MONGOLIA

DATA COLLECTION SURVEY FOR AGRICULTURE AND LIVESTOCK SECTOR IN MONGOLIA

FINAL REPORT

AUGUST 2017

JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)

NTC INTERNATIONAL CO.,LTD.
ALMEC VPI CO.,LTD
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PHOTO GALLERY

(1)Slaughterhouse for horse

(2)Cold storage for sheep

(3)Vegetable market (Khovd province)

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(5)Quarantine lab at border point (Zamiin-Uud)

(6)Quarantine at border point (Zamiin-Uud)

(7)Site visit of farmer's market (Study tour in Japan)

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ABBREVIATIONS

ADB	Asian Development Bank
ALAGaC	Administration of Land Affaires, Geodesy and Cartography
APLAC	Asia and Pacific Laboratory Accreditation Cooperation
AVSF	Agronomes Veterinaires Sans Frontieres Mongolia
CPF	Country Programming Framework
DEIA	Detailed Environment Impact Assessment
EIA	Environmental Impact Assessment
EPA	Economic Partnership Agreement
EU	European Union
FAO	Food and Agriculture Organization
FS	Feasibility Study
GAP	Good Agricultural Practice
GASI	General Agency for Specialized Inspection
GDP	Gross Domestic Product
GHP	Good Hygiene Practice
GMP	Good Manufacturing Practice
GNI	Gross National Income
HACCP	Hazard Analysis and Critical Control Point
IFC	International Finance Corporation
ILAC	International Laboratory Accreditation Cooperation：
IMF	International Monetary Fund
IRR	Internal Rate of Return
IWMP	Integrated Water Management Plan of Mongolia
JA	Japan Agricultural Cooperatives
JICA	Japan International Cooperation Agency
JV	Joint Venture
KOICA	Korea International Cooperation Agency
MASM	Mongolian Agency for Standardization and Metrology
MEGD	Ministry of Environment and Green Development
MEGDT	Ministry of Environment, Green Development and Tourism
MET	Ministry of Environment and Tourism
MNCCI	Mongolian National Chamber of Commerce and Industry
MNS	Mongolian National Standard
MOFALI	Ministry of Food, Agriculture and Light Industry
MONDEP	Data Collection Survey on the Regional Comprehensive Development

	in Mongolia
MPP	Mongolian Potato Project
NAMAC	National Association of Mongolian Agricultural Cooperatives
NAPCC	National Action Plan on Climate Change
NDA	National Development Agency
NFSP	National Food Security Programme
NPV	Net Present Value
NRL	National Reference Laboratory for Food Safety
OEM	Original Equipment Manufacturer
OIE	International Epizootic Office
PALC	Pacific Accreditation Laboratory Cooperation
PBP	Pay Back Period
PI	Profitability Index
PIP	Public Investment Program
PPP	Public–Private Partnership
PPR	Peste des Petits Ruminants
PUG	Pasture User Groups
PV	Present Value
SCVL	State Central Veterinary Laboratory
RUA	Rangeland use agreements
SEA	Strategic Environmental Assessment
SECiM	Support to Employment Creation in Mongolia
SDC	Swiss Agency for Development and Cooperation
SPPD	Strategic Planning and Policy Development
SSC	South-South Cooperation
ULTF	Unified Land Territory Foundation
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme

Units and Currency

kg	kilogram
t	Metric tons = 1,000 kg
km	kilometer
km^2	square kilometer
m^3	cubic meter
ha	hectare
ºC	degrees centigrade
%	percent
USD	United States Dollar
MNT	Mongolia Tughrik

Exchange Rate (December 2016)

USD1.00=	2,435.6 MNT
USD1.00=	113.1 JPY

Chapter1 Outline of the Study

1.1 Background /Purpose of the Study

1.1.1 Background of the Study

The agriculture and livestock sector in Mongolia constitutes about 12.2% of GDP (2016) next to the mining sector, and thus, is a key industry. About 30% of the working population belongs to this sector. Food processing sector i.e. meat processing, dairy products, beverages etc., and textiles processing sector (such as wool and cashmere) are the two fields that accounts for 52% (2016) of the production value in the manufacturing sector. Recently, while the economic growth rate declined suddenly by the decrease in mining price, the agriculture and livestock farming and processing are noticed as a key industry that contributes to industrial diversification. However, the livestock sector including traditional herding faces the following issues: (1) overgrazing by concentration of livestock number around large cities close to market areas; (2) frequent grassland degradation and *dzud* (damage from cold and snow) due to the increase in the number of cashmere goats with high grazing pressure, in spite of high cash income; and (3) necessity to address malignant infectious diseases such as foot-and-mouth disease (hereinafter "FMD"). The agriculture sector has achieved to increase the domestic self sufficiency rate by increasing cultivation areas and yields encouraged by the Mongolian government policies. Meanwhile, the agriculture sector needs to make efforts in the establishment of stable production and supply system in winter, improvement of productivitiy, and establishment of sufficient inspection system for imported vegetables. Regarding the agriculture and livestock processing and distribution, there are the following issues: low level of processing technology, insufficient distribution channel including cold chain, insufficient food hygiene and quality control that meets the international standard, and limited market and production scale. Therefore, the Mongolian agriculture and livestock sector has not yet been sufficient in competitiveness under current situation.

Under this situation, the Government of Mongolia consistently address the strengthening of agriculture and livestock production and related industries with various policies. The government's focus on the manufacturing/processing/distribution/sales and exports of agricultural and livestock products shifted from production of the first industry. In the long term policy "Mongolia's Sustainable Development Vision 2030" (2016, February approved), development of the agriculture and livstock sector is positioned to achieve the sustainable economic growth as well as to promote the processing and exporting of the products by introducing advanced technology. It is also stated in the "State Policy for Food and Agriculture" (2015, November approved) to establish the value chain and improve competitiveness considering food safety and environment. It has set numerical targets for the increase in processed food.

In the short term policy, "Action Program of the Government of Mongolia for 2016-2020" (hereinafter "Action Program 2016-2020") approved in August 2016 by the new government established in July 2016, the national programs for meat/dairy processing industries and developmemt plans of industrial cluster hub site for light industry are formulated.

JICA currently implements some projects to support the agriculture and livestock sector through veterinary education and research fields. JICA will discuss new ways of further cooperation, considering the agriculture and livestock sector as the key sector for industrial diversification with growth potential. Particularly, based on the previous research results by JICA, in order to achieve the sustainable balance between both systems of traditional livestock and agriculture and livestock promotion as an industry, it is necessary to establish an agro-value chain[1] by sustainable agriculture and livestock farming considering the following factors: (1) environment conservation (grassland

[1] Agro-value chain is a system of the whole series of activities that create and build value at each stage through production to export. Although it is often called "food value chain", in Mongolia, agricultural and livestock products such as cashmere, wool and leather are also subjected to the development of value-chain. Therefore, it is collectively referred to as "agro-value chain" in this report.

conservation, water resource management and land management, (2) resilience to *dzud*, (3) safety and security (malicious infectious disease control, sanitation, quality control, etc.).

Under the above circumstances, JICA planned to implement the Data Collection Survey for Agriculture and Livestock Sector in Mongolia (hereinafter "the study").

1.1.2 Purpose of the Study

The study focuses on the environmental consideration (grassland preservation/water resource management/land utility management, etc), and agro-value chain which include manufacturing/processing, distribution/sales and export, and collects information and analyze current situations and prevailing issues. Based on the reviews of the previous projects/surveys, the purpose of this study is to propose further assistance by JICA for the seamless establishment of agro-vale chain of through sustainable agriculture and livestock farming.

1.1.2.1 Government Offices and Organizations

Counter parts for this study was not identified, however, data and information were collected from some related ministries; 1) Ministry of Food, Agriculture and Light Industry (hereinafter "MOFALI"), 2) National Development Agency (hereinafter "NDA"), 3) Ministry of Environment and Tourism (hereinafter "MET"), 4) General Agency for Specialized Investigation (hereinafter "GASI"), 5) Mongolian Agency for Standardization and Metrology (hereinafter "MASM"). Particularly, the study placed emphasis on discussion with Ministers and policy makers. In addition, data collection was also undertaken through interviews with the Mongolian National Chamber of Commerce and Industry (hereinafter "MNCCI"), other related organizations, private companies and local governments.

1.1.3 Achievement of the Study and Members of the JICA Study Team

1.1.3.1 Members of JICA Study Team

The following team members implemented the study.

Table 1.1.1 Members of JICA Study Team

Title	Name
Team leader/Policy of agriculture and livestock 1	Uehara Aritsune
Sub team leader/Policy of agriculture and livestock 2	Takemura Maiko
Distribution/Marketing	Hara Hiromichi
Agriculture and livestock products	Saito Hideki
Infrastructure and integrated farming 1	Ishida Masayuki
Infrastructure and integrated farming 2	Nagaoka Hirokazu
Ecological resilience/Water resource management 1	Komiyama Hiroshi
Ecological resilience/Water resource management 2	Ohno Natsu
Quality control and food hygiene	Nishiyama Akiyo

1.1.3.2 Workflow Chart and Work Schedule

The study included four major components which were: 1) On-site data collection (field survey); 2) Study tour in Japan; 3) Market research in China and Japan; and 4) Seminar in Mongolia.

The flow chart (Figure 1.1.1) shows the study period and activities. The study was implemented for nine months which was from December 2016 to August 2017, and field survey was conducted from December 2016 to early July 2017.

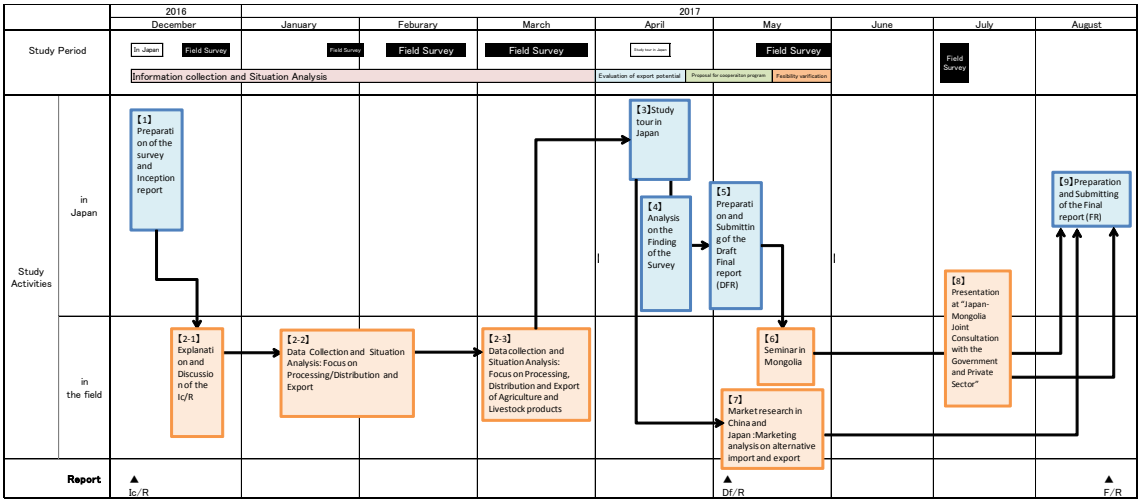


Figure 1.1.1 Workflow of the Study

1.1.3.3 Data Collection in Mongolia

The following table shows the field survey schedule including focused agencies for the interviews, target regions, and other activities.

Table 1.1.2 Work Schedule

Period	Schedules of the Field Survey
Dec 2016	・ Courtesy call and explanation/discussion of the Inception report to JICA Mongolia office, Embassy of Japan, and related Mongolian government ・ Interviews with MOFALI, NDA, GASI and MASM. ・ Interviews with MNCCI, private companies (of meat, dairy, leather, vegetable, etc)
Jan/Feb 2017	・ Interviews with Mongolian government, MOFALI, NDA, Construction and Urban Development, MET. ・ Interviews with provincial officers in Tuv, Selenge, Darkhan-Uul, and Bulgan. ・ Preparation of study tour in Japan (Explanation of the program and selection of the participants)
Mar/Apr 2017	・ Preparation of study tour in Japan (Mongolia/Japan) ・ Interviews with provincial officers in Bulgan (Selenge district) and Selenge (Mandal district) ・ Interviews with provincial officers in Dornogovi (Zamiin-Uud, Sainshand) ~ Erenhot (China): Survey on border trade and customs. ・ Interviews with provincial officers and private companies in Hovd (Survey on agriculture and livestock production) ・ Interviews with private companies (manufacturing/processing, distribution, etc) and economic organizations in Ulaanbaatar and urban areas. ・ Interviews with officials in GASI, MASM, MOFALI and Research Institution, etc. ・ Interviews with Asian Development Bank, Swiss Agency for Development and Cooperative, and other international organizations. ・ Implementation of study tour in Japan (From 12 to 21 April, 2017)
May 2017	・ Market research in China and Japan (China: From 17 to 19 May, 2017, Japan: From 24 to 27 May, 2017) ・ Implementation of seminar (23 May, 2017) ・ Additional interviews with Mongolian government and private companies.
July 2017	・ Presentation at the “8th Japan-Mongolia Joint Consultation with the Government and Private Sector.”

1.1.3.4 Study Tour in Japan, Market Research in China and Japan, Seminar

Table 1.1.5 shows the schedule of the study tour in Japan, market research in China and Japan, and the seminar.

(1) Study Tour in Japan

During this study, a study tour in Japan was conducted in order to share Japanese knowledge and experiences related to the establishment of agriculture and livestock value chain and to identify the comparative advantage technologies and systems in Japan, regarding agriculture and livestock manufacturing/processing, distribution/sales, and exports in Mongolia. The study tour was conducted from 12th to 21st of April and the lectures and site visits were held in Tokyo, Ibaraki, and Hokkaido. Table 1.1.3 shows the schedule of the study tour.

Table 1.1.3 Schedule of the Study Tour in Japan

Date		Visiting site
4/12(Wed)	Transport	Ulaanbaatar to Narita (OM 501)
4/13(Thu)	Courtesy call	JICA Headquarter
	Lecture	Ministry of Agriculture and Fishery
	Lecture	Ministry of Economic, Trade and Industry/JETRO (at JICA Ichigaya)
4/14(Fri)	Lecture	Ministry of Health, Labour and Welfare
	Lecture	Embassy of Mongolia in Japan
	Site visit	Oniku no Jyouhoukan (Meat Market in Shinagawa)
4/15(Sat)	Site visit	Ohta Market
	Transport	Tokyo to Tsukuba
	Site visit	Mizuho no Mura Ichiba (farmer's market)
	Site visit	Horticulture farmer's field
4/16(Sun)	Transport	Haneda (11:00) to Sapporo (12:35)
4/17(Mon)	Lecture	Hokuren, JA Hokkaido Chuokai
	Lecture	Hokkaido Bureau of Economy, Trade and Industry
	Lecture	Hokkaido Government, the Department of Agriculture
	Lecture	Hokkaido rakunou chikusan kyokai (Dairy husbandary association)
4/18(Tue)	Transport	Sapporo to Tokachi shimizu
	Site visit	Japan Agricultural Cooperatives(JA) Tokachi shimizu-cho
	Site visit	Tokachino Fromages (Cheese store and cafe), Michino eki Nakasatsunai (road side station)
4/19(Wed)	Lecture	Obihiro University of Agriculture and Veterinary Medicine, Center for Regional Collaboration in Research and Education
	Lecture	Hokkaido Chushokigyo DOYUKAI Tokachi branch
	Site visit	TOYONOKI Co., Ltd.
4/20(Thu)	WS	Workshop (at JICA Obihiro)
	Site visit	Ohno Farm
	Transport	Obihiro (15:30) (JAL574)→Haneda (17:15)
4/21(Fri)	Report	JICA Headquarter
	Transport	JICA Headquarter →Narita airport Narita(14:40)(OM502)→Ulaanbaatar (19:10)

(2) Market Research in China and Japan

The purpose of the market research is to examine the export and import policy of agriculture and livestock products in China and Japan, to exchange opinions with related organizations, and to survey market needs. The market research in China was conducted from 17th to 19th May, and in Japan from 24th to 27th May. Table 1.1.4 shows the schedule of the market research.

Table 1.1.4 Schedule of the Market Research in China and Japan

	Date		Schedule/Program
China	5/17(Wed)	Transport	Ulaanbaatar(06:10)→Beijing(08:25)(OM223)
		Transport	・ Meeting
		Site visit	・ Inner Mongolia Green Agriculture and Livestock Products Plaza ・ Discussion at Mongolian National Chamber of Commerce and Industry office in Beijing
	5/18(Thu)	Transport	Beijing(08:55)→Hohhot(10:25)(ZH1117)
		Transport	Hofhot(11:00)→Ordos(Transport by vehicle) ※Escort by Inner Mongolia/Mongolia Business association
		Site visit	・ Site visit of Cashmere factory
	5/19(Fri)	Transport	Ordos(07:00)→Hofhot
		Site visit	・ Site visit of Dairy company
		Transport	Hofhot(17:35)→Ulaanbaatar(20:05)(H14678)
Japan	5/24(Wed)	Transport	Ulaanbaatar(07:55)→Narita(13:40)：OM501、Narita→Shinjuku
	5/25(Thu)	Transport	Shinjuku(06:40)→Shinagawa(7:07 Nozomi203)→Shin-osaka(9:53)→Shinsaibashi(10:21)
		Courtesy call/Interview	・ Council General of Mongolia in Osaka
		Site visit	・ Gaishoku Business Week 2017 (Restaurant Business Expo), Intex Osaka
		Transport	Shinosaka(18:03 Nozomi44) →Shinagawa(20:37)→Shinjuku(20:57)
	5/26(Fri)	Transport	・ International Food Ingredients & Additives Exhibition and Conference, Health Food Exposition &Conference 2017 (Tokyo Big Sight)
			・ Wrap up meeting
	5/27(Sat)	Transport	Narita(09:00)→Soul →Ulaanbaatar(16:50)：OZ107、OM302

(3) Seminar

The seminar for related Mongolian government was conducted in Ulaanbaatar on 23rd May 2017. The purpose of the seminar was the presentation of interim report of the study and recommendation for the development of agriculture and livestock sector in Mongolia.

Table1.1.5 Seminar Program

Seminar for Agriculture and Livestock sector in Mongolia

The seminar on the presentation of the interim report on Data collecting survey on Agriculture and Livestock sector in Mongolia (MONALIS) and recommendation for the development of agriculture and livestock sector in Mongolia will be held.

1. Program

- Explanation of the outline of MONALIS draft final report
- Suggestion by Mongolian officials /Working team who participated in the study tour in Japan in April
- Discussion on the development of agriculture and livestock sector in Mongolia in the future

2. Participants

- Participants were from Ministry of Food, Agriculture and Light industry, National Development Agency, General Agency for Specialized Investigation, Mongolian Agency for Standardization and Metrology, and Mongolian National Chamber of Commerce and Trade. Japanese participants were members of JICA Study Team, JICA and Embassy of Japan in Mongolia.

3. Schedule

- Date: 23rd May, Tue 9:00 – 14:50
- Venue: Nomyn Khuree hall, The Ulaanbaatar Hotel, 6F
- Details:

Time	Contents
9:00-9:10	Opening remarks Mr. Oda, Deputy Director, East Asia division, JICA Headquarter
9:10-10:15	Presentation by Mongolian Officials ➢ Ministry of Food, Agriculture and Light Industry ➢ National Development Agency
10:15-10:30	Coffee Break
10:30-11:30	Presentation by MONALIS ➢ Outline of the Draft final report
11:30-12:00	Questions and Answers
12:00-13:00	Lunch break
13:00-14:30	Discussion among participants and JICA Study Team
14:30-14:50	Closing remarks ・ Mr.Enkh-amar, Director, General of the Policy and Planning Department, Ministry of Food, Agriculture and Light Industry ・ Mr. Sato, Chief Representative of JICA Mongolia Office

1.1.3.5 Japan-Mongolia Joint Consultation with the Government and Private Sector

The "Japan-Mongolia Joint Consultation with the Government and Private Sector" has been held since 2007 to promote trade and investment between Japan and Mongolia through a joint discussion with Japanese and Mongolian government and private sectors. The discussion topics relate to trade, investment issues, and the development and use of mineral resources in Mongolia. At the 8th Joint Consultation held in Ulaanbaatar on 4th July 2017, the team leader of the JICA Study Team made a presentation on "Issues of the Value Chain of Agricultural and Livestock Products in Mongolia and the Potentials for Japanese Markets."

1.1.3.6 Target Areas

An administrative area called "Aimag" in Mongolia is equivalent to province. There are 21 aimags except for Ulaanbaatar city. 347 soums (same as district) belongs to aimags, and 1681 bags (same as village/town) belong to soums.

Figure1.1.2 Administrative Areas in Mongolia

Source: https://commons.wikimedia.org/wiki/Atlas_of_Mongolia

In this study, based on the situation of agriculture and livestock sector in Mongolia, the field surveys were conducted at several areas with different regional conditions. The survey areas were selected based on the following criteria: (1) distribution of agriculture and livestock products from the target area of corridor development which was proposed in MONDEP[2]; (2) livestock density and land utility system; (3) potential of livestock and agriculture; and (4) information from interviews with governmental officers. The field survey was conducted in Tuv, Selenge, Burgan, Khovd, Dornogovi provinces. Figure1.1.2 shows the surveyed areas.

[2] Data Collection Survey on the Development Policy and Public Investment in Mongolia

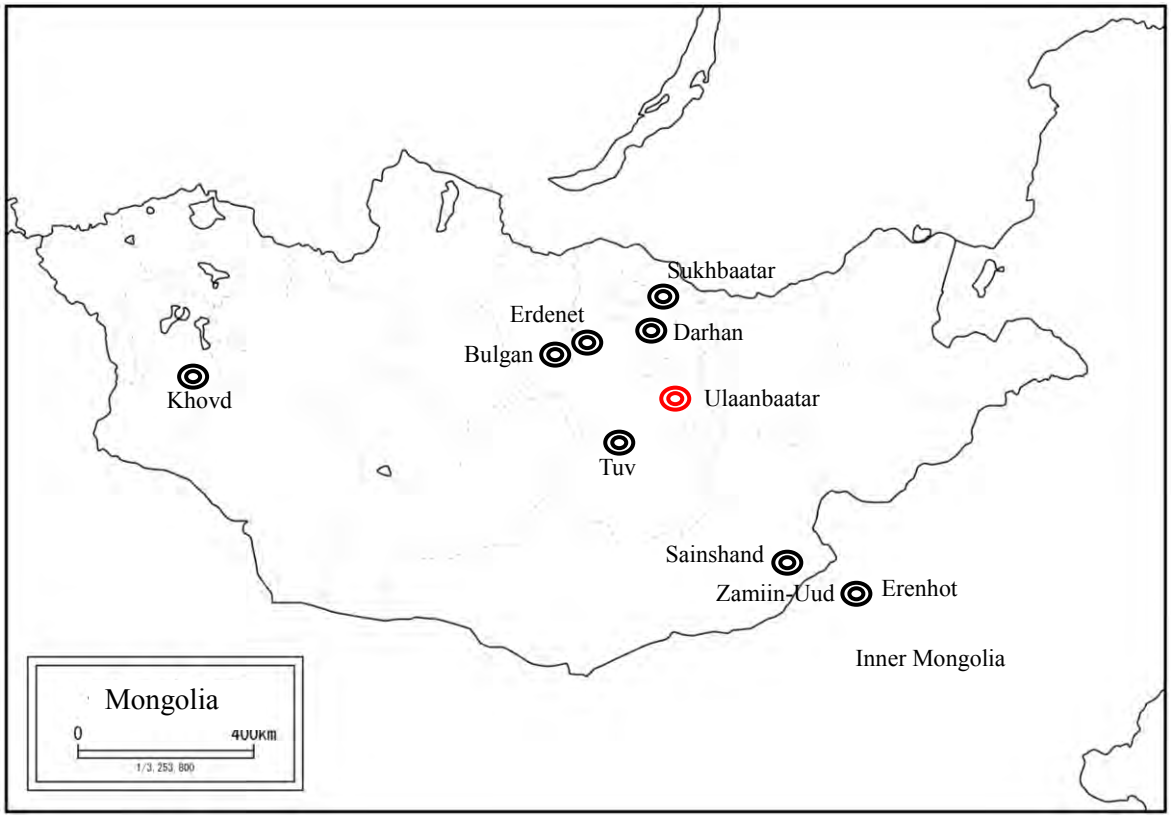


Figure1.1.3 Survey Areas

Figure 1.1.4 shows the places visited during the study tour in Japan and the market research in China and Japan.

