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**Livestock Sector Study**  
**VOLUME I – SYNTHESIS REPORT**

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## **ABBREVIATIONS AND ACRONYMS**

ADB	Asian Development Bank
AI	Artificial Insemination
ELPS	Extensive Livestock Production System
FMD	Food and Mouth Disease
GDP	Gross Domestic Product
GOM	Government of Mongolia
HIES	Household Income and Expenditures Survey
ILPS	Intensive Livestock Production System
LSMS	Living Standard Measurement Survey
MOF	Ministry of Finance
MOFALI	Ministry of Food, Agriculture and Light Industry
NSO	National Statistics Office
SDC	Swiss Development Corporation
UNDP	United Nations Development Programme
WP	Working Paper

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## **ACKNOWLEDGEMENTS**

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The report drew heavily on the five working papers commissioned by the Ministry of Food and Agriculture under the direction of Mr Davaadorj (former Head of Policy Division). Working Paper 1A: Herder Livelihood Profiles: Herder Typologies was prepared by Maaike van Hoeflaken and N. Nyamaa. Working Paper 1B: Herder Livelihood Profiles: Bayankhongor Herder Case Study was prepared by Maria Fernandez-Gimenez (Colorado State University) with research assistance from B. Batbuyen (Mongolian Institute of Geography and Center for Nomadic Pastoralism Studies) and J Oyungerel (Mongolian Institute of Geography). Working Paper 2: Urban Market Consumer and Retailing Dynamics was prepared by Jon Marlow (ProAnd Associates, Australia) with assistance from Dr Badarch Sundui. Working Paper 3. Production Level Constraints was prepared by Ralph van Gelder (freelance consultant) and Dr B. Erdenebaatar (Center for Policy Research, Mongolia). Working Paper 4. Public Expenditure Review was prepared by Dr Ulrich Koester (University of Kiel, Germany) with assistance from Densmaa Sharavjamts (Mongolian State University of Agriculture).

[To complete]

## EXECUTIVE SUMMARY

1. There are multiple perceptions and expectations of the livestock sector in Mongolia. One common perception evokes a romantic vision of nomads preserving timeless cultural practices living off the land. An alternative view of the sector regards herding as an outdated, unsustainable activity and that herders represent the outcasts from a modernizing economy, destined to remain on the land pursuing vulnerable livelihood strategies that trap them in poverty. Yet another view sees opportunities for rapid intensification of the sector and significant scope for increased productivity, increased trade and increased herder incomes in a modern livestock sector.

2. While there are elements of truth in all these perceptions, there are also many misperceptions and the true nature of the sector is harder to pin down. Some facts: first, the livestock sector has never been less important to the overall economy as it is today, with a share of Gross Domestic Product (GDP) down to around 20 percent. The contribution is likely to continue to decline, especially as mining revenues increase in coming years; second, approximately 40 percent of the work force is directly dependent on the livestock sector, and despite the decline in share of GDP, the sector is likely to continue to be the single most important sector to the economy in terms of employment; third, the livestock sector is dominated by an extensive livestock production system dependent upon access to grasslands and which is therefore inherently vulnerable to climatic and natural resource management risks; fourth, the sector is in a state of flux, as it has been since the breakup of state farms and rural collectives in the early 1990s, and where this will take the sector is unclear.

3. The purpose of this synthesis report is to try and draw together recent work on the sector to understand in greater detail what is driving the sector, and how these drivers and trends may play out in the future and what options are available in response. This is not a strategy for the sector, but rather an attempt to provide some clarity to the development of the sector as a basis for stimulating discussion to inform strategy and specifically, to inform government policy and expenditure in the sector. The report draws upon five working papers (WPs) that were commissioned by the Ministry of Food and Agriculture in 2006 and 2007<sup>1</sup>. These papers tried to fill gaps in current knowledge of drivers in the sector rather than provide a comprehensive study of the sector, and their findings have been supplemented by other work in the sector. The five papers are:

- WP1A: Herder Livelihood Profiles: Herder Typologies
- WP1B: Herder Livelihood Profiles: Bayankhongor Herder Case Study
- WP2: Urban Market Consumer and Retailing Dynamics
- WP3: Production Level Constraints
- WP4: Public Expenditure Review

4. Together, these working papers uncover some of the driving factors behind observed trends in the sector, including the rapid increase in livestock numbers, which at 42 million (NSO, December 2008) are now at a historical high; the change in structure of the national herd with a far higher proportion of goats than previously, and the impact of migration between rural and urban areas, and in particular to Ulaanbaatar. These can be understood in the context of environmental risk, increasing exposure to markets and a loose regulatory framework. The papers

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<sup>1</sup> These working papers, financed from a Japanese PHRD Grant, have already been drawn upon extensively in other World Bank publications, most notably the *Country Economic Memorandum: Sources of Growth* (2007) and the forthcoming *Mongolia Public Expenditure and Financial Management Review*.

also point towards the future, and how the sector needs to evolve to play multiple roles including as a source of economic growth through intensification, as a social safety net for poorer households, and as a means for managing natural resources.

5. While the livestock sector continues to be significant in many households' livelihoods, there is increasing divergence between households, between those which have become large scale producers, owning in excess of 500 head of livestock, and those for which the livestock sector does not, by itself, provide a sufficient source of income to support their household. Breaking this down further, WP1A and 1B, identify further sub-categories of herder types, which can be summarized as follows:

- (i) Wealthy households with in excess of 500 head of livestock (in extensive systems) or smaller herds if in intensive production such as dairy cattle, providing full time employment for household members, good access to pastures and inputs, good winter preparation (hay and fodder production) and ability to move long distance if required. Households with more than 500 head of livestock only account for six percent of the total herding households.
- (ii) Full time herders with growing herds of between 200 and 500 animals, accounting for around 25 percent of herder households. Households are typically from middle or lower wealth levels. While herding can support the household, they are vulnerable to dzud, and restricted to increase herd numbers by access to capital and pastures.
- (iii) Full-time herders with fewer than 200 animals (and frequently less than 100) are poor households, highly vulnerable to dzud, often dependent on state support, and for whom herding is not a preferred livelihood, but who have no alternative sources of income.
- (iv) Periodic herders, usually with fewer than 200 animals, who come in and out of the livestock sector, depending on their economic circumstance. Often herding is used as a safety net, or fall back option. This group includes recent migrants to urban areas for whom the move may not be permanent.
- (v) Part-time herders with small herds which they may or may not own (less than 200 animals), who supplement income from livestock with other sources, including "ninja" mining, farming, and seasonal migration to urban centers for temporary employment.

6. The categories above imply a diversity among households engaged in the livestock sector in terms of herd size, which has implications for the level of commercial orientation, management skills, and access to inputs and markets. However, while there is an increasing spread in the size of individual herds, the sector as a whole can still be regarded as low-input and high risk, and the mentality of herders is still geared towards increasing livestock numbers rather than intensification and focusing on quality. This approach has likely reached its environmental limits, and many would argue that it has already surpassed these limits, pointing to the now widespread degradation of grasslands. Traditional systems of tenure and livestock management appear to be breaking down in places, with more trespassing, conflict and livestock theft reported.

7. The sector has reached a critical juncture. In the absence of policy restricting livestock densities or any market-based incentives to stabilize or reduce livestock numbers, numbers of livestock will likely continue to rise as herders increase herd sizes to manage risk and increase output volumes. As in the past, the most likely scenario will be the repeat of the enormous losses experienced between 2000-2002 when dzud caused the loss of over 25% of livestock forcing many families into acute poverty, fueling rapid migration to cities and halting GDP growth. While the actions of herders can reasonably be explained by incentives and risks in the sector, the development of the sector is clearly at odds with the government vision of a modern livestock industry. Long term goals for the sector are to increase the quality and value of processed and unprocessed livestock products and increasingly to access export markets. There needs to be

some significant shifts in the current production, processing and marketing capacity to make this a reality, and there are different pathways to achieving this.

8. At present there is little incentive for herders to change their ways. Although under consideration, at present there is no secure tenure for herders for pastureland and therefore little incentive to invest in improved management. Input markets are not well developed especially for the feed and fodder necessary to intensify production and increase productivity. There are also no well developed markets for risk, which has to bourn by the herders themselves. Index-based livestock insurance is being piloted, and offers an alternative option to herders from increasing livestock numbers. On the output side, herders do not see any benefit from increasing the quality if their production. Currently, apart from some niche products, food exports from the sector (meat, dairy etc) are restricted mainly due to quality concerns (including import bans due to recent outbreaks of contagious livestock diseases such as Foot and Mouth Disease (FMD)) and to marketing challenges.

9. There are no cohesive supply chains in the livestock industries. It is possible that the domestic market can help to drive the needed developments in the sector. With a rapidly urbanizing population and growth in the number of wealthier, more discerning, customers, demand is likely to increase for quality aspects. WP2 shows that in Ulaanbaatar, there has been a recent expansion of more formal retailing outlets, including supermarkets, which pay greater attention to marketing (in terms of quality of product, packaging and promotion). However, the response of the sector to this trend by offering more differentiated products is so far only in its infancy.

10. Meanwhile the role of the government has been largely passive and not active in encouraging the emergence of modern livestock industries. The public sector still has a vital role to play in the livestock sector. Arguably, the privatization of the sector in the 1990s – not just for production, but also veterinary services – led to too much of a withdrawal of public support. Public sector spending in the sector has been low, below other comparator countries, and skewed toward the crop sector due to government concerns on the over-dependence of imported staple food, particularly wheat (WP4). In recent years, there has been a rapid increase in expenditure in the agricultural sector for both crops and livestock, however this expenditure has tended to favour direct interventions to influence the market, rather than on ensuring that a favorable production environment exists, inequalities in access to production resources are addressed and conflicts resolved, and assistance is provided during catastrophic events such as drought and dzud.

11. Against the background of these trends and issues, the report proposes some recommendations and options for taking the sector forward and achieving multiple goals towards creating a sustainable production base and commercializing production. The Government has an important role to play in a market economy: it has to produce public goods and it has to reduce market failure. Market failure is of special concern on agricultural markets in Mongolia: Transition in any country can only be successful if agriculture adjusts successfully to the new conditions. The land market, the market for agricultural finance and the know-how of people employed in the sector are the most important determinants of successful agricultural transition. Mongolia has decided to keep land in state property and, thus, has suppressed the development of a land market. If nevertheless agriculture has to improve efficiency policies should focus on mitigating the inherent and state-created market failure. Therefore, public expenditure in the agricultural sector can only be effective and efficient if it is focused on production of public goods and contributes to mitigate market failure. In this regard, there are a number of areas for intervention:



12. **Access to land and water:** The two most critical government legal/policy issues requiring resolution to accelerate the development of the livestock sector are Land Tenure Rights and Water Tenure Rights. Land is the most basic resource needed for agricultural production. As such, land is a commodity that has intrinsic value, both in itself as a potential marketable commodity and as a primary component of agriculture production. Likewise, water is a critical natural resource necessary for efficient livestock production and an essential natural resource for improving productivity and mitigating environmental risk associated with crop production. Other users of land and water are, or will be, competing with agricultural producers for use of these critical resources.

13. **Organization of herders:** Better organization of herders into cooperatives, possibly with joint-tenure of pastureland has considerable potential to improve management, lower marketing costs and facilitate access to inputs. Producer cooperatives can provide members, as a group, with opportunities to build market linkages between livestock producers and meat companies. For example, private meat companies are already established that purchase animals, slaughter, process, and distribute meat to restaurants, supermarkets, and meat store chains in urban centers.

14. **Development of the feed industry:** Mongolia has a comparative advantage in animal feed production because of climate suitability and the potential to rehabilitate large areas of abandoned cultivated ground for livestock feed production (WP3). The government and the international donor community should promote development of animal feed production centers in the central cropping region and in eastern Mongolia. Development of an animal feed base is consistent with the government's Action Plan for development of the agriculture sector.

15. **Support services:** The decline in the provision of public services to support the livestock sector needs to be reversed. This includes the monitoring and control of infectious diseases, research and development for livestock breeds and forage and fodder crops; animal breeding including artificial insemination; agricultural extension; monitoring of the national herd, through an identification program.

16. **Risk Mitigation and Disaster Management:** The livestock sector in Mongolia is in danger of going in cycles of boom and bust, with numbers of livestock and output increasing rapidly in years of good weather, only to be decimated in *dzud* years. The public sector needs to play a more prominent role in risk management and, in the event of a disaster, post-event recovery. Winter preparations are reported to have improved. Herders can therefore manage a level of climatic risk. Ultimately, however, risk will need to be shared and transferred to others, including government and the insurance market.

