty random winter camps marked on a topographic map and measured the closest camps. Our hypothesis was that camps would not be in close proximity to other camps, to reduce grazing competition between herders' livestock (*khot ail* are rare in this part of the Gobi and only two *khot ail* were documented in the 1998 interviews).⁸ We found that 75 per cent of the winter camps had another camp (winter or summer) located within 1 km, 92 per cent within 2 km, and 100 per cent within 2.5 km. Our data also showed that for a randomly selected winter camp there was on the average one summer camp and 2.5 winter camps within 2 km (Figure 4). Considering that sheep and goats will be herded only a few kilometres from camp, and larger stock will often graze over 10 km from camp, the close proximity of camps is an area of concern because of 'trespass' or competition for forage, especially from summer to winter grazing areas. We do not have data available on how significant the competition is to livestock condition, but we believe it is significant. The density of camps was high (Figure 4) and suggests that herders would have to manage livestock efficiently to prevent serious competition for forage. We observed many instances where

8. Logically, winter camps will be 'clumped' in areas where good winter camp conditions are found. However, our hypothesis was that camps would still generally not be too close to one another to reduce grazing competition.

Figure 4. Mean Number of Summer and Winter Camps by Distance from a Randomly Selected Winter Camp ($n = 50$) in the eastern portion of Gobi Gurvansaikhan National Park, Mongolia



summering livestock were using wintering areas and certainly ‘out-of-season’ grazing violates widely held traditional norms of Mongolian pasture use. Herders often referred to conflicts regarding pasture use, mentioned predominately as ‘trespass use’. We believe these conflicts are very serious but are not associated with the establishment of the park. The current situation is associated with the socio-economic changes following the collapse of the Socialist system and can be interpreted as a transition from a common property regime towards a more open access situation. However, it is also likely that conflicts would increase if park zonation regulations are enforced and the number of herders and livestock stays the same or increases.

Interviews and meetings with herders provided a very strong sense of critical problems related to competition for winter and spring grazing areas. Certainly, this competition for grazing areas also occurs on fall and summer pastures, but the competition in these seasons is more acceptable to herders, because the consequence to their animals is not as severe. Few herders thought there was a need to control livestock numbers, even though almost all herders recognized significant problems with the lack of winter and spring pasture. This may not be too surprising in that, while most families wanted to substantially increase herd size, they did not want to lose their freedom to make decisions in regard to livestock numbers, and possibly they sense control as being counter to the free market concept. Although the majority of herders are opposed to grazing controls, there is the recognition that government representatives (such as *sum darga*) can exert control on grazing lands and certainly grazing controls were exerted by the *negdel*. This ‘acceptance’ of grazing control by government officials has decreased with time since grazing controls have been only very weakly enforced since 1992.

Herders' History of Use in the Park

Only 40 per cent of the households interviewed had been in the area of the park more than ten years and 13 per cent had only been herding in the area for two years or less. Therefore, the majority of households had moved to the area after the collapse of the command economy and did not have a long history of using this area. Some 83 per cent of herders knew they were in the park; however, only 37 per cent were aware of potential changes in land use associated with park zonation (such as restricted livestock grazing in Special Use Zones). Also, only 58 per cent of the interviewed households had herded for a *negdel*. Of the 'new herders', those that had not herded for a *negdel*, 33 per cent were young families (not adults during *negdel* times). Most of the other new herders had been professionals and our interviewees included former teachers, accountants, drivers, nurses, bricklayers, shoemakers, and cooks. These 'new herders' could be separated into two groups: those who had worked for the livestock collective in a 'non-herding' position and lost their jobs (for example, accountants and drivers) with the disbanding of the *negdels*; and, those individuals who had quit their jobs, generally relatively recently, because their salaries were so low or their pay cheques inconsistent and thus they believed herding provided a more secure livelihood (for example, former teachers and nurses).

