

# Sustainable Grazing

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## Chaired by:

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## Introduction

In the past, semi-arid Central Asia had a nomadic civilisation with vigorous and well-adapted people who lived in harmony with nature. Livestock migrated over long distances avoiding severe weather or seeking sufficient fodder and water.

Once the Soviet Union was established, at least in the CIS countries, agriculture was concentrated in collective farms. The Soviet policy sought to sedentarise and intensify livestock production with supplies of cultivated fodder and other inputs. On the one hand, the mobility of livestock was reduced and concentrated in limited areas, leading to very intense grazing pressure on rangelands with a low carrying capacity, while, on

the other hand, stall feeding was introduced.

Following visits to the United States in 1955 by senior Soviet policy-makers, where they observed stable-feeding of cattle with irrigated maize grown for the purpose, they copied this approach for the Soviet Union. Intensive irrigation-based livestock production was promoted at the cost of extensive pasturing.

At present, collective farming in the CIS countries is being reorganized and markets are being liberalised. This has changed the economics of livestock production and patterns of rangeland use. The removal of state subsidies on supplies of cattle feed make it necessary for the newly-privatised pastoralists to again practice long-distance migration, as in the past. Another consequence is a huge de-stocking with the inherent benefit of regeneration of some degraded pastures, but the social and economic effects of de-stocking are negative. Maintaining

livestock mobility under market conditions poses new challenges to pastoralists and policy-makers in the region.

As an example, the problems of the Pamir mountain range may be highlighted. Here 70 per cent of pastures are situated at altitudes of 3,500m and above. As a result they experience harsh climatic conditions, such as extreme dryness of the air, a high insolation rate with a high content of ultra-violet light and an enormous variation of temperature over the day. These conditions, combined with heavy anthropogenic pressure, have led to serious degradation of pasture as a result of growing soil erosion, compaction of the soil surface, and, consequently, deterioration in the vegetative cover. It is felt that re-establishment of the original environment is hardly possible.

In Xinjiang, an estimated 80 per cent of the 48 million hectares of pasture is at one stage of degradation or another. As a result, about 1.3 million head of livestock died annually over the period from 1990 to 1995, involving an economic loss of 1.5 billion yuan per annum.

It is clear that all measures possible should be taken to re-establish the disturbed, delicate balance between grazing and the carrying capacity of the land. This means, on the one hand, a reduction in the numbers of cattle grazing in the area and, on the other, an improvement in the carrying capacity of the land. There are many good examples of cropping and management practices within the region and greater efforts are needed to share and adapt successful involvement and practices from specific areas.

In the Central Asian region, each of the products, viz., milk, meat, wool, and hides, are very important. It is also efficient to produce these commodities nearer to the consumers who need them. Given the geographic conditions, it

would be wise to specialise, with meat, wool, and hides being obtained from cattle, sheep, and goats grazing on the pasture lands; and milk being produced by irrigation-based livestock production upstream of the Aral Sea basin, near the concentration of people in populous Uzbekistan. Thus fodder crops, such as maize, which are less demanding on the use of water and pesticides, are being tested as an alternative to cotton. Once sufficient milk is produced, dairy industries can also be established.

Overexploitation of grazing areas has to be prevented by reducing the numbers of grazing animals per surface area. Because of the economic situation, considerable de-stocking has already taken place, but more will have to follow if the balance with the environment is to be re-established. Once that is the case, pastures, as long as they have not been affected by erosion, will more or less return to their original condition. Mainly, gully erosion will have to be controlled by damming the gullies so that erosion will not spread any further.