17. **Social services:** Finally, the government should maintain social services in current suoms, which are critical to livestock producers in providing access to schools and social services. Lack of access to social services is frequently cited as a critical factor leading to rural urban migration.

18. Change in the sector will take time, as deep rooted perceptions and approaches to production and marketing may need to be challenged. But change is necessary for the sector to remain as a cornerstone of Mongolia's national identity.

## I. INTRODUCTION

### World Livestock Production

1. Animal production has been, and continues to be a significant source of livelihood, food and fiber for the world's population. Animal production systems are classified into three general types: grazing or forage-based, mixed crop-livestock, and industrial (Sere and Steinfeld, 1996). These systems are often stratified to combine two or all three of the broad generalizations:

- *Grazing based* production systems obtain animal products from beef and dairy (usually dual purpose breeds) cattle and sheep and goats. These species are highly mobile grazers and have ruminant digestive tracts capable of processing coarse forage that is needed to successfully produce animal products from rangeland ecosystems.
- *Mixed crop-livestock* animal production systems are generally stratified, both relative to animal production and farm enterprises, often with the major emphasis on crop production and a secondary emphasis on livestock production. Animal feed is obtained from a number of sources including natural forage, grown feeds, crop by-products, and processed feeds purchased externally to the immediate livestock production enterprise.
- *Industrial* animal production systems are generally landless with animals at least partially confined and fed processed and often purchased feeds that comprise animals total ration or are a major part of their diet.

2. Prior to the 20<sup>th</sup> Century, most animal production occurred in a pastoral context (i.e., forage based and obtained through the act of grazing by domesticated herbivores) and off-take was largely self-consumed by the actual producer. Forage-based animal production systems dependent on natural rangeland ecosystems for feed continue today in many parts of the world including western North America, South America, northern and Mediterranean Europe, Africa, Asia, and the Pacific. These traditional or modified pastoral livestock production systems continue to dominate livestock husbandry and production practices in less developed countries and in the less industrialized regions of developed countries (Sheehy *et al*, 1997).

3. Grazing animals and forage-based livestock production systems remain relevant and important to the world's food supply (Kellems and Church, 1998). Rangeland, which produces forage for grazing animals and is more suited for grazing by large herbivores than cultivation, occupies 40 percent of the Earth's land surface. Forestlands, much of which can be utilized by grazing animals, comprise an additional 28-30 percent. In the United States, which is one of the most industrialized countries in the world, over 54 percent of the feed consumed by animals is obtained by grazing rangeland directly or harvesting it as hay. On the Mongolian and Tibetan Plateaus of Asia, almost all animal feed is obtained as forage by grazing livestock.

4. Most of the forage-based and much of the mixed crop-livestock animal production systems incorporate some form of pastoral management and husbandry techniques into the production system. Although current global animal production is dominated by mixed crop-livestock and industrial animal production systems, traditional or modified pastoral animal production systems continue to dominate use of land.

## Mongolian Livestock Production

5. The Mongolian livestock sector, which remains dominated by extensively managed livestock production and is dependent almost entirely on natural forage continues to be an important (though declining) component of the Mongolian economy. Livestock have been the mainstay of Mongolian agriculture and the basis of its economy and culture for millennia. During the socialist period, considerable emphasis was placed on development of a cropping sector, primarily grain, that provided some of the animal feed needed to support both extensively managed livestock production (i.e. livestock collectives or *Negdel*) and mixed livestock-crop production (i.e. state farms).

6. With the end of the socialist period in 1990, both cropping and livestock sectors underwent considerable change as Mongolia began transformation to a market economy. Changes and impacts during the early transformation period have been relatively well documented, especially the collapse of the rural collective and state farm systems, and the resumption of more traditional animal management and livelihood strategies in the extensively managed, pastoral livestock production system (Nixson and Walters, 2006; Sheehy, 1996, Asian Development Bank, 1997; Mearns, R., 2004a,b). During the “transition” from command to market economy, livestock production became more traditional as the well-developed physical and socio-economic support infrastructure of the rural collective and state farm collapsed.

7. The resumption of more traditional forms of livestock production during the transition period has created the popular misconception that livestock production as currently practiced in Mongolia is a continuation of traditional “nomadic pastoralism.” In reality, the current form of livestock production is a rational response of producers to: 1) the collapse of the socialist support infrastructure, 2) the privatization of livestock, 3) lack of alternatives to continuation of pastoral grazing management and animal husbandry strategies, 4) withdrawal of direct government production support, and 5) a gradual assimilation of livestock producers into the market economy. While agriculture and livestock development has been a major focus of international development assistance, the support received has not always been targeted to the real and emerging needs of the Mongolian livestock sector or livestock producer. Government expenditure in the sector also has tended to miss key priorities in developing a strong, market-based sector.

## Livestock Sector Development

8. The loss of livestock from the extensive pastoral livestock production system due to *dzud*<sup>2</sup> and drought in 2001-2003 period (i.e., approximately 9 million head died during this period) generated interest in finding alternative production systems. The Mongolian Ministry of Food, Agriculture and Light Industry (MoFALI) proposed the development of intensively managed and diversified crop and livestock production systems that would potentially reduce future losses of livestock due to extreme weather events. Intensively managed livestock production systems would also safeguard food security and encourage diversified product production to meet changing market demand. This can be seen as Mongolia’s second attempt to develop a more intensively managed and semi-industrialized agriculture production system, the first being the heavily subsidized state farm and rural livestock collective (*negdel*) in the command economy. However, this time intensified livestock production, whether using crop-livestock or industrialized production systems, will have to respond to the constraints and opportunities

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<sup>2</sup> *Dzud* are extreme winter climatic events; one or more of extreme cold temperatures, heavy snow fall, snow storms, drought or high winds that can cause high rates of livestock mortality.

imposed by the market economy. The costly support provided by the former socialist regime will not be available.

9. A primary reason for the failure of the livestock collective and state farm production systems were the higher costs associated with intensification of the production system. The organization, management and production inputs required by the state farms failed to generate the quantity and quality of outputs needed to at least balance the higher costs. Likewise, the extensively managed livestock collectives that employed traditional grazing and animal management strategies failed to generate the income needed to overcome the costs of additional inputs provided at a high cost by the command economy. Attempts to maximize long-term off-take productivity by increasing external inputs such as hay and concentrate were generally curtailed by uncontrollable environmental events such as *dzud* and drought. Eventually, the high costs associated with provision of subsidized inputs to marginally increase off-take proved untenable. The state farms, with greater dependence on external inputs, much greater susceptibility to adverse environmental conditions and much higher real costs, generated grossly unsustainable costs that could not be maintained after support from the Soviet Union was withdrawn.

10. Under the open market economy, the agricultural sector in general, and the livestock sector specifically, are gradually acquiring the characteristics of a “commercialized” production system. While the Mongolian transition to commercialized livestock production has not been easy, it is not unique. In one form or another it has happened in Europe, Australia and New Zealand, and North America. China, which for millennia has been dependent on agriculture, is still undergoing a similar transformation as cultural and institutional change occurs in response to demands of a socialist market economy. In rural North America, the market economy continues to exert a destabilizing influence on natural resource dependent communities. Political, legal, and economic power has shifted from the rural agriculture base to the urban population. The urbanized population depends on rural agriculture as a source of cheap but relatively high quality and safe food made available by the well-developed production, transfer, and value-added food chains in an increasingly industrialized and global agricultural production system. Mongolia has the opportunity to learn from the experience of other countries operating in a market economy and to extract lessons that are in keeping with its environment and agricultural systems.

### **Study Rationale**

11. The livestock sector will continue to be an important component of the Mongolian economy and culture into the future. Although the “transition” to a market economy has occurred (i.e. all participants in the livestock sector understand buying and selling products, do not expect the state to provide direct assistance other than in emergencies, and realize that their livelihood largely depends on their own efforts), participants must still adapt to changes emanating from the market economy itself. For this reason, and because of the changes and challenges still facing livestock production in Mongolia, the Government of Mongolia and the World Bank commissioned this study into the evolving livestock sector.

12. The main goal of the study is **to identify the major drivers of change in the livestock sector, the implications for sector growth and distribution among livestock households, and priority adjustments in government policies and investments to facilitate beneficial livestock sector development.** This synthesis report brings together the findings of five discrete pieces of work (Volume II) and draws on other recent sector analysis (e.g. the MoFALI / ADB Agriculture Sector Strategy). The four topics addressed by the five working papers were:

- Herder Livelihood Profiles: This component of the study was split into two working papers: a) creating a typology of herder households in Mongolia since the *dzud* of the early 2000s, to provide better understanding of how they provide for their families, generate income and access inputs, services and markets; and b) a detailed survey of herders in Bayankhongor aimag, tracking the change in livelihoods since the mid 1990s.
- Urban Market Consumer and Retailing Dynamics: This study identified how urbanization and changing demand patterns is driving change in the livestock sector, including linkages between producers and markets. It also makes forecasts for domestic consumption, as well as international trade. The paper also provides information on drivers of change and what should be the Government's priority focus areas.
- Production Level Constraints (Inputs and Services): Livestock feed production from sources other than natural pastureland is insufficiently developed to allow livestock producers to produce or purchase supplies of animal feed needed to improve animal productivity. This paper focuses on producer access to animal feed and other inputs and services critical to livestock production and considered these impacts on production risk, development of the sector, and implications of changing consumer demand for livestock products.
- Public Expenditures Implications: While Government expenditures in the livestock sector channel a significant portion of public resources to subsidies that support what are essentially private production activities, provision of a number of normally important public goods appears to be under-funded (e.g., livestock, forage and feed research, facilitation of commercial market deepening, and animal health and disease control). This background paper explores whether adjustments to public expenditure allocations and implementation can be identified that provide for a better balance and more effective provision of the most important public goods for development of the livestock sector.

13. This Synthesis Report pulls together the findings from the working papers as well as other relevant literature in the sector to produce a forward looking report on the trends, challenges and options for the future of the sector. Specifically this includes:

- What are the key trends shaping the sector now and into the future?
- What are the key environmental, social and economic challenges / issues in the future?
- Which are the key public and private players / partners in developing the livestock sectors, and what are their respective roles in addressing challenges?

## II. SECTOR OVERVIEW

### Introduction

14. Conceptually, the Mongolian livestock sector is comprised of three linked components (i.e., production, marketing and consumption). The production system integrating the sector components together includes: (i) the producer (i.e., herder) who manages actual livestock production and derives a livelihood from consumption and/or sale of livestock and livestock off-take products, (ii) livestock production activities which involve the actual production of livestock and livestock off-take products by the producer, (iii) secondary production activities which involve processing and value-added activities and which are often distinct from primary production, (iv) marketing and sale of livestock and livestock off-take products which can occur throughout the livestock production system but which generally refers to wholesale and retail marketing of end-products, and (v) consumption which can occur throughout the production system for livestock off-take products but most often refers to retail purchases of meat and milk and other off-take products by retail purchasers.

15. The livestock production system is affected by social, economic, environmental, and technical factors that include: (i) livelihood strategies (i.e., subsistence, risk mitigation, incomes, commercialization), (ii) production systems (i.e., access to animal feed, animal breeding for production or quality improvement, livestock disease control, resource management, etc.), (iii) market structure and demand (i.e., selling off-take products, purchasing inputs, accessing services, market competition), (iv) land use (i.e., pastureland management, resource access), and (v) public sector intervention (i.e., resource use policies, food safety, access to production resources, subsidies, food import etc.). While livestock production is now considered to be a “private sector activity”, the public sector by necessity must remain involved to ensure that interests of the Mongolian people as a whole are served.

### Herders: Incentives and Livelihood strategies

16. **The nomadic herder myth:** Pastoral livestock production as it evolved in Mongolia, and continues to be practiced, is surrounded by a mythology that continues to influence national and international efforts to support producers and further develop the livestock sector. Although often popularly viewed as “traditional nomadic herders,” Mongolian livestock producers during the socialist period were highly organized into production units that practiced relatively intensive animal production until the demise of the state farm and rural collective in the early 1990s. However, traditional grazing management and animal husbandry strategies were employed during the socialist period, and have been continued during the transition period. It is the employment of these strategies, and the continued use of the highly mobile “ger” by most producers that facilitated the myth of the nomadic herder. In actuality, herders have had relatively well-defined and commonly accepted boundaries for grazing of household and group livestock. Introduction of non-resident herders and their livestock into pasture areas controlled by other herders without prior negotiation and government approval, especially during critical grazing times, usually leads to conflict.

