

JOURNAL OF INFORMATION AND MANAGEMENT

# 日本情報経営学会誌

Vol. 33  
No. 1

June, 2012

特集

## モノづくりと環境の マネジメント(Ⅱ)

Manufacturing and Environmental  
Management (II)

ISSN 1882-2614

日本情報経営学会

Japan Society for Information and Management

# Journal of Information and Management

June 2012

Volume 33, Number 1

———— Manufacturing and Environment Management (II) ————

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## ■ 研究論文

# Activation of Meat Cluster with Favorable Environment

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**Abstract:** *Value chain of the livestock production rooted in locations has been facing challenges due to diverse livestock impacts on environment and new ways of thinking about local and regional economic development. On one hand, rapid increase of herds is one of the major causes of nature degradation and loss of biodiversity. On the other hand, transactions can impose costs on livestock production. In that case, cluster plays a crucial role in both favorable environment and competitive positioning. Indeed, cluster group of actors must compete to deliver value. This paper tackles the question of how we resolve a stable livestock production and environmental services in order to activate meat cluster based on different vegetation zones. Since the natural resource base is different region to region, local as well as regional meat cluster will concentrate on "who provides the best value" instead of "who supplies the meat to the market".*

**Keywords:** *increase of biodiversity, livestock production and environmental services, herder as a cluster incumbent*

## 1. Introduction

Traditionally, nomadic livestock has been relying on the endowment of herdsmen. The herdsmen, while fighting with harsh weather, their efforts for livestock growth has not stopped. Indeed, natural resources including livestock can be intensified by location based on competitiveness. A focus on animal husbandry led to the source of competitiveness of different regions.

Livestock production is stronger dependent on cli-

mate and weather. Mongolia had 36.3 million head of livestock or 14.5 million sheep, 13.9 million goat, 2.1 million cattle, 2.1 thousand camels, and 1.9 thousand horses in 2010. This is more than 12.1 heads of animal per person (3 million people population). Agriculture ratio of major division value added to GDP is 17.9 percent in 2010. These indicators differ among 21 provinces and four economic regions. Table 1 shows selected socio and economic indicators.

Every economic region has more number of husbandry animals rather than the country's average heads of animal per person. But number of herdsmen of western economic region is quite higher compared

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**Table1: Selected socio and economic indicators of the economic regions**

Economic Regions	Number of population, 2010	Number of herdsmen 2010	Head per person, 2010	CAGR of pastoral herds, 1990-2010				
				sheep	goat	cattle	camel	horse
Western	402.7	88.2	18.4	-2.3	3.2	-3.5	-3.7	-2.3
Khangai	567.1	135.0	21.5	1.0	5.9	-0.7	-2.5	-0.4
Center	459.1	61.6	16.5	0.2	4.7	-1.1	-2.5	-1.1
Eastern	200.4	37.1	26.3	1.1	8.5	-0.6	-2.5	1.0
Ulaanbaatar	1151.5	5.3	0.2	-0.1	5.7	0.3	4.5	-0.3
Total	2780.8	327.2	12.4	-0.1	5.0	-1.3	-2.8	-0.8

Source: National Statistical Office, 2010

**Table2: Use of pastureland, grassland, and arable by region, 2010**

Economic Regions	Pastureland		Grassland		Arable	
	Volume	Share	Volume	Share	Volume	Share
Western	28833395.4	97.8	55806.7	0.2	57764.5	0.2
Khangai	25212586.1	97.9	231294.5	0.9	137549.1	0.5
Center	35031007.8	94.3	193131.4	0.5	583255.6	1.7
Eastern	21459485.3	93.7	1414473.6	6.2	731376.8	3.4
UB	245923.8	94.0	5588.0	2.1	6043.8	2.5
Total	221792424.6	95.5	3609655.3	1.98	2442372.1	1.66

Source: Administration of Land Affairs, Construction, Geodesy, and Cartography, 2010

with other regions. Current study tells us that number of herdsmen has been decreased and being stabilized at around 170,000 for every year during 2005-2009. But number of herdsmen has decreased in 2010 and it was counted 160,265.

Moreover, approximately 100,000 out of 170,000 herder households (i.e., mobile/country households) have been in herding activity only during the last 20 years. Hence, not all herders have long experience of herding or agricultural comprehensive knowledge.