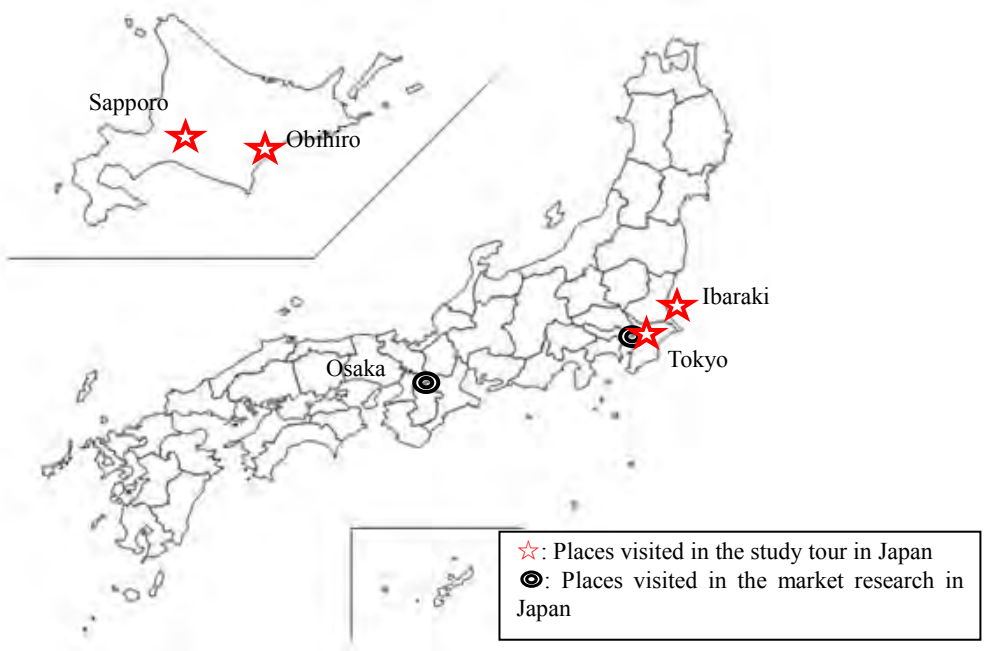


Figure1.1.4 Places Visited during the Study Tour in Japan and Market Research in Japan

Source：http://www.freeformat.co.jp/AddInIndex.htm?FFOptionMapList.htm

Figure1.1.5 Places Visited during the Market Research in China

Source：http://abysse.co.jp/china-map/admin/uchimongoru.html

1.1.3.7 Composition of the report

The report is composed of the following contents.

Chapter1 Outline of the Study

This chapter explains the background, purpose and components of the study.

Chapter2 General Conditions and Issues of the Mongolian Agriculture and Livestock Sector

This chapter describes the overview of agriculture and livestock sector in Mongolia regarding production, imports and exports of agriculture and livestock products, policy for agriculture and livestock sector, industrial organizations, other cooperating donors, and environmental conditions.

Chapter3 General Conditions and Issues of the Mongolian Agro-value chain

This chapter describes the current situations and issues in the system of agro-value chain in Mongolia based on the case studies of relevant actors in the value chain, with the following view points; distribution/marketing, agriculture and livestock processing, hygiene and quality control, production infrastructure, and establishment of cluster hub sites.

Chapter4 Conclusion and Recommendation

The chapter describes the recommendation of the course of action for JICA's cooperation in order to establish the agro-value chain in Mongolia.

Chapter2 General Conditions of the Mongolian Agriculture and Livestock Sector

This chapter provides the outline of agriculture and livestock sector in Mongolia focusing on the industrial structure, government policies related to the sector, industrial organizations, donor cooperation, and environmental conditions related to the sector.

2.1 Industrial Structure of Agriculture and Livestock Sector

2.1.1 Features of the Agriculture and Livestock Sector

2.1.1.1 Features of the Agriculture and Livestock Sector in GDP

The GDP ratio of agriculture and livestock sector accounts 12.2% in 2016, second largest following the mining sector (Figure 2.1.1). It was the largest sector before 2004, and particularly in after the 1990s, it was the major industry in Mongolia accounting more than 30% of GDP (Figure2.1.2). Although its rank has lowered because of mining development, the agriculture and livestock sector is still significantly important that supports the Mongolian economy. While the annual overall GDP growth ratio in the last five years (2012 to 2016) is 13%, it is 18% among the agriculture and livestock sector which indicates that the sector is the leading sector for the economic development in Mongolia.

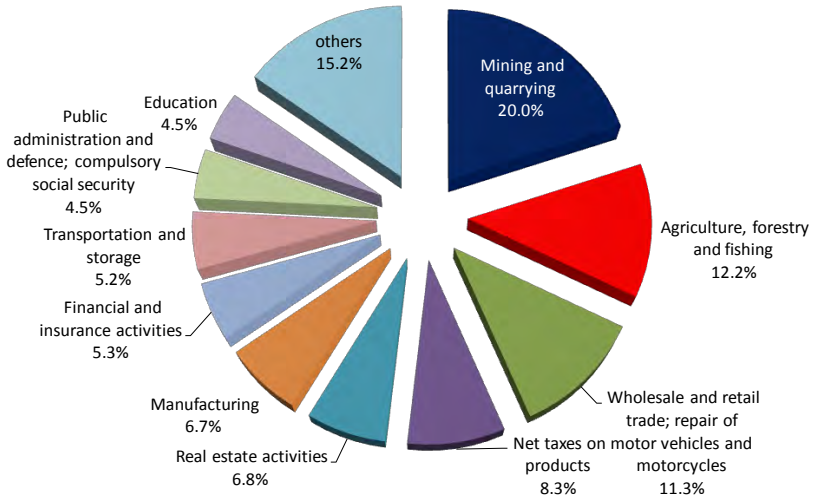


Figure 2.1.1 GDP Sector Composition(2016)

Source: Prepared by JICA Study Team based on Mongolian Statistical Information Service

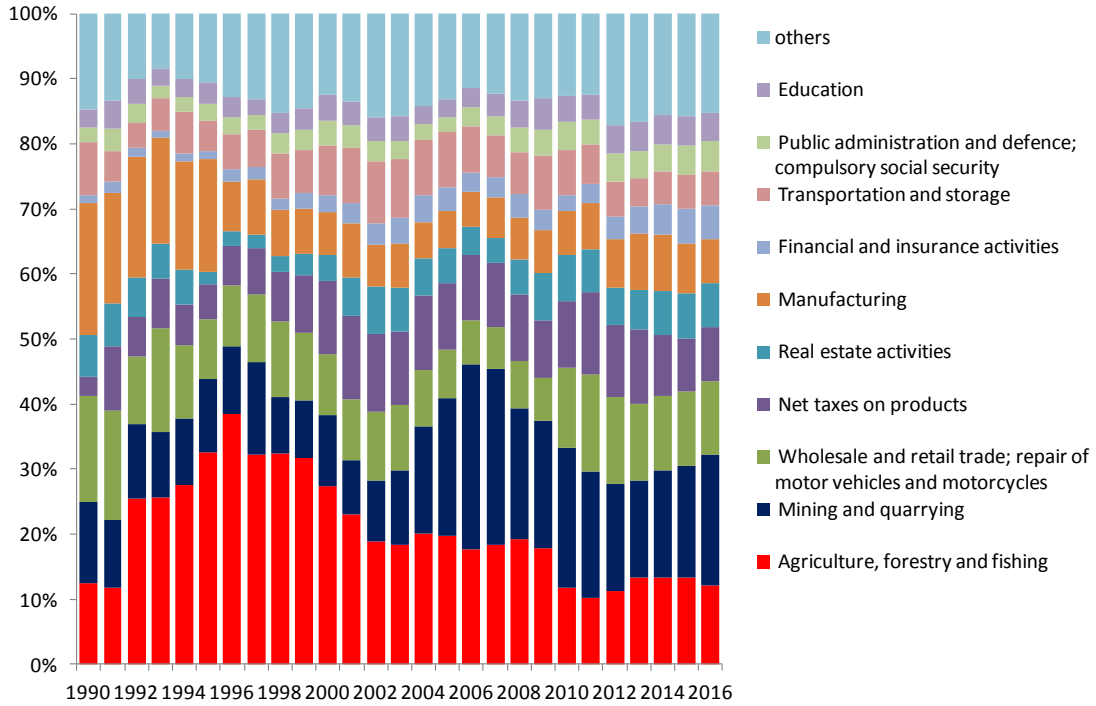


Figure 2.1.2 Transition of the GDP Sector Composition (1990-2016)

Source: Prepared by JICA Study Team based on Mongolian Statistical Information Service

2.1.1.2 Features of Livestock

Livestock farming based on grazing on the natural grassland is suitable to the environment conditions in Mongolia, and thus has a long history until today. The number of livestock in Mongolia[1] is 61.5millions in 2016, which is the highest number ever recorded, and the number of livestock is about 20 times of population in Mongolia. The number of livestock has reached about 2.5 times when compared with 25 million in the socialist era (Figure2.1.3). By type of livestock in 2016, the number of sheep, goats, cattle, horses and camels are 27.9 million, 25.6 million, 4.1 million, 3.6 million and 400 thousand respectively.

[1] Mongolian Statistical Information Service (http://www.1212.mn)

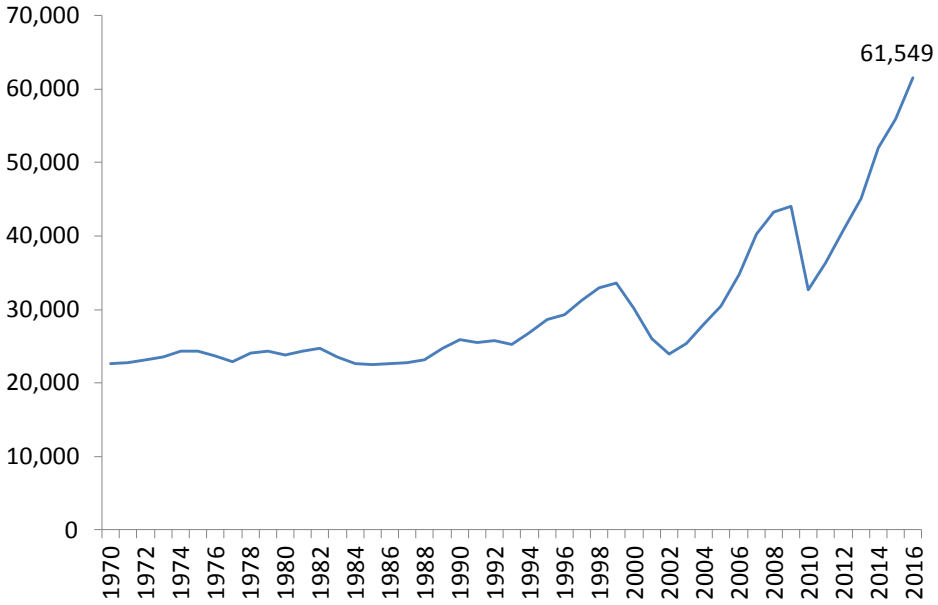


Figure 2.1.3 Transition of Number of Livestock (1970-2016) (Unit: thousands head)

Source: Prepared by JICA Study Team based on Mongolian Statistical Information Service

2.1.1.3 Features of Agriculture

As for agriculture (crop farming), large scale agricultural development was conducted in the socialist era, and there was a production scale that could be exported overseas in the 1980s[2]. The sown area in 2016 was 505,283 ha, and it decreased by 40% since 1990 which was 795,954 ha (Figure2.1.4). The agriculture sector once experienced a drastic slowdown after the transition to market economy. However, it recovered by the "Third Crop Rehabilitation Campaign" and in the recent years the campaign enabled the sown area to reach the level of the planned economy[3]. In the end of the socialist era, relatively high precipitation and well-functioning of irrigation systems increased the yield, reaching 1,460 kg/ha at the highest. However, after the transition to market economy malfunctions of irrigation systems and relatively bad weather conditions made the yield to fall continuously. The yield has gradually risen in recent years, which marked 1,680kg/ha in 2014, by accounting of rich precipitation and increase of irrigation areas (Figure 2.1.5).

[2] Yuki Konagaya (2010). The History of Agriculture Development in Mongolia: seeking a trade off between development and conservation. Bull Natl Mus Ethnol 35(1):9–138
[3] Hiroshi Komiyama (2016). Agriculture and livestock at dried land in North and East Asia

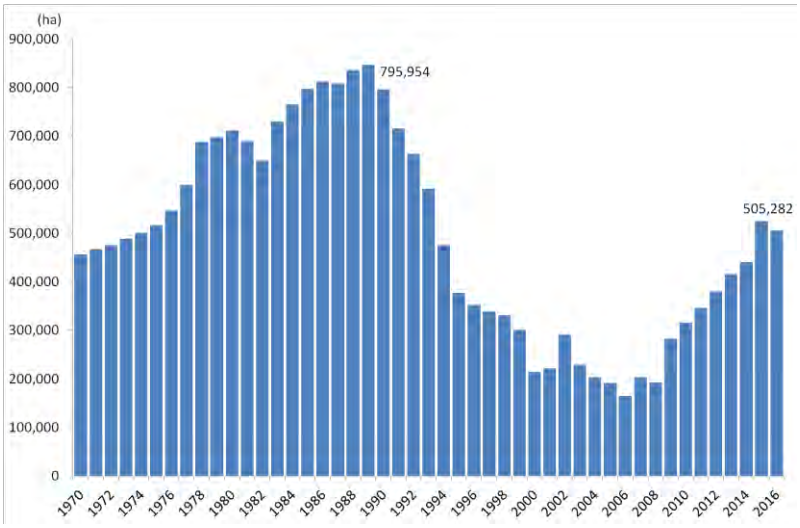


Figure 2.1.4 Transition of Total Sown Areas (1970-2016) (Unit: ha)

Source: Prepared by JICA Study Team based on Mongolian Statistical Information Service

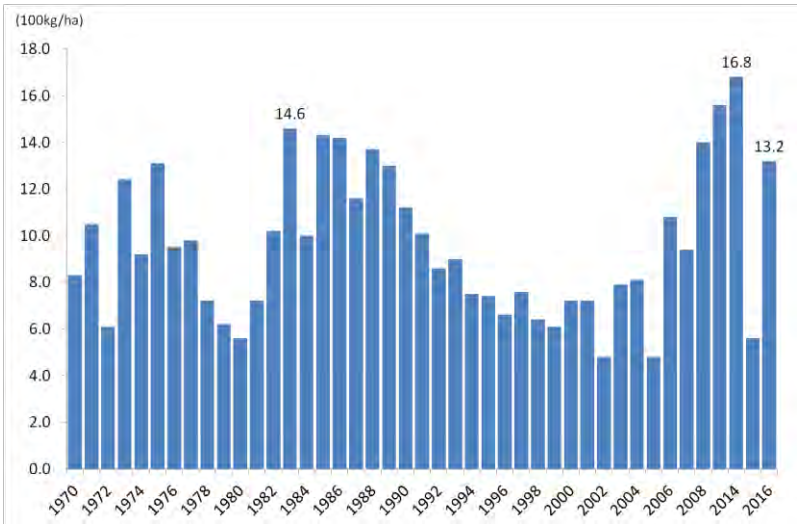


Figure 2.1.5 Transition of Wheat Yield (1970-2016) (Unit: 100kg/ha)

Source: Prepared by JICA Study Team based on Mongolian Statistical Information Service

2.1.2 Production Volume of Agriculture and Livestock Products

In 2015, the livestock production volume was 448 thousand tons of meat, 874 thousand tons of milk, 8,900 tons of cashmere, 26 thousand tons of wool and 15.2 million of leather. Regarding meat, compared to its production volume from 2012 to 2014 that was less than 300 thousand tons, and it has risen by 1.5 times in 2015. All of wool, cashmere, milk, and eggs were around 1.1 times in comparison with the previous year, and the production volume has steadily increased.

Table 2.1.1 Transition of Livestock Production Volume by Commodities (2012-2015)

Commodities	thousand tons			
	2012	2013	2014	2015*
Meat, slaughter	263.4	299.3	291.7	448.3
beef	59.7	57.7	54.9	93.2
mutton & goat	123.6	155.0	151.8	220.9
pork	0.4	0.5	0.8	0.6
Hide and skin, mill.pcs	8.6	11.0	10.2	15.2
horse	0.2	0.2	0.2	0.4
cattle	0.5	0.5	0.4	0.7
sheep	3.7	5.2	5.0	7.4
goat	4.0	4.7	4.3	6.2
Sheep wool	17.5	20.2	22.3	25.8
Cashmere	6.3	7.0	7.7	8.9
Milk	588.0	667.0	765.4	874.4
Eggs, mill.pcs	56.6	63.2	72.2	100.6

*Provisional value

Source: NSO "Statistical Yearbook 2015"

Major agricultural products in Mongolia are wheat, potatoes, and vegetables and the production volumes in 2014 were 440 thousand tons, 160 thousand tons, and 100 thousand tons, respectively. In 2015, many agricultural products were affected by drought. The year-on-year rate of production volume in 2015 was 0.42 for wheat and 0.69 for vegetables in total. The declined rates indicate that agriculture in Mongolia is strongly affected by the weather. On the other hand, the production volume of potatoes increased by 1.01 times, which shows that they were less affected by the weather than wheat and vegetables.

Table 2.1.2 Transition of Agricultural Production Volume by Commodities (2012-2015)

Commodities	thousand ton			
	2012	2013	2014	2015**
Cereals	432.8	350.2	470.0	194.6
wheat	418.8	331.5	439.5	183.5
Potatoes	245.9	191.6	161.5	163.8
Vegetables	99.0	101.9	104.9	72.3
cabbage	20.2	20.6	18.7	15.4
turnip	23.8	22.4	23.9	17.6
carrot	32.8	34.5	34.7	18.5
onion	5.5	9.3	9.4	6.7
cucumber	3.7	4.3	4.7	3.8
tomato	2.1	2.5	2.4	1.9
watermelon	6.4	5.4	6.3	6.5

*Provisional value

Source: NSO "Statistical Yearbook 2015"

2.1.3 Production, Consumption, and Imports of Agriculture and Livestock Products

The Table below shows production/consumption, import/export volume, import dependency ratio of major edible livestock products in 2014 and 2015. Regarding meat and meat products, although there is considerable export capacity, exports of artiodactyls meat have been sluggish due to FMD. Meanwhile, importing pork and chicken has a slight dependence on imports of meat and meat products. Regarding milk and dairy products, the domestic production capacity is enough to be self-sufficient. However, since factories of domestic dairy products use a considerable amount of imported milk powder or concentrated milk, there is a certain import dependency. In terms of eggs, the domestic production volume is gradually increasing, but about 40% depends on imports.

Table 2.1.3 Production / Consumption, Import / Export Volume, Import Dependency Ratio of Main Livestock Products for Edible in 2014 and 2015

	Meat and meat products (Unit: thousand tons)		Milk and dairy products (Milk equivalent[*1], Unit: thousand tons)		Eggs (Unit: Million pieces)	
	2014	2015	2014	2015	2014	2015
Domestic production volume	291.7	448.3	765.4	874.4	72.2	100.6
(Household consumption volume[*2])	290.1	286.0	448.3	464.3	118.7	138.0
Export volume	2.6	5.0	0.0	0.0	0.0	0.0
Import volume	14.3	11.7	45.7	38.7	87.3	66.4
Import dependency ratio[*3]	4.7%	2.5%	5.6%	4.2%	54.7%	39.8%

[*1]Conversion to milk is 7.55 times for powdered milk, 3.87 times for concentrated milk, 9.26 times for butter, 6.6 times for cheese.

[*2]Household consumption volume was estimated from monthly consumption per capita.

[*3]Import dependency ratio = import volume ÷ (domestic production volume + import volume)

Source: Prepared by JICA Study Team based on the data from NSO "Statistical Yearbook 2015" and International Merchandise Trade Statistics

The figure below shows the imports/exports volumes of meat and meat products by commodities. Most of the exported commodities are horse meat. Although frozen beef is exported, fresh/chilled beef is mostly not exported. Imported commodities are poultry and pork, and the volume of poultry is the same as exported horse meat.

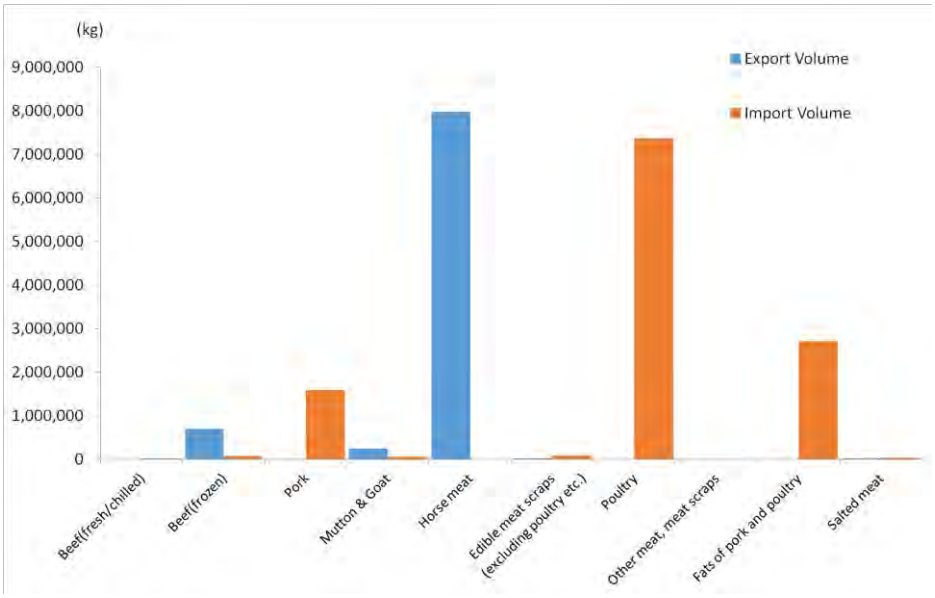


Figure 2.1.6 Imports/ Exports Volumes of Meat and Meat Products by Commodities

Source: Prepared by JICA Study Team based on the data from NSO "Statistical Yearbook 2015" and International Merchandise Trade Statistics

Regarding the import volume of milk and dairy products (Figure 2.1.7), the largest import volume is "milk powder, condensed milk, cream" which is the breakdown of milk powder. There is little export of dairy products. Fresh milk is scarcely imported. Approximate value is shown for export and import volume of honey. This is assumed to be affected by the amount of transit trade from China to Russia being calculated.

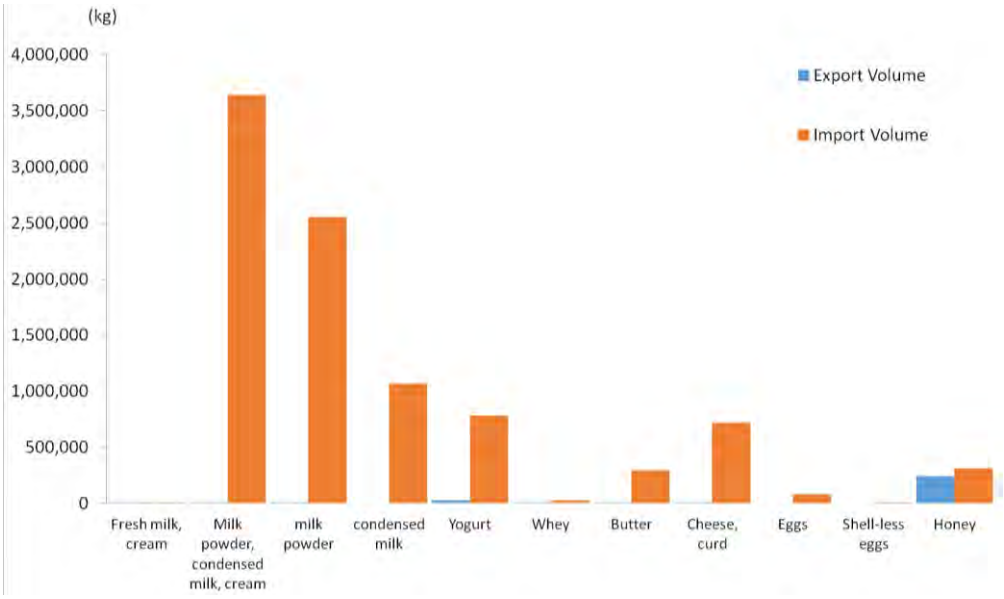


Figure 2.1.7 Imports/ Exports Volumes of Milk and Dairy Products by Commodities

Source: Prepared by JICA Study Team based on the data from NSO "Statistical Yearbook 2015" and International Merchandise Trade Statistics

The Table below shows the production/consumption volume, import/export volume, and import dependency ratio on imports of major agricultural products in the sector in 2014 and 2015. The agricultural production volume declined sharply after the transition to market economy. The "Third Crop Rehabilitation Campaign" launched in 2008 contributed to increasing agricultural production significantly, leading nearly to meet the domestic demands for wheat[4] and potatoes. In 2015, the production of wheat temporarily declined due to the drought. Except for wheat and potatoes, other agricultural products depend highly on import. Vegetables and vegetable oils[5] depend on imports about 30 to 50%, and fruits depend on import over 90%.