17. **Multiple (mis)perceptions of herders:** It is interesting to note that Mongolian livestock herders are currently viewed from a number of different perspectives by herders themselves, urban citizens, government, tourists, and the international development community. Included among these perspectives are: (i) poverty-stricken and exploited by profiteering traders (‘changers’), (ii) pastoral nomads living traditional lifestyles, (iii) castoffs of the new Mongolian

market-oriented economy and society, (iv) ignorant exploiters of the public's natural resources by overstocking goats and causing degradation of pasturelands, (v) rural citizens who are ignored by the state and urban population during good times and are insufficiently assisted by the state during bad times, and (vi) rural citizens who are the backbone of Mongolian culture and society.

18. **Herding is a business and a way of life:** Although the above descriptions of herders do apply to individuals and herder groups at certain times and in certain places, these appellations are increasingly inaccurate and misleading, and foster misdirection of support and development of the livestock sector. Livestock production is the primary goal of all herders, and reasons for doing so are variable, as are management skills and access to the resources needed for optimal production. For the most part, herders pay taxes, send their children to school, use available (and often inadequate social services), have vehicles for transportation, and increasingly are linked to the rest of Mongolia and the world via radio, television, the internet, and the cell phone. Herders should be more appropriately viewed as rural citizens (for the most part) engaged in agriculture production with livestock, and who view livestock production as both a business and a way of life.

### Herder Migration

19. A large segment of the Mongolian population (i.e., 40 % in 2007) remains dependent on livestock production as their primary means of livelihood (Figure 2). During the early transition period, the number of livestock herders increased as the livestock sector absorbed much of the newly unemployed population displaced from their jobs by the collapse of the socialist command economy. Since the late 1990s, the trend has reversed, with out-migration of segments of the rural population to the larger urban areas. This latter migration is transforming Mongolia from a rural nation to a demographically urban nation. Although out-migration occurs for a number of reasons, there is considerable concern, especially by the international community, that livestock herding families are forced to migrate for reasons of poverty associated with the inability of marginal livestock households to withstand loss of livestock from catastrophic weather events and inability to compete for natural resource access with wealthier herders.

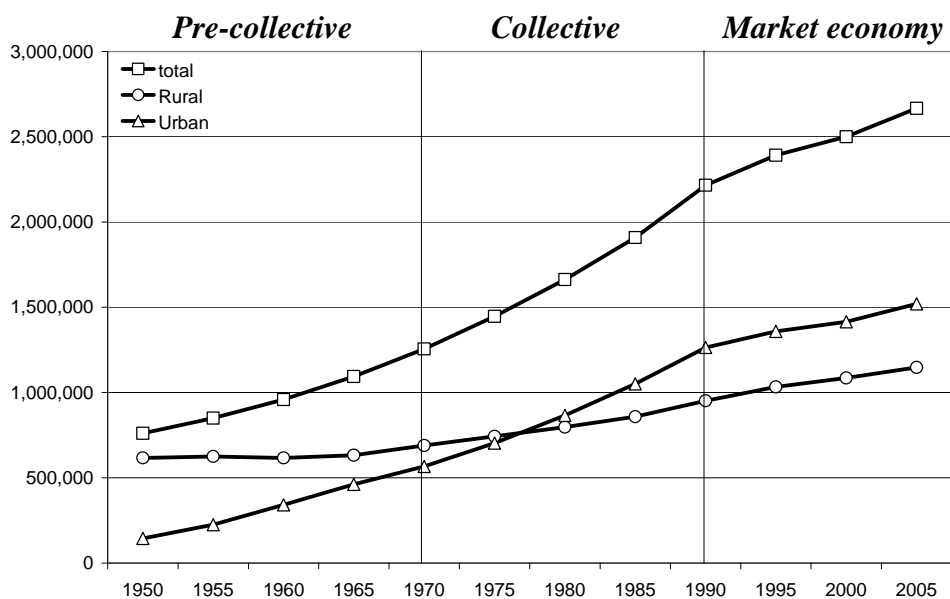


Figure 2. Human population trend in Mongolia 1950-2005 (Source: FAOSTAT 2005)

20. The evidence also suggests a number of reasons for out-migration of herders ranging from poverty due to loss of livestock from severe weather events to a desire to obtain, or return to, a less difficult and more rewarding lifestyle with better access to social services. Many households that remain in the livestock sector have family members leave, especially children after high school, to seek employment opportunities and lifestyles not related to livestock production. Circumstantial evidence also indicates that many households are becoming dependent on income generated by family members engaged in business or employed outside the livestock sector. In general, there are many reasons members of herding families wish to leave the livestock sector besides poverty caused by catastrophic loss of livestock, including obtaining a better education for their children, access to health care, a more interesting lifestyle, and others.

21. Out-migration of marginal livestock producers appears to be a relatively common outcome of transition to a market economy. Loss of a substantial number of younger people and families from agriculture has been, and continues to be, a major factor affecting the sustainability of rural communities in all market economies. The implication for Mongolia is that out-migration of marginal herders to urban areas will continue for an indeterminate time. Viewed from the human perspective, the out-migration can have tragic consequences if marginal herders become urban poor; however, viewed from the perspective of the livestock production system, out-migration of marginal herders will strengthen the livestock production system and support development of commercialized livestock production by reducing the number of subsistence-based herders.

22. Migration of rural people to urban areas has both positive and negative ramifications. Positively, it will reduce pressure on local natural resources as resource users leave the land to look for opportunities elsewhere. Impacts are many including the general depopulation of much of the countryside which puts more pressure on urban areas, increases the number of urban poor, and decreases the power base of the remaining herders and non-herders that constitute the rural population of Mongolia. Similar to other agricultural societies during transition periods, losing young people will have serious consequences for rural areas. In North America, it led to a consolidation of properties and a decreasing rural population base that leaves political power and decision-making with the urban population, who then gain defacto control of rural areas with little knowledge of rural needs or desires.

### **Herder Typologies**

23. Reportedly, between 2002 and 2006, households with less than 100 animals declined by 26% while households with more than 100 animals increased by 74%. Households with less than 100 animals have been unable to survive dzud, predation, disease and theft. They have been forced to sell (or consume) their livestock to survive and many of them have not found alternative livelihoods. Many have migrated to urban centers where they live in relative poverty, or have undertaken high-risk jobs in other sectors (e.g., ‘Ninja’ miners). Although herding will continue to attract people as long as there are few other alternatives and climatic factors remain positive, the next serious drought or dzud could wipe out the majority of the small-scale herders and potentially destabilize the sector. Concern has also been expressed that rural areas of Mongolia are gradually becoming depopulated, with unknown political and social consequences for the nation. While rural population does appear to be contracting in some aimags as herders withdraw from livestock production, activities of other sectors (i.e., mining and tourism) are causing the rural population of some suoms to stabilize or increase.

24. Livestock producers with large numbers of livestock and with access to production resources will adjust to producing livestock off-take products for a market much faster and easier



than marginal herders that, through necessity, must consume a major portion of their annual livestock output. Wealthier herders can react to market incentives by switching production capacity (i.e., they are not as dependent on Cashmere as their main income source; if market demand improves the price paid for beef and lamb, the wealthier herder can increase breeding stock of beef cattle and meat sheep to meet market incentives). Consequently, the types of livestock producer that appear to be evolving in Mongolia are:

- (i) Wealthy households with in excess of 500 head of livestock (in extensive systems) or smaller herds if in intensive production such as dairy cattle, providing full time employment for household members, good access to pastures and inputs, good winter preparation (hay and fodder production) and ability to move long distance if required. Households with more than 500 head of livestock only account for six percent of the total herding households.
- (ii) Full time herders with growing herds of between 200 and 500 animals, accounting for around 25 percent of herder households. Households are typically from middle or lower wealth levels. While herding can support the household, they are vulnerable to dzud, and restricted to increase herd numbers by access to capital and pastures.
- (iii) Full-time herders with fewer than 200 animals (and frequently less than 100) are poor households, highly vulnerable to dzud, often dependent on state support, and for whom herding is not a preferred livelihood, but who have no alternative sources of income.
- (iv) Periodic herders, usually with fewer than 200 animals, who come in and out of the livestock sector, depending on their economic circumstance. Often herding is used as a safety net, or fall back option. This group includes recent migrants to urban areas for whom the move may not be permanent.
- (v) Part-time herders with small herds which they may or may not own (less than 200 animals), who supplement income from livestock with other sources, including “ninja” mining, farming, and seasonal migration to urban centers for temporary employment.

25. **Development challenges:** The increase in livestock numbers following privatization and the increase in livestock numbers since the drought and dzud of 1999 to 2002, clearly indicate that the livestock sector is maintaining itself in terms of livestock numbers, even though some marginal producers are being forced out, or are opting out of the livestock production system. Preventing the decline in total herder population should not be a primary focus of the livestock sector. Rather, intervention should focus on developing and implementing programs that mitigate financial and environmental risk of livestock producers in a gradually commercializing livestock production system. Government support should focus on formulating policies and programs that improve capacity of the livestock producer to provide products for the market place. The challenge facing those responsible for the sector is to find alternatives for those leaving herding through creation of formal social safety nets and job creation in service industries and other economic sectors.

26. The development challenge then facing both the private and public sectors for those producers choosing to stay in the sector will be designing and implementing measures that will mitigate the financial and environmental risk of livestock producers and the formulation of policies and programs to create a better enabling environment for those investing in the livestock sector. Differentiated approaches are needed for herder types and geographical locations. The challenges facing livestock herders in the Gobi are very different from those living in mountain steppe, and the challenges facing a soum based herder with 100 goats are very different from those of a herder with a mixed herd of 400 animals.

## Production Systems

27. The Mongolian livestock sector has producers ranging from nearly subsistence-based herders with relatively few livestock to producers with sufficient livestock to provide subsistence to the household and trade or sell surplus livestock and livestock off-take products to urban markets. Indirect ownership of livestock whereby owners not directly involved in actual livestock production hire other people to manage their livestock is increasing.

28. **Extensive and Intensive Systems:** Two substantially different animal production systems are developing in Mongolia. The current extensively managed, forage-based livestock production system (ELPS), has some similarity to the system employed by the rural collective (negdel) during the socialist period relative to animal husbandry and grazing management strategies used by the herder. In the current system, livestock are privatized, the state does not directly intervene in production management decisions except to a limited degree in organizing pastureland and water use, and all components of the production system are affected by constraints and opportunities offered by the market economy. The other type of animal production system that is gradually evolving is the more intensively managed livestock production system (ILPS). This production system has several forms depending on the focus of production. Adjacent to urban areas (including suoms and aimags as well as large urban areas such as Ulaanbaatar and Darkhan), the ILPS focuses on producing specialty products such as milk, eggs, and meat from swine, chickens, and rabbits. The other form of the ILPS that is just beginning to emerge is the integrated crop-livestock production system designed to support large animal livestock production. A current focus of international donor agencies and MOFALI is the development of more intensive livestock production systems as a way to mitigate risk to food production and improve national food security.

29. Livestock production in Mongolia has gradually been evolving towards a production system with characteristics similar to other systems that focus production activities to meet demands of consumers through the market-place. The move towards a more commercial, market-oriented production system is one of the key driving forces behind changes in the sector. The best opportunity to fully commercialize ELPS lies with the larger herders. In the ELPS, size matters, and larger livestock producers are more likely to make a profit than small enterprises (MoFALI, SDC, UNDP, 2007).

30. There are other factors that determine whether or not intensification and commercialization of livestock production is viable. Distance to market, transport costs and access to inputs including feed, veterinary services and market information are all critical deciding factors. This is reflected in the Government's regional development policy, which targets the central region with its proximity to large markets and processing capacity as having the greatest potential for intensive livestock production. In addition, the ability of the producer to produce a quality product and maintain regular supply is critical. One of the greatest opportunities for intensive production is in providing livestock products (milk and meat) out of season when the prices paid by the consumer are highest. However, this is hampered by lack of access to inputs, especially high quality animal feed that will support growth and development of younger aged livestock during the winter and spring seasons.

31. The apparent trend towards commercialization of the livestock production system has a number of implications. It is obvious that a commercialized livestock production system will have greater need for inputs into the production system, especially more reliance on non-forage animal feed and veterinary services, and access to competitive markets. Unless these constraints are

overcome, there will be little incentive for herders to embrace commercialized livestock production because prices received for offtake products will not offset added costs of producing higher quality and quantity of products.