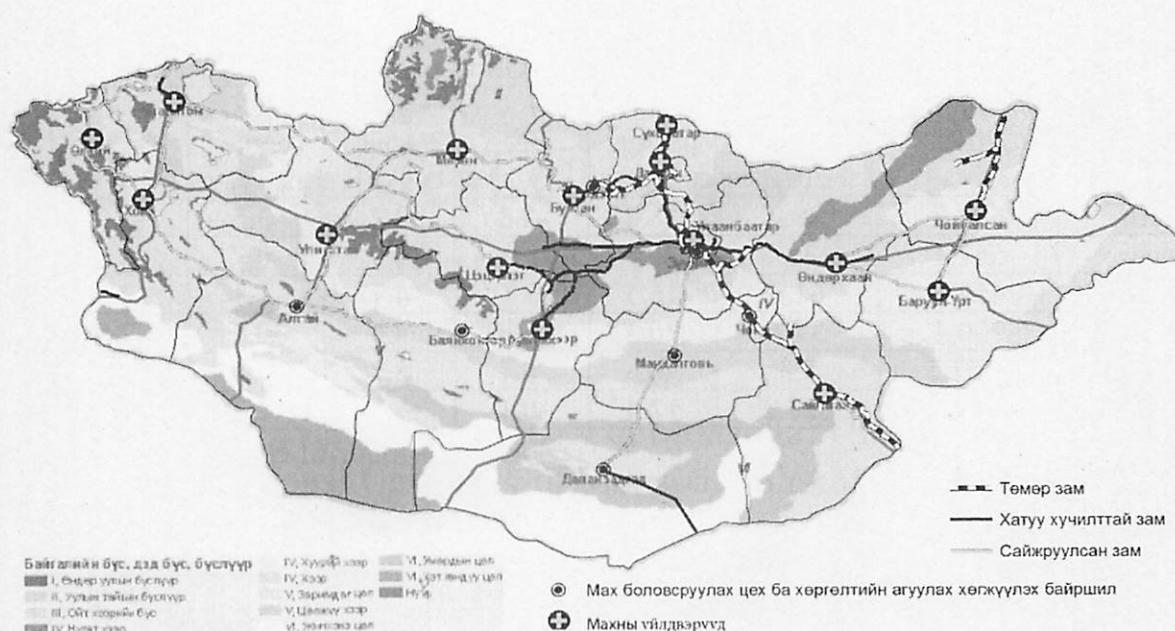
#### Pastureland and grassland changes

According to the Administration of Land Affairs, Construction, Geodesy, and Cartography, in 2010, 73.86 percent or 115,525.9 thousand hectares of the state land was included in the agricultural land category.

Human Development Report 2011 shows that pasture degradation accounts for over 95 percent of all

land degraded in seven provinces: Dundgovi, Bayan-Olgii, Govisumber, Sukhbaatar, Khovd, Bayankhongor, Khentii and in Ulaanbaatar. In Darkhan-Uul province, damage to farming land is the main form of land degradation.

A study described the Zone of Normalized Difference Vegetation Index (ZNDVI) which describes the normalized values of monthly spectral curves of 6 types of vegetation zones, namely high mountain, mountain taiga, forest steppe, steppe, desert steppe and desert (Y.Bayarjargal, et.al.). The slope of ZNDVI was negative for all sub-provinces. The lowest values show the largest decline or negative change in vegetation index. For instance, Uvs, Arkhangai, Bulgan, Khovsgol, Tov, Selenge, Dornod and Omnogovi provinces have the lowest index. With the exception of Uvs, all the remaining seven provinces have livestock growth during 2005-2009 significantly greater than national average



Source: Administration of Land Affairs, Construction, Geodesy, and Cartography; 2011

Figure 1: Existent Meat Factories at the Provinces and Vegetation Zones

level.

Generally, large meat factories were located in every vegetation zones. Most of them have operated in mountain taiga and forest steppe in accordance with the vegetation zones. If livestock growths in seven provinces remain, then vegetation index is supposed to be declined. This negative externality might be damaged the resources of animal husbandry.

Figure 1 shows existent meat factories at the provinces and vegetation zones. Since 1970, those large meat factories have satisfied urban and rural consumers as well as other economics agents. Because of economic inefficiency, some of them closed the door.

