Population and the Pastoral Economy in Mongolia

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ABSTRACT

Nomadic pastoralism has been the main economic activity of most Central Asian societies and it is still the economic foundation of the Republic of Mongolia. Considering that nomadic pastoralism as an economic activity and as a way of life is vanishing worldwide, its continuance in Mongolia is of great historical interest and it represents an exceptional case. It has subsisted in spite of radical economic, social and political changes that the country experienced during the present century. From a feudal, impoverished and backward province of the Manchu empire it became a modern socialist state under the influence of the former Soviet Union. More recently, the country began a process of transition toward a free-market economy with the subsequent liberalization of the pastoral economy, formerly organised in the form of collectives or state-controlled cooperatives.

The central hypothesis discussed in this study is that the main determinant of the subsistence of nomadic pastoralism in Mongolia has been the low population density existing in rural areas. The rapid urbanisation experienced by the country after World War II prevented a significant expansion of the rural labor force which, in turn, resulted in limited population pressures on the vast grassland areas where nomadic pastoralism is practised. As a result, intensification of livestock breeding activities conducive to sedentarization was not necessary.

The first purpose of this paper is to examine the hypothesis proposed above. A second objective is to discuss the possible impact on the pastoral economy of some of the economic transformation that Mongolia has been experiencing after the 1990 reform movement. The collapse of the urban industrial sector is resulting in an unexpected process of urban to rural return migration and a subsequent increase in population densities in rural areas. A rapid rural population growth combined with the substantial transformation being experienced by the livestock sector may result in a significant expansion of the herds. The pressure of the animal population on the pastureland may force a process of intensification that may endanger the fragile ecosystem of the Mongolian steppe and prevent a sustained development of the pastoral economy. A third objective of this paper is to analyse the policy implications of these events and to propose a framework for the discussion of possible interventions.

POPULATION AND THE PASTORAL ECONOMY IN MONGOLIA

Ricardo F. Neupert

Nomadic pastoralism was the main economic activity of most Central Asian societies and it is still the economic base of the Republic of Mongolia. Considering that nomadic pastoralism as an economic activity and as a way of life is vanishing worldwide, its persistence in Mongolia is of great historical interest and represents an exceptional case. It has persisted in spite of the radical economic, social and political changes that the country experienced during the present century.

Mongolia’s nationhood can be traced to the year 1206, when Genghis Khan unified Mongolian tribes and formed the first Mongolian state that subsequently expanded its territory to cover most of modern-day China, Korea, and as far as Central Europe. By the mid-1300s, however, the Mongolian Empire disintegrated and a long period of internal strife followed. In 1691 Mongolia ceased to exist as a political entity and became a frontier province of China. Mongolia remained as such until the second decade of the present century. It was a traditional and impoverished society with an economy based almost exclusively on subsistence nomadic animal husbandry. By 1924, political autonomy from China was achieved and a socialist ‘People’s Republic’ founded. A system of centrally planned economy dates from the late 1930s. The following decades witnessed a dramatic process of economic and social change, a strengthening of ties with the former Soviet Union, and increasing industrial and mining activity facilitated by Soviet aid. By 1990, like other former socialist countries, Mongolia began a process of transition toward a free-market economy with the subsequent liberalization of the pastoral economy, formerly organized in the form of collectives or state-controlled cooperatives (Bawden, 1968; Milne et al., 1991; Sanders, 1991; Asian Development Bank, 1992).
Mongolia is a land-locked country in the northern part of Central Asia bordering Russian Siberia in the North and China in the South, East and West. Its territory covers more than 1.5 million square kilometres. Mongolia has an hyper-continental climate, with low precipitation, long winters, and average temperatures below freezing for seven months of the year (Academy of Sciences, 1991). The geographical characteristic of Mongolia that has shaped its economy and culture is the steppe. This is usually a grassland zone between forest and desert (in the case of Mongolia the Siberian tundra and the Gobi desert), where fire and/or browsing animals have prevented the spread of trees (Ehrlich, Ehrlich and Holdren, 1977). The low temperatures and the short growing season in the Mongolian steppe have prevented crop cultivation; only recently, and after major efforts, has the cultivation of some cereals become possible. In spite of the adverse climatic conditions, the land is particularly apt for extensive animal husbandry. Nomadic pastoralism has been precisely the determinant of the Mongolian way of life and main economic activity from ancient times until the present. Traditional herds include cattle, horses, camels, goats and sheep.

The purpose of this paper is to discuss the relationship between human and animal populations in Mongolia and the importance of this relationship for the persistence of nomadic pastoralism in the country. A second objective is to discuss the possible effect on the pastoral economy of some of the economic transformation that Mongolia has experienced after the 1990 reform movement.