### **Production risk**

32. Livestock producers in Mongolia and elsewhere are subject to two primary categories of production risk: (i) environmental risk, especially weather and climate related factors, which influence productivity of animals; and (ii) financial risk, which influences the balance between costs of production and income from sale of livestock products. Environmental risk can be viewed as an inherent constraint to optimal livestock production at the primary level of livestock production. Financial risk, however, is only recently becoming a constraint to optimal livestock production in Mongolia as the developing market economy begins to influence producer response to both environmental and financial risk.

33. Discussion of environmental risk usually refers to impacts of weather events such as drought and dzud (i.e., winter blizzards accompanied by very low temperature) on livestock production. During the transition from a socialist command economy to an open, market-oriented economy, Mongolian livestock production has been dependent almost solely on forage produced by natural pastureland. As such, livestock production is highly susceptible to natural (i.e., weather and climate) and anthropogenic (i.e., natural resource exploitation) risk. Variance in temperature and precipitation can induce drought and severe winter storms, which cause losses in livestock productivity or abnormal livestock mortalities. In areas where drought and dzud persist for longer time periods, continued use of forage resources can induce degradation of pastureland resources.

34. In the near-term, the death of livestock and/or reduced productivity associated with severe weather events can substantially increase the financial risk to which the herder is subjected. The loss of livestock during the 1999-2002 drought and dzud has reportedly increased the out-migration of herders who lost most or all of their livestock, while the degradation of pastureland in some areas with persistent drought is substantially increasing both environmental and financial risk to herders remaining in these areas. In Dundgov aimag, where drought has persisted for six consecutive years, herders are forced to move to neighboring aimags which, even with official approval, increases conflict with resident herders in the move-in areas because their environmental and financial risk increases proportionately.

35. Herders are increasingly being subjected to a new type of environmental and financial risk. Both legal and illegal mining activities reduce herder access to pastureland and water resources needed for optimal livestock production. Licensed, large scale and often open-pit mining activities dispossess herders of significant areas of pastureland and water resources without adequate compensation. Illegal small-scale mining activities despoil pastureland and water resources and, over time, can degrade relatively large areas of highly productive resources critical to livestock production. Suom government officials responsible for enforcing land and water use regulations have insufficient capacity or legal authority to enforce mining company compliance with disturbed land rehabilitation or prevent illegal mining activities on suom pastureland. Another type of risk that will increasingly impact herders is the acquisition of pastureland resources for the purpose of livestock production by either wealthy absentee owners or foreign investment interests who are seeking to contract with the government to use of large areas of cropland and pastureland used by local herders.

36. The infrastructure needed to support Mongolian livestock production does not adequately meet producer needs in averting environmental and financial risk. Lack of access to inputs,

especially livestock feed inputs, is a major limiting constraint to optimal livestock production and further development of the sector. Livestock and crop producers have little or no access to affordable inputs needed to improve production efficiencies or access competitive markets that will allow producers to respond to changing demand for livestock products. Pastureland and risk management programs are not institutionalized in either the public or private sectors, which is creating an environment leading to both overt and covert exploitation of natural resources, often to the detriment of local herders and suums in which these activities occur.

### Livestock Herd Numbers

37. Size and kind of animals forming the national herd is an issue. The common wisdom is that over-stocking of livestock will lead to degradation of Mongolia's natural resources and substantially increase the risk of livestock losses (i.e., either through mortalities or reduced productivity) to the livestock producer. Reportedly, total number of animals in the Mongolian national herd has exceeded 37 million animals (Figure 3). The majority of animals are in the ELPS and subsist on forage produced on natural pastureland.

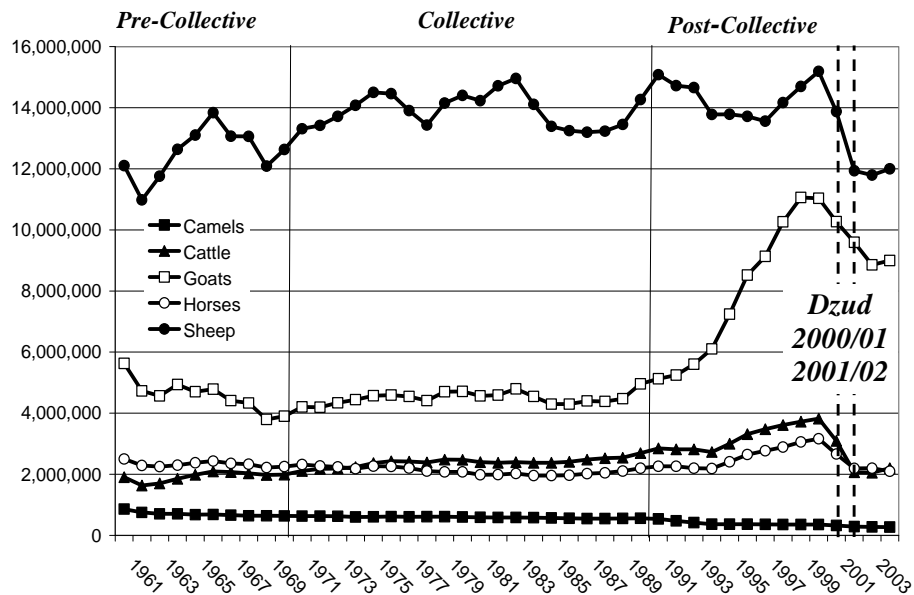


Figure 3. Trend in livestock numbers comprising the national herd from 1960 to 2003 (Source: FAOSTAT 2003). 1960-2003 оны

38. Changes in livestock numbers between 1961 and 2003 is correlated with social, economic and political changes during the same time period. During the latter part of the Pre-Collective period, both sheep and goat numbers showed consistent trends: sheep numbers variable but trending higher; goat numbers more consistent but trending lower. Large livestock numbers were lower but more consistent. During the collective period, sheep numbers were variable but a general trend towards higher numbers continued while goat and large livestock numbers were relatively stable throughout the period. The organization and stability brought to livestock production by the collective is evident.

39. Following the collapse of the collectives and state farms in 1990, changes in livestock numbers reflect the many other changes occurring in Mongolia, especially privatization of production assets, including livestock but not pastureland, retraction of most direct government involvement and support in livestock production, and gradual development of an understanding of the market economy by all elements of the livestock sector. Since 1990, camel numbers have trended consistently downward, while horse and cattle trended higher after 1993. However, the most significant change occurred in goat numbers while sheep numbers continued their variable but slightly higher trend. Goat numbers increased from approximately 5 million head in 1990 to 11 million head in 1999. A number of factors caused the rapid increase in goat numbers, including high reproductive rates and the relatively short time required to reach maturity, the high prices paid for cashmere, and the payment in cash rather than “in-kind.” These factors indicate that producers rather quickly understood the commercial aspects of livestock marketing and were responding in a rational manner to market forces.

40. Although livestock producers were correct to increase livestock numbers in response to market factors, especially cashmere goat numbers, the widespread and multi-year drought/dzud of 2000/02 caused high livestock mortalities in the national livestock herd. Approximately 9 million total head of livestock died during the 2-year drought/dzud period. Sheep, horse, and cattle were reduced to pre-collective numbers, and camel were at such low numbers that losses apparently only continued to reflect the downward trend in numbers. However, goats which had approximately 4 million mortalities, maintained their relatively high numbers in the national herd that was acquired in the post collective period.

41. In the six years following the 2000/02 drought/dzud period, goat numbers have continued to increase, and have surpassed pre-drought/dzud numbers (Figure 4). Sheep numbers have also reached pre-drought/dzud levels, and the apparent trend direction for both livestock species is higher.

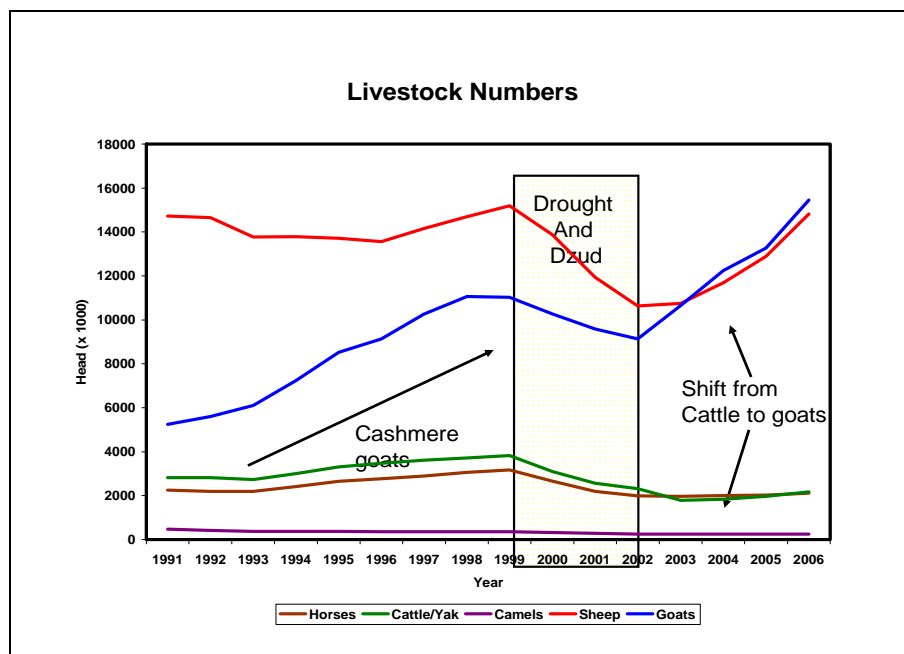


Figure3 . Number and trend of livestock species in the national herd before and after the 2001/02 drought/ dzud.(Source: Gobi Forage Project 2007).

42. Although total livestock in the national herd have reportedly reached historically high numbers, with the increase primarily resulting from higher goat numbers, cattle numbers have trended lower. Cattle mortalities caused by the 2000/02 drought/dzud apparently have not been replaced in the post-drought/dzud period. Cattle numbers in the national herd have declined to pre-collective levels, and have been surpassed by horse relative to total numbers for the first time since 1973. Sheep and goats with approximately equal numbers now dominate the national herd; cattle and horses with approximately equal numbers appear to have stabilized below pre-drought/dzud numbers; and camels appear to be continuing their post-collective downward trend.

43. A study by the Ministry of Food and Agriculture, the Swiss Development Cooperation and UNDP examined the potential for intensification of the sector (MoFA, SDC, UNDP, 2007). Results of the study indicated that:

- Profits are greatest in herds of 300-800 animals.
- Total profit is directly correlated with herd size as profit per animals tends to be constant,
- Herders invest surplus income in animals as there are few investment alternatives,
- Climatically good years lead to increases in herd size
- Herders near urban areas with less than 300 animals get more income from milk than meat. Herders with over 300 animals generate more income from meat. Income from cashmere is in addition to meat and milk, and increases with the number of goats, but never exceeds 14% of total income,
- Most expenditure is related to the depreciation and maintenance of fixed assets (i.e., winter sheds, enclosures, vehicles and machinery).

44. The study found that herder households with up to 300 animals in sheep units are subsistence producers, while herder households with more than 300 sheep units are profit oriented, commercial producers (MoFA, SDC, UNDP, 2007). Households with small herds rely more on income from milk than meat or cashmere and have to undertake other income generating activities to secure a livelihood. Larger, more commercial producers acquire more income from meat than milk as production of milk requires more labor, time, animal feed, and proximity to a market. Herders, particularly poorer herders, continue to keep goats because they are a source of cash income, payable at one time in the year, rather than scattered over the year as in the case of meat and milk. In addition, few inputs are required and goats provide milk and meat in addition to cashmere.

Table 2: Income structure of extensive livestock herders (%) (*Source: MoFA, SDC, UNDP, 2007*)

<b>No. sheep units</b>	<b>Meat</b>	<b>Milk</b>	<b>Cashmere</b>	<b>Other</b>
Up tp 300	20	51	5	24
301-800	47	34	7	13
801-1300	56	26	9	9
Over 1301	54	28	14	4
Average	44	35	9	13

### **Production Inputs and Services**

45. The Mongolian agricultural sector has undergone considerable change during “transition” from the socialist command economy to a market economy. Between 1990 and the present, herders and farmers have had to adapt to top-down driven markets and the loss of inputs and

services provided by the state. The incomplete integration of herders and farmers into a privatised, market-driven economy continues to impact the crop and livestock sub-sectors. Drought and severe winter weather cause losses in overall livestock and crop productivity, significantly increase livestock mortalities, and degrade soils forming the agricultural resource base.

46. Livestock production remains primarily an extensively managed, foraged based, pastoral production system that is dependent almost solely on forage produced by natural pastureland. Crop production, which is mostly rain-fed, is also subject to and limited by natural factors, especially inadequate precipitation at critical times as well as difficulty in obtaining inputs and services needed for optimal crop production. The risk, both environmental and financial is exacerbated by the lack of suitable response options available to herders and farmers.