Of those herders who had herded for a *negdel*, 31 per cent had not herded in the area that is now Gobi Gurvansaikhan National Park. The three reasons given by these herders for coming to this area were: (1) they had relatives living in the vicinity; (2) they perceived this area as having better grazing conditions; or (3) they had a family member that had lived in the area before collectivization and thus were moving back. It was relatively common for herders and park staff to comment about 'new herders', especially from Dalanzadgad, moving into the park although they had no legal right (they were herding in a *sum* other than where they were legally registered or where they had been herders before the collapse of the livestock collectives). Others (Agriteam Canada, 1997; Erdenebaatar, 1996; Fernandez-Gimenez, 1997, 1999; Mearns, 1993b) have raised concerns regarding 'new herders' and their knowledge about livestock management and/or norms of pasture use. It is interesting to note that the concern regarding inexperienced herders occurred in the recent past.⁹ Sambu — an employee of the Mongolian Ministry of Animal Husbandry and later president of Mongolia — authored a book entitled *Malchdad ogho sanaj (Advice to Herdsmen)* (see Sanders, 1987),

9. Although perhaps not too surprising in that there have been several dramatic changes for Mongolian pastoralists during the twentieth century. First, with the transition to the communist ideology and the destruction of Mongolia's monasteries and organized religious systems in the 1930s and early attempts in the 1930s for forced collectives, and second with the establishment of livestock collectives in the 1950s.

written in response to concerns that new herders were not properly managing their livestock. The significance of the relatively large number of 'new herders' is difficult to determine, but it appears that the more inexperienced herders were more impacted by the first winter disaster (*dzud*) of 1999–2000 compared with the more experienced herders (subsequent *dzuds* in 2000–2001 and 2001–2002 also impacted experienced herders).

DISCUSSION

Park Impact on Pastoral Livelihoods

Pastoral families in Gobi Gurvansaikhan National Park face a number of critical problems, but currently there is no evidence that the establishment of the park has had a negative influence on their lives or on the use of communal land. In fact, a few herders are benefiting in direct and indirect ways (renting horses to tourists, selling carpets, working as part-time park rangers) as tourism has increased. The problems faced by these pastoral families are associated with the dramatic socio-economic changes that have occurred throughout the country since the collapse of the Soviet Union and Mongolia's transition to a free market economy. In the park (and largely throughout Mongolia) we find that since 1992 there has been: (1) a significant trend towards increased numbers of herding families (largely a result of a lack of other opportunities for making a living); (2) a significant increase in livestock numbers and a change in the ratio of types of livestock; (3) a lack of opportunities, ability, or interest in marketing livestock and livestock products; (4) a lack of control of land use by governing agencies or local groups (seen largely as a change from a common property regime to one of open access where no one is denied access); (5) a lack of co-operation among herders (lack of co-operative interaction such as *khot ail*, grazing associations or co-operatives for marketing of livestock products) and conflicts (especially associated with winter grazing areas); and (6) a loss of 'traditional' semi-nomadic movement (herders seem to believe transportation to move *gers* is too costly or is perhaps the role of the government as per *negdel* times). Zonation enforcement in the park would have direct impacts on some pastoral families as grazing is prohibited in certain areas. However, park staff are not considering these changes lightly and local programmes are being developed with groups of pastoral families to balance the needs of herders and conservation.

National parks, such as Gobi Gurvansaikhan, restrict grazing in Special Use Zones, but allow livestock grazing in large areas. As such, Mongolian National Parks provide an opportunity to demonstrate conservation of resources and continuation of communal grazing use. Although the protected area status given in 1993 to the area that is now Gobi Gurvansaikhan National Park was not found to significantly impact on pastoralist families,

we believe there is still a need for caution in regard to the establishment of additional protected areas in Mongolia. The goal of protecting 30 per cent of the country (Chimed-Ochir, 1997), or approximately doubling the area of Mongolia currently under protected area status, would no doubt impact on pastoralists' livelihoods, especially if Strictly Protected Areas were dramatically increased and if the Ministry of Nature and Environment and Park administrators enforced the laws regarding livestock use. Potentially negative effects include changing traditional migration routes, reducing total grazing area and grazing access to a variety of ecological sites, and creating additional complexity of land-use regulations. In any future development of protected areas, the development of national parks should result in less impact on pastoralists when compared with strictly protected areas; and, thus less conflicts between pastoralists and protected area administrators. Currently, there is evidence that at least in some protected areas, and most likely most of the protected areas, laws regulating livestock grazing in different zones are not enforced. For example, for the Khokh Serkhi Strictly Protected Area livestock grazing was excluded for decades following its establishment in 1977, but is now occurring in all zones and at stocking rates considered detrimental to the wildlife resources which the area was developed to protect (Schuerholz, 2001). Several protected areas are considered no more than 'paper parks' with little or no active management or changes in land use (Reading et al., 1999c). The problems with livestock controls are a result of changes in customary institutions for allocating pasture and enforcing pasture norms, largely a free-access situation since 1992, associated with the change in socio-economic conditions following the collapse of the command economy.