As for wheat in the Table below, the household consumption volume in 2015 is larger than its production and import volume. This is due to the time lag between the production year and consumption year, in fact, wheat is harvested from September to October in Mongolia, in 2015, and that wheat is mainly consumed in the next year, 2016.

Table 2.1.4 Production/Consumption, Import/Export Volume, and the Dependence on Imports of Major Agricultural Products in 2014 and 2015

	Wheat and wheat flour products (wheat flour equivalent[*1], thousand tons)		Potatoes (thousand tons)		Vegetables (thousand tons)		Vegetable oil[*3] (thousand tons)		Fruits (thousand tons)	
	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
Domestic wheat production volume	320.8	142.1	161.5	163.8	104.9	72.3	20.8	9.4	1.2	1.4
(Household consumption volume[*2])	349.4	353.3	98.9	94.2	69.2	67.3	16.5	16.8	26.4	23.6
Export volume	0.2	0.2	4.5	4.5	0.0	0.0	17.6	17.6	0.0	0.0
Import volume	42.5	35.9	5.4	17.1	66.4	50.5	8.8	9.3	27.8	29.1
Import dependency ratio[*4]	11.7%	20.2%	3.2%	9.5%	38.8%	41.1%	29.7%	49.7%	95.9%	95.4%

[*1] Wheat was converted to wheat flour with the wheat flour production yield as 73%.
[*2] Household consumption was estimated from monthly consumption per capita.
[*3] Regarding the production and export of vegetable oil, the oil content of rapeseed was calculated as 40%.
[*4] Import dependency ratio = import volume ÷ (domestic production volume + import volume)

Source: Prepared by JICA Study Team based on the data from NSO "Statistical Yearbook 2015" and International Merchandise Trade Statistics

[4] The data for Table 2.1.4 includes wheat flour products.
[5] Though rape seed is grown in Mongolia, most of them are exported to China before processed, thus the domestic consumption of oil rely on imported vegetable oils.

The Figure below shows the import dependency ratio of agriculture and livestock products by commodities.

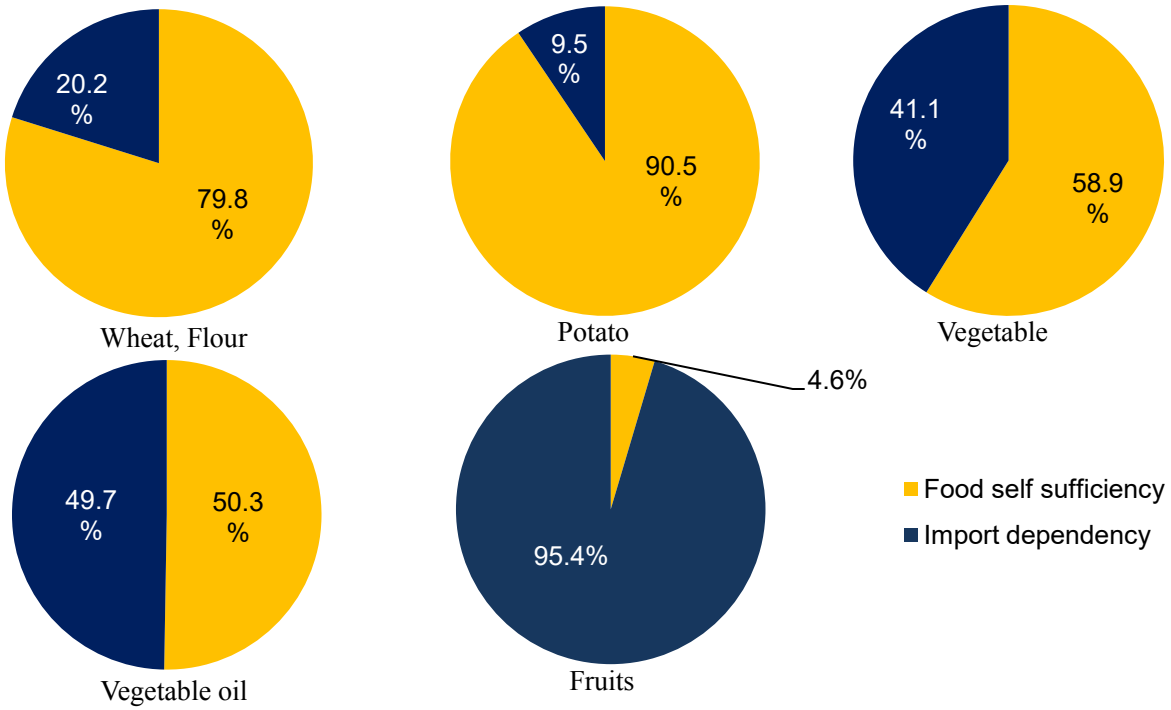


Figure 2.1.8 Percentage of Imports of Agricultural Products in Mongolia (2015)

Source: Prepared by JICA Study Team based on the data from NSO "Statistical Yearbook 2015" and International Merchandise Trade Statistics

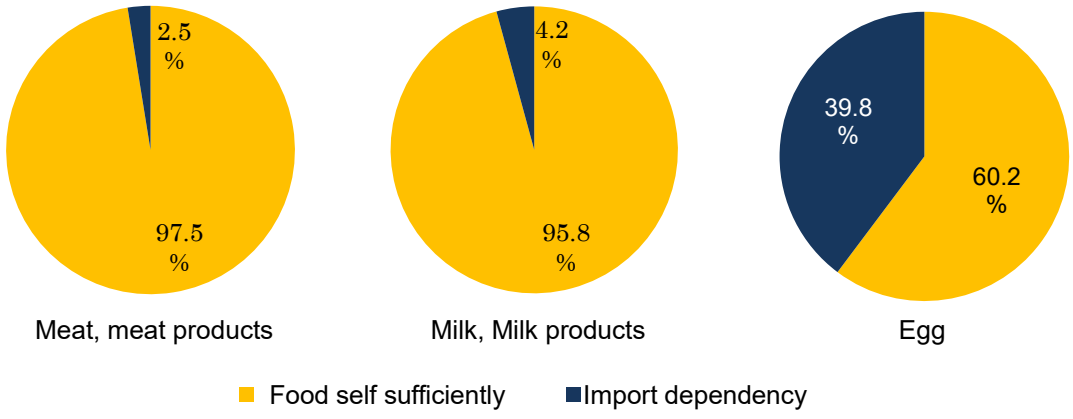


Figure 2.1.9 Percentage of Imports of Livestock Products in Mongolia (2015)

Source: Prepared by JICA Study Team based on the data from NSO "Statistical Yearbook 2015" and International Merchandise Trade Statistics

Import dependency ratio of fresh and processed vegetables is high. The largest import volume is cabbage, it is imported about 25 thousand tons yearly from 2014 to 2016. The next is onion/ garlic, carrot, radish and beat. The import direction is mostly from China, and certain volume is imported from Russia. Regarding fruits, the order of large import volume is apple, melon (included water melon), banana, citruses. Banana is mainly imported from Philippine, and other fruits are mostly imported from China.

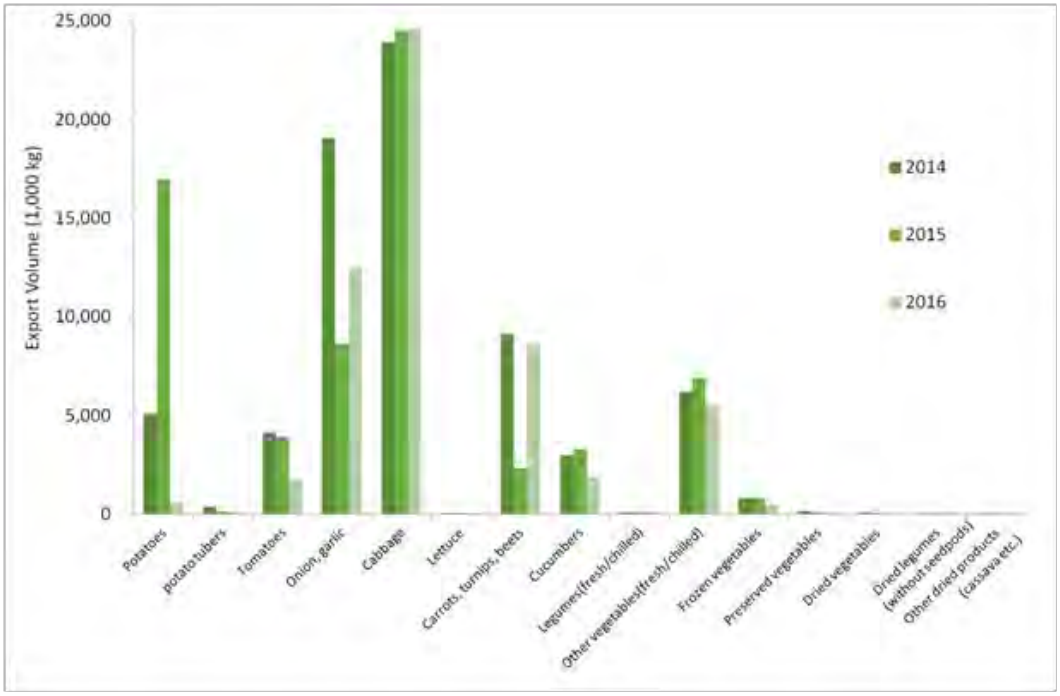


Figure 2.1.10 Transitions of Import Volume of Agricultural Products (2014-2016)

Source: International Merchandise Trade Statistics2016

2.2 Markets of Agriculture and Llivestock Products

2.2.1 Domestic Market

2.2.1.1 Markets in Urban and Rural Areas

Regarding the domestic market of agriculture and livestock products, a comparison of monthly average expenditure is made between urban and rural households. The percentage of cash account for the expenditure is 95.3% in urban areas and 80.4% in rural areas. It can be found out that there are many dealings other than cash in urban areas. In cash expenditure, the share of food expense is 25.9 % in urban areas and 15.5 % in rural areas. Cash expense is low in rural areas appears to be due to self-production and consumption.

The population ratio of urban areas over 50% are Ulaanbaatar, 100%, and Orhon, Darkhan-Uul, Govisumber, Dorrnogovi, Dornod, and Selenge province[6]. In other provinces, the percentage of urban residents is 20% to 35%, in which many residents make living in traditional livestock farming. In the provinces with a large number of urban residents, Orhon and Govisumber province were developed by mining advancement, and Darhan-Uul province was developed by mining advancement in addition to light industrial development. There are border ports with China and Russia in Dornogobi, Dornodo, and Selenge province.

Table 2.2.1 Monthly Average Expenditure of Urban/Rural Households

Types of expenditure	2015					
	National average		Urban		Rural	
	(MNT)	(%)	(MNT)	(%)	(MNT)	(%)
Total expenditure	1,064,808	100.0	1,100,058	100.0	999,615	100.0
Monetary expenditure - Total	**962,671**	**90.4**	**1,048,923**	**95.3**	**803,154**	**80.4**
Food expenses	239,436	22.4	285,268	25.9	154,673	15.5
Non-food expenses and services	694,983	65.3	737,192	67.0	616,920	61.7
Gifts and benefits gave for others	28,252	2.7	26,463	2.4	31,561	3.2
Received from other free of charge - Total	**50,508**	**4.7**	**45,286**	**4.2**	**60,165**	**6.0**
Food expenses	19,560	1.8	14,924	1.4	28,133	2.8
Non-food expenses and services	30,948	2.9	30,362	2.8	32,032	3.2
Foodstuff, consumed from private farm or enterprise	**51,629**	**4.9**	**5,849**	**0.5**	**136,296**	**13.6**

Source: NSO "Statistical Yearbook 2015"

[6] NSO (2015) "Statistical Yearbook 2015"

2.2.2 Overseas Markets

The total export value in Mongolia is 4.91 billion dollars and import value is 3.35 billion dollars (2016). In 2015 and 2016, the volume of imports decreased and of exports exceeded, which is estimated due to the downturn in the construction industry and the decline in the price of petroleum. However, the balance of trade in 2011, 2012, 2013 turned out as -17.8 billion, -2.35 billion, -2.09 billion dollars with excess of imports. 83.7% of Mongolia's export trade partner is China, and therefore the economy is deeply dependant on export to China. On the other hand, import trade partners are China and Russia, 36.6 % and 26.9% respectively, followed by Japan (7.2%), Korea (6.8%) and Germany (3.3%).

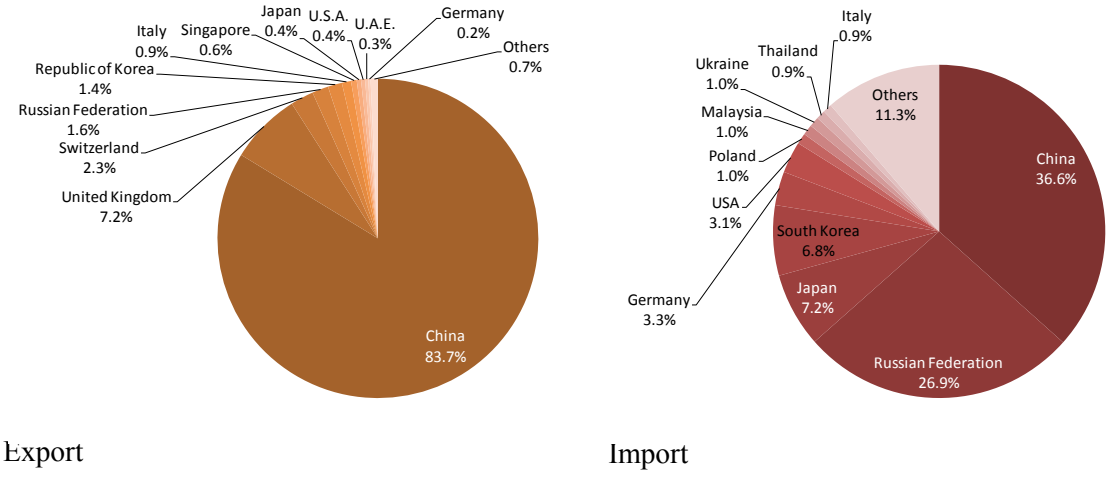


Figure 2.2.1 Imports/ Exports Trade Partners

Source: Prepared by JICA Study Team based on the data from NSO "Statistical Yearbook 2015" and International Merchandise Trade Statistics

The mineral product which is the largest export commodities accounts 71 % (2016) in the total export value. The percentage of agriculture and livestock products[7] shows 9 %. The percentage of agriculture and livestock products in the import commodities shows 17 % of the total[8].

Table 2.2.2 shows the percentage of export trade partners and export value of agriculture and livestock products (meat, vegetables, food products, leather and textiles)[9]. The percentage of agriculture and livestock products in China is 8.06 % though it is the largest export value country. The percentage in Japan shows 34/36%. Countries which Agriculture and livestock products ratio over 50% in the export value are Italy (99.89%), Germany (56.31%), France (67.46%), Australia (99.18%), Canada (63.79%), and others are North Korea, Finland, Turkey, Qatar, Belgium, Thailand, Vanuatu, Czech, Kuwait. China is the top of the export value in all commodities besides the ratio of agriculture and livestock products. The countries which are the second of China by commodity type are Russia, Germany, and Italy as for meat. For vegetables, they are North Korea, Japan, Korea, and as for food products, UAE, Russia, and Korea. Regarding the vegetable exports for Japan, it is supposed that the products are carrots, turnips and beets, according to the coding 0706[10] of International Merchandise Statistics. For leather, they are Italy, Hong Kong, Turkey, and as for textiles, Italy, United Kingdom and Japan.

[7] According to "Mongolian Statstical Inforamtion Service", agricultural and livestock products are defined as [Food products, Vegetable origin products, Textiles & textile articles, Live animals, animals origin products, Animal & vegetable fat & oil, raw & processed leather, fur and articles thereof]
[8] Mongolian Statistical Information Service
[9] Export value is under 10 thousand dollar is excluded.
[10] Coding No. 0706 refers to carrots, turnips, beets for salad, salsify, celeriac, Chinese radish, and other root vegetables (only

Table 2.2.2 Export Partners/ Export Values of Agriculture and Livestock Products

Export Partner	Product	Export Value (1,000 USD)	Total Export Value (1,000 USD)	Proportion of Export Value (%)	Total Proportion of Export Value (%)
China	Meat	10,030.69	314,019.52	0.26	8.06
	Vegetables	36,149.17		0.93	
	Food Products	12,614.99		0.32	
	Leather	23,484.19		0.60	
	Textiles	231,740.48		5.95	
Italy	Meat	1,919.17	43,353.95	4.42	99.89
	Leather	8,140.33		18.76	
	Textiles	33,294.45		76.71	
United Kingdom	Meat	0.79	13,757.44	0.00	4.08
	Leather	19.23		0.01	
	Textiles	13,737.42		4.07	
Russian Federation	Meat	6,121.72	8,785.38	7.96	11.43
	Vegetables	117.60		0.15	
	Food Products	635.58		0.83	
	Leather	22.27		0.03	
	Textiles	1,888.21		2.46	
Japan	Meat	1,256.30	6,978.96	6.18	34.36
	Vegetables	424.15		2.09	
	Food Products	29.66		0.15	
	Leather	104.97		0.52	
	Textiles	5,163.88		25.42	
Germany	Meat	3,549.11	6,088.15	32.83	56.31
	Food Products	5.92		0.05	
	Leather	17.56		0.16	
	Textiles	2,515.56		23.27	
France	Meat	1.00	4,950.51	0.01	67.46
	Leather	9.53		0.13	
	Textiles	4,939.98		67.32	
Korea, Rep.	Meat	43.46	3,059.57	0.07	0.07
	Vegetables	234.80		0.35	
	Food Products	271.25		0.41	
	Leather	199.34		0.30	
	Textiles	2,310.72		3.47	
India	Vegetables	279.74	2,931.05	7.37	7.37
	Leather	0.04		0.00	
	Textiles	2,651.27		69.82	
Switzerland	Meat	1,850.50	2,367.81	1.70	1.70
	Food Products	4.25		0.00	
	Leather	0.45		0.00	
	Textiles	512.61		0.47	
United Arab Emirates	Meat	128.30	1,736.85	0.87	11.78
	Food Products	1,589.33		10.78	
	Leather	0.02		0.00	
	Textiles	19.20		0.13	

fresh and chilled).

Export Partner	Product	Export Value (1,000 USD)	Total Export Value (1,000 USD)	Proportion of Export Value (%)	Total Proportion of Export Value (%)
Hong Kong, China	Meat	116.45	1,099.26	0.99	9.31
	Food Products	0.20		0.00	
	Leather	618.47		5.24	
	Textiles	364.14		3.08	
United States	Meat	72.70	1,089.31	0.39	5.82
	Food Products	18.57		0.10	
	Leather	41.07		0.22	
	Textiles	956.97		5.11	
Austria	Meat	401.66	1,038.99	38.34	99.18
	Food Products	4.77		0.46	
	Leather	0.55		0.05	
	Textiles	632.01		60.33	
Canada	Meat	1.00	1,038.89	0.06	63.79
	Leather	0.46		0.03	
	Textiles	1,037.43		63.70	
Korea, Dem. Rep.	Vegetables	691.84	691.84	100.00	100.00
Kazakhstan	Meat	171.33	655.68	8.30	31.76
	Food Products	46.32		2.24	
	Leather	163.67		7.93	
	Textiles	274.36		13.29	
Vietnam	Meat	98.10	455.21	2.08	9.67
	Food Products	248.02		5.27	
	Leather	109.09		2.32	
Finland	Leather	276.30	348.49	76.74	96.79
	Textiles	72.19		20.05	
Sweden	Meat	0.03	338.89	0.00	44.07
	Food Products	0.47		0.06	
	Leather	1.24		0.16	
	Textiles	337.15		43.85	
Turkey	Meat	0.25	331.58	0.06	79.14
	Leather	299.50		71.48	
	Textiles	31.83		7.60	
Qatar	Meat	328.47	328.47	100.00	100.00
Belgium	Textiles	254.77	254.77	73.28	73.28
Thailand	Leather	230.07	230.07	59.82	59.82
Spain	Meat	72.67	166.39	8.58	19.65
	Leather	1.60		0.19	
	Textiles	92.12		10.88	
Vanuatu	Food Products	143.46	143.46	100.00	100.00
Czech Republic	Textiles	130.85	130.85	65.82	65.82
Norway	Textiles	124.24	124.24	21.88	21.88
Kuwait	Meat	102.69	102.69	100.00	100.00

Source: Prepared by JICA Study Team based on WITS - World Integrated Trade Solution

The export value by commodities related to wool (textile) / leather products except for food products in agriculture and livestock products is shown. The highest value is Washed Cashmere, 197.18 million USD, and the value is 4.8 times as comparing to the second of Combed Cashmere. These export value is the most important export products and its value is largely exceeded the export volume of food products.

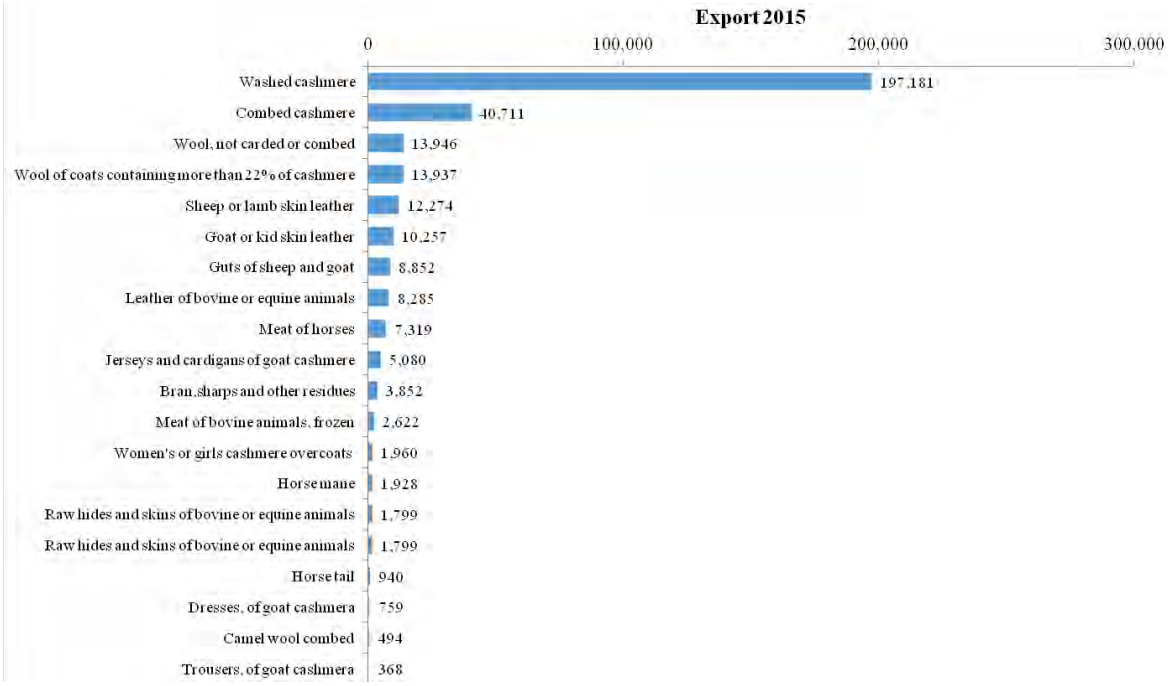


Figure 2.2.2 Export Values by Commodities (Unit: 1,000USD)

Source: Prepared by JICA Study Team based on the data from NSO "Statistical Yearbook 2015" and International Merchandise Trade Statistics

When products made of Mongolia are exported to Japan, it is necessary to submit the certification of origin to apply the tax rate of Economic Partnership Agreement (hereinafter "EPA")[11], regarding the Japan-Mongolia EPA taken effect on 7th June 2016. According to the Mongolian National Chamber of Commerce and Industry which is issued organization for the certification of origin, agriculture and livestock products which were obtained the certification of origin in Mongolia and exported to Japan were 14 items including wool/Cashmere products as of April 2017 (Table 2.2.4). As for the products applied EPA tax rate, other products are dairy products, other cheese, natural honey[12], processed beef, and pasta, but there is no example of exported products to obtain the certification of origin.

[11] Ministry of Economy, Trade and Industry (http://www.meti.go.jp/policy/trade_policy/epa/epa/mn)
[12] Natural honey was issued the certification of origin on May 2017.