THE MONGOLIAN PASTORAL ECONOMY

By the early 1950s, animal husbandry was still the main economic activity of most of Mongolia’s population. It was completely pastoral and nomadic, and groups of one to three families formed the basic stock-breeding unit (Cooper and Gelezhantsin, 1993; Mears, 1993; Potkanski and Szynekiewics, 1993). As might be expected, livestock breeding activities based on a multitude of nomadic smallholdings were not consistent with the principles of a centrally planned economy. After the revolution, an unsuccessful and disastrous attempt to create negdels or pastoral co-operatives was made by the government. Collectives were introduced again by the early 1950s and indirect but more effective measures toward collectivization were slowly established. By 1963 the process of collectivization of the agricultural sector was complete. Private ownership of livestock was restricted, private ownership of land abolished, and all production reserved for the state (Milne et al., 1991).

From the early 1960s until 1990, the administration of the rural economy was organized at the level of central government, province (or aimak) and rural district (sum). The rural population was employed by collectives (negdel) or state farms. A collective covered the same territory as a single sum. The collective was the economic unit responsible for producing livestock products, marketing them, and supplying inputs and consumer goods as well as fodder and transport services to its members. The rural district administration was responsible for providing health, education and veterinary services (Neupert and Goldstein, 1994).

Collectives were divided into production brigades or teams, which were further broken down into suur, individual production units comprising between one and four households. The collective set production targets for each suur, determining the quantity of meat, wool and other products to be supplied according to the annual central government procurement order (Potkanski and Szynekiewics, 1993). Each suur was generally involved in the production of single species herds for which monthly salary was paid. Households were permitted to own a small number of animals that could be sold or used for their own consumption.

Animal herding continued being pastoral and nomadic. The collective allocated seasonal pasture areas to each brigade, and each suur was free to set up camp wherever they wanted within the assigned area, always within the collective. However, the collective administration determined when moves to spring, summer, autumn and winter pasture could begin (Goldstein and Beall, 1994). In the past, each household owned its livestock, managed its herding, and took independent decisions regarding production and marketing. Pastures were controlled by feudal lords or monasteries but were open to all herders. Under the collective system of negdels, the co-operative owned the livestock and took all the decisions regarding
production and marketing. The *negdel* system eliminated large differences in herd size and economic resources among herder families. The collective assigned similar numbers of animals to households and paid salaries that did not differ very much among families (Means, 1993). In spite of these changes, important features with respect to the organization of production in the pastoral economy varied little from the past: the basic unit of production continued being the household units, herding remained pastoral and nomadic, and the division of labour within the household experienced small modifications.

In a strict sense, Mongolian herders cannot be considered as nomads but as semi-nomads. They practise only small-scale movements with reference to a permanent settlement (the *sum* centre) and within a previously established area (Goldstein and Beall, 1994). Even before collectivization nomadic movements were not made over large distances (Bawdon, 1968). However, movements not only are made by the whole household but also include the transport of the dwelling unit. In order to cope with the harsh steppes environment and to conduct nomadic pastoralism, Mongolians have developed simple but effective technologies during the centuries. Transportable shelters are essential to a pastoral way of life and, in the freezing cold of Mongolia, are a matter of survival. The Mongolian *gurek* or *yurt*, is superbly adapted to this. These are demountable and portable round tents, usually made of felt, which can accommodate a family of four to eight members.

There are different reasons to move: sometimes they move because the grass surrounding a campsite has been consumed; sometimes in winter they move to areas that are more sheltered from the wind or to avoid heavy snowfalls; other times, they move because a type of vegetation the animals like is available somewhere else (Horowitz, 1981; Goldstein and Beall, 1994). What is important is that the movement is by the whole household and not only by some members while others remain in a permanent settlement as is the case with sedentary pastoralism.

Compared to the situation during the first half of the present century, Mongolia’s livestock sector has experienced some progress. However, improvements have been largely limited to the construction of winter shelters in some co-operatives, water supplies in areas with inadequate river, lake or spring water, and production of some winter fodder. There have been some efforts to control endemic and parasitic diseases, but generally veterinary care is inadequate (UNIDO, 1993). Industrial cattle breeding or modern dairy farms are mere exceptions than the norm. For the most part, animal husbandry continues to be a traditional and labour intensive activity and much more progress might be needed to make production competitive in the world market.

**HUMAN POPULATION AND ANIMAL POPULATION**

Although limited, the improvements introduced in the livestock sector by the early 1950s should have resulted in a substantial expansion of the national herd. Nevertheless, the increase has been quite modest. Table 1 shows the livestock population of Mongolia, between 1930 and 1994, according to the five species of animals herded in the country. The last column shows the size of the herd in Sheep Forage Units (SFU). This measure makes it possible to express the size of herds containing diverse species in a common unit. It is based on the food requirements of the different species relative to sheep (a horse corresponds to 7 sheep, a goat to 0.9 sheep, a cow to 6 sheep, and a camel to 5 sheep).

The variations observed in the size of the herd during the first half of the present century are probably the result of the economic and political instability in Mongolia between independence and World War II. It has been argued that more recent variations in the size of the national herd have depended largely on climate (UNIDO, 1993). Climatic conditions may explain variations in numbers through time, but they do not seem to be related to the limited increase of the herd. Although animal numbers are still very dependent on climatic conditions and losses may be high after severe winters, available statistics show that survival rates for younglings are, in general, relatively high: approximately 90 per cent (Honhold, 1995). Therefore, the natural reconstruction of the herds does not take long periods. In addition,
extremely heavy losses, involving for example more than 20 per cent of the national herd, have never taken place.