47. Even with prior warning of adverse weather events, livestock herders and farmers do not have access to inputs that can mitigate environmental and financial risks inherent to agricultural production in the Mongolian environment. In livestock production, lack of access to inputs, especially livestock feed inputs that include forage, hay, and manufactured feeds, is a fundamental limiting constraint to sustainability and development of livestock production systems. Also important and related is the declining quality of livestock, which will further retard adaptation of existing livestock herds to fill increasingly health-conscious consumer demand for “healthy” meat products centered on beef and lamb as opposed to mature livestock. The livestock feed industry is not sufficiently developed to allow livestock producers to produce or purchase supplies of animal feed. Equally limiting to livestock producers is the lack of an adequate marketing system to link producers with consumers.

48. Livestock herder access to services necessary to develop a commercial livestock sector is as important as access to basic inputs. The services required are varied and include extension services, access to credit, access to information on inputs and markets and access to processing services. Current extension services are very limited and do not provide herders with regular or reliable information on which to base their decision-making. Government has very limited capacity at the local level (*soum* agriculture officers) and there are few private providers of extension services. A further constraint is the lack of herder associations and cooperatives, which could provide this support to herders on a fee paying basis. Surveys indicate that herder cooperation is largely due to project interventions, that their impact at a national level has yet to be determined and that their sustainability beyond the period of project intervention is in question (Nyamaa & van Hoeflaken, 2007). The lack of such an institution at the production level is a challenge both to production and marketing, as there are few business associations along the supply chain. Herder business cooperatives and associations could play an important role in strengthening the links between producers, processors, retailers and consumers.

49. Access to credit is another critical issue affecting the development of the sector. While credit is regularly used by herder households, this tends to be used to cover short-term cash flow shortages rather than for capital investment. Producer access to credit has improved with facilities now available in all soums. Seventy-two percent of herders surveyed had used bank loans in the last six years, but these tended to be consumption loans repaid over a period of six months. While improvements are being made in terms of interest rates and collateral requirements, the terms are not suitable for investment in assets such as equipment, shelters and fencing.

50. **Livestock Feed:** Use of animal feed to supplement natural pasture forage has several key benefits including: (i) reducing environmental risk during cold weather, (ii) improved survival rate of young animals, (iii) improved livestock product quality, (iv) improved growth

rates of younger animals, and (v) improved reproductive rates. However, the return on input investment from sale of higher quality products must be higher (i.e., market incentive). The main factors resulting in insufficient availability of livestock feed and reluctance to invest in feed and fodder are:

- Over reliance on standing crop of forage and poor quality hay as the main feed for winter months,
- Hay is cut too late because of summer precipitation, and as a result is low in energy and protein,
- Fodder and silage production is no longer common since the demise of subsidized state farms,
- High quality supplementary feeds are considered too expensive by the majority of herders,
- There is inadequate differentiation by herders between emergency fodder / feed reserves and supplementary feeding to improve production,
- Lack of knowledge amongst herders about the nutritive quality and value of feed and fodder means a lack of incentives to invest in inputs
- Little national capacity to produce processed and manufactured compound feeds necessary to support optimal livestock production in the ILPS exists. Currently, these expensive feeds are imported from China and Russia.

51. The lack of a well-developed animal feed industry, combined with the current lack of competitive markets for livestock off-take products, will continue to seriously impede development of commercialized livestock production in Mongolia. Both the government and international development community should regard animal feed development as a high priority for improving productivity of the livestock sector.

52. Currently, the limited animal feed available is of poor quality, high priced relative to product prices received by livestock herders, and is produced in a form (i.e., lightweight 20 kg bales) that significantly increase cost to herders who have to absorb transportation costs (e.g., in 2007, native baled hay produced at the former Shamar State Farm which sells for 1000 tg/bale at the farm to middleman transporters is sold to the Ulaanbaatar hay market for 1800 Tg/bale). Reportedly, high quality alfalfa hay is selling in Ulaanbaatar for 2,600 Tg/bale). Other forms of animal feed such as processed compound feed are imported from Russia and China, and are used primarily for intensive production of small livestock such as chickens and swine and for peri-urban dairy milk production. Livestock herders in the extensively managed livestock production system have little or no incentive to purchase high priced, generally poor quality baled hay, because there is currently no indication from the market that provision of costly animal feed inputs will be rewarded with higher prices for off-take products.

53. **Livestock Health and Disease Control:** The availability of veterinary services is important to livestock production in any type of production system. In the Mongolian livestock production system, both traditional and modern forms of services are available and used by livestock producers. In 2004, production related services were privatized as part of the transition to a market economy, with the state retaining responsibility for the control of infectious and parasitic diseases.

54. Currently, over half of the total annual program budget of MoFALI supports the national program to control infectious diseases. Livestock producers bear the costs associated with day-to-day animal health and production related veterinary services. Although vaccination of animals against contagious diseases is free, many animals are not vaccinated. The reasons for this are not



clear but it is likely that the shortage of veterinarians to provide the services is an issue, along with the difficulty in organizing transportation to more remote areas. It is also likely that some herders feel it is not necessary to vaccinate or are willing to take the risk that their animals won't contract the infectious disease.

55. The financial burden on the State for the control of infectious diseases is significant because:

- Regular outbreaks of infectious disease such as Foot and Mouth (FMD) are difficult to control and consume most of the budget leaving few resources for more long-term disease control measures.
- Herders are reluctant to invest in veterinary services as long as animals are under-valued in the production system,
- Inadequate incentives exist for herders to invest in disease control and animal health from the emerging market economy (i.e., no demand from abattoirs, meat processors, consumers)
- The number of private veterinarians available to livestock producers, especially the extensively managed livestock production system, is declining. Practicing veterinarians at present are aging (average age 48) and are not being adequately replaced. Young veterinarians are reluctant to work in isolated, rural areas (e.g., only six veterinary school graduates from the 80-100 graduates per year indicate preference for rural veterinary practice). Access to remote areas is problematic, as many private vets don't have their own transport.
- Herders are not lobbying for an improved service, hence there is little incentive to change or improve the system.

56. The contention that herders are generally unwilling to invest in private practice veterinary services other than those mandated by the state to control infectious diseases is correct. However, their unwillingness to invest in production related veterinary services is also related to the lack of market incentives that compensate producers willing to invest in activities to produce higher quality livestock off-take products, especially meat and milk products that are guaranteed to be healthy and safe. A herd health program is also the basis for food safety throughout the production system.

57. **Livestock Breed Improvement:** Another key input is access to improved breeds, which would help Mongolian herders to increase their productivity. The main constraint inherent in current breeds is low carcass weight. As finishing on fodder and feeds become established there will be a need to identify breeds that provide good daily weight gain on supplementary feed. Access to these breeds is currently very limited and research and farm-based trials are needed. The National Centre for Livestock Gene Bank Unit provides Artificial Insemination (AI) services but demand is currently low and work needs to be done to raise awareness of the services available and the benefits of investing in AI.

58. The development of more intensive beef production in the ILPS will provide a commercial basis to drive breed improvement in the direction of increased carcass weights and improved daily weight gain. The opportunity to increase carcass weights is far greater for cattle than for sheep. Competitive international cattle producers achieve beef carcass weights around 250-300kg (cf 120-130 kg in Mongolia) and sheep carcass weights around 18-20kg (cf 15-18 kg Mongolia).

59. Key constraints to breed improvement are:

- Lack of access to tried and tested improved breeds.
- Lack of access to the quantity and quantity of animal feed necessary to support improved breeds in the Mongolian livestock production environment.
- Reluctance of herders to invest in breed improvement (preference to increase animal numbers)
- Lack of demand for higher quality meat products, which would encourage the adoption of improved breeds.
- The need for specialized extension services to assist herders willing to invest in improved breeds.

## **Marketing**

60. The Mongolian livestock producer continues to consume a substantial portion of livestock off-take product, especially meat and milk products. Consumption is either directly by the producer or indirectly by providing off-take products to urban relatives and friends (i.e., *edish*). However, all excess livestock and livestock off-take products enter the market chain, as large annual surpluses are not apparent. The current perspective that most purchases of livestock off-take products is by “changers” (i.e., traders contracting to purchase live animals and off-take products, especially Cashmere) directly from livestock producers), while generally accurate for the ELPS, doesn’t account for a number of other marketing channels that are developing in both the ELPS and the ILPS. Alternative marketing channels that are developing include:

- Marketing cooperatives that self-market off-take products, especially milk and meat, are becoming relatively common.
- Most livestock producers have acquired vehicles to assist direct marketing of product and purchase of inputs.
- Direct herder marketing of cashmere to the Chinese market at border points in the Gobi Region is common.
- Large meat companies have field agents that find and purchase live animals directly from livestock producers which are slaughtered, processed, packaged, and distributed to domestic wholesale and retail meat markets.

## **Live Animal Marketing**

61. In the ELPS, marketing of live animals at the primary level of production predominates. Animals are sold to buyers either directly by the livestock producers or are sold to outside buyers at the *suom* and *aimag*. Although not verified, it is probable that a number of formal and informal marketing channels exist for livestock producers for those herders possessing sufficient initiative to find alternatives to selling to changers. However, there is no indication that a formal and organized competitive marketing system for live animals, meat, and other livestock off-take products exists. Livestock sold for meat are mature animals, which are purchased on a “price per head” basis as they move through the production system. Although purchase of mature animals on a “price per head” basis is common in commercialized livestock production systems, animals raised and sold directly into the wholesale and retail meat supply chain in these systems are not mature animals and are purchased at different levels of the supply chain on a “price per weight unit” basis. The latter approach rewards the producer that sells better quality and more productive animals in respective age and weight classes, and provides a major incentive to the producer to

maintain a herd health program that engages and utilizes costly veterinary services, feed inputs, and higher quality livestock.

### **Agro-Processing and Value-Added**

62. Access to agro-processing and value-added infrastructure is problematic away from the main urban centers. While there are some small, herder driven initiatives (e.g. felt making) these are not on a scale to facilitate the commercialization of the sector. This is a role which could be filled by herder cooperatives and associations as a private sector activity. At present the incentives to establish these services are limited as supply is variable, informal traders have a monopoly on the market and the market is not yet sophisticated enough in terms of demand. Initiatives to develop value-added processing facilities such as wool-scouring, compound feed manufacture, and milk pasteurization facilities exist, but at a small scale relative to capacity and extent of producer participation.

### **Market Orientation and Demand**

63. Working Paper 2 (Annex 2) explores urban market consumer and retailing dynamics and reveals many constraints to, and opportunities for, development of the market component of the production system (Marlow & Badarch, 2007). What is clear from their analysis is that consumer tastes are starting to change, particularly among the urban elite. However, the majority of the population has quite low expectations of the sector in terms of quality, safety and hygiene.

64. The richest 20% of the population consumes five times the amount of the poorest 20%. Poor urban consumers fare worse than their rural counterparts who tend to have access to their own production to meet nutritional needs. Urban households reduce all meat intake when they are short of cash rather than making a change to less expensive types of meat, however there has been a rise in the consumption of horse meat and offal in urban areas as beef and mutton prices have risen since 2002. Consumption of milk and dairy products is similar across all income groups.

65. Overall, Mongolian consumers do not differentiate between cuts of meat. Consumers tend to buy meat on a daily basis, use slow wet-cooking techniques and mincing to tenderize meat and preserve meat by drying or ambient freezing. They do not demand high food hygiene standards or sophisticated packaging. There are some indications of change towards higher quality products in supermarkets and specialized meat markets and it is expected that this trend will continue.

66. The balance between the formal and informal modes of production and consumption of livestock products in Mongolia is a critical factor to consider in the development of the sector. Firstly, a large proportion of the population obtains their meat and dairy needs informally through their own production, from family members or by bartering to exchange food for other services provided. Between 30 and 50% of meat reaches urban consumers through these informal channels. The formal channels consumers use to obtain meat and dairy products include food markets (privately operated food stalls for a variety of retailers), food stores (individually owned), supermarkets and restaurants and hotels. These formal channels are increasing in importance as Mongolia becomes more and more urban, with the highest standards required by supermarkets and specialized restaurants.