Table 2.2.3 Commodities Exported to Japan Obtaining the Certification of Origin in Mongolia

Exported Products by Commodities
Wool, Cashmere products
Carpet
Cashmere products
Combing hair
Beer
Felt bag, Slipper
Yak wool products
Camel wool and Cashmere
Seep casing in salt
Livestock by products
Pine nut oil
Middle size ger[13]
Dried horse liver
Horse meat

Source: Prepared by JICA Study Team based on the data from the MNCCI

Figure 2.2.3 shows work flow of cashmere processing which are the most important commodities in the exported agriculture and livestock products.

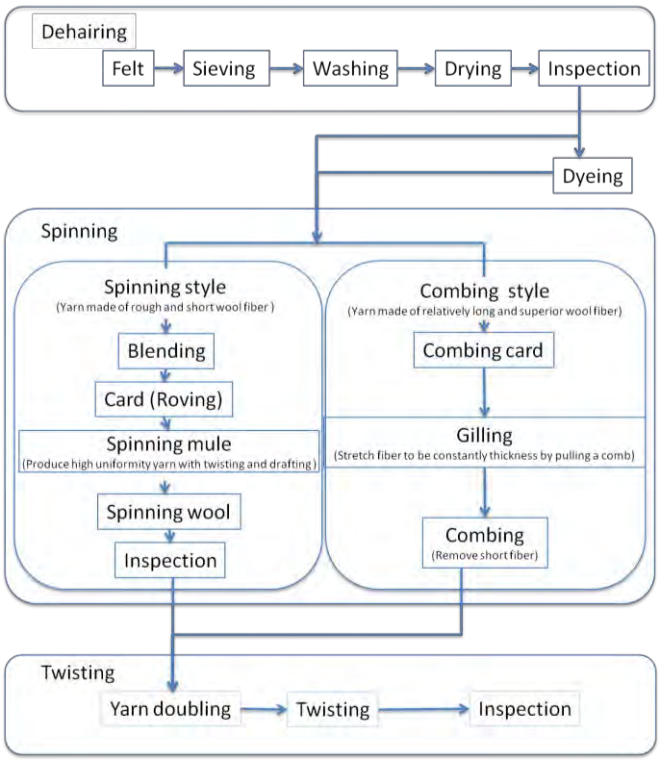


Figure 2.2.3 Flow Chart of Cashmere Processing

Source: Prepared by JICA Study Team

[13] Ger is included because it is mainly made of sheep wool felt

As for the cashmere oriented exported products shown the exported value by commodities in the figure 2.2.2, the highest exported value is Washed Cashmere (refer to the above figure "washing wool"), and the next is Combed Cashmere (refer to the above figure "combing card"), and most of the export partner is Italy[14] (Figure 2.2.4, Combed goat down). In the above work flow of cashmere processing, it is shown the cashmere through combing process at the middle and right side of the figure, original yarn/thread is relatively long and quality wool fiber. Combed wool can be produced thin yarn so that it is used to produce fancy suits and so on. The value of commodities is 1.5 times of China. The value-added is dramatically appreciated through the combed process.

Raw materials (Washed Cashmere, refer to the above work flow of cashmere process, dehairing process) are exported to China are to use for sweater and cardigan.

Most of the high value-added products primary processed, such as combing cashmere export to Europe, Italy and it has high competitiveness. Establishment of agro-value chain through exporting is able to add more value in order to provide primary processing products and secondary processing products of material, even though they are not final products.

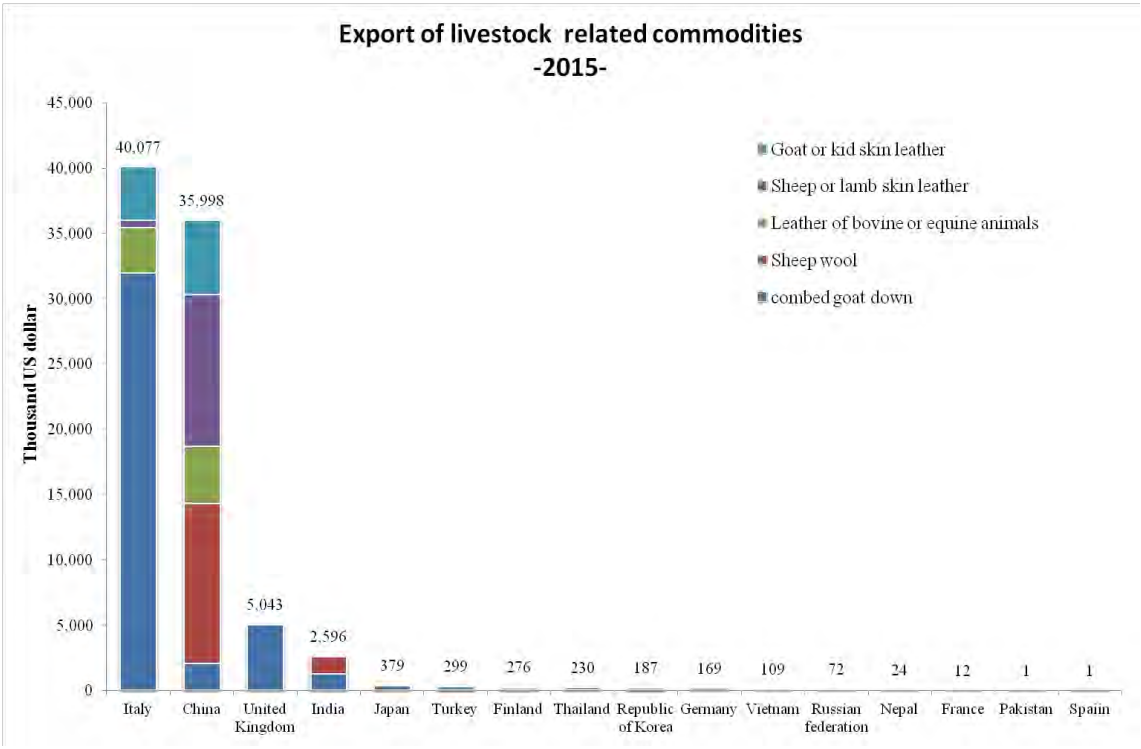


Figure2.2.4 Export Volume of Livestock Related Products by Countries and Commodities (Exclude Washed Cashmere)

Source: Prepared by JICA Study Team based on the data of NSO "Statistical Yearbook 2015" and International Merchandise Trade Statistics

[14] NSO Monthly Bulletin of Statistics(2016/12)

Wool and cashmere are mainly used as raw materials for clothing. China deals with 90% of the world market[15]. Most of the raw cashmere wool prepared in China is exported to Italy.

Most of the exporting countries of wool and cashmere-related items in Mongolia are targeted at China. Few of women's or girls cashmere overcoats, combed cashmere, and camel combed wool are exported to China. Women's or girls' cashmere overcoats are mostly exported to England, France and Canada. Combed cashmere is mostly exported to Italy, and camel combed wool is exported to Germany and Italy. Raw materials are exported to China, and materials after primary processing and final products are exported to Europe. The variety of export partners can be expanded by primary processing of raw materials and developing final products for target markets. Therefore, it is important to introduce technologies of primary processing (such as washing and dehairing) and secondary processing (dyeing, spinning, combing) and to develop products for a defined market for the development of agro-value chain.

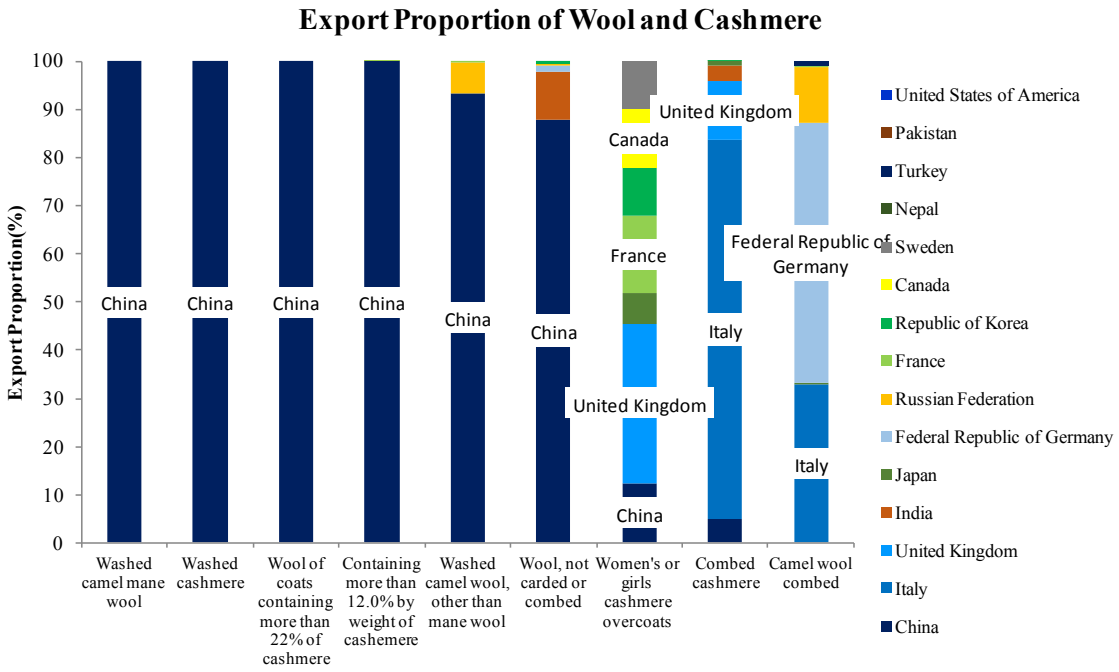


Figure 2.2.5 Export Volume of Wool and Cashmere by Countries

Source: Prepared by JICA Study Team based on the data of NSO "Statistical Yearbook 2015" and International Merchandise Trade Statistics

Meat is mainly exported to Russia and Kazakhstan. This is due to the production system during the socialist era. Exports of beef are mostly for Russia, mutton, and goat for Kazakhstan and horse meat is for Russia and China. In spite of the large demand for meat in China, exports of beef and mutton were restricted due to murrains such as FMD which occurred in the western region of Mongolia. The intestines of mutton and goat are exported to Germany, Italy and Switzerland. They are used for the casing of sausages and also exported to Japan.

Considering that meat is supposed to be exported to Iran and Viet Nam 2017, the export volume is expected to expand[16]

[15] "Asian Industrial Infrastructure Reinforcement Project" report (2017), SELC Corporation
[16] Mongoru Tsuushin No.615, 616, published on July 6th 2017

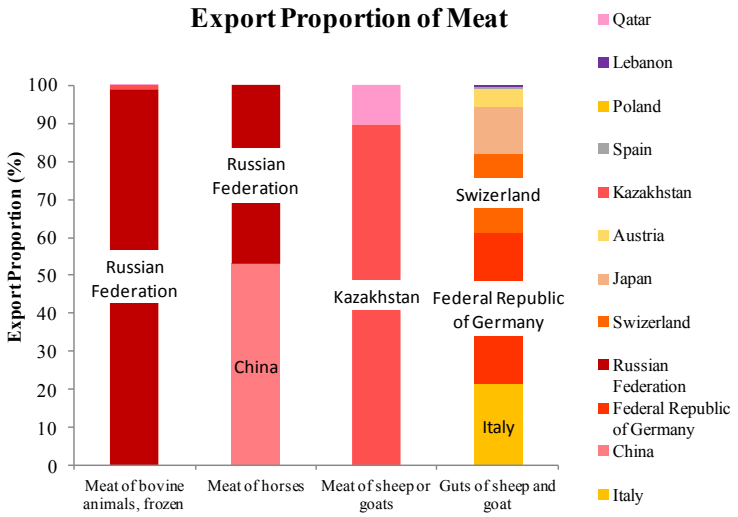


Figure 2.2.6 Export Volume of Meat by Countries

Source: Prepared by JICA Study Team based on the data of NSO "Statistical Yearbook 2015" and International Merchandise Trade Statistics

As for leathers, raw hides and skins of cattle and horse and tanned leathers of sheep are mainly exported to China. Most tanned pelts and hides of goats, cattle and horses are for China and Italy. They are used as raw materials or clothing.

Figure 2.2.7 Export Volume of Leathers by Countries

Source: Prepared by JICA Study Team based on the data of NSO "Statistical Yearbook 2015" and International Merchandise Trade Statistics

2.3 Medium and Long Term Policy for Agriculture and Livestock Sector

2.3.1 Agriculture and Livestock Policy

2.3.1.1 Law on Development Policy and Planning

" Law on Development Policy and Planning" ,approved by Parliament in December 2015, determines the stages of planning, implementation, monitoring and evaluation of the development policy of Mongolia, for the purpose of setting out guiding principles, to outline rights, duties, and responsibilities of the engaged parties and to build up a unified development policy planning system.

The development policy is classified and composed as following.

Table 2.3.1 Composition of the Law on Development Policy and Planning

Classification	Terms	Component
Long term	15-20 years	・ Development Concept of Mongolia
Mid-term	8-10 years	・ State Policy ・ Regionalized Development Policy ・ Development Vision for provinces and the Capital city
	3-5 years	・ Government Action Plan ・ Action Program 2016-2020 ・ National Programme and Sub-programme ・ Public Investment Program
Short term	1 year	・ State General Guideline for Socio-Economic Development ・ General Guideline for Socio-Economic Development for Provinces, Capital City, and Districts ・ State and local budgets planned in Conformity with the General Guidelines ・ Development Policy Documents approved by the Government of Mongolia

"Regionalized Development Policy" which is classified for a mid-term period (8 to 10 years) aims for the acceleration of economic and social development and for narrowing gaps between provinces and regions on the basis of the optimal use of raw products of agricultural origin. Development of agriculture and livestock sector is the key to the regional development.

National Development Agency (hereinafter "NDA") compiles the Law on Development Policy and Planning as an action plan, and establishes/updates the integrated data base. The duty of NDA is to develop the comprehensive development policy, to determine economic priority fields and promote sector development, to formulate the rationalized development policy, to plan the main strategy for foreign investment policy and to implement general actions to attract and promote direct investments in Mongolia.

2.3.1.2 Mongolian Sustainable Development Vision 2030

"Sustainable Development Vision 2030" (hereinafter "SDV2030"), approved by Parliament in February 2016 is defined as a long term national development vision at higher levels based on the Law on Development Policy and Planning. SDV2030 is composed of 4 sections, which are "Sustainable Economic Development", "Sustainable Social Development", "Sustainable Natural Environmental Development", and "Sustainable Development of Governance", and it is aimed to diversify the economic structure. The Sustainable Economic Development is composed of 7 sectors.

1) Agriculture and Livestock[17]
2) Tourism
3) Industry
4) Mining
5) Energy and Infrastructure
6) Macroeconomic policy
7) Favorable Business Environment

Agriculture and livestock sector is the top priority of the SDV2030, and it means that agriculture and livestock development is focused for the diversification of the economy. Development goals related to agriculture and livestock sector in SDV2030 are sorted out as following.

Table 2.3.2 Development Goals related to Agriculture and Livestock Sector

Sector	Development Goal
Agriculture and Livestock	・ Strengthening of competitiveness to adopt international standards ・ Reconstruction of supply network ・ Introduction of intensive agricultural technology ・ Support for small-medium scale agricultural enterprises
Industry	・ Factories of raw materials of agriculture and livestock products ・ Support food processing industry
Infrastructure	・ Development of logistics network
Business environment	・ lamination of trading service

The development goals related to agriculture and livestock are involved not only in agriculture and livestock sector but also in other sectors such as industrial and infrastructure sectors. Especially, supports for raw material processing and food products processing for industry sectors are important development objectives to increase value-addition in agriculture and livestock products in order to re-establish the agro-value chain. Establishment of the supply chain[18] is important to collect effectively the agriculture and livestock products at random in local areas. It is necessary for the establishment of agriculture and livestock value chain to cooperate agriculture and livestock sector with other sectors based on the long-term national development vision in Mongolia.

The detailed development objectives related to agriculture and livestock sector described in SDV2030 are as follows.

[17] Though it is written "Agriculture" in the original text, it contains contents related to livestock sector, thus referred as "Agriculture and Livestock sector" in the report.
[18] A network with its major distribution function that connects each stage through production, manufacturing/processing and sales.

Agriculture and Livestock sector

Objective 1: Preserve the genetic resources and resilience of pastoral livestock breeding that is adept to climate change, increase productivities; to create proper flock structure of livestock in line with grazing capacity, reduce the grazing, land deterioration and rehabilitation, to adopt international standards in animal disease traceability, inspection and monitoring, and to develop livestock sector that is competitive in international markets.

Phase 1(2016-2020)	Ensure appropriate numbers and flock structure in the total livestock, have no less than 10 percent of Mongolia's territory as disease free, for trade and quarantine, confirmed by the World Organization for Animal Health, develop veterinary services that are compliant with animal health standards for the export of livestock and livestock products to the neighbouring countries, and improve the national veterinary system.
Phase 2(2021-2025)	Ensure appropriate numbers and flock structure in the total livestock, have no less than 30 percent of Mongolia's territory as disease free, for trade and quarantine, confirmed by the World Organization for Animal Health, increase opportunities to export livestock and livestock products, improve the national veterinary system, to be line with the international benchmarks.
Phase 3 (2026-2030)	Ensure appropriate numbers and flock structure in the total livestock, have no less than 60 percent of Mongolia's territory as disease free, for trade and quarantine, confirmed by the World Organization for Animal Health, increase opportunities to export livestock and livestock products, improve the national veterinary system to meet international standards.

Objective 2: Develop intensive livestock farming based on the population concentration and market demands; increase the manufacture of meat and milk products; and develop the supply, storage, and transportation network for raw materials and raw products

Phase 1 (2016-2020)	Increase the share of animals and livestock having 'high output potential' in the total animal and livestock population to 3 percent, increase the head of pure breed cattle to hundred thousand in intensive livestock farming, increase the number of pigs and chicken in livestock, reduce imports of livestock products, and establish the supply, storage and transportation of raw materials and goods at the aimag (province) and soum (district) levels.
Phase 2 (2021-2025)	Increase the share of animals and livestock 'having high output potential' in the total animal and livestock population to five percent, increase the pure breed cattle heads to 150 thousand in intensive livestock farming, increase the number of pigs and chicken livestock farming, reduce imports of livestock products, and develop the supply, storage and transportation network of raw materials and goods at the aimag (province) and soum (district) levels.
Phase3 (2026-2030)	Increase the share of animal and livestock 'having high output potential' in the total animal and livestock population to eight percent, increase the pure breed cattle heads to 200 thousand in intensive livestock farming, increase the number of pig and chicken farming, and reduce imports and develop national supply, storage and transportation network of raw materials and goods.

Objective 3: Increase the fertility of soil, reduce land deterioration, adopt economical and efficient advanced agro-technical and irrigation technology to repair soil, and develop intensified farming in order to meet the domestic demand for grains, potato and vegetables.

Phase1 (2016-2020)	Increase the use rate of zero-tillage farming technology to 70 percent in grain fields, adopt new and efficient irrigation technologies, increase the area of irrigated arable land to 65 thousand hectares, increase the supply of fertilizer demand to 50 percent, raise the supply of high quality local seeds to 75 percent, increase the fertility of farmlands, and reduce soil degradation and erosion.
Phase2 (2021-2025)	Increase the use rate of zero-tillage farming technology to 80 percent in grain fields, adopt new and efficient irrigation technologies, increase the area of irrigated arable lands to 100 thousand hectares, increase the supply of fertilizer demand to 70 percent, raise the supply of high quality local seeds to 90 percent, increase the fertility of farmlands, and reduce soil degradation and erosion.
Phase3 (2026-2030)	Increase the use rate of zero-tillage farming technology to 90 percent in grain fields, adopt new and efficient irrigation technology, increase the area of irrigated arable land to 120 thousand hectares, increase the fertilizers demand to 100 percent, raise the supply of high quality local seeds to 100 percent, increase the fertility of farmlands, and reduce soil degradation and erosion.

Objective 4: Support the business and economics of herders and herder groups, and small and medium sized farmers; provide modern techniques, technologies and electricity; and create a financial, economic and legal environment for sustainable production.

Phase1 (2016-2020)	Provide up to 50 percent of herders and farmers with electricity, techniques and technologies capable of supporting household businesses, and support them financially through leasing, concessional loans and other financial instruments.
Phase2 (2021-2025)	Provide up to 75 percent of the herders and farmers with electricity, techniques and technologies capable of supporting household businesses, support them financially through leasing, concessional loans and other financial instruments, and create a prudent system for herders and farmers to supply their products to the markets.
Phase3 (2026-2030)	Herders and farmers would have a permanent business income.

Industrial sector

Objective 1: Develop the industrial sector based on advanced methods, technology and innovations, and increase productivity.

Phase1 (2016-2020)	Increase the share of production and processing sector in total exports to up to 15 percent, improve the agricultural products exchange network, develop export-oriented processing industry clusters that deploy advanced technologies, and increase the share of processed products in leather, wool and cashmere to up to 60 percent in the total raw material produced.
Phase2 (2021-2025)	Increase the share of production of the production and processing sectors in total exports to up to 25 percent, develop export-oriented processing industry clusters that deploy advanced technologies to increase productivity, and increase the share of processed products in leather, wool and cashmere to up to 70 percent in the total raw material produced.
Phase3 (2026-2030)	Develop export-oriented processing industry clusters that deploy advanced technologies, and increase the share of processed products in leather, wool and cashmere up to 80 percent in the total raw material produced.

Objective 2: Introduce advanced technology in the food industry, improve the competitiveness, increase domestic supply in main food products, and ensure that citizens are supplied with healthy and safe food products.

Phase1 (2016-2020)	Ensure full supply of grains, potatoes and vegetables from domestic production, develop agriculture, and food processing industry clusters in cities and urban settlements, and ensure that the domestic production meets at least 30 percent of the meat demand and 40 percent of the milk demand in the country.
Phase2 (2021-2025)	Provide healthy and safe food products to the population; introduce advanced technologies, export "Mongol brand" food products to the international markets, and ensure that the domestic production meets at least 50 percent of the meat demand and 60 percent of the milk demand in the country
Phase3 (2026-2030)	Provide healthy and safe food products to the population, diversify the export of "Mongolian brand" food products in the international markets, and ensure that the domestic production meets at least 70 percent of the meat demand and 80 percent of the milk demand in the country.

Energy and Infrastructure sector

Objective 3: Expand and develop roads and transportation logistics network to enable economic growth.

Phase1 (2016-2020)	Build transportation and logistics centers at Zamiin-Uud, Khushigiin Khundii and Altanbulag, extend asphalt roads for international and domestic travels by 1600 km, build and use the railroad from Ukhaa Khudag to Gashuun Sukhait, initiate construction of railroads from Erdenet-Ovoot to Bogd khaan, and develop transit transportation.
Phase2 (2021-2025)	Build and use transportation and logistics centers to serve the agricultural, industrial and mining sectors, develop new forms of transportation; extend the domestic asphalt roads length by 800 km, complete the construction of railroads from Erdenet - Ovoot to Bogd khaan, and initiate the railroad construction work in the regions.
Phase3 (2026-2030)	Develop new transportation and logistics centers, extend asphalt roads for international and domestic travels by another 470 Km, and complete the construction of railroads in the regions.

Establishment of Business Environment sector

Objective 1: Improve trade and services, develop transportation and logistics network of import and export goods, simplify the system for special license issuance, digitalize and improve tax payments and state registration systems, and establish a favorable business environment.

Phase1 (2016-2020)	Develop trade and services infrastructure, coordinate the activities of the border control organizations and reduce the number of days for foreign trade /exports/ to 25 days, and decrease the costs and expenses related to trading and related activities.
Phase2 (2021-2025)	Simplify the system for special license issuance, digitalize and improve tax payments and state registration systems, reduce the number of days for foreign trade /exports/ to 18 days, and decrease the costs and expenses related to trading and related activities.
Phase3 (2026-2030)	Develop infrastructure and logistics networks of trade and services to improve competitiveness of export goods, reduce transportation costs and expenses of imported goods, reduce the number of days for foreign trade /exports/ to 25 days, and decrease the costs and expenses of trading and related activities.

2.3.1.3 Action Program 2016-2020

The Action Program 2016-2020 was approved by Parliament in August 2016 and consists of (1) Special policy to overcome economic difficulties, (2) Policy to Ensure Sustainable Economic Growth, (3) Social policy, (4) Policy on Environment and Green Growth, and (5) Policy on Governance. Among these policies, activities related to the development of food, agriculture, and light industry are included in the (2) Policy to Ensure Sustainable Economic Growth, and major measures to be implemented are "Healthy Food-Healthy Mongolian", "Industrialization 21:100" program, "First Meat and Milk Campaign", and "Third Crop Rehabilitation Campaign". Apart from the "Third Crop Rehabilitation Campaign", the other programs are newly launched.