Table 1
Mongolia: livestock population, 1930 to 1990

<table>
<thead>
<tr>
<th>Year</th>
<th>Cattle</th>
<th>Horses</th>
<th>Sheep</th>
<th>Goats</th>
<th>Sheep Forage Units (SFU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1930</td>
<td>480,900</td>
<td>1,566,900</td>
<td>1,887,300</td>
<td>15,660,300</td>
<td>4,080,800</td>
</tr>
<tr>
<td>1940</td>
<td>643,400</td>
<td>2,358,100</td>
<td>2,722,800</td>
<td>15,384,200</td>
<td>5,996,300</td>
</tr>
<tr>
<td>1950</td>
<td>844,200</td>
<td>2,317,000</td>
<td>1,987,800</td>
<td>12,574,600</td>
<td>4,978,600</td>
</tr>
<tr>
<td>1960</td>
<td>859,100</td>
<td>2,502,700</td>
<td>1,905,500</td>
<td>12,108,900</td>
<td>5,631,300</td>
</tr>
<tr>
<td>1970</td>
<td>633,500</td>
<td>2,317,900</td>
<td>2,107,800</td>
<td>13,311,700</td>
<td>4,204,000</td>
</tr>
<tr>
<td>1980</td>
<td>591,500</td>
<td>1,985,400</td>
<td>2,397,100</td>
<td>14,230,700</td>
<td>4,566,700</td>
</tr>
<tr>
<td>1985</td>
<td>559,000</td>
<td>1,971,000</td>
<td>2,408,100</td>
<td>13,248,800</td>
<td>4,296,600</td>
</tr>
<tr>
<td>1990</td>
<td>537,500</td>
<td>2,262,000</td>
<td>2,848,700</td>
<td>15,083,000</td>
<td>5,123,700</td>
</tr>
</tbody>
</table>


It has also been argued that in the particular case of Mongolia the main limitation to increasing production and herd growth was the intrinsic inefficiency of the collective or negdel system. Mediocre productivity would have been fostered by the government's ideological commitment to eliminate capitalist competition and exploitation by removing the profit motive and market mechanisms. Herders did not have to exert themselves in order to have a satisfactory existence because the negdel system provided them with a reasonable livelihood without insisting on high productivity (Milne et al., 1991; Goldstein and Beall, 1994). Although the economic and productive inefficiencies of the system may have limited the growth of the herds, it seems that other factors also played an important role. The most important one is related to the population dynamics experienced by the country during the past five decades.

Whereas the demography of pastoral herds is relatively well understood, herd demography remains far less convincingly examined. However, studies conducted in nomadic pastoral societies in diverse arid and semi-arid regions in the world suggest that there is a close relationship between population size and the size of the herd (Stenning, 1959; Leeds, 1965; Dahl and Hjort, 1976; Dahl, 1981; Horowitz, 1981; Thebault, 1995). On the one hand, the size of the animal population must guarantee food requirements and, on the other, population size has to correspond to the labour requirements for the proper care of the herd. However, the matching sizes of the human and animal populations cannot be explained solely in terms of subsistence requirements and labour capacity but also in terms of the formation of domestic groups (Lefebvre, 1979), especially when the main unit of production is an autonomous nuclear household as is the case in most nomadic pastoral societies (Khazanov, 1978).

Families and herds develop along parallel lines. Each stockbreeder seeking to found a new production unit is faced with two requirements: first, he needs to acquire livestock and get married; second, he must be able to increase the size of his herd and beget heirs (Lefebvre, 1979). The cycle of the family herd assumes that the newly married couple receive a herd from the herds of their families of origin, usually through a system of pre-inheritance and dowry. From the initial nucleus received after marriage, the new family herd has to grow substantially in the subsequent years, first to satisfy the food requirements and second, these having been satisfied, to accumulate animals to give as pre-inheritance or dowry to their own children. A major incentive to increase the family herd beyond subsistence requirements is the eventual need to divide the herd. An additional child poses the need of more animals to provide the additional food necessary to feed him and also for him to take when he marries.

Therefore, a rapid process of population growth in a nomadic society as a result, for example, of a decline in mortality, results in the formation of a larger number of households, that is, in an increase in the absolute number of productive units. More children survive up to age of marriage and consequently, more productive units are created. This process would tend to increase substantially the size of the herds provided that natural resources are plentiful. The newly formed families will try to maximize the size of the herds. In a context of extensive
pastoralism this is possible through skilful management of the demography of the herds. For example, herders keep a large number of females not only to increase the natural growth but also to increase milk production in order to limit culling. To speed the increase of the herd, pastoralists focus for a few years on herding small ruminants, mainly goats and sheep, because their rate of growth is much higher than that of large ruminants. Eventually, small ruminants can be sold and herders can purchase more cattle, camels and horses (Thebaud, 1995). On the other hand, slow population growth limits the formation of new productive units and, therefore, the expansion of the herd. In addition, low rates of population growth may result in a situation in which the size of the herd exceeds the labour capacity of the human population. Although nomadic pastoralism is not a labour-intensive activity (Horowitz, 1981), insufficient labour reserve is a major difficulty because it substantially affects the mobility of the herds. It is when the herds are moved in search of pastures and water, that the herder needs to allocate more labour. Mobility constraints resulting from insufficient manpower prevent the adequate watering and feeding of animals and therefore the herd’s productive and reproductive capacity will be threatened. Nutritional stress will substantially reduce the fertility of the animals. The herd size will reduce until it reaches a number adequate to the provision of the labour force.