### **Food Safety**

67. On the production and processing side there are also significant differences between formal and informal systems that reflect consumer demand as 90% of animal slaughtering is performed informally at household level, at soum slaughter-slabs and at slaughter facilities

outside urban areas. Only 10% of slaughtering is carried out in formal abattoirs where veterinary checks are assured and hygiene levels meet approved standards. There are 28 formal abattoirs in Mongolia and these are primarily used in the export industry which requires food safety standards. The capacity of the formal sector far from exhausted and it operates over a very short season when meat is in plentiful supply. Until domestic demand starts to require higher standards, the formal sector will continue to struggle to compete with the lower cost informal sector and the processing capacity will continue to be underused.

68. In addition to changing consumer demand or imposing government regulations on food safety and hygiene, the other key opportunity for the sector lies in making the most of seasonal variations in price. Seasonality of supply makes it difficult to establish sustainable businesses based on livestock production as supply cannot be guaranteed year round. Likewise, commercial and intensive production, which does not take seasonal prices differences into account, is unlikely to make a return on input costs. Meat production which can provide product during times of low supply in spring / summer (April – July) will make most profit but will rely on the use of supplementary feed and other inputs to have animals in slaughter condition at the end of the winter. This requires a fundamental shift in the way meat has been produced up to now and a move away from relying solely on ‘free’ natural resources.

69. The findings of recent MoFA, SDC, and UNDP studies show that there is considerable merit in focusing on developing the domestic sector where demand is continuing to grow before investing further in accessing the more stringent export market. In the short to medium term, the main market for Mongolian meat will be the domestic market (Marlow & Badarch, 2007). It has also been observed that demand for meat from formal channels is growing, contributing to an increase in prices for beef and mutton. This changing demand will help to develop the formal processing and retail sector and lead to changes in food safety and quality which ultimately have a positive impact on the export market.

70. Lack of access to information on markets is another key constraint on the sector – there are no information flows along market supply chains. There is no formalized method of imparting knowledge from processors to producers, or from processors to consumers. In addition, information that does pass between players in the market supply chain is not aimed at improving product quality. Neither the Government, nor the trading and processing entities in the chain impart meaningful management and marketing information to herders. The only medium for imparting business information to herders appears to be through development projects which cover only certain parts of the country.

71. Herders, who should be a strong link in the supply chain, are extremely weak, as they are simply ‘price takers’ (not negotiators) selling directly to traders (often from China) who make no price differentiation for quality. A conceptual change is required from a production focus to marketing focus and herders need to support each other and access professional extension services to achieve this shift to business oriented production.

### **Role of Public and Private Sector**

72. Both the public and private sectors need to be responsive to producers needs for the livestock sector to develop and grow. Currently, neither sector is responding adequately to the evolving needs of commercialized livestock production. Risk management programs are not institutionalized in either the public or private sectors at a scale that has meaning to the livestock producer. This is creating an environment leading to both overt and covert exploitation of natural resources. Even with prior warning of adverse weather events, livestock and environmental and

financial risks inherent in agricultural production in the Mongolian environment. As presented in previous sections, lack of access to inputs, especially livestock feed inputs that include forage, hay, and manufactured feeds; animal drinking water, and to a lesser degree, animal health inputs are fundamental limiting constraint to sustainability and development of the livestock sector and substantially increases producer exposure to both types of risk.

73. As commercialization of the agriculture sector continues, a private sector production support organization that allows herders and farmers to respond adequately to risk and enable them to compete in the developing market economy is needed. As presented in the preceding sections, drivers of commercialized livestock production to be met by the private and public sectors include:

- The existence of competitive markets that reflect change in consumer preference and provide market incentives to change production actions;
- Producer access to inputs needed for optimal production and competitive markets for agricultural products;
- Timely information about markets to facilitate informed production decision-making;
- Access to financial services that can provide operating and private agriculture infrastructure investment capital at equitable rates;
- A legal system that protects the agricultural producer from unfair and arbitrary practices;
- Technical and financial assistance from donor institutions at the right time, and in sufficient quantity to affect outcomes.

74. In the above context, the primary function of the private sector producer is to develop a livestock production system that efficiently converts resources through animals into quality products that meet secondary (processing) and consumer demand. The primary function of the market economy is regulating supply and demand through market price incentives that elicit a response from the production system. In this regard, the government function is to facilitate development to meet national agricultural sector goals by ensuring the existence of an enabling environment that includes access of producers to financial and investment services, building a national agricultural infrastructure supporting private sector agricultural development, ensuring that participants in agriculture sector development have equal opportunity to develop agriculturally related production businesses, and developing and implementing the policy and regulatory framework necessary to ensure economic and environmentally sustainable growth in the agricultural sector.

75. In Working Paper 4, the authors summarize the role of government in a market economy – ‘*it has to produce public goods and reduce the risk of market failure*’ (Koester & Densmaa, 2007). Their analysis of public expenditure in agriculture reveals that spending on agriculture has declined over time, amounting to only 1.3% of the total budget in 2007. In addition the sector is highly dependant on donor funds which raises questions about the government’s ability to provide the public goods necessary to facilitate the development of the sector in a market economy. A lack of coherence between government policies, distortionary taxes, over investment in some aspects of infrastructure (e.g. wells), ineffective use of funds (e.g. disease control) and an inability to address the key causes of underperformance by the sector are key criticisms of the role of the state. The authors conclude that the state does not produce an optimal set of public goods on which to improve the efficiency of the private sector. This in turn means that the private sector does not use resources efficiently, largely due to the lack of coordinated actions along the value chain.

### III. SECTOR TRENDS

#### **Trend Overview**

76. Mongolia appears to be entering the “developmental phase” of its transition from a command economy to a market economy. Within the livestock sector, the primary stimulator of change has been the withdrawal of direct government (Ministry of Food, Agriculture, and Light Industry) intervention and participation in production. This has been accompanied by the gradual development of a legal framework governing production, the embryonic development of commercialized livestock production, and on-going changes in retail and consumer markets. These changes have had positive and negative effects on the sector that are closely related to the challenges of operating in a market economy. Within the livestock sector, privatization of livestock and open access use of pastureland have also contributed to development of the livestock sector in its current form.

77. Changes that have occurred in the livestock sector vary from the obvious (e.g., herd composition favoring goats over sheep) to the less obvious (e.g., changing consumer preference for meat and dairy products). Some change is gradual, occurring over long time horizons (e.g., adjustment of herders to selling product and buying inputs in a market economy) while other change occurs over short time horizons (e.g., privatization of livestock). Some change has had profound impacts (e.g., withdrawal of direct government support for livestock production) while other change has secondary impacts (e.g., decline in quality of the breeding herd). A number of practices originating before or during the command economy continue to exist, including the continued use of pastoral grazing management strategies, multiple livestock species forming the national livestock herd, and the continued high demand for meat and dairy products in the diet of Mongolians.

78. The primary driver of change in the livestock sector between 1990 and the present has been the continuing adaptation of both the public and private sectors to the function and form of the market economy. A number of trends can be observed based on the changes undergone thus far and the continuing development of the sector. Some trends were initiated early during the transition period and continue to shape development of the livestock sector; other trends are only now becoming obvious and their impact on the livestock sector is less clearly understood. This section of the report attempts to synthesize information on trends and place the information into a contextual format that relates to major issues affecting current development of the sector.

#### **Keys Trends and Drivers of the Livestock Sector**

##### **Size and Composition of the National Herd.**

79. The national herd has been growing steadily since the losses of 2000-2003 and numbered over 42 million animals in 2008. It is not just that the number of animals is increasing and having a greater impact on the pasture, the composition of herds is also changing. This stems in part from the impacts of the dzud, when herders who lost many animals started to reconstitute their herds with more affordable, smaller animals (goats in particular) rather than larger and more expensive cattle, yaks and camels (Nyamaa & van Hoeflaken, 2007 WP1). The increase in the number of goats is also due to the cash benefits of selling cashmere. The proportion of goats in the national herd has increased from 20% in 1990 to 44% in 2006 (National Statistics Office, 2007).

80. These changes in herd composition also affect the quality of the pasture as a range of animals graze pasture more efficiently than a single species and a concentration on small ruminants such as goats limits the possibility of migration. Many commentators recommend a reduction in the number of livestock and increased focus on animal quality; however, until

incentives are put in place to encourage these changes, the Mongolian herder will continue to reinvest profits in livestock and expand his herd (Nyamaa & van Hoeflaken, 2007 WP1). Although state ownership of pastureland creates disincentives for investment in sustainable management practices by herders, further contributing to degradation, other conflicts associated with land use issues can be more appropriately addressed if pastureland remains controlled and administered by the State.

### **Changes in Herd Size.**

81. Available demographic information indicates the number of large-scale herders (with over 500 livestock) is increasing. The origins of this trend go back to the privatization of livestock after the collapse of the command economy in 1990. The distribution systems employed during privatization meant that many small herds were created – by 1992 only 5% of households had herds of more than 200 animals, while at the bottom of the distribution, 42% of households had herds of less than 31 animals (Griffin, 2001 in Nixson and Walters, 2006). The trend toward small-scale herders continued and by 2000, 63% of herder households had less than 100 animals, 22% had herds of 100-200, and 12% had herds between 200 and 500. By 2006, the number of households with less than 100 animals had decreased to 39% as many families were forced to leave herding after losing their animals in the dzud, with an increase in the number of large herds (30% between 100 and 200 animals, 25% between 200 and 500, and 6% above 500 animals).

82. As herd size under 100-150 animals is considered unviable, there are still many herders living on the edge, at serious risk of being wiped out by drought and dzud. Meanwhile the increase in the number of larger herds indicates that some herders are successfully making the transition to more commercialized livestock production. There is also the implication, based on experiences in other countries that have adapted to the market economy, that declines in the number of small-scale primary producers such as livestock herders in Mongolia is an expected, and possibly a necessary response to development of commercialized livestock production. Whether or not this trend is the most favorable alternative is debateable but what is certain is that rural citizens are moving out of livestock production, and that Mongolia is demographically becoming an urban nation.

### **Emergence of more intensive forms of production**

83. There are some successes in intensified animal production, particularly around Ulaanbaatar and near large urban centers. Small-scale dairies have sprung up in recent years and have the potential to develop further as the processing capacity exists if supply can be ensured to meet demand. The potential for intensified meat production in feedlots is slightly riskier in the current context of livestock production as a profit can only be made if advantage is taken of seasonal price increases between autumn and early summer (MoFA, SDC, UNDP, 2007). As consumer eating habits continue to change, and mimic eating habits of countries with well-developed product supply chains, there are opportunities for producers who are able to provide “fresh” meat and milk to urban consumers.

### **Vulnerability to risk.**

84. Herder households with less than 100 animals continue to be extremely vulnerable to exogenous shocks such as drought, dzud and market prices. They have fewer risk mitigating strategies at their disposal than herders with large herds who have the resources to undertake longer migrations with their livestock to find new pastures, to build improved winter shelters and to buy supplementary feed. The impacts of climate change are likely to compound this problem, with water scarcity already becoming a serious problem in parts of the country. Herders with small herds live below or close to the poverty line; any kind of environmental, social (e.g. illness)

or economic shock (e.g. fall in cashmere prices) can force them out of the sector and into unemployment. At the present time, there are few alternative livelihoods or jobs available to those leaving the livestock sector.

#### **Access to inputs and services**

85. The livestock sector is undoubtedly becoming more commercial. However, the extent of this modernization and commercialization is limited by access to supplementary feed, extension services, market information, access to credit and secondary processing plants (van Gelder & Erdenbaatar, 2007). During the socialist period, research and development to improve livestock production received considerable funding from the central government. The Research Institute of Animal Husbandry was associated with the Ministry of Food and Agriculture and very actively conducted research on various aspects of the livestock production system including breed development, forage and fodder crop development, intensive management of livestock production, and grazing management improvements.

86. The absence of producer associations is a key factor limiting the capacity of herders to lobby for the services, inputs and infrastructure they require. Until herders have greater access to credit, they will be unable to take advantage of emerging market demand. Likewise, until there are reliable and affordable supplies of inputs such as hay and concentrate feed, herders will be unable to intensify production. A service is needed to provide advice, training and information if most herders are to have the confidence to engage in new types of livestock production activities. Under-funding of research and development, aging of research staffs, and movement of research staff to the private sector have severely affected capacity of research and development institutes to assist the livestock sector in meeting current and future challenges.