The Action Program 2016-2020 is based on the mid-term policies i.e. "State Policy on Food and Agriculture", "The State Policy towards Herders", and "State Industrial Policy". The outlines of the policies are as below.

Table 2.3.3 Outline of State Policies related to Agriculture and Livestock Sector

State Policies	Outline
State Policy on Food and Agriculture	The "State Policy on Food and Agriculture", approved by Parliament in November 2015, is directed towards increasing productivity of manufacturing which improves the competitiveness of the food and agriculture sector. The policy upholds the following six principles: 1) Supply nutritious and safe food evenly to the population 2) Build capacity of the personnel sustainably 3) Base production on research and development 4) Endorse and protect investment 5) Develop production through a value chain and increase competitiveness 6) Aim towards decreasing risks
Government Policy on Herders	The "Government Policy on Herders", approved by Parliament in 2009, aims to improve the living environments and living standards of herders. The policy sets up the following principles: 1) Increase employment of herders and improve their health and social security 2) Improve livestock production techniques of herders 3) Encourage organization of herders' cooperatives 4) Improve the traditional extensive livestock production and support intensive livestock farming 5) Develop comfortable living conditions for herders 6) Manage the livestock business in a risk-free and guaranteed mode
State Industrial Policy	The "State Industrial Policy", approved in August 2016, aims to create the industrialization and service with advanced techniques, high technology and competitiveness and to develop the industrial sector as the priority sector that provides the sustainable development of Mongolia. The principles of the policy are as follows: 1) Manage healthy, safe and environmentally friendly manufacturing 2) Support manufacturing of the export-oriented, import-substitutive and competitive products that assures the national and international standards 3) Develop economic efficient manufacturing based on the advanced techniques, high technology and innovation 4) Be based on effective state, science and business collaboration 5) Provide equality and fair competition to stakeholders of industrial sectors 6) Formulate a Strategy for diversification of manufactured products by researching industrial productivity and competitiveness

Source: The Resolution of the Mongolian Parliament Number 104(2015), Website of Ministry of Foreign Affairs of Mongolia, Ministry of Industry

Following the Action Program 2016-2020, MOFALI implements various programs and campaigns. The relationship matrix of the implementations is illustrated in the Figure below.

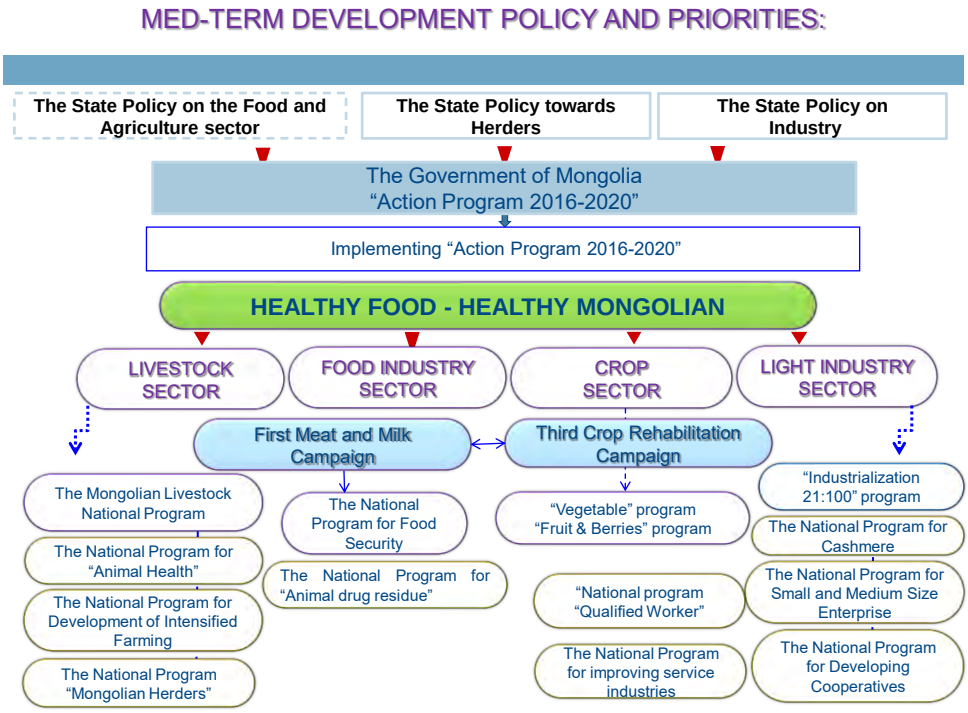


Figure 2.3.1 Relationships of Policies in Agriculture and Livestock Sector

Source: Revised by JICA Study Team based on presentation slides from MOFALI

Regarding the Action Program 2016-2020, MOFALI set up the overall goal as "Healthy Food – Health Mongolian" for the various campaigns and programs to be implemented. The aim is to create an environment for Mongolian citizen to consume healthy and safe food and improve food safety through the establishment of food preparation, processing, storage, transportation, and sales system. It is also acknowledged that the establishment of an integrated registration and electronic information system for food safety is instrumental to ensure food security and nutrition.

According to the Action Program, various programs are implemented which can be classified into four categories: "Livestock", "Agriculture", "Food Industry", and "Light Industry". The outlines of major programs are described below.

(1) Mongolian Livestock National Program

The objective of this program is to establish a sustainable livestock sector in environmental and economic aspects through increasing competitiveness of the livestock industry in the market economy. It also aims to supply safe and healthy food, and to promote exports by livestock processing. The first phase was in operation from 2010 to 2015, and the second phase (2016-2021) is currently in place. During the first phase, 67.8% of the total plan was achieved. The progress of the first phase is shown in the table below. The financial resources were initially within 3 percent of the government budget, but in recent years the framework has been removed. There are no specific budget quotas at the moment. The Department of Livestock Policy Implementation and Coordination of MOFALI is in charge of the program.

Table 2.3.4 Progress and Future Challenges of the Mongolian Livestock National Program

Activities	Implementation Rate	Future Challenges
Rationalization in developing legislations of the livestock sector. Renovation of structures and organizations	74%	Laws on "Livestock Health", "Livestock Gene Pool", and "Promoting Animal Husbandry Development" are yet to be established. The first two laws are already submitted to Parliament in 2017.
Improvement of livestock and livestock products	74.3%	There are delays in improving artificial breeding technologies and procrastination of establishing animal breeding branches in particular regions. Although genetic funding facilities have been built in Darkhan, preparations of equipment and human resource development are not addressed yet.
Maintenance of livestock health	-	According to the new law, the country is to directly connect with the veterinarian department in provinces. The law will be renamed to "Law on Livestock Health" and will be able to manage a wider range of things (such as products, drugs, financing, and meadow payments).
Strengthen adaptability to climate changes and reduce risks	60.5%	It has not achieved the goals of increase in animal forage production. Pastureland management is insufficient (vegetation management, devastation due to underground resource development and excess use, etc).
Improvement of systems for preparation and distribution of raw livestock materials	72.6%	Reestablishment of systems is difficult due to the situations of direct sales of herders to middlemen. Moreover, lacking in storages and human resources also exists.

(2) Third Crop Rehabilitation Campaign

The campaign aims to promote intensive farming, supply safety and healthy foods to citizens, and improve the self-sufficiency of agricultural products. The campaign corresponds to the third[19] campaign of the "Atari" (virgin lands)[20] programs conducted from the socialist era. At first, the third campaign was planned to end in 2010, but the continuation was decided by the government in January 2017. Though the implementation period has not been set, it should be continued until 2020 as it is one of the mid-term policies. The "Fruit and Vegetable Program" is one of the activities in the campaign. At present, there are no actual achievements. A budget of 72.1 billion MNT has been allocated for three years. The Department of Crop Production Policy Implementation and Coordination of MOFALI is in charge of the campaign.

[19] The first campaign was from 1959-1965, the second was from 1976-1988, and the third was planned to be from 2008-2010.
[20] The word "Atari" means virgin lands, but nowadays it also includes the meaning of abandoned agricultural lands.

(3) First Meat and Milk Campaign

The objective of this campaign is to reduce seasonal dependence of meat and dairy products and stably provide healthy and safe food to the citizens. The campaign promotes intensive livestock farming, establishes a supply system of livestock products, improves processing technologies, and promotes domestic consumption and exports to overseas. As results of the activities, 4,000 tons of mutton was exported to Iran in July 2017. A budget of one billion MNT has been authorized. The Department of Food Production Policy Implementation and Coordination is in charge of the campaign.

(4) "Industrialization 21:100" program

This program plans to establish 100 factories related to agricultural and processed products in 21 provinces with the aim of local development and supports to domestic companies. Further goals are to revitalize local economies by decentralization of production areas and to promote import substitution products and exports to overseas. More than 20 meetings have been held, and now the work is finished at the officials level, awaiting the approval of the minister. The Department of Coordination of Light Industrial Policy Implementation is in charge of the program.

In association with the "Industrialization 21:100" program, the Department of Coordination of Light Industrial Policy Implementation has created a conceptual diagram of agro-value chain as illustrated in Figure 2.3.2 and Figure 2.3.3. As for Figure 2.3.2, it shows the flow of each process in the agro-value chain by products. Figure 2.3.3 illustrates the functions of the gateways (points that link each process in the value chain) of shipping raw materials and distribution system. These diagrams are in the middle of creations, thus it is to be updated when necessary.

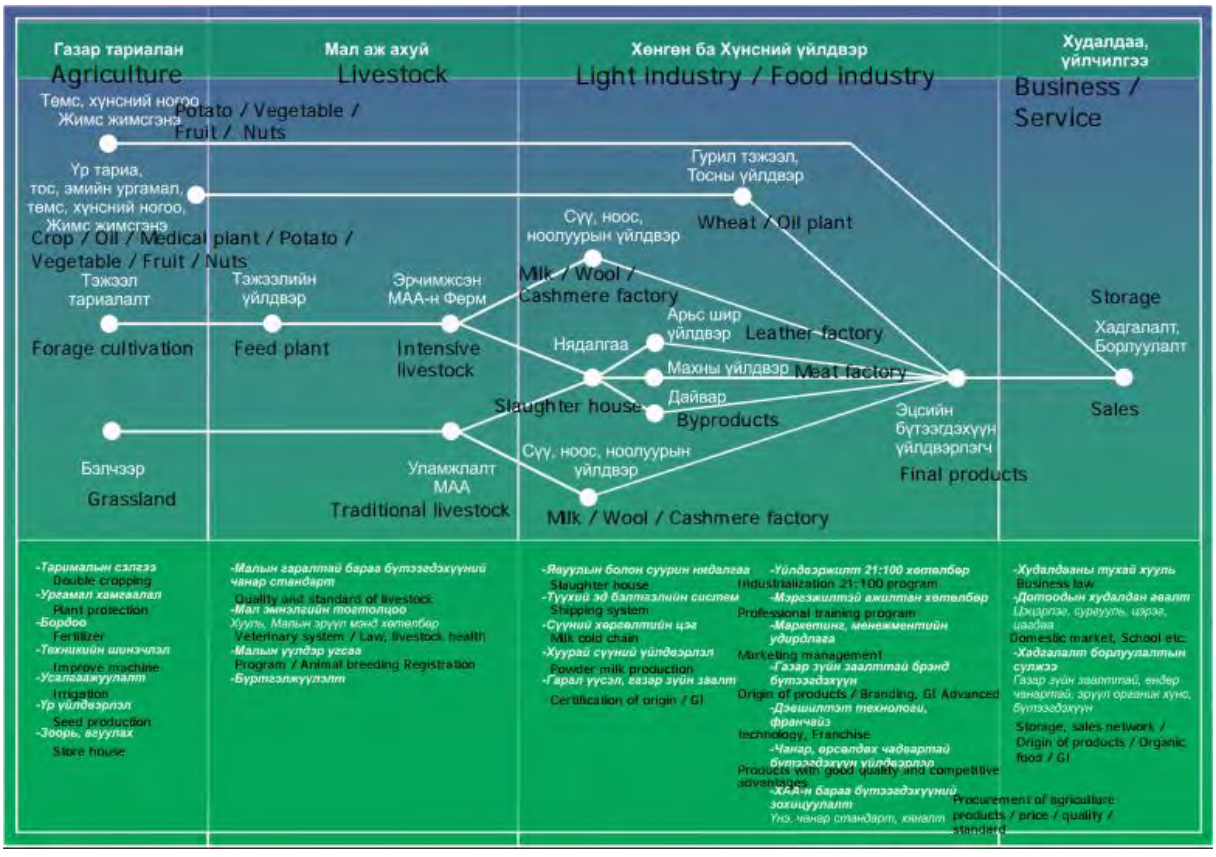


Figure 2.3.2 Process of Agro-Value Chain by Products

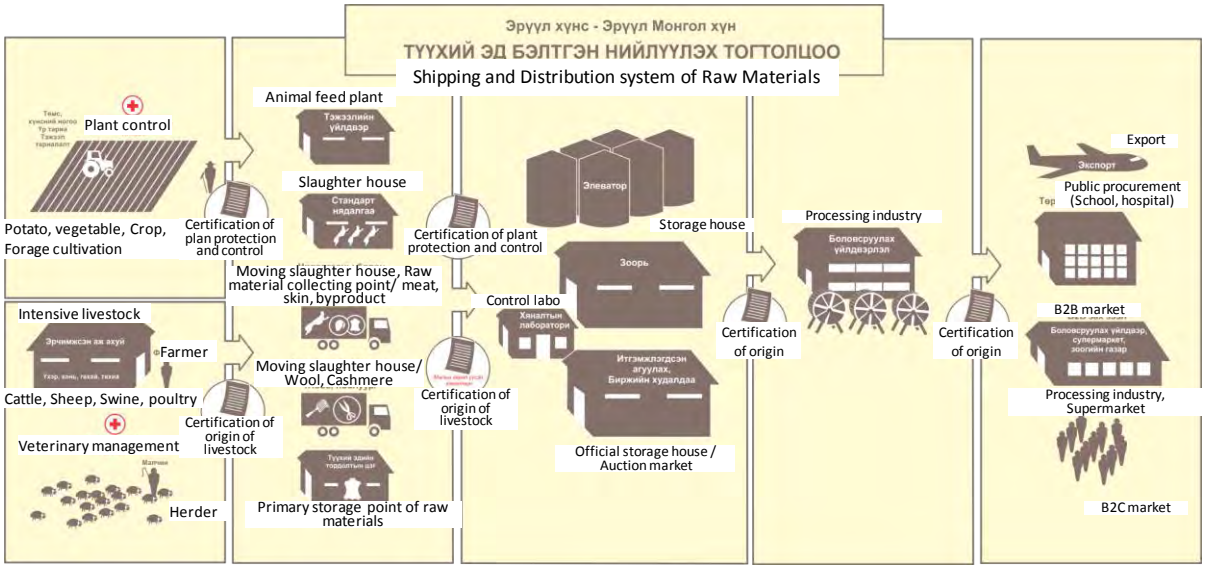


Figure 2.3.3 Diagram of Shipping Raw Materials and Distribution System

Based on these campaigns and programs, MOFALI has set up objectives for mid-term policies in the "Livestock", "Agriculture", "Food Industry", and "Light Industry" sectors, as shown in Table 2.3.5 to Table 2.3.8.

Table 2.3.5 Medium and Long Term Policy for Livestock Sector

Policy	Contents
Long term	・ Sustainable animal genetic resources and proper herd structure ・ Selecting and breeding of animals meeting market demands and improvement of productivity ・ Strengthen adaptability to climate change and reduce risks ・ Improve water supply, pasture recovery, and animal forage ・ Prevent and control highly contagious diseases and developing strategy to select areas to have disease free zone ・ Confirming disease free or eradication of disease status in selected areas and keeping the disease free status and increasing meat export
Mid-term	・ Improve livestock productivity and economic benefits, introduce high technology and innovation, and accelerate the implementation of Mongolian Livestock National Program ・ Implement programs such as "State Policy towards Herders", " Mongolian Herder", and "Increase Livestock" ・ Support the export of meat and meat processed products by an effective collaboration of traditional and intensive livestock farming and agriculture. Increase the export volume to 50 thousand tons per year and raise herder household's income. ・ Provide retraining for livestock experts, study and introduce international best practices on livestock farming, and implement programs to "provide knowledge and information to herders". ・ Support livestock producers with soft loan, investment, insurance and flexible tax policy to protect them from price fluctuations of raw materials. Expand the coverage of the animal husbandry development fund in order to reduce burdens of herders, and ensure income and livelihood of herders. ・ Develop livestock registration system, improve quality standards for preparation of raw livestock products, and introduce origin identification system. ・ Include herders in the housing program and take action to resolve their social issues. ・ Bring the current veterinary structure to the international standards, ensure its expeditious and integrated action, take actions to prevent from contagious and high-risk zoonotic disease and implement a strategy to control and fight these risks along the border points, and enhance the possibility to export raw materials and products originating from livestock. ・ Improve the quality of animal husbandry, increase its productivity and output, protect the gene pool, conduct artificial selections based on scientific methods, introduce biotechnological innovations, create new breeds and improve the capacity of local livestock breeding units. ・ Provide loans to support activities to establish regional livestock fodder factories and increase safe reserves of fodder. ・ Construct wells and water holes and water reservoirs at pasture lands to increase water supply for rural citizens and livestock and improve management of water use. ・ Improve pastureland usage and its protection, define its conditions, conduct monitoring, rehabilitation, and prevent degradation and desertification. Increase herders' involvement in addressing issues of rodents and insects that cause damage to pasturelands, and use eco-friendly, advanced methods. ・ Create favorable legislative environment by developing and adopting laws on Livestock Gene Pool, on Livestock Health, and on Promoting Animal Husbandry Development aimed at ensuring the sustainable development of livestock sector. ・ Acquire and develop traditional livestock farming methods and knowledge, ensure appropriate ratio of the number, species, and composition of herds of livestock. Implement a program on animal husbandry development by species in the aim of developing intensive farming.

Table 2.3.6 Medium and Long Term Policy on Agriculture Sector

Policy	Contents
Long term	・ Identify areas of crop farming and put farmland usage to full economic circulation ・ Improve farmland utility in the central region, and reuse virgin lands in the western and southern regions ・ Introduce no-tillage technology to prevent soil from wind and water erosion ・ Supply seeds that are produced domestically, adapted to soil and climate characteristics in the area. Promote rebuilding the crop variety and seed system. ・ Establish advanced technology park, build network of maintenance, provide service system ・ Improve irrigation system to reserve surface water, snow and rain water, and to increase irrigated crop lands. ・ Introduce advanced technology of environmentally friendly irrigation system for potatoes, vegetables, and fruits production ・ Implement comprehensive chemical fertilizer and plant protection methods and improve monitoring capacity ・ Increase fruits production and varieties ・ Supply and produce seed of barley, potatoes, vegetables, and oil seeds for domestic needs, and to develop them for export ・ Supply fodder for all kinds of intensive livestock farming ・ Supply fresh vegetables throughout the year to people living in urban areas, develop modern green house for winter and summer, and develop storage technology
Mid-term	・ Improve utilization of cultivated lands, identify regions for intensive agriculture and livestock farming, and meet the self-sufficiency ratio for barley, potatoes, and vegetables to 100 percent, and livestock fodder to 50 percent. ・ Supply the population with nutritious fruits and berries by increasing their varieties and production, establish a consolidated sea-buckthorn production network and increase the export revenues. ・ Increase per hectare of crop yield through comprehensive industrial development on soil yield and plant seed protection, and improving the quality and variety of seeds. ・ Develop comprehensive plant protection measures and prevent crop land from soil erosion and degradation, and introduce gradually the zero tillage technology, suitable crop rotation and improve the soil fertility. ・ Construct new and renovate existing irrigation systems based upon hydro survey and research, and promote the introduction of advanced irrigation technologies, and increase annually the size of irrigated land. ・ Develop a model green house complex for winter and summer, and sustainable supply urban citizens with fresh vegetables. ・ Promote utilization of advanced agricultural technologies, equipment, fertilizers and agricultural chemicals by taxation policy and financial leasing methods. ・ Increase storage, warehouse, and grain elevator and barnyard capacities and provide support for setting up a comprehensive system for storing and marketing. ・ Create a legal environment for agricultural insurance.

Table 2.3.7 Medium and Long Term Policy on Food Processing Industry

Policy	Contents
Long term	・ Process raw materials using traditional techniques and high technologies, and ensure food security, and supply nutritious food to the citizens stably. ・ Supply the citizens evenly with healthy, safety, nutritious food ・ Reduce seasonal dependency for raw material procurement to food manufacturing, encourage food production to substitute import ・ Increase the production of processed meat and milk products made at factories ・ Ensure food security through strengthening registration, quality supervision and control and to develop logistic network ・ Improve knowledge, education on food
Mid-term	・ Ensure the supply of healthy and safe food products to the citizens by implementing the "First Meat and Milk Campaign", to stabilize the food provision and reduce the seasonal dependence of strategic food stock. ・ Increase the competitiveness of the food production and create the opportunity to export value-added products. ・ Create a legal environment for organic and functional food and support their production through financial, investment and tax policy. ・ Support establishments of small and medium-sized food processing pilot factories equipped with advanced technologies that meet the needs of the capital, provinces, and districts. ・ Establish an integrated registration and electronic information system for food safety. ・ Create conditions that enable citizens to consume healthy and safe food. Improve food safety through the establishment of food preparation, processing, storage, transportation, and sales system. ・ Increase the variety of domestic food production and implement sub programs such as poultry, pig farming, beekeeping and fisheries to increase the supply of products and their availability.

Table 2.3.8 Medium and Long Term Policy on Light Industry

Policy	Contents
Long term	・ Implement the "Industrialization 21:100" program and create priority export-oriented sectors to substitute imports ・ Create a system for sustainable for transportation and processing of raw materials such as wool, cashmere, and leathers in order to secure a sustainable supply to domestic factories, and set up a raw material fund. ・ Support the establishment of the light industrial park, promoting collaboration among the manufacturers and registering clusters through policies. ・ Increase the variety and volume of raw materials and goods trade at Agricultural Commodity Exchange and upgrade its operations. ・ Promote putting up "development model" factories in light industry, small and medium-sized enterprises through franchising and adapting foreign industries with advanced technologies.
Mid-term	・ Implement the "Industrialization 21:100" program and create favourable taxation, legal and business environment for priority export-oriented sectors to substitute imports as well as for small and medium-sized enterprises, cooperatives, trade and services and increase the share of the value-added products in the GDP. ・ Create a legal environment to regulate commodity for agricultural products and manufactured goods. ・ Implement flexible long-term investment and financial/loan policy for light industry, small and medium-sized enterprises and cooperatives. ・ Create a system for stacking and transporting wool, cashmere, and leathers in order to secure a sustainable supply to national industries and set up a raw materials reserve. ・ Promote the development of trade and manufacturing at both the international trade zones and the border port areas of the neighboring countries ・ Develop human resources for light industry and small and medium-sized enterprises, implement a "Qualified Worker" program through the development of training and re-training system ・ Support setting up information and incubator centers in collaboration with relevant professional associations to provide counseling, information sharing and training to promote the development of light industry sectors. ・ Promote putting up "development model" factories in light industries and small and medium-sized enterprises through franchising and adapting foreign industries with advanced technologies. ・ Strive to regularly host in Mongolia international exhibitions on leading and advanced techniques and technology in light industry and support manufacturers' participation in exhibitions organized abroad on machinery, goods and products. ・ Render policy support by setting up a light industry park, promoting collaboration among the manufacturers and registering clusters. ・ Increase the variety and volume of raw materials and goods traded at Agricultural Commodity Exchange and upgrade its operations.

2.3.2 Proposed Laws under Discussion

The Mongolian Government is processing the establishments of related laws in order to embody and promote the medium-and-long-term policies. Table 2.3.9 shows the proposed laws (including those submitted to Parliament) to be discussed from 2017 to 2019 and the overview of each law is given in Table 2.3.10.