### **Major Issues and Experiences**

#### **IMPORTANCE OF THE MAINTENANCE OF TRADITIONAL LIVESTOCK HERDING CULTURE IN SUSTAINING RANGELAND ECOSYSTEMS IN MONGOLIA Prof. Donald J. Bedunah and Daniel Miller**

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For at least 1,500 years and perhaps for 4,000 years, large numbers of livestock and nomadic herders have lived on the rangelands of Mongolia. Mongolia's long history of nomadic pastoralism and the value that Mongolians place on their nomadic heritage certainly imply that herders have a rich store of knowledge about these rangelands and the livestock using these environments. Rangelands'

products continue to be the dominant source of feed for livestock, but these rangelands are also important as watersheds and as a source of medicinal plants and genetic material for future economic use. There is little doubt that the environment is of concern to the Mongolian pastoralist, but the significant changes in the political system during this century have altered grazing practices. Presently, there is justifiable concern that rangeland degradation and loss of wildlife are accelerating as Mongolia proceeds with its economic reform process. Changes associated with the movement of the economy from a command economy to a market economy since 1991 have had a number of significant impacts on livestock herders, including an increase in the number of families with livestock and an increase in the number of 'absentee' livestock owners.

There is also justifiable concern that socio-political changes are increasing poverty and risk to herding families. To maximise sustainable livestock production and to maintain the rich biological diversity of these lands, the best methods of traditional livestock herding systems, including traditional, cultural grazing control practices, reduction of risk, and sharing of labour will need to be closely considered in policies implemented during the economic reform process. Mongolia offers the opportunity to join modern technical knowledge with traditional livestock management, but to do this will require a careful examination of how the economic reforms in Mongolia are impacting semi-nomadic populations.

The main threats to sustainable livestock grazing in the South Gobi, Aimag, identified during fieldwork in 1998 are:

- 1) a significant increase in numbers of herding families since 1992;
- 2) a significant increase in numbers of livestock;

- 3) a lack of markets (or low prices) for some livestock products, especially meat and dairy products;
- 4) a general lack of control of land use by governing agencies and/or herding groups leading to conflicts, especially for winter pastures;
- 5) a lack of cooperation among herders, such as the traditional '*khot-ail*', for sharing labour, resources, and controlling grazing use;
- 6) a general lack of recognition of the negative impacts of significant forage competition on the condition of livestock; and
- 7) a loss of 'traditional' nomadic movement resulting in greater competition for forage and greater degradation around these sites.

**MOBILITY AND THE MARKET: ECONOMIC AND ENVIRONMENTAL IMPACT OF PRIVATISATION ON PASTORALISTS IN KAZAKHSTAN**

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The paper examines post-independence privatisation of state collective farms as the latest stage in the expansion and contraction of pastoral mobility over several centuries. The seasonal movement of livestock to different natural pastures is predominantly a response to climate and ecology, which in the case of Central Asia has been modified by the degree of dependence on winter fodder and engagement with markets. Availability of feed over the cold winter period sets the limit to carrying capacity in this environment. Feeding cultivated fodder to livestock over the winter is a practice that has varied over the years, according to the demand for surplus livestock products by the market or state. Increased demand accompanied by more winter fodder production led to increases in the livestock population. This relationship can be simply expressed as follows: degree

of mobility is a function of the availability of winter feed and livestock population – reduced mobility is possible when livestock can be stall-fed over the winter. The availability of winter feed is in turn a function of demand for livestock products – it becomes economical to produce more winter feed when there is increased demand for the outputs. There are of course biological and economic thresholds at the upper and lower ends of this relationship. Discovering and sometimes exceeding these thresholds have been the principal experiences of the state's interaction with the pastoral livestock sector.

Shifts in the balance between livestock mobility, winter fodder, and the market have resulted from state policies, beginning with Russian settlement in the 19<sup>th</sup> Century, continuing throughout the Soviet period of collectivisation and up to the present, following institutional and economic reforms made by the new government of Kazakhstan. The carrying capacity of Kazakhstan's pastures has thus been conditional rather than fixed, changing according to the impacts of state policies on livestock management. This remains true for the future, as the effects of the most recent change-decollectivisation – have again altered the dynamics between pasture productivity and livestock populations. Stability in the carrying capacity may not be established in the future and several scenarios are possible. This paper summarises the stages of change, focussing on the impacts of current policies on mobility and livestock density. Several trends and their associated policy options are identified.