Population increased at a modest pace in Mongolia until the first half of this century as the result of a combination of political and economic instability and high mortality rates (Neupert, 1994). By the beginning of the 1950s, however, the population dynamics of Mongolia became similar to other developing countries. High fertility rates, combined with declining mortality, resulted in unprecedented rates of growth. Total fertility rates fluctuated between 7 and 8 children per woman. By the mid-1970s, however, fertility began to undergo a slow but sustained decline and during the 1980s this decline significantly accelerated. By the end of that decade the total fertility rate was approximately 4.5 children per woman. This fall increased even more during the 1990s; the official estimate for 1993 is 2.5 children per woman (State Statistical Office, 1994a). Fertility has declined in the whole territory, although the fall has been more rapid and substantial in urban than in rural areas (Neupert, 1994). In spite of this decline in fertility rates, population growth has been substantial. The large cohorts born during the 1950s, 1960s and 1970s, who have already begun their reproductive careers, will maintain a comparatively high rate of growth for the next three to four decades. When a population has a large and young population base, it takes a generation or more for declining growth rates to offset the numerical effect of high growth rates in the past.

Although natural population growth has been considerable in rural areas, high rates of rural-urban migration limited a significant rural population expansion. As shown in Table 2, the growth of the rural population was modest compared with the growth of the total and urban populations. For the purpose of this discussion, changes in the size of the economically active population in rural areas in general and in the pastoral economy in particular are more important than the growth of the total rural population. Between 1960 and 1990 the economically active population in agriculture increased by only 0.7 per cent per year. The population engaged in animal husbandry declined by 34.0 per cent between the same years. The reasons for this substantial decline will now be explored.

Table 2
Mongolia: population patterns and trends, 1960 to 1990

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>968.1 1265.4 1682.0 2149.3</td>
<td>2.71 2.89 2.48</td>
</tr>
<tr>
<td>Urban</td>
<td>337.1 584.8 887.3 1225.1</td>
<td>5.66 4.26 3.28</td>
</tr>
<tr>
<td>Rural</td>
<td>631.0 680.3 794.7 924.2</td>
<td>0.76 1.37 1.52</td>
</tr>
<tr>
<td>Economically active population in agriculture</td>
<td>254.2 220.8 202.7 256.1</td>
<td>-1.40 -0.85 2.37</td>
</tr>
<tr>
<td>Economically active population in livestock breeding</td>
<td>227.9 162.0 170.4 149.9</td>
<td>-3.36 0.51 -1.27</td>
</tr>
</tbody>
</table>


After War World II development began to be planned through Soviet-type five-year economic plans. The government realized that agriculture in general, and livestock breeding in particular, should be a basic branch of Mongolia's economy. However, Mongolian leaders also
shared the Marxist view held by theorists in the Soviet Union that industrialization was a desirable goal and the only real base for economic and social progress. During the 70 years of socialist rule, the overall economic strategy was to develop an industrial-agricultural society (Milne et al., 1991). Emphasis on the need to industrialize as the only way to achieve development and progress characterized all the economic plans (Bawden 1968; Academy of Sciences, 1991; Milne et al., 1991). While in 1940 the contribution of industry to the gross social product was only 13.7 per cent, in 1990 it contributed 48.9 per cent. In 1960 non-agricultural employment represented 39.2 per cent of the total employment; in 1990 it represented 67.3 per cent (State Statistical Office, 1994b: Tables 3.1 and 2.7).

The spatial distribution of the population in the 1950s conflicted with these economic goals. The population concentrated in urban areas was small and insufficient to initiate and develop an industrial sector. Therefore, rural-to-urban migration was encouraged to satisfy the growing industrial labour demands. This was not difficult considering the lower standard of living in rural areas than in the cities. The standard of living of the rural population under collectivization was certainly an improvement on the situation during the first decades of the century; however, economic opportunities and economic and social conditions were much better in the city, especially for the younger generation who have been educated in the vast network of provincial schools (Neupert and Goldstein, 1994). According to the 1989 census, 35.6 per cent of the population living in the capital city, Ulaanbaatar, were born in rural areas. In Darhan and Erdeneet, the two largest cities after Ulaanbaatar, these percentages are 46.6 and 56.5 respectively. In other urban areas the percentage of the population born in rural places varies between 40 and 60 per cent.