Table 2.3.9 Proposed Laws to be Discussed from 2017 to 2019

2017	2018	2019
Submitted to Parliament ・ Law on Animal and Livestock Health ・ Law on Livestock Gene Pool ・ Revised governmental special fund law **Planned to be Submitted** ・ Price Regulatory Legal Framework for Agricultural Goods and Products ・ Law on Protection of Grazing Pastureland ・ Commercial Law ・ Cooperatives Law ・ Dump Law ・ Revised Law on Small and Medium Sized Enterprise ・ Smoking Restriction Law	・ Law on Agricultural Insurance ・ Law on Agriculture and Livestock Cooperatives ・ Revised Food Law	・ Revised Crop Breeding Law ・ Functional Food Law ・ Law on Food with Nutrient Function Claims ・ Law on Introducing Agriculture and Livestock Service

Table 2.3.10 Overview of the Major Proposed Laws

Proposed Laws	Overview
Price Regulatory Legal Framework for Agricultural Goods and Products	Establish a legal environment to prevent sudden price fluctuations and stable the price of agricultural products and manufactured goods.
Law on Protection of Grazing Pastureland	Establish a legal environment to improve the protection of the use of pastures for *otor* (reserves) that are spread out over several provinces. Contents of pasture protection are under consideration.
Cooperatives Law	The Cooperative Law will improve the guiding coordination, management and business principles as needed.
Agricultural Insurance	Establish a legal environment to reduce the natural risk of agricultural production, expand the insurance market, and protect the risk of agricultural farmers.
Law on Agriculture and Livestock Cooperatives	Establish a legal environment to determine the category and activities of livestock farming and government's cooperation policy to develop the livestock sector, and define its principles.
Revised Food Law	Set approval rules for the regulations of rating restaurants.
Functional Food Law	Implement Article 9 in the Good Law, "9.3: Individuals and legal entities must comply with the following requirements when importing foodstuff"
Law on Introducing Agriculture and Livestock Service	Establish a legal environment to apply scientific technologies to the agriculture and livestock sector

2.3.3 Agriculture and Livestock Policy from the Perspective of the Value Chain

In the SDV2030 which is a long-term national policy, it is aimed to develop a nation with a diversified and sustainably growing economy. The sector development activities toward sustainable economic development are based on the principles of (1) introduction of technology and product development related to productivity improvement, (2) promotion of production method considering the natural environment, and (3) compliance with principles related to efficiency and effectiveness in all sectors, and the vision sets the agriculture and livestock sector as the leading sector. In the SDV 2030, the development goals for the agriculture and livestock sector are set to introduce international standards, to re-establish the supply chains system, to introduce advanced agricultural technologies, and to support small and medium-sized farmers/herders. These are significant issues that should be addressed with a long-range perspective.

In the "Regional Development Policy" whose establishment regulations are explained in the "Law on Development Policy and Planning", it is stated that the efficient use of agriculture and livestock resources (raw materials) for socio-economic development is one of the regional development objectives. The policy is positioned as a mid-term plan for a period of 8-10 years, and it can be recognized that the agriculture and livestock sector has also been focused as a sector that contributes to regional development.

MOFALI implements various plans/programs based on the Action Program 2016-2020 as well as referring to the mid-term policies which are "State Policy on Food and Agriculture", "Government Policy on Herders" and "State Industrial Policy". In particular, when the ministry was reorganized in July 2016 due to the change of government, the light industry department was integrated with the food and agriculture department, and thus the Department of Coordination of Light Industrial Policy Implementation was established in MOFALI. This enabled a consistent administration covering the production, processing and marketing by a single ministry.

From the perspective of the development of the agro-value chain, this administrative situation indicated that the measures previously been implemented at each stage (production, processing, and marketing) can be effectively coordinated and the environment has been provided to implement consistent policies. In particular, although the mid-term plans shown in Table 2.3.5-2.3.8 have comprehensively brought together each of the four fields of livestock farming, agriculture, food industry, and light industry, it is recommended to consider the following factors from the viewpoint of the agro-value chain.

(1) Emphasis to Supply Raw Materials

As mentioned above, Figure 2.3.3 is a diagram created by the Department of Coordination of Light Industrial Policy Implementation regarding the "Industrialization 21:100" program. Referring to the title "Shipping and Distribution System of Raw Materials", the supply system of raw materials is to be restructured in the process of considering implementations in the light industry sector. The necessity of the restructuring is also stated in the Mongolian Livestock National Program (Table 2.3.4). One of the reasons pointed out is that the situation of herders directly selling to middlemen is impeding to ensure the quality of raw materials and to adjust the sales price. This is one of the obstacles to undertake the reconstruction of the shipping and distribution system of raw materials. The situations show that there is huge difficulty in restructuring the stage of delivering upstream raw materials to the stages of manufacturing and processing in the agro-value chain and it can be noticed that an emphasis is placed on improving raw material supply in order to solve this issue. Particularly, since the requirements for raw material supply depends on the needs at the stage of processing and the market, from the perspective of agro-value chain development, it is necessary to secure association for each policy and each plan/program, so that the raw material supply will cooperate and synchronize with the provision of downstream market information.

(2) Cross-sectoral Coordination of Plan/Programs

MOFALI sets “Healthy Food - Healthy Mongolian Citizen" at the upper position of national programs, and implements several plans/programs in the four fields, i.e. livestock farming, agriculture, food industry, and light industry. “Mongolian Livestock National Program” for livestock farming and the "Third Crop Rehabilitation Campaign" for agriculture is positioned as continuation policy, and they are focused on strengthening the production in the agro-value chains.

On the other hand, for food industry, "First Meat and Milk Campaign" sets out plans for each product specializing in meat and milk as well as working on the improvement of food safety and quality control. In the light industry sector, in addition to promoting agriculture and livestock processing in accordance with the regional characteristics through the “Industrialization 21:100” program, plans/program focused on wool, cashmere and leather are set out (Table 2.3.8). These plans have the characteristics of integrating product-specific approaches and cross-product issues.

The agro-value chain system faces issues that overlap these four fields and it constructs a mechanism of a series of value-addition. The mechanism is constructed by a crossover of a vertical line of products and a horizontal line of stages constituting the agro-value chain. Therefore, it is necessary to consider the pathway of agro-value chain development based on the coordination of each policy and each plan/program in these sectors and the consistency in the two lines of products and agro-value chain stages.

(3) Collaboration with Policy on Regional Promotion

In promoting agro-value chain development, it is necessary to determine the target area, where and what to do. In order to introduce the targets as a priority and in a strategic way, it is important to take into consideration the regional characteristics (constraints and potentials of natural environmental resources, the link between the production and the market etc.). Although NDA has started to formulate the "Regional Development Policy" from the perspective of regional promotion, it is considered that industrial promotion will be an economic cornerstone for regional promotion. As agriculture and livestock farming (in terms of agriculture and livestock resources) and related processing industries are major local industries in many regions in Mongolia, it is ideal to cooperate and synchronize the policy on agro-value chain by MOFALI and the policy on regional development by NDA.

2.4 Relative Governments in Agriculture and Livestock Sector

2.4.1 Ministry of Food Agriculture and Light Industry (MOFALI)

2.4.1.1 Organizational Structure

MOFALI is composed of 8 departments and 4 divisions allocated under Policy and Planning Department, Administrative Supervision Department, and Light Industry Policy and Implementation Adjustment Department. Each department and divisions are assigned 121 staffs. Due to the advent of the new administration on 7 July 2016 and reorganization of government ministries, MOFALI handles light industry and small and medium-sized enterprises (hereinafter "SMEs") sector which was under former Ministry of Industry. The Department of Coordination of Light Industrial Policy Implementation handles textiles, sewing, leather, wood, printing, electrical and electronic products, etc[21].

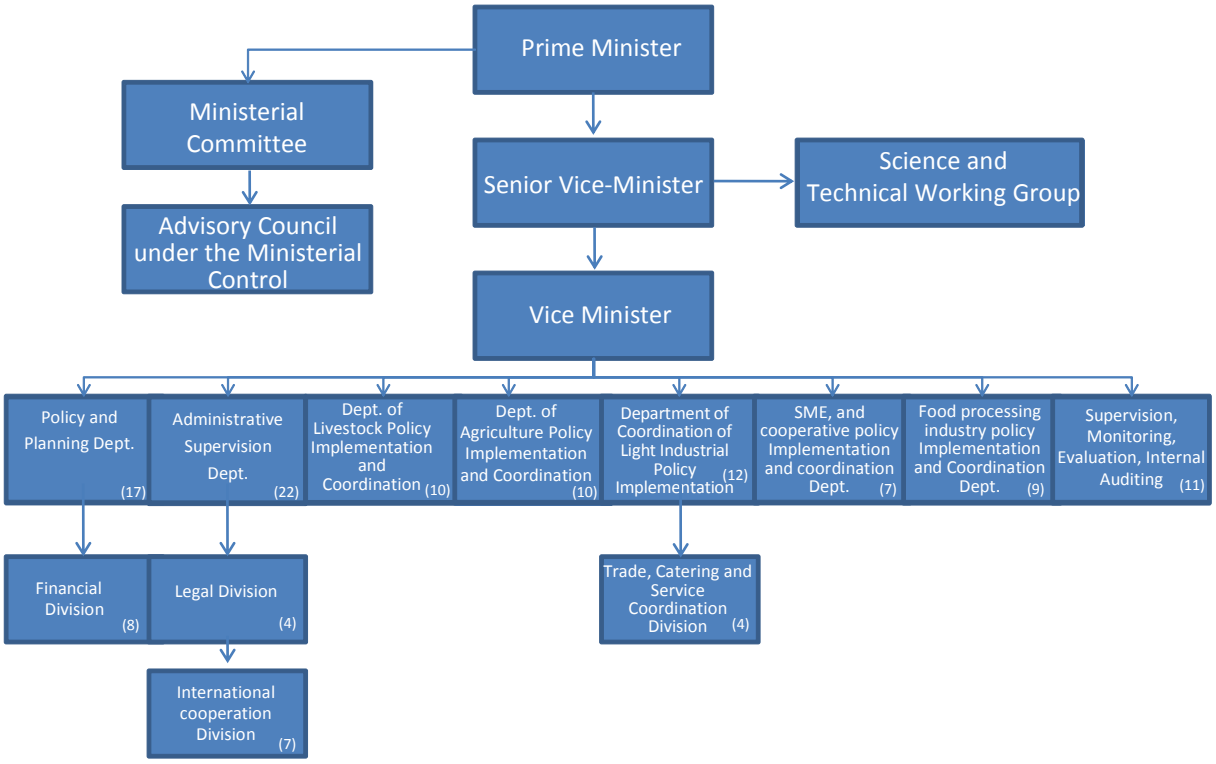


Figure 2.4.1 MOFALI Organizational Structure

Figure Note: Figures in parenthesis ( ) show the number of staff.

2.4.1.2 Administrative Roles

Major roles of MOFALI are 1) Proper use of raw materials and resources, 2) Production of import substitutes and export products, 3) Establishment of value chain, 4) Improve productivity, profitability, and competitiveness and promote sustainable economic growth in the industry, 5) Supply healthy, safe and nutritious food to the population, and stably supply clothing and equipment with hygiene considerations.

[21] Mongolian Business Environment Guide, 2-17 (JICA) p-11

2.4.2 National Development Agency (NDA)

2.4.2.1 Organizational Structure

NDA was formulated as an agency directly controlled by the prime minister associated with the formation of a new cabinet on 7 July 2016. Its administrative roles are defined based on the Act.No.2016-64 of prime minister. According to the act of prime minister, NDA is defined as a government regulatory agency under the prime minister, (chief/administrator) and 55 staffs were allocated. The organizational chart is shown in the following figure. It is composed of five divisions; specialized units are organized under three divisions out of 52 staffs are assigned as of 4 of February 2017.

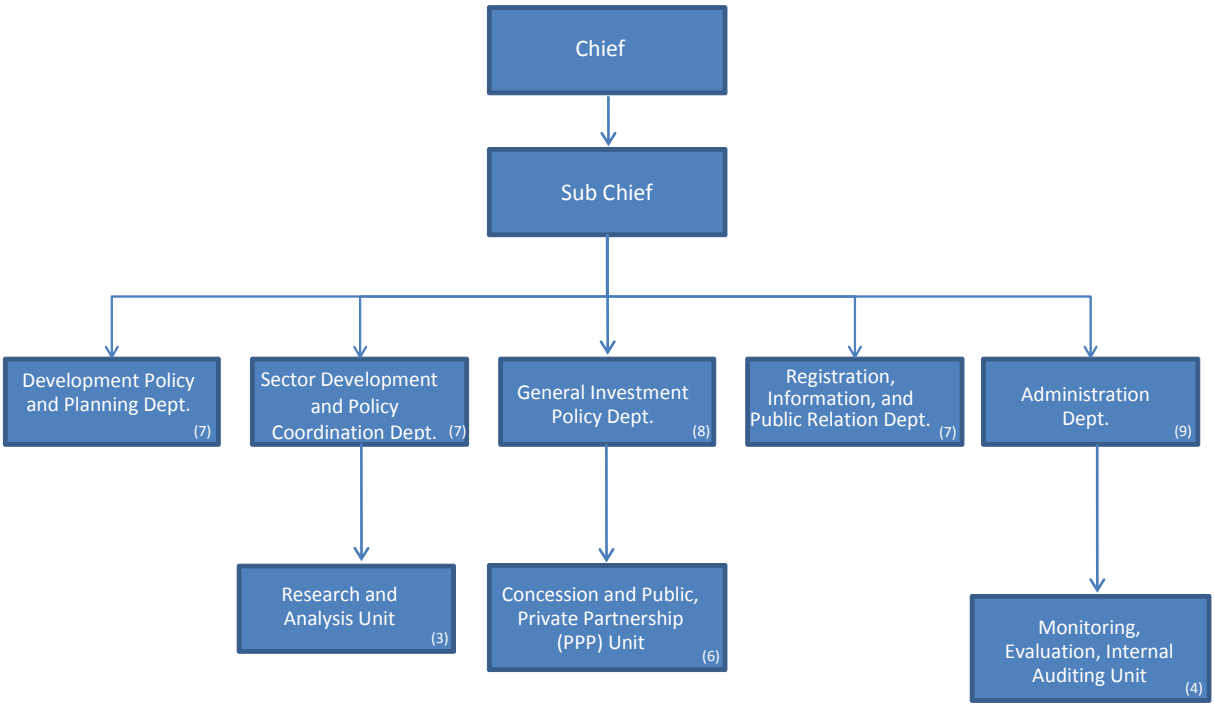


Figure 2.4.2 NDA Organization chart

*The figures in parenthesis () show the current number of people allocated. Except for the Sector Development and Policy Coordination Division, the figures match the provisioned capacity. The term "sector" in this chart means the field or department under the ministry's jurisdiction, indicating development policies for each ministry.

Source : MONDEP final report

(1) Administrative Roles

With the establishment of the NDA in July 2016, the Law on Development Policy and Planning was revised. The authority on National Investment Program (Article 1, paragraph 4), Regional Development Policy and Planning (Article 13, paragraph 2 and 5), management of database related to development policies and other guidance (Article 22, paragraph 3-5) was transferred from the central administration (Ministry of Finance that manages fiscal budget) to NDA which is in charge of national development.

2.4.3 Mongolian Agency for Standardization and Metrology (MASM)

Standardization service has been introduced in Mongolia in 1953. MASM is in charge of all the national affairs of Standardization in Mongolia. The President of MASM is appointed by the Mongolian Government. Deputy Prime Minister controls MASM. Decision-making body of MASM is MASM Council and concerned Ministries, research institutes, NGOs and representative of industries participate in the Council.[22] MASM controls national standards in Mongolia and supervises various activities in the society in order to harmonize the standards. The coverage of the service is a wide range such as Government organizations, inspection institutes, public entities and private companies, etc. They have main 3 duties; i) to issue national standards, ii) to accreditate certification bodies including ISO related bodies and inspection agencies, and iii) certificate products and managements, MNS.

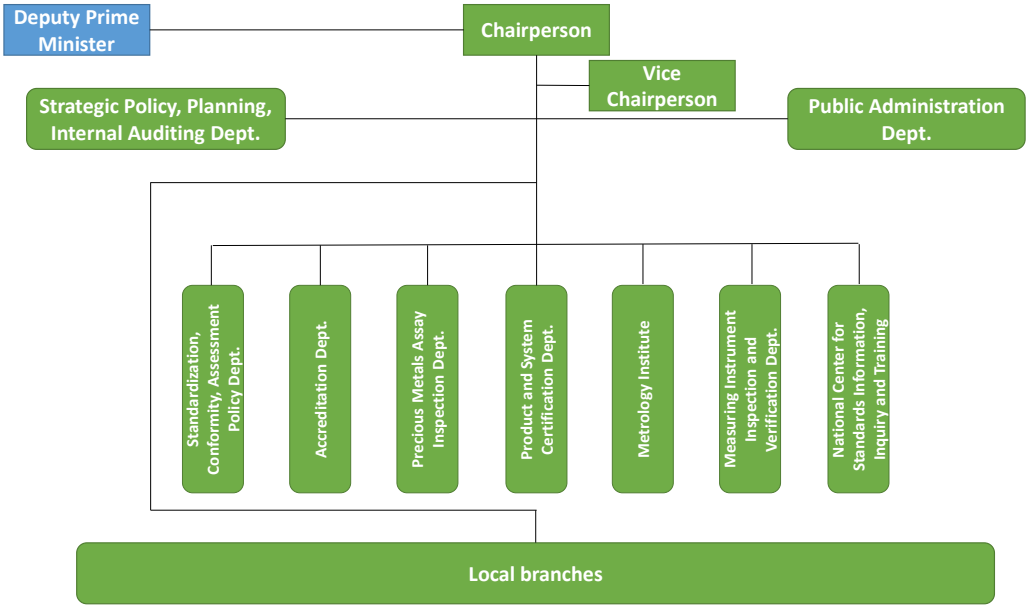


Figure 2.4.3 MASM Organizational Chart

Source: Prepared y JICA Survey Team based on the Web site of MASM (access on 19 April 2017)

Regarding national standards of MNS, MASM issue, revise or make a deletion based on the proposal from National Committee for Standardization composed of concerned administrative organizations, research institutes, and industrial associations.

Covered fields of accreditation are laboratories (testing, calibration, measurement instruments verification, medical, proficiency testing provider), certification bodies (product, management system, personnel, greenhouse gas validation) and inspection bodies

Presently, there are 24 certification bodies, of which, 2 bodies, including Certification Department of MASM, for management conformity, 20 bodies for product certification and calibration. These 20 bodies for product certification and calibration are MASM provinces offices and in charge of standard establishment in the rural area.

[22]International Organization for Standardization Web Site (https://www.iso.org/)

2.4.4 General Agency for Specialized Inspection (GASI)

GASI is responsible for monitoring conformity with the standards. GASI monitors by unannounced inspections at markets and on-site inspections in business offices. GASI has its branch office in each province and each district in Ulaanbaatar and conducts inspections. Inspectors of branch offices in each province and Ulaanbaatar are officials of GASI and inspectors staffed in each district are concurrently served by district officials. Inspection Department of Food Security and Agriculture is in charge of food and agriculture and livestock product inspection. They conduct on-site inspections on food business operators including markets, retail shops and restaurants as well as inspections of food and agriculture and livestock products distributed in the market. GASI also conducts food survey annually, in this fiscal year, the survey theme are 1) milk, 2) ham, 3) tap water and 4) surface natural water. The survey themes of last fiscal year were 1) chemical residue of domestic produced potato, 2) aflatoxin of cow milk, 3) bottled beverage and 4) powdered milk. The results of the survey have not been publicly disclosed.

551 national inspectors are involved in the food, agriculture and livestock fields and 218 inspectors are GASI personnel among them. Of which a number of 218, 74 inspectors are staffed for veterinary, 17 for livestock breeding, 30 for quarantine of plants and animals and 97 for food safety and standards. Remaining 330 inspectors operate inspections at district level, including 196 inspectors in charge of veterinary field and 137 inspectors in charge of livestock breeding[23].

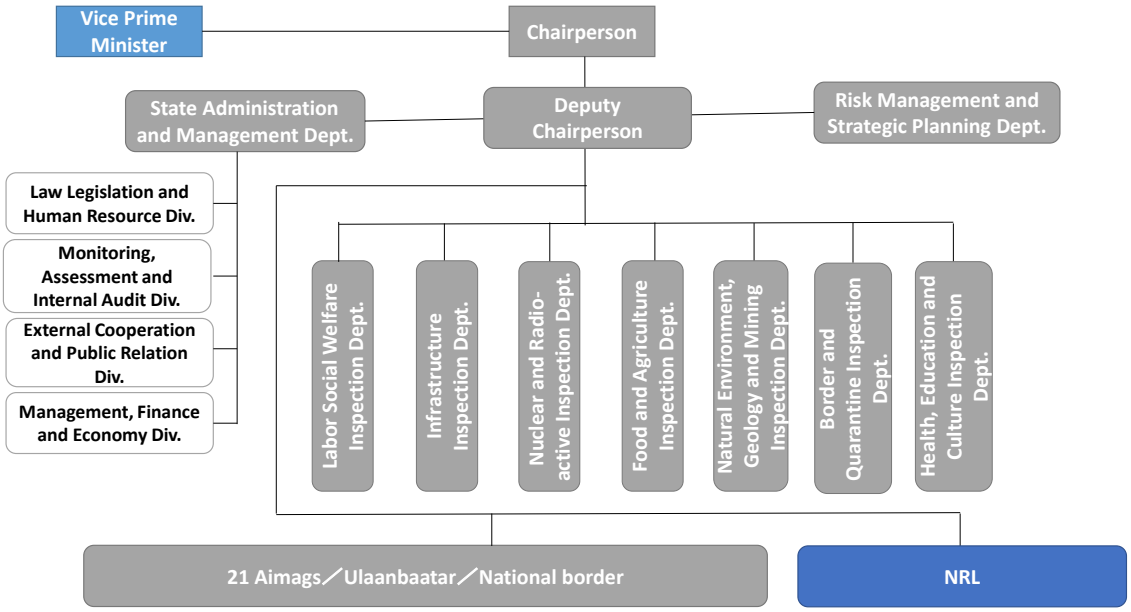


Figure 2.4.4 GASI Organizational Chart

Source：Prepared by JICA Survey Team based on brochure of GASI

[23] Interview with Inspection Department of Food Security and Agriculture, GASI (13 March 2017) and "FOOD SAFETY AND AGRICULTURE INSPECTION DEPARTMENT", GASI

2.5 Industrial Organizations

2.5.1 Mongolian National Chamber of Commerce (MNCCI)

MNCCI was established in 1960. Currently, the number of members is 3,226, 70% of which are SMEs, and 20% of agriculture and livestock industries. Approximately 1,200 companies are based in Ulaanbaatar and the remaining 2,000 companies are located in rural areas. The branches are headquartered in 21 prefectures and 42 offices in the country. Office managers are assigned in 12 countries. Currently, MNCCI operates the following main activities as NPO based on NPO law.

1) Improving business environment through public-private dialogues
2) Policy recommendations to protect the property of companies and entrepreneurs
3) Marketing supports for member companies and entrepreneurs
4) Business collaboration, sustainable network building, and partnership
5) Providing information related to the economy and market to member companies and entrepreneurs
6) Improvement of governance and management of organizations, internal collaboration and resource enhancement

In detail, MNCCI issues origin certificates or eco-label as a third-party certified organization, implement research on domestic economy and management, conduct business-related events such as inspections and meetings, and offer training for companies and entrepreneurs. MNCCI have issued 189 origin certificates to 29 companies and is aiming to be a third-party certification body for organic food aligned with the "Organic Food Act" enacted in 2016.

MNCCI consists of the Congress, Supervisory Board, Governing Board, The Presidency, Board of Directors and President of a member company. A deputy chair, a secretary, and a general manager are under the Chairman, and eight departments are located under it.

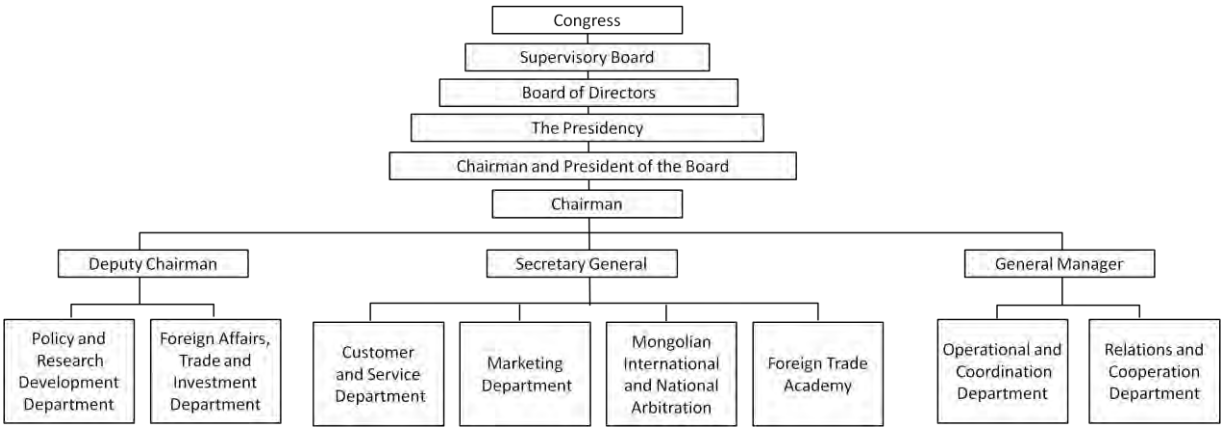


Figure 2.5.1 MNCCI Organizational Chart

Source: Prepared by JICA Study Team based on website of MNCCI

2.5.2 National Association of Mongolian Agricultural Cooperatives

As of 2015, there are 4,111 cooperatives in Mongolia and the number of members adds up to 76,585[24]. Among those cooperatives, 1,600 relate to agriculture and livestock, 400 relate to finance and the rest relate to environmental conservation. 57.3% of the total cooperatives are operating in the western region (five provinces) and Khangai region (six provinces).