The paper concludes the following.

- ▶ Pasture productivity is the result of human management as well as the environment. Management of Kazakhstan's pastures has changed their carrying capacity over time.

- ▶ State livestock collectives have been privatised recently, and this has resulted in major de-stocking, emergence of a few large-scale private livestock farmers, and great difficulties for small-scale livestock keepers. Carrying capacity is now underused in many pasture areas, but may be exceeded in other areas.
- ▶ Kazakhstan's pastures can become more productive again, but a balance is needed between intensive and mobile management methods. Livestock farmers need technical advice and some economic assistance to achieve this balance.

**'BLACK SOIL TYPE' DETERIORATED  
GRASSLAND  
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The Qinghai-Tibetan Plateau is the main base for animal husbandry in China. The total degraded grassland on the Plateau is 42,510,000ha and is 33 per cent of the total grassland area in the region. Among the degraded grasslands, the 'Black Soil Type' covers about 7,031,900ha and is about 16.54 per cent of the total grassland area in the region. On the 'Black Soil Type', the ratio of forage to toxic plants is 1.73:1 — in the slightly degraded area; 2.46:1 in the medium degraded area; 0.98:1 in the seriously degraded area; and 0.33:1 in the extremely degraded area. The living roots, organic matter, and soil moisture content are decreasing according to the degree of degradation. But the salt content and available nutrient content are higher than the non-degraded areas.

Rodents are a very serious problem. The number of pica burrows is 4,168/ha; active burrows 1.167/ha and 374 pica/ha on an average on the 'Black Soil Type' grassland. According to statistics, the area of 'Black Soil Type' deteriorated grassland in Dari county increased from 167,700ha in 1982 to 575,000ha in 1994. The incremental rate is 14.75 per cent annually, about 45,000ha of grassland deteriorate annually. The increase in 'Black Soil Type' deteriorated grassland has damaged the eco-environment in the riverhead area and hindered the sustained development of animal husbandry. Scientists in the province have carried out many research and rehabilitation activities in Guoluo and Yushu prefectures and have accumulated much experience on setting up sown pasture on the deteriorated area. 'Black Soil Type' deteriorated grassland is caused by over-grazing, rodents' damage, human activities, and a dry climate.

It should be realised that the control and rehabilitation of the black beach are very difficult and require long-term efforts. It is well known that the eco-system of alpine meadows is very fragile; once it is destroyed it is very difficult and takes a long time to regenerate. The rehabilitation of degraded areas will also require the co-operation of many social sectors. The action must be taken under the general arrangement of the government in order to make it good. Research on the rehabilitation of degraded areas should be carried out along with improvement in the germination and seed multiplication of *Kobresia* species. Once *Kobresia* is successfully re-seeded and established, demonstration areas should be set up to determine the proper combination of different species for recovering degraded areas. People living in seriously degraded areas should be re-settled in areas where conditions are better. After removing the people, the area should be fenced off to allow natural rehabilitation. This is a serious decision that needs to be taken by the government.

**GRAZING COMMONS OF THE HINDU  
KUSH-HIMALAYAS AND TIBETAN  
PLATEAU: CONSTRAINT OR  
OPPORTUNITY?**  
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Today's development paradigm often portrays pastoralist strategies involving the use of grazing commons as unsustainable. Despite the extensive documentation of the efficacy of indigenous pastoral systems, negative perceptions pervade pastoral policy and management throughout the developing world.

This paper explores the origins of such negative attitudes, given the historical context of political change and expanding markets in agriculture and commercial forestry. Case studies are derived from two regions of the Hindu-Kush Himalayas (the Tibetan Plateau and the British Punjab of India), different in terms of physical and political environment, but similar in socioeconomic outcomes. In both cases, the displacement of indigenous systems of common property management, specifically of grazing lands, in favour of expanding agricultural, timber, and even livestock market economies, has led to increasing livestock pressure on remaining commons and to the marginalisation of pastoralist cultures. In today's socioeconomic environment, there is a growing trend on the part of Asian governments to promote increased livestock production through privatisation of rangelands without considering the unintended consequences of such actions.