Under the current economic conditions there is little evidence that significant new livelihood options are available that could decrease the numbers of herders and livestock, or that livestock products are being produced and marketed more efficiently in the short-term. The current record numbers of herders and livestock will exert continued pressure on Mongolia's rangelands. The 'shrinking' of pasture lands by establishing large protected areas that restrict pastoralists' use is likely to increase degradation outside of these protected areas, potentially resulting in a significant alteration of historic semi-nomadic movement patterns, and changing cultural aspects of Mongolian life that deserve protection. If Mongolia continues to increase the total area under protected area status, the creation of National Parks¹⁰

10 Mongolian National Parks with large special use zones would restrict livestock grazing; however, for those national parks with approved zonation, the special use zones have been less than 30 per cent of the total park area and because livestock grazing can be permitted, the special use zone may act as a grazing reserve area (Wingard and Odgerel, 2001). With the increased livestock numbers following the collapse of the command economy, and the associated concerns regarding overgrazing, conservation proponents may see most Mongolian National Parks as not offering adequate controls for habitat protection from livestock grazing.

or areas with IUCN protection status IV or V (IUCN, 1994) represent types of protection in which conservationists would be able to restrict uses, but traditional pastoralism could be allowed to continue.

Participation of Pastoralists in Managing Park Resources

Other factors that need to be considered are how protected area status influences protection and use of key resources. Horowitz (1998), examining resource management and wildlife conservation in Malaysia stresses that people will only be motivated to conserve a resource if they are assured of long-term use. Bruijn and van Dijk (1999) also stress the need for pastoralists to have greater legal and managerial control over the resources they need to pursue their way of life. They point to the need for development policies to move towards the creation of institutional and economic conditions that would allow pastoralists to protect themselves from the impact of ecological hazards and market fluctuations. However, current regulations preventing hunting in all protected areas may in fact decrease opportunities for local peoples to participate in community based projects that could provide incentives for natural resource protection and financial rewards. In the past, fee-hunting was a major use of the area that is currently Gobi Gurvan National Park. Between 1973 and 1995, 642 hunters from foreign countries harvested 425 argali, 701 ibex, 201 black-tailed gazelle, 14 white-tailed gazelle, 6 snow leopards, and 3 wolves.¹¹ Recognizing local people as rights-holders and co-managers of the resources of the park, including implementation of sustainable hunting programmes, would provide more 'ownership' of resources and potentially reduce some market fluctuations associated with only a livestock-based livelihood. Community-based wildlife resource management through the CAMPFIRE (Communal Areas Management Programme for Indigenous Resources) movement has been successfully by applied (Child, 1995, 1996) in Zimbabwe¹² as well as other areas in Africa (Benson, 1998). There are instances of very successful community-based natural resource management (Getz et al., 1999), but also concerns. Belsky (1999) stresses the need for the identification of multiple interests and identities within communities,

11 Unpublished data presented at the White-gazelle workshop in Dalanzadgad, Mongolia, 27–28 September 2000 by S. Amgalanbaatar, Wildlife Biologist, GTZ, Ulaanbaatar, Mongolia.

12 Alexander and McGregor (2000) discuss a specific case of two districts in Zimbabwe where CAMPFIRE resulted in confrontation. The local histories and institutional policies for these districts are very different from the Gobi Gurvansaikhan National Park, but the paper does point out the need for careful analyses of local histories and institutional politics. We believe that in Mongolia, the socialist past and traditional values placed on wildlife, provide a setting for successful CBM (community based management) of wildlife resources.

and understanding their relationships to external actors, political institutions and national policies in order to grasp the challenges facing community-based conservation. She found that income from ecotourism was too sporadic, insufficient, and concentrated among a few households to make much difference in village livelihood security or to change conservation attitudes and behaviours in Belize. We believe that in Gobi Gurvansaikhan National Park community-based programmes need to be seriously considered for the conservation of wild resources and the maintenance of pastoral culture that is currently relying on the area for their livelihood. Sustainable hunting programmes in the park, because of the value of the market (such as argali and ibex), may have the potential to provide significantly more income to communities than programmes such as ecotourism. However, it is important to have realistic goals regarding community-based programmes as changes will occur slowly and there is the threat that peoples' expectations will be unrealistically high.