#### **Increased Access to Information.**

87. The global-wide change occurring in access to information access is also on-going in Mongolia. Access to all forms of information is rapidly improving throughout the livestock sector, especially the capacity to use cell phones, view television programming, and access the internet. The nationwide cell phone coverage is expected to be completed in two years. When information systems reach national coverage, livestock producers in all parts of Mongolia will be able to have access to information needed to improve production, marketing, weather forecasting, etc. that will be instrumental in reducing financial and environmental risk. The public sector, especially universities and resource oriented ministries should be preparing educational and informational materials, programs, and delivery systems to take advantage of the greatly increased capacity in providing meaningful information to rural residents in general and livestock producers specifically. For rural farmers and livestock producers, an extension system based on an electronic format rather than the older, western style format that depends on a knowledgeable extension agent passing on research findings from research organizations, answering questions related to production practices or new technology, and disseminating “how to do” pamphlets. Although a knowledgeable extension staff will remain important, improved self access to information by the rural livestock producer and farmer will change the role of the extension staff from primarily providers of information to facilitators of accessing information.

#### **Improving Transportation Systems.**

88. An adequate transportation system is vital to a commercialized livestock production system to give participants access to markets and inputs needed to improve livestock production. Although the Mongolian ground traffic transportation system has consisted of little more than dirt tracks, an improved road network is gradually developing. The capacity to quickly transport product for sale to urban markets or transport inputs to livestock production is critical to development of the livestock sector. Government and the international donor organizations



should focus on development of transportation infrastructure. With development, herders will have more inclination and more opportunity to access and purchase inputs and sell products in urban markets.

### **Increasing Demand for Livestock Products.**

89. As Mongolia becomes increasingly more urban, there is a need to supply meat and milk products to these consumers. While much of this demand is still met through traditional arrangements (e.g. meat sent to UB from members of the extended family living in the countryside), there is increased demand for products through food markets, convenience stores and supermarkets. There is significant seasonal variation in prices for milk and meat and if herders learn to adapt their production to coincide with these price hikes they stand to benefit significantly.

90. Consumer taste in Mongolia is changing as the country develops and urbanizes. Change in consumer preference is manifested in the availability of a wider range of quality meat products in supermarkets and restaurants. However, this is only the top end of the market – the majority of consumers do not specify particular cuts, do not require evidence of good food hygiene (most meat is slaughtered informally) and have a preference for fatty over lean meat (Marlow & Badarch, 2007 WP2). These market forces are not yet sufficiently strong to drive a significant change in livestock production methods. Changes in preference and the buying habits of consumers will increasingly affect the livestock sector. The new generation of urban consumers is increasingly demanding food that is perceived to be healthier, especially meat such as beef and lamb, instead of fat mutton that has been the Mongolian meat of choice. Consumers are also becoming conscious of preparation, processing and packaging of food items relative to food safety. Consumers are increasingly willing to pay more for what they perceive as a healthy and safe product that is attractively packaged and that will reduce their time shopping. This change will increasingly influence all components of the livestock sector as new generations of urban residents dominate purchasing in the retail market.

### **Withdrawal of Government Intervention and Expenditure**

91. Gradual withdrawal of direct government intervention in the sector beginning in 1991 and completed with privatization of most livestock in 1993 was an influential driver of change in the livestock sector. Withdrawal of most government support to all segments of the sector exposed primary and secondary producers to financial and environmental risk without the existence of a supporting infrastructure (i.e., credit access, emergency response, information access, etc.) The withdrawal of government intervention in the sector, which had built and maintained the production infrastructure during the socialist period, also caused a contraction of land and forage resources previously available to the herder as state developed mechanical wells failed and herders had to depend on their own resources to make seasonal movements. Along with livestock privatization, the state discontinued the prohibitively expensive transfer of winter supplemental feed (i.e., the State Emergency Fodder Fund) and reduced access to veterinary medicines and treatments necessary to optimize livestock production. In 2007, public expenditure in the agriculture sector was only 1.3% of the total national budget (this is substantially lower than other transitional economies such as Poland, Czech Republic and Slovakia). This does not reflect the contribution of the sector to GDP nor the investment in public infrastructure needed to develop the sector.

92. Withdrawal of most government support to all segments of the sector exposed primary and secondary producers to financial and environmental risk without the existence of a supporting infrastructure (i.e., credit access, emergency response, information access, etc.), made the transition period difficult for the livestock producers, and essentially destroyed the value-added

and agro-processing components of the production system. Consequently, livestock off-take products markets have been dominated by the Chinese, and the majority of food, except meat, is now imported. While external investment in the sector remains significant, it has declined in recent years and government may need to be ready to fill the shortfall (Koester, 2007 WP4). In addition Mongolia's tax regime fails to protect national production (e.g. tax on the export of raw cashmere) and produces little revenue to support the development of the sector). Public expenditure is particularly low at the local level (aimag and soum) limiting the capacity of local authorities to implement government policies and programs.

### **Decline in Influence of the Sector**

93. Although the livestock sector will remain an important component of the future Mongolian economy and culture, the sector is already declining in capacity to influence national policy making. Other sectors of the Mongolian economy are, for a number of reasons, becoming more influential in influencing policies and regulations, especially mining which is dominated by foreign interests. Leasing of Mongolia's natural resources to foreign business concerns for crop and livestock production, little or no regulation of mining activities, and domination of the livestock sector by foreign business interests has serious implications for future long-term sustainability of Mongolian livestock producer. The voice of herders may be lost at the national level.

## IV. THE WAY FORWARD

94. The previous section sets out a challenging agenda for the sector and for government policy. The sector is on an unsustainable path. Incentives in place encourage over-stocking, increasing vulnerability to financial and environmental risks. The majority of herders continue to practice a low-input, low quality output approach to livestock management. This is holding back the development of the sector, and ultimately the incomes of herders. However, the situation of herders needs to be viewed as a rational response to the current environment. Although the government pursues a goal of increased commercialization and intensification, the reality is that the policy, inputs and services are not in place to enable this. To commercialize the sector, producers will need:

- Access to animal feedstuffs (forage, fodder, and concentrate feeds) at affordable prices needed to optimize animal production.
- Development of competitive markets for animals and off-take products that provide incentives to the producer to improve quantity and quality of animal products to meet changing demand and support livelihood of the producer.
- Effective programs to control and eradicate disease in animal populations to enable Mongolian livestock products to compete effectively in national and international markets.
- Defined and enforced land and water tenure/use relations for livestock producers including water use relations between potential users and water management institutions, established and financially supported programs to administer use of natural resources.
- An enhanced government and private sector research and development capacity capable of addressing current and future needs of the livestock sector.
- Application of emerging institutions, technologies and tools to livestock sector needs to replace costly and inefficient institutional structures and programs (i.e., cell phone vs. land lines, web-based extension and educational programs, etc.).
- An improved national risk mitigation program based on new technologies (i.e., drought and dzud forecasting, drought relief programs, resource management, etc.) that can mitigate environmental and financial risks to the livestock production system.
- Improved access to financial services for producers willing to innovate and embrace new production practices.

95. Livestock production and marketing should remain a private, market driven activity. However, there remains a role for the public sector, which has been largely absent since the transition in the early 1990s. This report concludes by highlighting priority areas for public engagement, to put in place the basic foundations of a stronger sector.

### **Legislative and regulatory environment**

96. In the absence of effective government regulation of natural resources, and the absence of competitive markets or market incentives to increase supply of different livestock or livestock off-take products, the livestock producer would be irrational to reduce herd numbers or change herd structure. The livestock producer would also be irrational to reduce herd numbers or change herd structure because of concern that livestock were adversely impacting ecological condition of natural resources. The livestock producer has an inherent interest in using natural resources for livestock production, especially natural resources with relatively free access, and expecting the

livestock producer to address natural resource use from the perspective of maintaining or improving ecological condition is irrational. Regulating use of natural resources such as pastureland and water is the responsibility, by constitutional decree, of the Mongolia government. Regulating livestock kind and distribution, in the absence of prohibitive regulations, is a function of the livestock producer. Furthermore, the absence of legislation and regulatory policies is not conducive to the development of commercial livestock production. In order for the sector to prosper in a market economy, government needs to provide an enabling environment for business development. Current legislative gaps in areas such as land tenure, water resource rights, food safety standards (e.g. use of formal abattoirs and vaccinations), import-export regulations, quality control (e.g. animal tracking) and credit-investment are hampering the development of the sector.

97. The two most critical government legal/policy issues requiring resolution to accelerate the development of the livestock sector are Land Tenure Rights and Water Tenure Rights. Land is the most basic resource needed for agricultural production. As such, land is a commodity that has intrinsic value, both in itself as a potential marketable commodity and as a primary component of agriculture production. Likewise, water is a critical natural resource necessary for efficient livestock production and an essential natural resource for improving productivity and mitigating environmental risk associated with crop production. Other users of land and water are, or will be, competing with agricultural producers for use of these critical resources (e.g. mining).

98. Defining relationships between controlling and user entities relative to pastureland and water tenure rights has implications for the livestock sector and the role of the public and private sectors in that development. Specific to the livestock sector is the issue of pastureland, which is being classified as a distinct land type warranting separate discussion under the land law. Pastureland, by constitutional decree is, and will remain, property of the state. The relationship between the user and the owner needs to be defined according to tenure rights and obligations of both the user and the state. Defining the legal relationship between users of the resource and controllers of resources (i.e., government and producers) as they will be applied in practical terms is key to developing the livestock sector.

99. To improve resource management, the government needs to first legislate into reality the new version of the pastureland law and the pastureland management office. The Mongolian parliament is currently engaged in defining issues related to ownership, possession, and use of land and water. Resolving these issues and defining relationships between controlling entities and user entities has implications for agricultural development in the crop and livestock sub-sectors, and the role of the public and private sector in that development. Following the needed legislation, the government, through the responsible agencies, needs to enhance capacity of government staff in aimags and suoms to implement and administer pasturelands according to statutes of the law. It is critical that statutes defining access to, and use of natural resources that comprise pastureland be implemented as soon as possible at local levels. The government will increasingly need to be involved in resolving disputes over access to natural resources (e.g., legal and illegal mining is already causing conflict between livestock producers and miners).

100. Passage of a new pastureland law and implementation of the law's statutes, especially those that define users rights to pastureland and assign value to those rights, would reduce out-migration and poverty of livestock herders. Work on upgrading the Land Law or formulating a new Pastureland Law began in at least 2000, and was submitted to Parliament in 2007 but passage is still forthcoming. Even if passed, aimag and suom government capacity to enforce provisions of the law will remain inadequate unless enforcement and management capacity is substantially improved at the suom administrative level. Legislation to upgrade the current Water

Law or develop a new water law is urgently needed as water use throughout Mongolia is becoming a critical issue for livestock herders and urban and rural citizens alike.

### **Improving access to inputs and services**

101. **Animal Feed Production.** The lack of a well-developed animal feed industry, combined with the current lack of competitive markets for livestock off-take products, will continue to seriously impede development of commercialized livestock production in Mongolia. Both the government and international development community should regard animal feed development as a high priority for improving productivity of the livestock sector. The type and quality of feed to which an animal has access determines dietary nutrition, which in turn is the primary determinant of animal growth, development, product quality and fecundity. Nutrient availability influences critical events in the annual cycle of livestock production such as estrous, milk production, growth, body condition, etc. The (ILPS) is already showing a demand for specialized concentrate and high quality roughage-based feeds for poultry, swine, and dairy production. In the ELPS, livestock feed will increasingly be used as a risk management tool by livestock producers or by the government as stockpiled, emergency feed. Development of an animal feed production base potentially will provide a high-value export product to densely populated neighboring countries with intensive, industrialized animal production systems.

102. Development of a private sector livestock feed industry can provide numerous advantages to Mongolia, including:

- Facilitating private sector development by providing jobs and employment needed to reduce poverty and provide additional incentives to develop the physical and financial infrastructure.
- Improving productivity of livestock and the quality of livestock off-take products.
- Stimulating development in the entire agricultural sector.
- Supporting commercialized/intensified livestock production and development of the integrated crop/livestock production system.
- Improving secondary production access to quality raw materials to develop growth and fattening centers.
- Developing links between production levels in the livestock production system.
- Supporting animal breed development.
- Reducing producer risk and supporting resource management systems.

103. Mongolia can, and should have, a comparative advantage in animal feed production. The comparative advantage exists both nationally and internationally; nationally because of climate suitability and the potential to rehabilitate large areas of abandoned cultivated ground for livestock feed production, and internationally as a producer of quality feed to support intensive livestock production in the Asia Region. The government and the international donor community should promote development of animal feed production centers in the central cropping region and in eastern Mongolia. Development of an animal feed base is consistent with the government's action Plan for development of the agriculture sector.