It is argued that common management of rangelands can be a viable alternative to private ownership, especially in areas where, until recently, such resources have been traditionally managed in a communal manner. The challenge for Central Asian policy-makers is to:

- 1) assure secure property rights and tenure;
- 2) develop policies and programmes that support and legitimise local institutions; and
- 3) conduct sound participatory research that helps identify environmental and socioeconomic constraints and opportunities specific to each region in terms of appropriate technologies and markets. This participatory approach would benefit the larger community while still preserving the resource through local community control. Indigenous communal management systems can be adaptable and efficient, if given the flexibility to adjust to changing conditions and given the support and legitimacy by government agencies.

**ENVIRONMENTAL INDICATORS OF  
SUSTAINABLE DEVELOPMENT IN THE  
REGIONS OF KAZAKHSTAN**  
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The powerful anthropogenic pressure on the natural complexes of Kazakhstan has resulted in aggravation of the ecological situation in vast territories of the Republic. The accumulation of negative anthropogenic effects is caused by many factors. Among these, selected ones have been highlighted.

- ▶ Certain locations have experienced greater environmental problems than others, and it is necessary to identify the factors behind these variations
- ▶ Direct impact (climate) determining natural factors
- ▶ Re-distributive (relief, soil, etc) differentiation of impacts

All these factors basically cause a feedback reaction of ecological systems to a complex of specific loads, determining the rates and the degree of their trans-

formation, current condition, and development trends.

The negative influence of anthropogenic pressures on the environment is characterised by various degrees of transformation in ecological systems. For their quantitative definition, the principle of integrated estimation of influence on the environment of industrial and agricultural production and the degree of pollution of water reservoirs are applied. As a quantitative parameter, technogenic pressure is a degree of urban construction in administrative areas of Kazakhstan (the ratio of rural and urban population). An agricultural pressure is estimated in the final results of its impact, looking at the share of damaged (deserted) and ploughed areas to the total area of the Republic.

The degree of pollution of water mains was estimated by assessing the ecological situation of the territories. It was assumed that the extent (to which there is a risk in terms of reduction in biodiversity) could be determined by the ratio of the total areas to the area under transformed ecological systems.

Analysis of the data rendered the following information.

- ▶ The Kazakhstan territory, according to the degree of urban development indicator is non-uniform, and this is explained by the degree of socioeconomic differentiation. Urbanisation determines the extent of technological pressure on the environment and, accordingly, the ecological situation in particular territories.
- ▶ The areas of damaged land occupy vast territories within the total area, also indicating the extent to which diversity is at risk in the ecological systems and their components.
- ▶ Water facilities located in a number of areas are differentiated by the degree of pollution and, accordingly, have varying degrees of impact.



In general, for the whole territory of the Republic of Kazakhstan, it is necessary to review the use of nature and to develop measures to conserve biodiversity in correspondence with socioeconomic trends in the development of specific regions.

#### **CHANGING PROPERTY RIGHTS' SYSTEMS IN WESTERN MONGOLIA**

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This paper deals with changes in property rights' systems in the context of livestock and pastures in Western Mongolia in the post-socialist period. The aim is not to focus on the contradiction between private herd ownership and communal grazing or on the superiority of private property rights, but rather to look for the criteria essential for an effective property rights' system.

Property rights are defined as formal and informal rules regulating the access to and usage of different kinds of resources. They include not only ownership structures, but also the actual control and rights people have over a specific resource. So, for example, taxes, restrictions on sales, or the danger of appropriation by the state or other actors are all part of a specific property rights' system. Clearly defined property rights are thought to be the main prerequisite for an efficient allocation of resources, and thus the relative success of different economies as well as ecologically well-adapted behaviour, because they result in legal security and offer incentives for investment and long-term strategies. As well as other economic and social institutions, property rights are a product of repeated interaction among self-interested actors. This means that they are constantly under pressure to change to serve the interests of individual actors; and thus they always reflect the power and resource asymmetries inherent in the respective society.