Park Management and Livestock Controls

There is little doubt that the most difficult challenge for park administration involves issues of livestock management. The weakened customary institutions for allocating pasture and enforcing pasture norms during collectivization (Mearns, 1996) coupled with the lack of functioning regulatory institutions for Mongolia (Fernandez-Gimenez, 1999) create an extremely difficult situation for management of the park's resources. The future control of grazing and livestock numbers will no doubt have significant consequences on all resources of the park and the herders who live there. Conservation of wildlife and wildlife habitat should be a priority, but the pastoralists and their cultural heritage cannot be ignored. The history of Mongolia shows that the country has done a notable job in preserving natural resources, but the area that is now Gobi Gurvansaikhan National Park lost at least two wild ungulate species, elk or wapiti (*Cervus elaphus*) and Przewalski's wild horse, in the twentieth century. Reading et al. (1999b) stress that habitat loss of threatened species and increased desertification is an important concern in Mongolia. We believe that some natural resources of the park are threatened by the increase in the number of herding families and their livestock and the associated problems with lack of nomadic movement and lack of land use controls by either government or local groups. Livestock movement is a key mechanism for providing sustainable use of these 'non-equilibrium' communal rangelands; however, when there are too many herders and livestock there are just too few opportunities for moving livestock to areas where conflicts will not occur. Also, there are too few areas being reserved for emergency conditions (such as drought

or winter storms) and livestock competition for forage in some areas is apparently significant. This competition will result in poorer livestock body condition and may lead to greater losses during winter and spring storms.

The lack of movement and overgrazing of areas can be insidious in their effect on resource values. Ward and Ngairorue (2000) discuss the extremely long-term nature of declining productivity or desertification brought about by heavy grazing in arid habitats.¹³ However, for all rangelands the impacts of livestock grazing are variable across the landscape. In Gobi Gurvansaikhan National Park the greatest impacts from grazing are near water sources and towns, followed by areas of mountain steppe, but livestock grazing occurs across much of the park's landscape. We believe the impacts of livestock grazing must be carefully considered in the management of all of the park's resources. The control of pasture areas (separation of winter, spring, summer and fall pastures) and the control of livestock in areas of special resource concerns (rare species, wildlife habitat, tourist areas, and so forth) will need to occur through mechanisms and approaches of consensus and collaboration. In Gobi Gurvansaikhan National Park current projects are using participatory approaches to strengthen community institutions, plan resource management and develop sustainable livelihoods with all stakeholders (Schmidt et al., 2002). Difficult problems and challenges in the planning are identifying stable, cohesive, community groups in this non-equilibrium environment (also see Mearns, 1993b) and allowing enough time for a self-determined process in forming community groups. One participatory planning project that has so far met with some success is the Shavartai community. This group of thirty-one families, living on the western edge of the Dund Saikhan mountains, has agreed on a spring date when all families will move from their winter camps, a fall date before families can return to their winter camp area, and on areas reserved as winter pasture, as well as on not using *Amygdalus* as fuelwood. So far, adherence to these group norms has been very high and the group perceives incremental improvements in their economic and social status as well as in pasture and livestock condition.

Mongolians have a long history of conservation and herders within the park recognize a need for conserving resources. For these reasons, the situation in Gobi Gurvansaikhan National Park presents an opportunity to develop a collaborative resource management approach to these lands. This co-ordination will require an intensive effort on the part of government, including park administrators and *aimag, sum*, and *bag* governors, and the users. For Gobi Gurvansaikhan National Park this type of co-ordinated resource planning will be challenging because

13 For in-depth discussions of issues and concerns regarding desertification and identification of desertification see Leach and Mearns (1996) and Swift (1996).

users of these non-equilibrium communal grazing lands will need large areas, which will require co-ordination with many users, several *sums* and possibly more than one *aimag*. In the future livestock management concerns will need to be integrated into resource management plans for specific areas. The conservation of the park's resources and the sustainable use of the communal grazing lands will depend on the recognition of the values of each, a strengthening of the local institutions of the users and their co-operation with local government, as well as on policy and macro-economic aspects.

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