## 2. Changes of the Livestock Products

In practice, most frequently natural resources are obtained for free or underpriced, which leads to over-exploitation and loss of biodiversity. Often perverse subsidies directly encourage livestock producers to engage in environmentally damaging activities.

In order to activate livestock production in the regions, a core aim is to achieve prices and fees that reflect the full livestock value chain and environmental services, including all externalities. One requirement for prices to influence behavior is that there should be secure and if possible tradable rights to pastureland and use of common land.

Government subsidies on livestock are believed to be affecting the competition negatively. Value chain and environmental externalities should be valued and included into the agricultural commodity prices through selective taxing of and/or fees for husbandry animals. In some regions, short term and effective incentives may be required. Fee for environmental services should be reinforced, especially in relation to extensive grazing systems: herders and producers can pay a specific fee for environmental services such as regulation of water flows, soil conservation, nature



degradation, or carbon sequestration. Provision of environmental services may emerge as a major purpose of extensive grassland-based production systems.

A main lesson from transition is that the livestock sector has deep and wide-ranging environmental impacts. Hence, more efficient farmers can produce large and multiple payoffs. Indeed, as societies develop, it is likely that complementarities between livestock production and environmental protection, along with human health issues, will become the dominant research considerations for the sector.

Moreover, there is an urgent need to develop suitable institutional and legal frameworks, at local, and regional, and national levels, for the created value proposition to occur. This will require strong institutional reinforcement, and increased knowledge and awareness of the environmental risks of continuing "business as usual" and the environmental benefits of actions in the livestock value chain.

### 3. Local Meat Cluster Activation with Favorable Environment

Logistics are limited in the economic regions in order to reduce transaction costs of livestock value chain. Products were not easily transported and technological innovation was not swift. Traditionally, livestock production was based on locally available feed resources. To activate the local meat cluster, low cost and diversified goods are essential issues for the sophisticated herders in different economic regions and cross borders.

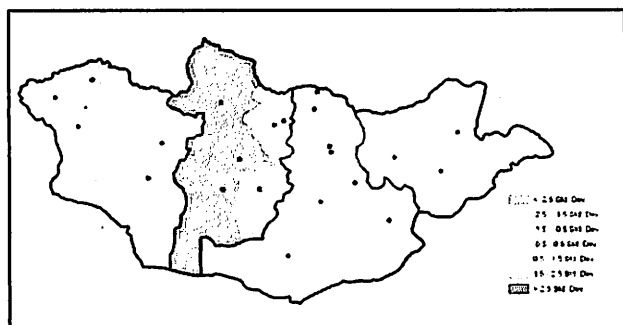
Production and competition environments, as well as incentives vary greatly within and across regions. Animal agriculture systems correspond to agro-ecological opportunities and demand for livestock commodities.

The current meat production and distribution systems are adjusted to the prevailing natural and socio-cultural environment. Traditionally, since there were no strong endowments, for the most part, there was no sustainable equilibrium similar to the current system. In some cases, mobile forms of livestock production have been developed to harness resources from semi-arid or mountainous, seasonally shifting or temporarily available pastures. Although many of these systems result from a long-historical evolution, they are currently under pressure to adjust to rapidly evolving value chain and environmental services. In past two decades, large intensive livestock production units, in particular for cashmere production have emerged in many steppe regions in response to rapidly growing demand for goats.

For clarity of value chain analysis, the following criteria should be considered: proper number of goats in the herd; balanced vegetation ratio to the pastureland; agro-ecological zone; efficient value chain system; type of differentiated products and its innovative levels.

In every economic regions livestock production has grown in the same way as industry, and is no longer directly tied to land or to specific diversifications. If the environment around the herds becomes more sophisticated in terms of value chain and standardized in terms of environment, the local and regional meat clusters will be competitive. Furthermore, it is necessary to encourage specialized suppliers in the local and regional meat cluster with clear defined strategy for the cluster incumbents.