104. Although animal feed production is a private sector activity, MOFALI can support animal feed development by taking the following steps:

- (i) commission research and development trials of native and introduced forage and fodder species to determine highest producing varieties under Mongolian

environmental conditions and promote the production of grain species most useful in manufactured compound and concentrate feed such as barley and oats,

- (ii) encourage the private sector to develop a feed and fodder production base in the central cropping zone (i.e., primarily Tov and Selenge aimags) by:
  - defining land tenure rights and arrangements of participants,
  - defining, organizing and administering use of irrigation water,
  - provide incentives that support development of an animal feed industry and encourage use of animal feed in the livestock sector.
- (iii) develop programs to reintroduce herders to the concept of using supplementary feeds in the ELPS. Small-scale production of animal feed by individual or producer group should be continued and encouraged, especially the harvest of native or improved hay crops and vegetables suitable as animal feed. Local government should assist producers to develop protected feed production areas within the Bag and Suom as local initiatives to mitigate environmental risk.

105. **Veterinary Services:** Veterinary services are important to all livestock production systems. The Mongolian veterinary system is separated into two primary areas of responsibility, similar to western style veterinary systems. The government is responsible for control of infectious diseases that have potential to adversely affect large-scale livestock production and ensuring food safety throughout the livestock production system. Although the privatized veterinary system interacts with the national veterinary system in implementing disease control, it has primary responsibility for production level veterinary care. Currently, approximately half of MoFALI's annual budget is assigned to controlling infectious diseases. Although use of private veterinary services by livestock producers is gradually increasing, there are few incentives in the ELPS to increase the use of veterinary services or inputs. Most livestock producers have little cash available to pay for services or inputs and much of the vaccines and medicines that are available are inferior imports, primarily from China or are too costly. Continued development and commercialization of the livestock sector, both ELPS and ILPS, will gradually strengthen the privatized, production related veterinary system. Further development of the ILPS will, however, require the presence of a responsive privatized and effective veterinary service.

106. The government should continue to focus human and financial resources on the national program to control infectious diseases in livestock. Control of infectious disease is critical to ensuring the health of all citizens and Mongolian participation in the globalized food economy.

### **Risk Mitigation and Disaster Management**

107. The livestock sector in Mongolia is in danger of going in cycles of boom and bust. Numbers of livestock have hit historical high levels, higher still than the levels before the last major crash in 1999, which, following three bad winters, reduced numbers drastically and caused great hardship to many households. Since 2003, numbers have again increased, and if anything, the situation is more dire than in 1999, because the geographical spread of animals has seen greater densities of animals in central and northern aimags, and also because there has been a shift to goats. In these areas, grasslands are increasingly degraded and the nutritional status of animals will be exposed in the event of dzud. A repeat of the level of losses witnessed in 1999-2002 is probable.

108. More experienced herders have learned from the experience of 1999-2002. Winter preparations are reported to have improved. Herders can therefore manage a level of climatic risk.

Ultimately, however, risk will need to be shared and transferred to others. The government is supporting a highly innovative index-based approach to insurance, under which commercially priced insurance is available to herders. This is still at a pilot level, and further government support (including establishing an appropriate legal and institutional structure) will be necessary for the insurance to be made available to herders throughout the country.

109. While insurance promises to transfer some risk to the insurance market, it is unlikely to be available nationwide for several years, and it would naturally be voluntary for herders to purchase and therefore would not achieve universal coverage. As such, it represents one part of a risk management system, but certainly not a comprehensive solution for the sector. Insurance would also not cover catastrophic losses, which would continue to be the responsibility of government under a disaster management and response program. The experience of the 2002 dzud illustrated that the disaster response of government had numerous flaws, specifically with regard to: targeting the most affected and needy; providing a timely response; providing support in an appropriate form (there was a focus on re-stocking, which was not effective, and in many cases inappropriate). Nothing much has changed since then and a repeat of the experience is likely when the next severe winter comes.

110. Government needs to develop a robust system for preparing for and responding to disasters. Without this, herders will continue to be reluctant to invest in their livestock assets. The system needs to be able to quickly respond to herders' needs before disasters strike, and channel aid quickly to herders following an event to minimize the impact on the household. The government is piloting a Disaster Response Product, currently linked to the index-based livestock insurance, that potentially provides a transparent and rapid mechanism for post-event recovery. Government could develop this further, and seek pledges from donor agencies, which are likely to be willing to support government to provide post-event aid, to channel funds through this mechanism.

### **Strengthening market supply chains**

111. Marketing remains a major issue affecting the Mongolian livestock production system. Currently, it appears that, in one form or another, the annual off-take of livestock and livestock off-take products are either consumed directly by producers or are sold through the marketplace. Even with high numbers of livestock, overproduction and the stock-piling of surpluses does not appear to be an issue. Markets exist throughout the production system, and apparently work well enough to move all livestock and livestock off-take products from the producer to the consumer. However, the marketplace provides little incentive to producers or value-added processors to improve quality of product, especially quality over quantity of product.

112. The major issue facing the supply side of livestock production is that the current market system does not provide incentives to the producer to improve quality of livestock off-take products. The producer will not be willing to assume the financial risk involved if the lack of a well-developed competitive market system does not reward producer investment in inputs and services to produce higher quality products, especially during times of over-supply of product. The fact that traders/changers buy the product directly from the producer at an agreed-upon price/unit is not the problem, rather the problem is the lack of competitive markets where incentives to the producer and value-added components of the production system to produce a better product will be rewarded. Since the livestock producer has relatively free access to the natural resources needed for production, is still dependent largely on their own livestock to meet self-consumption needs, and sells livestock and livestock off-take products on a "per unit" basis

rather than a “weight basis” and often on a barter basis, there is little incentive for the herder to improve quality of product. Even the fact that traders/changers buy the product at cheap prices is not a major issue with livestock producers who remain relatively self-sufficient.

113. Developing market incentives will be complicated and may require government action to develop a commodity based, competitive, market infrastructure capable of supporting and stimulating improved livestock production. Such a market is crucial to commercialized livestock production driven by strong and well-developed primary and secondary production levels. Currently, it is not sufficiently developed to provide sufficient incentive to the producer to add the additional inputs, time and labor required of commercialized livestock production. While current livestock producers understand animal husbandry principles and grazing management strategies, most do not yet fully understand commercialized livestock production. Without the producer fully understanding commercialized production, there is a possibility that meat markets as well as fiber markets will be controlled by a few colluding companies.

114. **Producer cooperatives.** Although a number of interventions will be needed to facilitate development of a market supporting commercialized livestock production, a first step is establishing supply side producer cooperatives. Producer cooperatives are formed and operated by their members to improve access of the members as a group to production inputs and services and improve marketing opportunities. A pilot livestock producer’s cooperative has been initiated in Bayanhongor aimag. Development of producer cooperatives by and for herders and crop farmers could facilitate further development of commercialized livestock production. It would also provide a basis to link different components of the livestock production system in production, value-added processing, and marketing by:

- Establishing contracts with livestock producers to market livestock and livestock off-take products through the cooperative to allow volume sales;
- Overseeing value added activities to livestock off-take products at the sum;
- Transporting off-take products to markets;
- Obtaining favorable sale prices for livestock off-take products at centralized markets; Purchasing production inputs desired by members of the cooperative including filling orders placed by members;
- Overseeing activities and services provided by the cooperative;
- Tracking all transactions through strict accounting procedures.

115. The complete line of services provided through the producer cooperative could be identified and developed in response to demand from livestock and crop producers. Examples of services include:

- Wool and Cashmere collection and grading,
- Sheep shearing,
- Hide collection and preparation
- Provision of production inputs such as livestock feeds, hardware, fuel, veterinary supplies, livestock handling equipment, etc.
- Indirect associated services established in association with the alliance such as credit and veterinary services, personal and livestock insurance,
- Information on market prices and input costs.
- Facilitate introduction and implementation of livestock disaster prevention programs and livestock insurance.

116. **Value-Added and Market Linkages:** The issue of value-added and market linkages differs by off-take product and livestock production system. Market linkages and value added



components of the production system exist for live animals that are traded primarily between producers to add to herd numbers and/or breed improvements. Although most information about live animal trading is by word of mouth, breed associations to promote specific breeds are forming. Imperfect market linkages for purchase of meat animals exist with live animals either directly sold into meat markets by producers or sold to middleman traders/changers. Cashmere, wool, and hides have linkages to several markets but with little value-added processing available. The majority of these type of offtake products from the ELPS, other than meat, enter the Chinese market either directly at cross-border fairs organized by the Chinese or indirectly through Chinese purchasing agents buying in Mongolian markets or directly from producers. Value-added processing occurs after the products enter China. Household processed dairy products, sometimes with value-added packaging are sold directly at the household or in local suom and aimag markets. The other common dairy product, fermented mare's milk, is sold directly to consumers by the large producers near urban centers.

117. In the ILPS, off-take products are sold by producers directly into urban markets but usually in competition with imported products. Consumers purchase fresh milk through informal market arrangements; some fresh milk is seasonally processed into ice cream and dairy drinks; and some milk producers have contracts to provide milk to government institutions and school milk programs. Locally produced eggs are sold into all types of urban markets while pork and chicken are most often sold to restaurants. Although some value-added processing for livestock off-take products is beginning to develop, capacity in both types of production systems will be limited by lack of supply. Except for meat, the Chinese have captured the supply of off-take products from the ELPS and the products from the ILPS have to compete with imports that dominate retail consumer markets. Development of value-added processing and market linkages in the ILPS has immediate potential and should be a focus of development in the livestock sector by the government and the private sector.

118. Producer cooperatives can provide members, as a group, with opportunities to build market linkages between livestock producers and meat companies. For example, private meat companies are already established that purchase animals, slaughter, process, and distribute meat to restaurants, supermarkets, and meat store chains in urban centers. These companies have purchasing agents that buy meat animals from livestock producers to ensure their source of supply. Opportunity exists to develop market linkages between producer cooperatives and meat processing companies

### **Food safety.**

119. Food safety is increasingly becoming a concern of urban consumers. Both meat and milk, which are the two livestock off-take products that are most likely to transmit disease or cause ill-health in consumers, are not adequately monitored as products move from production sources to markets. Ensuring food safety of meat and milk is difficult, and requires cooperation between a number of different entities in both the government and the private sector. Ensuring food safety requires that government programs effectively control infectious diseases of livestock, especially diseases that can be transmitted from animals to humans such diseases as brucellosis, avian influenza, tricknosis, etc. and that meat and milk be fully inspected at different points in the supply chain to ensure that products meet health and safety standards. It is clearly the government's responsibility to develop disease control programs, determine standards and requirements for food safety, monitor food health and safety throughout the supply chain, and to ensure compliance by all participants in food production and marketing. Although the advantages of having a fully developed and effective food health and safety program is recognized by both government and private sector participants, implementing such a program is difficult because of

the physical distances between production sources and urban markets, the dispersal of producers, veterinary and inspection agency staffing requirements needed to make such a program effective, and lack of funds needed to develop a support infrastructure.

120. The government should continue to: (1) improve capacity of the national veterinary program to control infectious disease, (2) upgrade capacity of the inspection agency to monitor and enforce food health and safety requirements, and (3) develop “animal quality and health assurance programs” with producers in the private sector.

121. The government should initiate an “animal identification and tracking” program throughout Mongolia that identifies animals by individual producers and tracks movement of the animal and/or off-take products of the animal from source to consumption. Although complex electronic identification and tracking systems are being developed, the Mongolian program should initiate a simpler program based on brands, eartags, and tattoos, with identification information recorded by veterinarians and inspectors at time of vaccination for infectious diseases, change of ownership, or movement of the animal or off-take product across administrative boundaries. The program would also be instrumental in controlling animal theft.

122. The private sector producer will need to absorb some of the identification costs (i.e., registration of brands and other identifiers, purchase of tags, etc.) and will have to comply with regulations associated with the identification system, but will benefit in the long term as the identification system is also the base for the quality assurance program.

#### **Maintaining rural services to support herder communities.**

123. Movement of people out of agriculture, including livestock production, appears to be a characteristic response of rural populations to development of the market economy. People are moving from rural areas for a number of reasons, some of which are related to other issues affecting livestock production but also for a variety of personal reasons. Although it is unrealistic, and possibly undesirable to prevent out-migration of rural people, who generally become urban poor at least during the first generation, far more attention should be paid by government to developing the social and economic infrastructure needed to support the future form of livestock production

124. The government should maintain the services in current suoms, which are critical to livestock producers in providing access to schools and social services. In rural areas, the suom center is where government and the private sector interact. In the final analysis, the government can spend money on programs that improve the social and economic welfare of the rural population and keep at least a portion of people expected to out-migrate from migrating or the government can spend more money on urban poverty reduction programs.

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