As mentioned above, after collectivization, the basic productive unit in the Mongolian collective system continued being the domestic group. However, the pace of formation of new households and, therefore, new productive units was limited by heavy rural out-migration. Between 1963 and 1989 the number of households in rural areas increased from 151,031 to 192,221, that is by 27.3 per cent. During the same period, the increase in urban areas was from 84,201 to 235,613 households, or 179.8 per cent. The total increase was 81.9 per cent (State Statistical Office, 1994b: Table 8.2). Mongolia developed an extensive educational system. To facilitate access of nomadic families’ children, boarding schools were established in all rural districts. The state assumed the costs of education, including accommodation and board. The educational system provided a path of upward mobility for herders’ children and a source of workers for Mongolia’s urban sector (Goldstein and Beall, 1994). Only a limited number of children remained in the pastoral economy as herders, slowing down the process of family formation that seems essential to expand the size of the herds.

The collective system removed from herder families the need and motivation to increase their number of animals by restraining the number of private animals that each family could own and, therefore, by limiting the intergenerational transfer of herds. Education provided most children with the means to move out of the pastoral economy and large private herds were not permitted. The collective system provided herder families with some incentives such as bonuses, free trips, medals, titles and honours; it also penalized inefficiency and mediocre production. However, incentives and disincentives were not substantial enough to result in differences in the standard of living of those who over-fulfilled and those who under-fulfilled (Goldstein and Beall, 1994), and they never replaced the strong motivation provided by the need to expand the number of animals for the intergenerational circulation.

THE FOOD SUPPLY SYSTEM

Although the rural population experienced a modest rate of growth, and the herding labour force an absolute decline, the overall population increased substantially: between 1960 and 1990 it more than doubled. As a result, the national requirements for food also increased considerably. This increase placed substantial pressure on the livestock sector to increase production; however, as discussed above, production increase in the Mongolian extensive animal husbandry system would have required a larger rural population increase. The government was not willing to jeopardize the industrial development plans with labour shortages by limiting the transfer of labour resources from the livestock sector to the non-
agricultural sector. The solution would have been to increase labour productivity in the pastoral economy. However this would have been accomplished only by increasing the resources available and by improving the efficiency with which such resources were used. This would have been possible only by establishing a sedentary system and major investments would have been necessary, such as intensive production of fodder, artificial pastures, storage facilities, pens to confine animals, watering wells, etc.

The option to intensify the livestock sector was not adopted by the Mongolian government. Instead, a process of intensification was induced in the crop-farming sector. Starting in the 1960s, arable farming became an independent sub-branch of agriculture. It was developed after overcoming many difficulties connected with the country's geographical and climatic conditions. Huge mechanized state farms were established for this purpose and they specialized in the production of grain and some vegetables able to replace animal products (Academy of Sciences, 1991; Warden and Savada, 1991; UNIDO, 1993; Neupert and Goldstein, 1994). The policy was apparently successful in replacing extensively produced meat and milk with intensively produced cereals (Honhold, 1995). This enabled Mongolia's economy to adapt to a rising population without intensification in the livestock sector. This also prevented an excessive culling of animals that might have even resulted in a reduction of the animal population. State procurement of meat has increased comparatively modestly during the past three decades: between 1960 and 1990 procurement increased from 135.6 to 175.3 thousand tons, that is, by only 29.3 per cent (State Statistical Office, 1991: Table 4.15). As shown above, during the same period population increased by 122 per cent.

Why did the government opt for an intensification in the crop-farming sector instead of one in the livestock sector? One possible explanation is that the necessary technology and capital equipment for an intensification of farming activities were readily available from the Soviet Union; but technologies for animal husbandry intensification were more difficult to obtain. A second explanation is that the government probably perceived agricultural diversification as similar to industrialization: a desirable development goal. Unfortunately, very little has been published about the process of collectivization in Mongolia except in official and very general terms.

Before collectivization, in the traditional pastoral system, herds relied entirely on standing forage during winter; so the central management strategy of herder families was to fatten the animals as much as possible during the summer so they could withstand the long winter with only senescent vegetation (Mearns, 1993; Potkanski and Szynkiewics, 1993). After collectivization and with the introduction of crop farming, hay crops began to be produced and some winter fodder became available in most collectives. Nevertheless, production was not substantial enough to replace winter grazing on standing forage and to avoid nomadic movements. For example, in 1990 the fodder crop harvest was 527,100 tons (State Statistical Office, 1994b: Table 4.14). The size of the herd in that year was the equivalent of 55,309,830 SFUs (see Table 1). Thus, in 1990 the availability of fodder per SFU was only 9.5 kilograms. Fodder is used mainly as a reserve for emergencies and to provide some nutritional supplement to the animals in winter. The introduction of crop farming and in particular the introduction of fodder crops, as well as advances in the Mongolian pastoral economy, can be considered as an intensification of technological factors. However, this intensification was not directed toward the implementation of a sedentary system. Rather, it was a by-product of the intensification induced in the farming sector and was used only to reduce the typical uncertainties of the nomadic pastoral production system. Production continued being nomadic and extensively practised in natural pastures by family productive units.