It is argued that one main prerequisite for an effective property rights' system is that it has to be self-organized, i.e., results from bargaining among the affected actors, and is not imposed by a third party such as the state. This enables the emergence of mutual trust and confidence that others will respect the institution and therefore it will pay to respect it as well. This creates legitimacy and credibility, which may be more important for the effectiveness than for criteria of economic efficiency or social justice.

The delegation of the privatisation procedure to the individual collective enabled local power asymmetries to influence the outcome of this bargaining process to a significant extent, as demonstrated above. Nevertheless, the modus was quite successful because it was perceived as a self-organized institutional change and created a great degree of legitimacy and credibility.

Both legitimacy and credibility are lacking from the property rights' regime for pastures. The existing system is not perceived as self-established but as one superimposed by the former socialist organization. At the same time, free-riding increases because of the low time horizons in post-socialist society, especially among former city-dwellers who often move between different districts within the year and are not part of local networks. In addition, the option of emigrating to Kazakhstan may reduce the expected benefits of behaving in accordance with existing rules.

Considering the ethnic heterogeneity and the economic decline faced by many households, it might be necessary to introduce neutral agents to encourage and conduct the search for new and effective informal arrangements. Nevertheless, these have to be based on a self-organized procedure since this seems to be, as argued previously, more important for the effectiveness of an institu-

tion than economic efficiency or social fairness.

**PRIVATISATION AND CHANGES IN  
PASTURE USE IN BETPAK-DALA,  
CENTRAL KAZAKHSTAN**  
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The study described in the paper was carried out in 1997 and 1998 in Betpak-dala, an area of steppe covering much of central Kazakhstan. This area includes much of Dzhezkazgan *oblast*\*, plus the Northern *rations* of Dzhambyl and Chimkent *oblasts*. The area is home to one of the three populations of saiga antelope in Kazakhstan, and these follow roughly the same migration routes once followed by domestic animals. The object of the study was to examine how land use in the area has changed since the fall of the Soviet Union, and how these changes might affect the pastures and the population of saiga that live on them. The Kazakh steppe is very variable in terms of forage quality, both temporally and spatially. Because of this, traditionally Kazakh pastoralists were very mobile, as this enabled the efficient use of all pastures available at higher stocking densities than would have been possible under a sedentary system (Kerven et al. 1996). Under the Soviets, the migrations were less extensive, but there was a greater provision of winter fodder, enabling high stocking rates. In independent Kazakhstan, stock numbers have dwindled, migration has declined, and unavailability of winter feed has decreased. The effects of these changes and how they have come about during the process of privatisation are examined in the paper.

This study provides a snapshot of the situation on farms in Kazakhstan in 1997/8. The situation is changing very

rapidly, and it is difficult to predict how things will develop. It is unclear whether the southern farms will go the same way as those in the north, as the fact that the collective structure had completely disappeared on the northern farms was due to a decision at the *oblast* level rather than at the farm level.

However, common to all the farms was the fact that most of the wells or springs, especially those far from the centre, were unused, and in general the stock density is well below carrying capacity. The central area of Betpak-dala, which is *gosfund*\*\* land, is to all intents and purposes empty. This includes a large part of the saiga's range, including the main birth areas.

On the northern farms, grazing patterns have not changed much since Soviet times, shepherds tend to have received the land they used before 1992. However, there has been a trend to reduce stock movement by swapping land shares for those that are closer together.

Around the population centres stock densities were very high because this land is tax free, and people with less than about 50 sheep tended to graze them on this land — which is visibly in poor condition. Such numbers of sheep are not adequate for long-term family survival, as sheep are not only eaten, but also given away for marriages and as barter goods. On the northern farms, almost every family who did not have a private farm (i.e., who had fewer animals) either ate or sold saiga meat several times a week in order to avoid losing their sheep herds altogether. The increasing poverty of the majority of inhabitants in the region is therefore resulting in under-use of the pasture in most areas, over-use in others, and increased exploitation of saiga herds for meat.