The National Association of Mongolian Agricultural Cooperatives (hereinafter "NAMAC") is an independent non-governmental organization re-organized in 1992 after the transition from socialism to a market economy. The precursor of NAMAC is the Supreme Council of Agricultural Cooperatives, founded in 1967. Through the collapse of the socialist system, state-owned agricultural assets were privatized and distributed to individual members of *negdel*[25], pastoral cooperatives under the system of collective farmers. Consequently, *negdels* were divided into companies, cooperatives or dissolved completely as independent herders. NAMAC is currently supporting the formation and management of cooperatives in the new economy. The radical reform of the political and economic structure caused some confusions among the herders during the transition period between 1990 and early 2000. As the economy became stable and voluntary participation of large agricultural cooperatives and influential organizations were made, the number of members has gradually increased.

Regarding the activities, NAMAC (1) promotes the formation of agriculture and livestock cooperatives, (2) conducts training for the members (30 sessions per year), (3) advocates government policies representing demands and rights for the members, and (4) extends cooperative relationship with international development organizations.

The major difference between Japan Agricultural Cooperatives (known as "JA") is that NAMAC does not have a financial division. In Japan, JA directly supports farm financial managements such as borrowing money from the private account system of cooperative members and keeping automatic records on balance of payments. Regarding the unstable income between the seasons, the roles of cooperatives operating in conjunction with such financial divisions are important for farm financial managements. Since livestock products are sold in particular seasons and herders do not have a steady income, some member cooperatives run barber shops or small restaurants in order to supply money for cooperative activities. Some cooperatives have carried out one of the good practices and established a company that operates cooperative farming whose land area range from 15,000 to 100,000 ha. On the other hand, it is concerned that small-holder farmers who own 5 to 10 ha of land are left behind. .

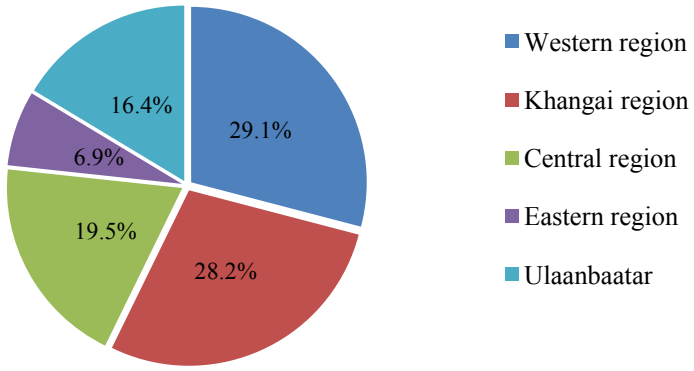


Figure 2.5.2 Regional Distributon of Cooperatives

Source: Prepared by JICA Study Team based on the NSO (2015) "Statistical Yearbook 2015"

[24] NSO Statistical Yearbook 2015
[25] *Negdels* are referred to as "livestock cooperatives" in Mongolia.

2.5.3 Related Industrial Organizations in the Agriculture and Livestock Sector

Table 2.5.1 describes the major industry associations related to the agriculture and livestock sector.

Table 2.5.1 Major Industrial Associations Related to Agriculture and Livestock Sector

Name of Association	Activities
Mongolian Veterinary Medical Association	The Association, founded in 1990, has approximately 2000 members. According to the president of the Association, the important issues for veterinarians in Mongolia are the following: 1) control of serious livestock diseases such as FMD and brucellosis; 2) institution of a prescription legend drug[26] and compliance with the suspension period; 3) thorough hygiene practices in slaughtering and meat handling at slaughterhouses. The point that the president of the association is concerned with is that the use of antibiotics, hormone medicines and vaccines are not thoroughly instructed to the veterinarians and herders in the fields. Such concerns were also aimed at the fact that much of the meat in the country is not processed into dressed meat following the principles of meat hygiene. It is the most important issue in terms of "food safety", thus future efforts are expected.
Mongolian Meat Association	The Association was established in 1999, with approximately 70 members (including processors, universities, slaughterhouses, inspection facilities, etc.). The original goal of its activities was export promotion, and the association has been encouraging the export of Mongolian meat to the present. In addition, the association has an important mission to make sure that all the meat distributed in the country is processed through the appropriate route, that is, the slaughtering is taken place at slaughterhouses where inspections are carried out. According to the Association's estimates, about 90 percent of meat is now being processed without going through the formal inspections, and this is the immediate issue of the Association.
Mongolian Wool and Cashmere Association	The Association was established in May 2011 and currently has 395 members consist of private companies, SMEs and individuals. In Mongolia, three types of wools are obtained from the fleece of sheep, camels and yak. According to the Association, regional characteristics exist in the production volume and the quality of the wool. Mongolia can be divided into four parts from the west: the western region, the Khangai region, the central region, and the eastern region. The Khangai region has the largest production volume and the central region comes second, both produce wool suitable for knitting. Sheep wool is sometimes referred to as "cashmere" in Mongolia, due to the fact that almost all Mongolian sheep produce a fine fiber which can be obtained a small amount from one sheep. The Association is attempting to expand the market to overseas by taking advantage of the chemical free wool products made by companies affiliated with the Association.
Mongolian Association of Leather Industry	The Association was established in 1997, but its precursor dates back to 1911. The Association is known for its first mechanization in the country in 1937, and its accomplishments of setting up the important industrial base. However, the management deteriorated soon after the collapse of socialism. Later, it was rebuilt in 2003, with currently 30 factories running in the country. The Association has a total of 838 members, composed of 700 raw material suppliers (middlemen, individuals, contractors, etc.), 30 processing factories, and 108 companies producing final products. All livestock leathers are used, but for different usage: sheep for clothing, goats for bags and boots, cows and horses and camels for hard materials such as shoe soles. The Association faces challenged of parasite penetration through livestock skins that cause the reduction of the selling value of leathers. The association is to address diseases such as hypodermyasis, and is expected to implement a national preventive campaign in cooperation with the Government,
National Dairy Development Board of Mongolia	The Board is a new organization established in April 2016. There are five founders who are currently supporting 10 companies. In cooperation with the FAO, the chairman of the Board has written about the meat value chain and dairy value chain in the report of the "Support to Employment Creation in Mongolia" project. The chairman of the board has deep knowledge and extensive network in the field of Mongolian dairy sector.

Source: Prepared based on interviews by JICA Study Team

[26] The institution regulates medicines to only be sold through prescriptions by veterinarians. This prevents abnormal use of drugs that require attention to use, such as antibiotics and hormone medicines.

2.6 Donor Cooperation

2.6.1 Food and Agriculture Organization

2.6.1.1 Outline

The Food and Agriculture Organization of the United Nations (FAO) developed "The Country Programming Framework (hereinafter "CPF") for Mongolia 2012-2016", a joint framework for strategic cooperation between the Government of Mongolia. The assistance by the FAO centers on four priority areas: 1) Promotion of sustainable livestock development through improved quality, health and productivity of livestock, and increased supplies of pasture, feed and water; 2) Introduction of environment-friendly production technologies; 3) Promotion of sustainable natural resource management as techniques for climate change adaptation and mitigation; 4) Value chain development, focusing on improved food products, food safety standards and food marketing

2.6.1.2 Ongoing Project[27]

Relating to the fourth priority in the CPF, FAO is conducting "Support to employment creation in Mongolia: Piloting quality private sector work in selected livestock and vegetable value chains" (hereinafter "SECiM project"), with the aim of supporting inclusive and sustainable development in Mongolia through promotion of quality employment focusing on the non-mining sector. The SECiM project is funded by the European Union (EU), and the project implementation period is from 2016 to 2019. The project consists of two components. Component 1 (C1) aims to reform employment policy and provide institutional support and Component 2 (C2) plans pilot employment creation in five specific food and non-food value chains, namely: (i) meat, (ii) dairy, (iii) textile (cashmere, camel and yak hair, wool), (iv) leather and (v) vegetable. The main activities are supported for decent employment and income opportunities in the five value chains mentioned above. In addition, the project implements mainstream inclusive decent work and eco-friendly practices within the five value chains that actively contribute to employment policy development.

2.6.1.3 Previous Projects[28]

Table 2.6.1 lists the projects that have been implemented or are currently implemented by FAO.

Table 2.6.1 List of Projects Implemented/ Being Implemented by the FAO in Mongolia

Period	Project Name
2014-2016	Developing aquaculture for improved fish supply in Mongolia
2014-2016	Technical Assistance under the South-South Cooperation (SSC) with the People`s Republic of China in support of the National Food Security Programme (NFSP) in Mongolia-Phase II
2016-2017	Emergency assistance to support drought-cum-dzud response and resilience
2016	Emergency assistance for the control of sheep and goat pox
2015-2018	Mongolia UN-REDD National Programme
2017	Provision of Animal Feed and Health Packages and Pox Vaccination for most vulnerable households
2016-2019	Support to employment creation in Mongolia (SECiM): Piloting quality private sector work in selected livestock and vegetable value chains
2012-2016	Integrated Livestock-based Livelihoods Support Programme
2014-2017	Assistance to Mongolian Organic Agriculture
2015-2016	Improve food security through promoting Chicken farm among vulnerable group in UB[29] city
2016-2019	Improve food security of group of small farmers through establishing solar water harvesting system UNDP/SPPD

[27] Food Agriculture Organization: COUNTRY PROGRAMMING FRAMEWORK CPF 2012-2016: For Cooperation and Partnership between The Food and Agriculture Organization of the United Nations and the Government of Mongolia; 2012, Ulaanbaatar, Mongolia
[28] http://www.fao.org/mongolia/programmes-and-projects/en/
[29] Ulaanbaatar

2.6.2 Swiss Agency for Development and Cooperation

Swiss Agency for Development and Cooperation (hereinafter "SDC") puts emphasis to three complementary and mutually reinforcing domains in its latest Swiss Cooperation Strategy with Mongolia 2013-2016: 1) Agriculture and Food Security; 2) Vocational Education and Training; and 3) State Reform, Local Governance and Civic Participation. The budget for Agriculture and Food Security accounts for 25% of the allocated budget for 2013 to 2017 Cooperation Strategy.

SDC has been supporting the livestock sector for several years, and currently conducting two major projects which are "the Green Gold project"(hereinafter "GGP") and "Animal Health project" (hereinafter "AHP")[30].

The GGP started in 2004 with a goal to improve livelihoods of herder households by ensuring the sustainable management of rangelands and securing better access to technological knowledge of management and markets. The project supported the establishment of 1'300 pasture user groups (hereinafter "PUG") and facilitated 700 rangeland use agreements (RUA) between PUG's and local authorities. In phase 4 from 2013 to 2016, the project focuses on 1) Promote further establishment of PUS and increase more households that will benefit from the PUG system; 2) Support applied agricultural research; 3) Support agricultural extension service through training extension staff and linking research, extension and the collective action system; 4) Promote yak and camel wool marketing which will bring greater benefits for vulnerable yak and camel herders. PUG contributed to developing close link between herders and farmers with the processors, allowing them to engage in the collection and supply of raw materials such as yak and camel wool, skin and hide, and meat for higher prices which led the increase in annual income of herder households.

SDC has decided to consolidate AHP and GGP to sustain the positive results of both projects and the "Green Gold and Animal Health Consolidated" is to be conducted from 2017 to 2020. The two projects are linked together as they both promote quality above quantity and they encompass the three basic elements of the livestock sector in Mongolia, which is sustainable rangeland management, better marketing and healthy animals.

The Mongolian Potato Programme[31], implemented from 2012 to 2015, was highly regarded as an effective Swiss intervention in Mongolia's agriculture sector that ensured national self-sufficiency in potato production. One of the accomplishments of the program is that for the first time, hybrid varieties with high productivity and early maturity was included in official variety registration. Also, vegetable seed shops were established to supply seeds of the main vegetables to farmers at wholesale prices.

Since 2016, SDC is implementing "Inclusive and Sustainable Vegetable Production and Marketing Project" (hereinafter "VEGI project") until 2019 whose goal is to contribute to improved livelihood of vegetable growers (especially small-scale farmers in rural areas and poor households in urban/peri-urban areas) through inclusive, gender balanced and sustainable growth of the vegetable sector. The expected outcomes are: 1) Increase domestic vegetable production of farmers through better varieties, seeds, improved technology and available know-how; 2) Increase the income of vegetable farmers, especially small scale farmers and women headed households through improved and inclusive markets for vegetables; 3) Improve vegetable production and consumption of poor households in urban and peri-urban areas through vegetable gardening; 4) Improve policy/legal and institutional framework of the vegetable sector. The project supports farmer organizations through activities such as strengthening capacities in marketing, providing market information, and encouraging collective action for storage, processing and marketing. Extension activities to farmers are held at two Vegetable Farmers' Centers established in the project[32].

[30] Swiss Agency for Development and Cooperation in Mongolia: Green Gold Project Report on "Collective action in the pastoral economy of Mongolia" 2015, Ulaanbaatar, Mongolia
[31] Swiss Agency for Development and Cooperation in Mongolia: Summary Results of Potato Project 2015, Ulaanbaatar, Mongolia
[32] Swiss Agency for Development and Cooperation in Mongolia: Factsheet: Inclusive and sustainable vegetable production and marketing project

2.6.3 World Bank

The World Bank Group set up the Mongolia- Country Partnership Strategy for the period 2013 to 2017. It identifies three priority areas which the World Bank Group will support: 1) Enhance Mongolia's capacity to manage the mining economy sustainably and transparently; 2) Build a sustained and diversified basis for economic growth and employment in urban and rural areas; 3) Address vulnerabilities through improved access to service delivery, safety net provision, and improved disaster risk management[33].

The "National Sustainable Livelihood Support Program" has been implemented for a period of 12 years since 2002, with its overall goal to contribute to secure and sustainable livelihood and reduce the vulnerability of rural communities throughout Mongolia. The program consists of three phases: 1) pastoral risk management; 2) microfinance outreach to finance livestock insurance; 3) community-based infrastructure development and basic social services. The program targets the local governments in 330 districts of all 21 provinces[34].

Phase 1 ran from 2002 to 2007 as a pilot project and established the "Local Initiatives Fund" by which members of the targeted communities can prioritize them for potential subproject financing, established the "Microfinance Development Fund", and supported pastoral risk management. The feasibility of the index-based livestock insurance was recognized and led to the "Index-Based Livestock Insurance Project" started in 2005 to spread nationwide.

During phase 2 from 2007 to 2013, activities in phase 1 such as the Livestock Early Warning System, pasture management and risk planning were operated nationwide. Moreover, 6,000 subprojects, mostly for investments in education and health, were implemented under the Community Development Fund.

Phase 3 provided support to the institutionalization of the mechanism utilized in phase 1 and 2, in the aim of sustainability and extension of the established funds in the rural areas. In 2011, the Parliament passed the Integrated Budget Law. The law established an intergovernmental transfer mechanism, the Local Development Fund (LDF), to transfer capital budget to the districts to address the issue that most local governments in Mongolia lacked significant own revenue bases. Guidelines for the implementation of the LDF under the law were developed, which enabled rural districts to enhance risk management, local pasture protection and community participation.

[33] World Bank, Mongolia - Country partnership strategy for the period FY2013-2017
[34] The World Bank (2014) International Development Association Project Appraisal Document on a Proposed Credit in the Amount of SDR 16.1 Million (US$ 24.8 Million Equivalent) to Mongolia for a Third Sustainable Livelihoods Project

2.7 Environment

2.7.1 Environment-Related Laws, Policies, National Plan (Land Use Management, Grassland Conservation, Water Resource Management)

In the Law on Development Policy and Planning, it is stated to effectively use agriculture and livestock resources for regional development policies. This section explains the current situation and issues on laws, national policies and plans related to land, grassland, water resources which are basic resources for agriculture and livestock farming in Mongolia.

2.7.1.1 Land Use Management

In 1990, Mongolia began to pursue the process of democratization and market economy, adopted the new democratic constitution in 1992, and changed the country name to "Mongolia". The new Constitution stipulates that livestock is an asset of the people, that it is under the protection of the state, and that the land can be privatized, except for grasslands, although it is a national asset (Table 2.5. 1).

Table 2.7.1 Livestock and Land Related Provisions of Mongolian Constitution (1992)

Article	Contents
Article 5 5.	All livestock is a national asset and shall be under the protection of the State.
Article 6 2.	The land, except that in private ownership of the citizens of Mongolia, as well as the land subsoil, forests, water resources, and faunas shall be the property of the State.
Article 6 3	The state may give for private ownership land, other than pastures and areas under public use or reserved for the State's special needs, only to the citizens of Mongolia. This provision shall not be applicable to ownership of the land subsoil. (The rest is omitted.)

In 1994, following the provision of such constitution, the first "land law" was enacted. Although it is a law established under pressure to privatize land from international donor agencies etc.[35], the actual law did not have sufficient provision for land ownership and pasture utilization. In Article 3 of this Land Act, we define three of ownership rights, possession rights, and usage rights, but only possession rights and usage rights were included in the law. After that, after lively debates and twists and turns surrounding the privatization of the land which divides public opinion in to, a major revision of the law was made in 2002[36], but there was not the addition of provisions on ownership.

Regarding private ownership of land, the "Land Privatization Law" was enacted in 2002 in the same way as the amendment of the land law, which was separately specified by this Law. Under the Law, privatization was permitted only in (1) family living site, (2) farmland, (3) others (private land for construction of private buildings, etc.). Also, in order to promote privatization of the land for the purpose of (1), lands of a certain area which varies according to the size of central and local cities or villages and other residential areas (up to 0.07 ha in capital city Ulaanbaatar, up to 0.5ha in Darkhan City, Eldernet City, Centers of other regions and other regional base cities, and up to 0.35ha in the center of provinces, districts and villages (bag) are given free of charge as a unit in "Family". Foreigners and foreign companies cannot possess any land as prescribed in the Constitution and Land Law.

Family land was granted free by March 2005. Distribution was advanced, but because the progress rate was low, the deadline for registration has been extended, and free distribution is still continuing now. On the regular Cabinet meeting on April 4, 2016, the agenda of land privatization was discussed and the following matters were passed.

[35] Akira Kamimura(2004)“Land use in pastoralism in post-socialist Mongolia - logic of development and practice of nomadism", "Mongolian law study group" Nagoya University
[36] Hisakazu Kato(2007)"Mongolian Land Legislation and Environmental Law in a Sudden Move" "Individual Report on the Mongolian Forest Revitalization Survey in 2006"

Private ownership of 298,209 ha in 2016, throughout Mongolia

In 2016, Mongolia decided to privatize 298,209 ha as household land and 39.26 ha as corporate land in nationwide. 93% of 298,209 ha is newly privatized land. 4.5% of the land is currently owned. 2.5% of the land is along the national highway. 55.1% of the corporate land is fielded for cultivating potatoes and vegetables, 6.5% is for grain, and 38.2% is land used for other purposes. Enforcement of the Land Privatization Law since May 1 2003, to the end of last year, 446,040 people own 478,405ha in Mongolia nationwide.

Source: Mongoru Tsuushin 2016, No.14 (2)

Table2.7.2 Article on Agricultural Land etc. of the Land Law

Article	Contents
Article 1. Purpose of the Law	1.1. The purpose of this law is to regulate possession and use of state-owned land and other related issues.
Article 3. Legal Definitions	3.1. The following terms used in this law shall be interpreted as follows: 3.1.1. "land" means a piece of space including the land surface, its soil, forests, water and plants; 3.1.2. "to own land" means to be in legitimate control of land with the right to dispose of this land; 3.1.3. "to possess land" means to be in legitimate control of land in accordance with purpose of its use and terms and conditions specified in respective contracts; 3.1.4. "to use land" means to undertake a legitimate and concrete activity to make use of some of the land's characteristics in accordance with contracts made with owners and possessors of land;
Article 6. Land Possessors and Land Users	6.1. Mongolian citizens of 18 years and over (hereinafter referred to as "citizens"), companies, organizations and companies with foreign investment may possess or use land in compliance with this law.
	6.2. The following [types of] land, regardless of whether they are given into possession or use, shall be used for the common purpose under government regulation: 6.2.1. pasturelands, water points in pasturelands, wells and salt licks; 6.2.2. public tenure lands in cities, villages and other urban settlements; 6.2.3. land under roads and networks; 6.2.4. lands with forest resources; 6.2.5. lands with water resources.
	6.3. Foreign countries, international organizations, foreign legal entities, foreign citizens and stateless persons may become users of land for a specific purpose and a specific time period subject to contract conditions and in compliance with the law.
Article 7. Land Fees	7.1. Citizens, companies and organizations possessing or using land shall pay land fees in accordance with relevant laws and contracts.
Article 11. Agricultural Land	11.1. Agricultural land shall include pastureland, hayfields, crop lands, lands for cultivation of fruits and berries, fallow lands, lands under agricultural constructions and other land for agricultural production.
Article 28. Types of Land Possession Licenses	28.1. Land possession licenses shall be of the following types: 28.1.1. for household needs; 28.1.2. for government organizations; 28.1.3. for companies and organizations.
Article 30. Duration of Land Possession	30.1. The state-owned land may be given possession with a license to Mongolian citizens, companies, and organizations as well as entities with foreign investment for the duration of 15 to 60 years. The land possession license may be extended for not longer than 40 years at a time.
	30.2. In the event of death or announcement of the death of the possessor of land or if the land possessor is announced as missing, the legitimate heir, if he/she wishes, may transfer the land possession license to register himself/herself, and may possess that land until the original expiration date of the license.
Article 54. Pastureland, Its Rational Use, and Protection (The text of the article is omitted.)	
Article 55. Rational Use and Protection of Hayfields (The text of the article is omitted.)	
Article 56. Rational Use and Protection of Crop Lands (The text of the article is omitted.)	

Regarding the use of the national land, first, the Ministry of Construction and Urban Development prepares plans for land use. A national land use plan from 2000 to 2020 has been formulated, which was created in 2003, so that a draft amendment to this is currently being prepared, and the land use policy until 2030 is expected to be formulated. In the draft revision of the National Land Use Plan, the Ministry of Construction and Urban Development plans a percentage of the national land as agricultural land and controls the plan. Based on this land use plan, MOFALI establishes production targets for grain, etc. and implements policies. Also in provinces and Ulaanbaatar, based on the National Land Use Plan, they have created a land use plan for 10 to 20 years. In addition, the district creates land use plans such as what percentage to use for what every year and year.

Regarding the use of land, basically judgment is made in the provinces etc. based on the land use plan, but the central government judges the demand for large scale land use. As an example, if there is a request to change grassland of 30,000 ha or more to arable land, it is definitely decided by the Cabinet through the Ministry of Construction and Urban Development. Large scale crop cultivation is done frequently in Dornod province, and in recent years there is a frequent demand for large conversion from grasslands to arable land.

Regarding the usage situation of the national land, annually, reports from provinces etc. are compiled by the Implementation Agency of the Government of Mongolia, Administration of Land Affairs Geodesy and Cartography based on the land law. This report is submitted to the Cabinet from the Ministry of Construction and Urban Development, and deliberated by the Cabinet, and it will be summarized as a national land annual report six months later. The land of Mongolia is divided into six purposes (1) agricultural land, (2) land for infrastructure such as road, (3) forest, (4) hydrological area, (5) urban land (6) country specific use land. Agricultural land occupies about 70% of the land, most of which is pasture land. The description of agricultural land in the 2015 National Land Annual Report is as follows.

2.1.1 Agricultural land

The agricultural land area is 114.982,800 ha, accounting for 73.5% of the national land area. Of the agricultural land area, 96.2%(110,661,3600 ha) is for pasture land, 1.5%(1,717,700 ha) is for meadow land of, 0.9% (1,028,200 ha) is for arable land, and 0.3% (305,000 ha) is for cultivated abandoned land, 0.16% (74,400ha) is for the agricultural structures, and 1.1% (1,259,700 ha) is for the land not used for agricultural purpose.

· **Pasture land**

Pasture land has decreased by 33,090 ha compared to 2014. This is due to the change in the land for arable land, road, land of electric wire, land of town/village in 2015. For example, in Khenti province, 14,725 ha of pasture land became arable land. This is related to the activities of the provincial governor to support agriculture for the 4-year plan/target.

· **Meadow land area**

It increased by 90 ha compared to 2014.