THE UNCERTAIN FUTURE

The pastoral economy will be strongly affected by two major economic changes that Mongolia experienced after the 1990 reform movement: the collapse of the industrial sector and the privatization of agricultural activities.
Industrial investment has almost stopped since 1990. The former Soviet Union, main provider of financial and capital resources for industrial development to Mongolia, because of its own economic crisis, has discontinued its assistance (Kaser, 1991; Asian Development Bank, 1992). Internal resources are extremely limited and the financial help received from other countries is being used mainly to maintain the functioning of the deteriorated economic and social infrastructure. The possibilities of foreign investment are also modest mainly because of the delay in establishing a clear and consistent legal framework, the limited infrastructure, and the lack of institutional capacity (Hahn, 1993; UNIDO, 1993). This situation may change but it is very unlikely that a massive flow of foreign investment will be generated during the next ten or fifteen years.

In September 1991 the privatization of the collectives began. By August 1992 the transition was completed in most areas and parallel developments in the liberalization of the rural economy were taken, especially regarding marketing and property. Collectives were given the opportunity to remain as shareholding companies that retained ownership of as many as 70 per cent of the animals. Individual herders could join the company or herd privately or a combination of the two; or members could simply decide to disband the collective. Meetings of the members in each collective would decide these issues. In most areas the company has remained as a popular and viable means of organizing herding production; in other areas companies have broken up to be replaced by more localized units of co-operation among herders (Goldstein and Beall, 1994). However, there is consensus among herders and also throughout the Mongolian political spectrum that agricultural land should not be privatized.

A real free-market agricultural sector is not yet established. The Government still has a major influence in fixing prices and remains the major purchaser of agricultural products (UNIDO, 1993). It is too soon to assess whether privatization will result in an increase in production or in improving the living conditions of the rural population. However, it is relatively safe to propose two emerging characteristics of rural development that will affect its adjustment to a market economy. First, heavy investments in agricultural development are not likely in the near future for the same reasons that restrict industrial investments. Therefore, modernization of agricultural activities will be quite limited, at least during the 1990s and the following decade. Second, agricultural production, and in particular the livestock economy, will increasingly rely on independent family productive units and less on co-operatives or other forms of collective organizations. This form of organization of production, especially in livestock breeding, is encouraged in the official agricultural privatization plan. The past ideological basis of rural development based on the Marxist principles of collectivization are being replaced by the more nationalistic concept that the Mongolian livestock economy was traditionally based on family production. Collectives, under the guise of private shareholding companies, will probably continue to exist, but their role will be different from in the past, focusing more on commercialization than on production itself.

A future significant job creation is unlikely in urban areas. Even if a more optimistic scenario is assumed and comparatively important industrial investments take place, the resulting new employment opportunities will not be likely to surpass the number needed to absorb the rapidly growing number of working-age people already living in urban areas. The population born in the 1960s and 1970s has, since the second half of the 1980s, expanded substantially the economically active population. Therefore, urban areas will cease to be poles of attraction to the rural population as in the past when substantial industrial and infrastructure investment took place. At present, the country is experiencing a deep economic crisis characterized by a substantial decline in the standard of living, inflation, unemployment, and severe food shortages. Urban areas, where industries and services are concentrated, appear to have been more affected by the crisis than rural areas.

The collapse of Mongolia's industrial base seems to have abruptly ended the rural-to-urban migration stream. As shown in Table 2, between 1960 and 1990 the total population experienced an average annual increase of 2.7 per cent, while the rural population increased by 1.3 per cent per year. However, between 1990 and 1993 the urban population increased by an average of only 0.1 per cent annually while the rural population increased by 2.5 per cent. The total population increase was 1.2 per cent annually during this period (State Statistical Office, 1994a: Table 2.3). It is difficult to explain this different rate of population growth only
as a result of differential fertility between urban and rural areas, especially considering that until recently the urban population grew much faster than the rural population. Part of this difference appears to be the result of the emergence of an urban-to-rural migration stream. It seems that as a result of the crisis an increasing number of people is returning to the countryside where at least employment and subsistence are assured. It is too soon to consider this an indicator of a lasting urban-rural migration trend but it is quite likely that the labour force engaged in the pastoral economy will substantially increase in the present and next decade.

The decline in fertility experienced by the Mongolian population has resulted in a significant deceleration of population growth; however, this deceleration will have little effect on the growth of the working-age population for a long time. Because of past high fertility, the population in working ages is increasing at a very rapid rate and will continue to do so for the next 30 to 40 years. Between 1990 and 1994, the average annual rate of growth of the population aged 15 to 65 years was approximately 3.5 per cent (State Statistical Office, 1994a). In addition, the collapse of Mongolia’s industry and the subsequent unemployment mean that only a small number of today’s herders’ children are likely to be able to find jobs outside the herding sector. Most of them will probably remain in the rural economy as herders.