\* *Oblasts* are administrative districts and *rations* are smaller districts within them.

\*\* *Gosfund* land is state-owned land which normally is not part of the territory of any particular *Sovkhoz* (collective farm).



Those who had started private farms seemed to be better off than those who had not, but it is also true that the only farmers interviewed were those who were still farming; many who had started private farms in the early 1990s were no longer working as farmers. Virtually all the shepherds interviewed had been shepherds in the time of the Soviet Union, and many had substantial numbers of stock before privatisation. Even so, many had lost almost all their stock since then.

The main problems with the privatisation process are the inequitable distribution of assets and access to winter feed. These are strongly linked to inequality of access to accurate, unbiased information about privatisation. This information would have enabled people to understand their legal positions with respect to allocation of *soukhoz*\* assets, thus strengthening their bargaining position.

## **Conclusions**

Pastoralism as seen today in much of Central Asia will most likely vanish, given changing values, attitudes, and external exposure. If it follows the path of other areas, uncontrolled growth and *ad hoc* market forces will also result in poorly-planned range privatisation schemes that can potentially result in rangeland degradation. Livestock are a major income source for Central Asia and policies must be in place that favour their development.

For a sustainable future, the crux of change lies not with the pastoralists, but rather with the people who dictate policy and design programmes. First policy-makers must be committed to decentralized land policy reforms that sustain local institutions and which guarantee that local effort will be met with a sense of pride and ownership. Government

agencies must work with communities to define constraints and opportunities and hence design appropriate programmes that are equitable, that promote self-sufficiency and self-governance, and, therefore, ensure sustainable conservation of the resource.

Seen from a historical perspective resource sustainability and secure tenure and property rights go hand in hand. A country sustained by self-sufficient, self-governing communities (in partnership with their government), is more likely to develop sustainably in today's global economy. Without the freedom, knowledge, and incentive to improve their own lives and seek out alternative forms of livelihood, an equitable inclusion into the global economy is unlikely.

The main issues emerging from the presentation and the discussions are as follows.

- ▶ Changing political systems have altered grazing systems by increasing livestock populations, reducing traditional mobility, altering land tenure rules, encouraging cropping or forestry, and introducing animal fodder. Some of these changes have led to or may increase pasture degradation.
- ▶ Case studies from Mongolia, Kazakhstan, Tibet, and the Punjab showed that grazing patterns had varied effects on social institutions and equity. In some cases new grazing patterns resulted in unequal distribution of key resources (better quality pasture, machinery or water). This resulted in some pastoralists being impoverished while others could accumulate livestock.
- ▶ Stocking rates and the resultant grazing pressure were linked to market demand for livestock and reduction in mobility.
- ▶ Social institutions were crucial in determining access to key resources, as

\* A *soukhoz* is a collective farm in which all workers are employees of the state.

were state-imposed regulations. In some regions, both social and state institutions were breaking down, causing greater pressure on key resources. A balance is needed between local social versus state control mechanisms to ensure sustainable and equitable grazing systems.

Some of the important solutions that were suggested are given below.

- ▶ Promote or retain mobile grazing systems in semi-arid areas and areas of low natural productivity, through exploiting ecological variability temporally and spatially.
- ▶ Promote cost-effective water management and interstate cooperation.
- ▶ Encourage specialised markets for livestock products, in order to raise the income of pastoralists.
- ▶ Assess the various causes of degradation through monitoring the impacts of political changes on grazing systems, in order to identify appropriate policy and technical measures to reduce degradation.
- ▶ Find the best balance between state and local control of key resources in each situation.
- ▶ Increase the carrying capacity of natural pastures through support to livestock farmers that will not be environmentally damaging.
- ▶ A proper legal framework for land ownership adapted to the local landuse patterns and traditions is required.