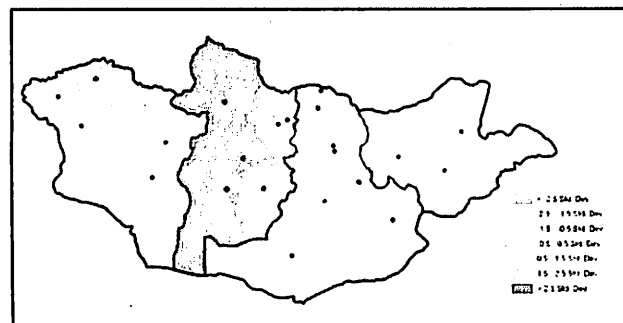
Herders might be sophisticated as specialized suppliers. Therefore, they should focus on their competence. Figure 2 and Figure 3 indicate the growth relationship between number of herders and their number of animal husbandry in two different periods.



Source: NSO, 1970-1990 and ARCGIS 10 program

**Figure 2: Growth relationship between herders and husbandry animal, 1970-1990**

During the 1970-1990 growth of animal husbandry was a negative and number of herder households was not changed. (Blue colored parts) Moreover, in Khangai economic region, growth of animal husbandry was a positive, while number of herder households was not changed.



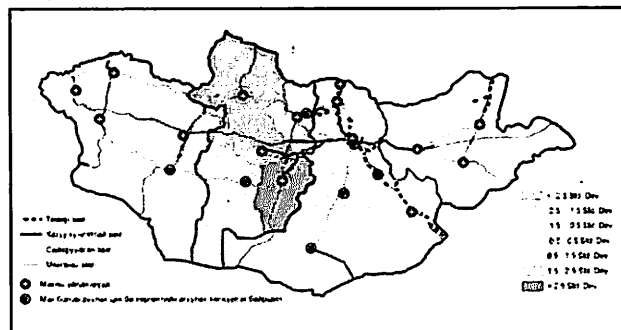
Source: NSO, 1970-1990 and ARCGIS 10 program

**Figure 3: Growth relationship between herders and husbandry animal, 1970-1990**

In past two decades, growth of animal husbandry was almost positive while number of herder households was not changed. An assumption was developed that if we will solve the private property problem, which is belonged to herders, instead of common property problem, then herders would be competitive based on location.

Figure 4 shows present locations of meat factories

and growth relationship between herders and husbandry animal during 1990-2010.



Source: NSO, 1990-2010 and ARCGIS 10 program

**Figure 4: Growth relationship between herders and husbandry animal and present locations of meat factories, 1990-2010**

Herders can be specialized as sophisticated suppliers based on their resource potentials. This is one most important prerequisite of environmentally friendly meat cluster development of Mongolia.

Environmental laws and programs closely related to imposing tax on livestock should be developed and enforced before significant damage will occur by the meat cluster incumbents. The focus of the law and agricultural policy should propose environmental protection and restoration, focusing on more cost-effective approaches such as environmental risk prevention and mitigation. The environmental issues should be solved by integrating with technology innovation in the value chain. Hence, the regional meat cluster will be genuinely activated.

The livelihood concerns of hundreds of millions of herders with weak capacity, who often engage in livestock production because they have no alternative, must be taken into account. Furthermore, many herders are only facilitating the demands of their household, family or the sub-provinces not being able to export to other regions by enhancing their productivity. There-

fore, products of these herders should also be included in the value chain as a specialized supplier. A specialized training for the meat cluster incumbents to make them local responsible entrepreneurs is a first step that is required for the local meat cluster activation.

#### 4. Conclusion

Based on the study, the following can be concluded.

1. It is necessary to improve the regional strategy for competitiveness which will influence the meat cluster value chain in relation to the effective usage of pastureland and water resources.
2. To formulate the meat cluster value chain, suitable logistics model is necessary for every economic region, concerning their unique characteristics for expanding the demand for agricultural goods.
3. A productive and growing meat industry requires educated, safe, healthy, incentive workers who are motivated by new ideas of entrepreneurship.
4. Local and regional competitiveness can be enhanced by balanced environmental performance, because companies' pollution results from unproductive utilization of resources.
5. Finally, location based competitiveness has does matter. For activation of meat cluster it is best

to resolve the complementarities of value chain and environmental externalities together.

#### Acknowledgments

This research was supported by Grant-in-Aid for Asian CORE Program "Manufacturing and Environmental Management in East Asia" of Japan Society for the Promotion of Science (JSPS)

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