The past restricted and slow process of family formation that prevented the expansion of the animal population will not exist any more. Moreover, the expected rapidly growing rural population will cause substantial pressure to expand the herds. Mongolians have centuries of experience in animal breeding and there is little doubt that they will be able to manage the herds well enough to increase the herd size up to a new equilibrium between animal and human populations. The most important limitation, however, will be that imposed by the carrying capacity of the pasture.

Carrying capacity is a difficult concept and its relationship to production even more so. However, without any input, as is the case of livestock breeding practised in natural pastures, any piece of land can produce only a limited vegetation (biomass) per year. Of this material only a certain amount can be consumed by the herds without causing damage to the ability of the pasture to regrow in those and subsequent years. A low to moderate harvest resulting from a small herd may lead to faster regrowth but with a larger herd grazing above these levels, regrowth will fail (Honhold, 1995). Each year a given amount of plant biomass is produced and only a limited proportion can be eaten or harvested in that year. If more than that is taken then the root systems of the prairies are affected and the ability of plants to regrow is decreased. A deterioration of the root systems leads to substantial soil loss through erosion and a decrease in soil quality.

An initial solution adopted by nomad pastoralists is to move the herd longer distances in search of new pastures, that is, to expand the grazing area (Goldstein and Beall, 1994; Horowitz, 1981). If population continues to grow, this horizontal expansion will soon become exhausted. In some cases the availability of grazing land may be limited while in other cases the distances that the herd need to be moved become too long. During this stage a solution is obtained through a process of intensification based on the development or adoption of new technologies such as irrigated artificial pastures, fodder crop production, and improvements in fodder storage facilities and management. This process starts when part of the nomadic population chooses to settle and became engaged in sedentary agriculture (Boserup, 1965). As more land is used for crop farming, nomadic pastoralism is beginning to be replaced by sedentary animal husbandry.

In spite of being a large country with vast pasturelands, the carrying capacity of the Mongolian steppe is limited. There is some evidence that the current size of the national herd is near the limit. It has been estimated that approximately 45.6 million tonnes of plant material is produced by the 121 million hectares of grassland existing in Mongolia. Of this amount, half is required to maintain the pasture species. Therefore, there is about 22.8 million tonnes of potential feed for grazing animals. It is estimated that one sheep eats one kilogram of forage per day; thus one sheep unit requires 365 kilograms per year. Mongolia can potentially support the equivalent of 62.5 million SFU per year. Since the 1994 animal population was
the equivalent of 55.5 million SFU, 90 per cent of the potential offtake is being used, leaving only 10 per cent for expansion (Honhold, 1995). Therefore, even a modest increase in the size of the herd may exceed the carrying capacity of the grasslands and, in turn, precipitate a spiral of ecological degradation that could be devastating.

The limits to the growth of the herd imposed by natural pastures can be expanded by a process of intensification. This process has taken place in Mongolia although on a very limited scale. There are major constraints for a process of agricultural intensification conducive to sedentarization of animal breeding in the country. The most important one is the severe continental climate: very low winter temperatures, a short growing season and erratic and low rainfall. High levels of technological inputs have been required to overcome these problems making unit production cost very high. Taking into consideration the economic crisis that Mongolia is experiencing, further intensifications in the agricultural sector are hardly possible at present. In addition, the resilience of the Mongolian steppe ecosystem seems to be particularly narrow. It would be extremely difficult to increase the herd without endangering the ecological stability, and a sedentary livestock economy would probably require an extremely complicated and expensive environmental management system to avoid an environmental degradation.

The Mongolian livestock economy is likely to reach a point of non-sustainable stocking rates as early as the end of the present decade. Rapid population growth within an agricultural system based on extensive animal husbandry in the particular ecology of the Mongolian steppe may have devastating environmental consequences. The future does not look particularly bright. Nevertheless, population growth and rising animal densities need not lead necessarily to resource depletion and environmental degradation. The relationship between population and environment is neither immutable nor direct (Panayotou, 1994). It is also important to remember that fertility in rural areas is declining and, therefore, population pressures will diminish substantially after two decades.

Proposing specific solutions to avoid a process of environmental degradation as a result of increasing animal densities goes beyond the aim of this paper. However, some technical strategies can be mentioned. Bringing in improved breeds of animals or increasing the production of the natural pastures through non-native species are options that may be worth exploring. However, more than searching for technical solutions, efforts should be directed toward the adoption by the former collectives, and the pastoral economy in general, of suitable management system to accommodate human and animal population increases within the future context of limited resources. The most critical aspect in this regard is that, at present, the pastures are open-access resources. Studies show that a considerable proportion of environmental destruction in Third World countries is associated with situations of open access to limited resources and lack of internalization of destructive practices (Pingali, 1989). National and local policies regulating the use of pastures in a sustainable form are urgently needed. What is proposed here is not a privatization of the grasslands but clear norms regarding its use. In this respect it is essential to set stocking densities (number of livestock units per hectare) for the different regions of the country that are equal to or below the carrying capacity of the land. It is also important to remember that the transition that Mongolia is experiencing is resulting in both winners and losers. Severe problems of rural poverty have already emerged (Cooper and Gelegramt, 1993; Harper, 1994). A concentration of livestock property may have negative ecological consequences since wealthy herders will be in a strong position to use the better pastures forcing small herders to more extensive and intensive grazing practices. Therefore, government policies toward the pastoral economy should also include interventions to reduce the vulnerability of poor households. An agricultural policy based on small productive units organized in private co-operatives or other forms of association is legitimate. Moreover, in terms of social justice and welfare of the rural population, and even from an ecological perspective, it seems the most appropriate model to the development of the rural sector in Mongolia. The problem is whether or not the co-operatives will be able to respond to rapid population growth with an adequate and flexible resource management system able to avoid environmental degradation.
Since a process of sustainable intensification through sedentarization and settled farming is virtually impossible in the near future, environmental degradation will also depend on the capacity of the pastoral economy to accommodate population growth by creating non-herding employment in the former collectives. This will depend also on the government policies toward the sector. A policy to provide former collectives with credit to develop small-scale agro-industrial enterprises linked to livestock activities may substantially increase non-herding employment. On the other hand, if the scarce available resources are used to maintain or revive the urban industrial sector, as has been the case until now, the pastoral economy will have little hope of sustainable development and of breaking the link between population growth and resource degradation.

CONCLUSIONS

Views on the possible consequences of population growth on the environment range from absolutely negative, even devastating, to positive and highly advantageous. From the neo-Malthusian position, population growth is the main cause of environmental degradation and destruction (Ehrlich and Ehrlich, 1990). It places growing demands against the planet’s finite resources and limited carrying capacity. At the other extreme, population growth is perceived as a source of increased efficiency and economies of scale, as well as the seed of technological innovation able to expand the earth’s carrying capacity and make possible increases in living standards and environmental improvements (Simon, 1990). Most studies of the relationship between population and environment consist of analyses realized at an aggregate or macro level; the relationship, however, seems to be highly conditioned by the particular characteristics of the ecosystem and modulated by a society’s institutional structure (McNicol, 1989; Pingali, 1989; Panayotou, 1994). To understand the association between population and environment, analysts require a number of case studies encompassing a wide range of experiences (Cassen, 1994). These should be undertaken in countries which have different ecosystems, are at various stages of development, and have used diverse modes of adjusting population growth to limited natural resources. The experience of Mongolia provides a valuable case study, elucidating a specific environment (the steppe), a predominant economic activity consistent with such environment (nomadic pastoralism), changing population dynamics, and rapid and substantial shifts in the organization of production.

While there are abundant examples in the literature of the effect of population growth on crop farming systems (Boersen, 1965, 1981; Robinson and Schutjer, 1984), the effect of demographic factors on livestock breeding systems has received less attention. As in the case of crop-farming, population growth seems also to have major consequences on animal husbandry and, in particular, on the transition from nomadic pastoralism to sedentary livestock breeding. In the particular case of Mongolia, in the past, limited population growth in rural areas, as a result of substantial cityward migration, was a major determinant of the limited expansion of the herds. The possible substantial rural population increase during the next three decades as a result of the recent political and economic reforms as well as demographic factors, will bring substantial pressures to maximize animal numbers and induce a process of intensification. However, as in crop agriculture, in pastoralist systems there are also environmental and institutional limitations to a sustainable intensification as a response to population growth. In Mongolia, the environmental characteristics of the steppe are the most important limitation to a more intensive system based on sedentary animal breeding. It is hard to think of Mongolia with its wide open spaces and scattered population as overpopulated relative to productive capacity, but that is the most likely conclusion from this paper.

Two factors were identified here as the main determinants of the capacity of the pastoral economy to accommodate an increasing rural population without or with limited resource deprecation of the grasslands. The first is whether the cost of environmental degradation will be brought into the decision-making of individual herder families and former collectives by suitable resource management systems, pricing policies and regulations; the second is whether the government policies will favour the former collectives with economic resources to increase employment in non-herding activities such as small agro-industries. With an economic crisis gripping Mongolia and the shock of transforming the economic system from
socialism to capitalism, the government has been largely engaged in coping with emergency conditions. Specific policies regarding the livestock sector have not been formulated. Some official documents outline general principles to guide the process of privatization but they do not spell out policies or interventions with any precision, nor do they recognize the ecological problem that may soon begin in the grasslands. After the 1990 reform movement the official pronatalist policy that had been implemented for the past forty years was discontinued and a family planning program even began. However, the idea that a large population is best continues to be a deeply rooted conviction of the Mongolian government (Neupert, 1994). The current rate of population growth is considered unacceptable and it is likely that some pronatalist interventions of the past can be revived. Most policy-makers cannot imagine that population problems may exist in a country with such a low population density and that the much-desired population growth may impinge on a process of sustainable development of the pastoral economy. On the contrary, a slowdown of population growth is considered as a limitation to the growth of the animal population and, therefore, to the development of the livestock sector. At present, the most vital need is for the government to recognize the problem of increasing human and animal densities for the pastoral economy and for an informed and expert debate on this issue where possible solutions can emerge.

References