· **Arable land area**

It increased by 15,360 ha compared to 2014.

In terms of province-based land use management, in Tuv province there are decreases in grazing land due to new airport construction and arable land expansion. As national level's large-scale infrastructure development such as highway construction, railroad construction etc. is planned in the province, the land use plan is required to revise the province's land use plan formulated as a plan for 2006 from 20 years, and it is supposed to review and revise the plan within 2017. In Selenga province and Darkhan Uul province where crop production is popular, 305 thousand hectares and 32 thousand hectares are currently being used as cultivated land, respectively. There are policies to restrict the expansion of arable land with the upper limit of currently cultivated land.

2.7.1.2 Grassland preservation

"Green Development Policy" was adopted by the National Assembly on 13th June 2014. "Green development" means development that reduces poverty by using resources efficiently and effectively, through an inclusive economy in which the ecosystem is sustained and greenhouse gas and waste is reduced. This policy states that the following six strategic objectives will be achieved to ensure green development.

Strategic Objective #1: Promote a sustainable consumption and production pattern with efficient use of natural resources, low greenhouse gas emissions, and reduced waste generation;

Strategic Objective #2: Sustain eco-system's carrying capacity by enhancing environmental protection and restoration activities, and reducing environmental pollution and degradation;

Strategic Objective #3: Increase investment in natural capital, human development, and clean technology by introducing financing, tax, lending and other incentives for supporting a green economy;

Strategic Objective #4: Engrain a green lifestyle by reducing poverty and promoting green jobs;

Strategic Objective #5: Encourage education, science, and technology to serve as the catalyst for green development, and develop cultural values and livelihoods that are in harmony with nature;

Strategic Objective #6: Develop and implement a population settlement plan in accordance with climate change, while considering the availability of natural resources and the resilience of regions.

This policy will be implemented during the first phase from 2014 to 2020 and the second phase from 2021 to 2030.

The Action Plan for the Green Development Policy was resolved at the National Assembly on 11th January 2016. Specific action plans are shown to achieve the above six strategic goals. The following action plans are closely related to environmental management in agriculture and livestock sectors.

1.5.3	Protect soil fertility by fencing cropland, establishing forest zones, planting annual and perennial fodder plants, and increasing crop rotation forms and frequencies (Implementation period: 2016-2030)
1.5.4	Identify the rehabilitation of eroded and uncultivated croplands (Implementation period: 2017-2030)
2.12.1	Implement measures to protect and rehabilitate Gobi oases (Implementation period: 2017-2025)
2.12.2	Upgrade the legal environment for pasture management (Implementation period: 2016-2020)
2.12.3	Establish the special needs pasture for *otor*, and rotate by relieving livestock grazing, rehabilitate, improve and cultivate the overgrazed pasture(Implementation period: 2016-2030)
2.12.4	Establish the mechanism to run animal husbandry in accordance with the carrying capacity through the creation of tax and economic incentives, and determine the number and type of livestock by each livestock type for regions based on pasture carrying and recovering capacities(Implementation period: 2016-2020)
2.12.6	Support and develop the intensified husbandry in nearby settlement by determining land areas and promoting through tax and loan policies (Implementation period: 2016-2030)
2.12.7	Implement measures to rehabilitate pasture and establish forest zones for mitigating desertification along roads, railroads, natural border zones, and areas that are highly affected by desertification(Implementation period: 2016-2030)
2.13.1	Develop an integrated database to register environmental damages, compensations, and areas for rehabilitation with cost estimations (Implementation period: 2016-2018)
2.13.2	Organize rehabilitation activities by prioritizing degraded and eroded lands(Implementation period: 2016-2030)
2.13.3	Adapt and enforce the environmental conservation/protection and rehabilitation standards of the EU and other countries in which technology requirement and specifications for mineral types, exploration and processing are set (Implementation period: 2016-2018)

Based on the definition of United Nations Convention to Combat Desertification (hereinafter "UNCCD"), almost 90% of Mongolia's land is classified as land that is susceptible to land degradation/desertification. In fact, according to a survey in 2015, 76.8% of the country's land is said to have deteriorated/desertified. Whether the cause of this desertification is mainly due to climate change or whether it is mainly due to human activity cannot be clarified at this stage, but probably human activity is considered to be the most important factor. The most important factor among human activities is overgrazing. This is the result of inappropriate grassland usage regulations[37].

Mongolia joined the UNCCD in 1996 and formulated the National Action Plan for Combating Desertification in Mongolia in 1996 and 2003. As a framework to execute these plans, Ministry of Environment, Green Development and Tourism (hereinafter "MEGDT") has established the National Committee on Combating Desertification and various activities have been implemented, but because its effect was limited, a new National Action Program for Combating Desertification in Mongolia aimed at 2010-2020 was formulated in 2009. This is because the impact of desertification on the economy, society, and people's lives was recognized as the biggest challenge in the 21st century, and decided measures to deal with desertification had to be taken. The new Action Program (AP 2010 - 2020) shows some fundamental policies, one of which relates to the living of pastoralists etc. as below.

> It is understood that desertification is by far the most important environmental issue of Mongolia. It endangers the nomadic and semi-nomadic lifestyle and the cultural identity of Mongolia. It threatens the livelihoods of the rural population which is about 40% of the total populace of the country and it increases the risks for serious conflicts among the population. Therefore, it is recommended to formally treat desertification as a topic of national security.

AP2010-2020 consists of five components: 1) Institutional Strengthening; 2) Policy and legal framework; 3) Science, technology, and knowledge; 4) Advocacy, awareness raising and education; 5) Concrete actions at the grassroots level. Each output of the components and the activities to be carried out shown in AP2010-2020. As one of the things to be done with the 5 component, there is following action line which is relating to possession and use rights of traditional pasture areas.

> Component 5
> Action line 5.1.2. Support gradual transformation of pastoral herding from an inappropriately regulated access system into a system where local herding communities get long term possession and use rights over their traditional pasture areas with the obligation to manage them in line with the carrying capacity of the land.

Also, as a role of related organizations in the implementation of AP 2010-2020, it describes that "Parliament is responsible for determining an effective and good legal and policy framework. One of the most urgent needs is to make more effective rules concerning the use rights of natural resources by local user groups."

The United Nations Framework Convention on Climate Change became effective in 1992 and the Conference of the Parties (COP) has been held annually since 1995. In Mongolia, National Action Plan on Climate Change, "NAPCC" has been approved by the National Assembly in 2000 and 2011. The NAPCC in 2011 includes strategies and measures for adaptation and mitigation for important socioeconomic areas of the state. In the first phase (2011-2016), national mitigation and adaptation capacities will be strengthened, legal, and structural and management systems will be set up and community and public participation will be improved. In the second phase (2017-2021), climate change adaptation measure will be implemented and start up greenhouse gas mitigation actions. As measures to reduce greenhouse gas emissions, in agriculture "Limit the increase in the total number of livestock by increasing the productivity of each type of animal, especially cattle." And in forestry

[37] National Action Program for Combating Desertification in Mongolia (2010-2020)

"Improve forest management, reduce emissions from deforestation and forest degradation, enhance forest carbon stocks in forests." are shown.

Members of Parliament drawn up a draft of law (Law on Pasture Land) which controls usage of grasslands in 2007 in order to cope with the growing overgrazing and desertification in grasslands and the change of consciousness of pastoralist pastoral form (traditional herding → settlement and semi-settlement livestock). The Law on Pasture Land consisted of "Chapter One: General Provisions", "Chapter Two: Plenary Rights of the Central and Local Self-Governing State Organization on Pasture Land Relations", "Chapter Three: Ownership of Pasture", "Chapter Four: Using Unified Pasture land" with 28 articles.

In Article 5, Pasture land Possessor and User", Mongolian citizens over 18 years old, pastoral groups and others have the right for pasture land ownership in the following cases. (1) Grassland for the purpose of intensive and semi-sedentary pastoral livestock husbandry, (2) Pasturelands near pastoral herders' winter and spring places, (3) Citizens who, at their own expense, are willing to restore pasture land, which has been determined as deteriorated pasture land. It is said that Mongolian citizens can hold up to 30% of the district area. For this draft of the law, SDC and the like carried out various technical advice and so on[38].

This bill has been discussed four times in Parliament, but the law has not yet been approved. Giving ownership rights and usage rights of grasslands in Mongolia is the first major reform in history and the form of pastoral living differ greatly depending on the region, so adjustment of the bill is extremely difficult and many people are still viewing that it will be difficult to establish the law in the future. However, in recent years the livestock numbers have been rapidly increasing, and government officials have a sense of crisis that the grassland will collapse unless this law to control the use of grassland is enacted. In December last year, a new bill (Pastureland Protection Law) that strengthened the viewpoint of grassland preservation from the former bill was formulated. Since the law on grasslands is included in the list of bills to be deliberated in Parliament between 2016 and 2021, it is expected to be deliberated soon.

[38] Green Gold Pasture Ecosystem Management Program (2009) Livelihood Study of Herders in Mongolia

2.7.1.3 Water Resource Management

Water Law was enacted in 1995 and 2002, but a new Water Law (Law of Mongolia on Water) was enacted in 2012. The purpose of this law is to manage relevant matters concerning the protection and reasonable use of water resources and its watershed, and the recovery, and consists of "Chapter One: General Provisions", "Chapter Two: Powers of State and Other Institutions as regard to Water Relations, "Chapter Three: Rehabilitation of Water Resource and Water Area", "Chapter Four: Water Utilization", "Chapter Five: Water Constructions and Facilities", and "Chapter Six: Liabilities".

According to Article 4 of Chapter 1, ministries and agencies responsible for nature and the environment are supposed to formulate and approve an integrated management plan for watershed resources. Regarding the use of water resources, in Article 28 of Chapter 4, a daily volume of 100 m^3 or more of the water use, the establishment of a water pond and the digging of a waterway is decided by the central government, a daily volume of 50 to 100 m^3 is decided by watershed office, water use less than 50 m^3 per day is decided by the district. The right to use water is given to individuals, corporations, institutions for 10 years, and extension for five years thereafter is permitted.

Also, it is stipulated that Ministry in charge of nature and environment will decide the usage fee for water. Regarding matters concerning irrigation, in Article 32 of Chapter 5, based on the evaluation of the environmental assessment, the judgment of watershed management institution, and the recommendation of the district head, the central organization in charge of food and agriculture decides construction, refurbishment and repair of the irrigation system.

The National Water Program was approved by Parliament in 2010 as a follow-up to the "Millennium Development Goals-based Comprehensive National Development Strategy" decided in 2008. This program aims to create conditions for the protection of water resources from contamination and deterioration, proper use, and supply of water that meets healthy and hygienic requirements to the public, the first implementation period is 2010 - 2015, the second implementation period is 2016 to 2021. A detailed action plan for actually proceeding with this program was also adopted in 2010. Instructions on the implementation of this program are being conducted by the National Water Committee (hereinafter "NWC") which is established in 1999. Before the change of government last year, the NWC had a large scale as a body under the direct control of the Prime Minister, but after the change of the government, it became the jurisdiction of MEGDT and the scale has been sharply reduced.

Although the above-mentioned national water program is in operation, based on the Article 4 of the Water Law newly enacted in 2012, the Integrated Water Management Plan of Mongolia "IWMP" was formulated in 2013. The concrete action plan for implementing IWMP was approved by the National Assembly in November 2013. The Plan incorporates many parts of the National Water Programs and will underpin the National Water Program by providing scientific evidence, regional detailed information, and impact assessment methods etc.

In the IWMP action plan, the following items are specifically shown as water use targets concerning agriculture.

Table 2.7.3 Water Use Targets Concerning Agriculture in the IWMP Action Plan

Objective 2: Water supply for agricultural sector			
No.	**Measure description**	**Activities**	**Duration**
2.1	Local surveys and exploration studies to identify water resources for new boreholes, ponds, and reservoirs in rural areas	Surveys for ponds at 626 locations until 2015 and 829 locations until 2021	2014-2021
2.2	Construction of new and renovation of existing water sources (boreholes, ponds) based on grazing capacity and desertification condition	Number of boreholes constructed or rehabilitated: 2011-2015 2466 boreholes, 2016-2021 6050 boreholes. Number of ponds rehabilitated 5, constructed 54 (2011-2015). Number of ponds rehabilitated 7, constructed 125 (2016-2021).	2014-2021
2.3	Improve the operation and maintenance of livestock water supply points	Support to herder groups: 300 before 2015, 900 in 2015-2021	2014-2021
2.4	Support to improve water supply of intensive livestock breeding	Activities are concentrated around Ulaanbaatar, Darkhan and Erdenet	2014-2021
2.5	Surveys and exploration studies to identify water resources for irrigation and haymaking areas	Surveys for new and for renovated irrigation system	2014-2021
2.6	Construction and renovation of dams and reservoirs for irrigation	The total capacity of newly constructed or renovated reservoirs should be sufficient to supply: 62,910 thousand m^3/year for 22,000 ha until 2015 and 91,935 thousand m3/year for 32,000 ha until 2021.	2014-2021
2.7	Construction and renovation of headworks, main conveyance channel and irrigation systems	Total area newly constructed: 2,900 ha until 2015, 10,600 ha until 2021. Total area renovated: 17,100 ha until 2015, 22,500 ha until 2021	2014-2021
2.8	Improve irrigation management	Support of irrigation management groups: 50 until 2015 and 50 until 2021	2014-2021
2.9	Improvement of agro-technology of irrigated crops and conduct water saving technology	Improved use of fertilizers, of herbicides and pesticides, of sprinklers and other modern irrigation systems, of mechanical equipment for sowing, weeding and harvesting, of drought and cold resistant crops, of soil protection technologies, of irrigation water management to avoid salinization of soils by appropriate application of irrigation water	2014-2021

2.7.2 Environmental and Social Consideration

2.7.2.1 Environmental and Social Consideration System in Mongolia

Laws and Standards related to environmental and social consideration are listed as follows.

Table 2.7.4 Laws and Standards for Environmental and Social Consideration

Sector	Laws and Standards	Year
General	Law on Environmental Protection	1995 Amended total 12 times including 2005/2006/2008/ 2010
Environmental Impact Assessment	Law on Environmental Impact Assessment	1998 Amended in 2001, 2006, 2012
	Guidelines on Method of Natural Environmental Impact Assessment	2010
	Regulations and Guidelines on Preparation of Natural Environmental Protection Plan, Environmental Management and Monitoring Plan, and Rehabilitation Plan	2006
	Regulations and Guidelines on Method of Detailed Natural Environmental Impact Assessment	2000
Air	Law on Air	1995, Amended in 2010, 2012
Water	Law on Water	1995, 2004, 2012
Protection Area	Law on Special Protected Areas	1994 Amended for 7 times including 1997/2002/2003/ 2004/2006/2008
Ecology	Law on Natural Plants	1995 Amended in 1997/2002/2010
	Law on Forests	1995 Amended in 2012
Land	Law on Land	(1994 年) Amended for 10 times including 2002/2003/2004/ 2005/2006/2009/2010
	Law on Land Privatization	2002 Amended in 2005/2008/2011
Waste	Law on Solid Waste	2003 Amended in 2012
Others	Law on Protection from Toxic Chemicals	1995

Sector	Laws and Standards	Year
Standards	MNS 0017-0-0-06: Environmental protection standard system.	2000
	MNS 0017-5-1-13: Rehabilitation of destroyed lands. Terminology and determination	1979
	MNS 0017-5-1-18: Rehabilitation. Classification of disturbed lands	1993
	MNS 0017-5-1-19: General requirements for rehabilitation of disturbed lands	1983
	MNS 3473: Environment. Land. Land use. Terminology and determination	1992
	MNS 4191: Environmental protection standard system. Climate of Mongolia. Main parameters	1983
	MNS (ISO) 4226: Air quality. General subject and general requirements	1993
	MNS 4585: Air quality parameters. General requirements	1998 Amended in 2005, 2007
	MNS 17-2-0-07: Environmental protection. Air emissions. Classification.	1979
	MNS: 0017-2-3-16: Air. Rules of air quality monitoring of city and settlements	1998
	MNS 4586: Indicator of water environment quality. General requirements	1998
	MNS (ISO) 4867: Water quality. Sampling third part. Recommendation for storage and protection	1999
	MNS 3342: General requirements for protection of groundwater	1982
	MNS0 900: Drinking water. Hygienic requirements and quality control	1992 Amended in 2005
	MNS 4943: Water quality. Effluent standard.	2000
	MNS 3297: Soil. Volume of hygienic parameters of soil of city and settlements	1991
	MNS 4917: Environment. Requirements for determination of the fertile soil layer standard disposal while performing earth-moving activities	2000
	MNS 5850: Soil quality. Soil pollutants elements and substances	2008
	MNS 4990: Workplace atmospheres. Hygienic requirement.	2000
	MNS 5803: Occupational safety and health. General requirements for lead content in workplace air and the workplace.	2007

The Mongolian Law on Environmental Protection, which is the basic law of environmental protection and management, was established in 1995 and amended 12 times. The law briefly addresses on Environmental Impact Assessment (hereinafter "EIA"). The details of EIA is written in the Mongolian Law on Environmental Impact Assessment (hereinafter "EIA law"), which was established in 1998 and amended in May 2012.

Three items of "Strategic Environmental Assessment (hereinafter "SEA"), "Environmental Baseline Assessment" and "Cumulative Impact Assessment" were introduced in addition to the "EIA" through the revision of EIA law in May 2012. SEA shall be carried out by a professional entity licensed by the MET and the entity will make a report. The report shall first be discussed by the Technical Board and then presented to the government by the cabinet member responsible for nature and environment. Although the EIA law has been revised, related guidelines are not yet revised as of November 2012. The Technical Board was not held and procedures under the previous EIA law continue.

EIA in Mongolia shall be implemented by the two steps of "General Environmental Impact Assessment" (hereinafter "GEIA") as a screening procedure and "Detailed Environmental Impact Assessment" (hereinafter "DEIA").

At screening stage, projects are categorized into three based on screening criteria: (1) implementation proposal of project is remanded and rejected because of following reasons such as proposed technology, implement method and activities have high possibility of negative impacts, land use is not reflected in the land management plan, or the project does not comply with the policy, strategic assessment result, and related laws and regulations, (2) project is to be implemented without DEIA under certain conditions, and (3) project requires DEIA conduct. The projects with the conditions of the category which apply to the DEIA are the cases with large negative impacts that affect people's health and environment, or cases in which impact cannot be predicted. It will require further detailed study as it develops and uses a large amount of natural resources. DEIA implementation can only be carried out by the companies which are designated by the MET to perform such. The outline of the revised EIA law is shown in Table 2.7.4.

At present, related laws do not mention the treatment of resettlement and land acquisition.

Table 2.7.5 Summary of Mongolian EIA Law

Assessments of Environmental Impact (Article 4)	1. Assessments of environmental impact shall include the following: Strategic Environmental Assessment (SEA) Environmental Baseline Assessment Environmental Impact Assessment (EIA) Cumulative Impact Assessment 2. Technical Board with responsibilities to regulate issue that may arise in connection with EIA; review of assessments and reports based on SEA; cumulative impact assessment and EIA shall work at MET. Technical Board Member shall be appointed by the MET.
Environmental Baseline Assessment and Cumulative Impact Assessment (Article 6)	1. The project implementer is responsible for commissioning the environmental baseline assessment to identify potential impacts of the project. 2. The project implementer shall ensure that the environmental baseline assessment is performed with the due participation of a licensed professional entity or research institution and, if necessary, shall seek guidelines from the MET. 3. MET shall conduct Cumulative Impact Assessment in the specific regions and basins from various projects implemented by individuals and business entities with due inputs from a licensed professional entity. 4. If deemed necessary, the cabinet member in charge of nature and environment may appoint a team of experts for conducting the assessment. 5. The costs associated with the Cumulative Impact Assessment shall be borne by the project implementers according to its range of impacts. 6. The professionally licensed entity shall submit for review the Environmental Baseline Assessment report and Cumulative Impact Assessment report to the Technical Board at the MET.

EIA (Article 7)	1. EIA shall consist of a General Environmental Impact Assessment (GEIA) and Detailed Environmental Impact Assessment (DEIA). 2. Applications for a license for the use of natural resources, extraction of petroleum and minerals, possession and use of land for business purposes and an approval for any other projects are subject to screening. 3. The project implementer shall apply for a GEIA to MET, the province or Ulaanbaatar city governor's office, whichever is applicable according to the classification, by submitting a brief description of the project, a feasibility study (F/S), the engineering design and drawings, baseline description of the proposed project environment, written opinions of the relevant district governor and other related documents. 4. The screening shall be performed by an assessment expert who shall complete the assessment within 14 working days and issue a formal opinion as to whether, (if deemed necessary, it can be extended once for additional 14 days for the assessment according to a decision by the head of assessment experts): (1) The project should be rejected on the grounds that it is likely to cause considerable harm to the environment by virtue of its proposed technology, technique and activities; that it lacks land management planning: that its activities are inconsistent with the state policy, strategic assessment results or relevant legislation; (2) The project may be implemented without a DEIA subject to specific conditions; (3) The project requires DEIA.
DEIA (Article 8)	1. The results of the screening shall define the objectives, areas, scope and duration of the work for the DEIA. 2. The DEIA shall be conducted by a Mongolian entity authorized to do so. 3. The entity authorized to conduct the DEIA shall prepare a report presenting the findings of the DEIA and develop an Environmental Management Plan. 4. The DEIA report shall include the followings: (1) The baseline data and indicators of the environment in which the project is proposed to be implemented; (2) Estimations and findings of studies that are conducted to identify a potential and the major negative impact of the project and establish their magnitude, spatial extent and consequences; (3) Recommendations for measures to mitigate and eliminate potential as well as the major impact of the project; (4) Recommendations for alternative methods and technology that may potentially reduce the pollution level expected from the proposed project and for environmental considered method and technology. (5) Risk assessment of impacts of the proposed project on human health and the environment (if the general environmental impact assessment requires so doing) ; (6) Objectives, scope and indicators of the environmental management plan; (7) Notes of consultations made with local authorities and communities likely to be affected by the proposed project; and (8) Other issues pertaining to the cultural stratum and special nature of the project. 5. The project implementer shall be officially asked to comment on the DEIA report. 6. The project implementer shall bear the costs associated with the conduct of the DEIA. 7. The entity that has conducted the DEIA shall keep the original copy of the data and information collected in the field and findings of the investigation carried out by the assessment specialist. It shall prepare a DEIA report in four copies, one of which is to be submitted to the MET, another to the project implementer, and third to the province or district governments having jurisdiction over the proposed project. The entity shall retain the remaining copy.

Environmental Management Plan (Article 9)	1. An Environmental Management Plan shall form an integral part of DEIA. 2. The entity that has performed the DEIA shall develop an Environmental Management Plan in order to protect and ensure sustainable use and conservation of the nature and environment in which the proposed project is to be implemented, ensure the realization of recommendations outlined in the SEA, mitigate, eliminate and prevent adverse impacts that are identified by the detailed impact assessment, and monitor and identify potential negative consequences that may arise in the proposed project environment. 3. The MET shall approve the Environmental Management Plan for the proposed project and grant the permit to go ahead with the project. 4. An Environmental Management Plan shall consist of an Environmental Protection Plan and Environmental Monitoring Program. 5. The Environmental Protection Plan shall address measures to mitigate and eliminate adverse impacts identified during the EIA and provide for the timeframe and estimated budget for implementation of those measures. 6. The environmental monitoring program shall address the monitoring and analysis of changes made to the state of the environment as a result of the project activity and shall clarify reporting requirements and ways to implement the plan as well as providing the timeline and estimated budget.
Appraisal of DEIA (Article 10)	1. The licensed entity having completed the DEIA shall submit the DEIA report and related documents to the entity that performed the screening within the period specified. 2. The expert who has received the report on the DEIA shall appraise the quality of the assessment and issue an opinion within 18 working days. (The chief assessment expert of the MET may extend the appraisal period once by 18 days.) The chief assessment expert of the MET may exclusively appoint a team of experts to do an appraisal of the assessment report. 3. The MET shall decide whether the project should go ahead based on the DEIA report and the opinions of the expert and the Technical Board that have appraised the quality of the report. 4. The DEIA report shall be advertised and presented by the project implementer and the professional entity having performed the assessment to the communities likely to be affected by the project.

Source: JICA "THE STUDY ON IMPLEMENTATION OF ULAANBAATAR CITY URBAN TRANSPORTATION PROJECT IN MONGOLIA" with updated information

2.7.2.2 Natural Condition

(1) Climate

Mongolia as a whole is classified as almost the same climate classification belonging to the typical continental subarctic or step climate. The characteristics of the climate are the change of the four seasons is quite noticeable. It is divided into the dried short summer (June to August), cold long winter (November to April), and rapidly changing spring and autumn.

The annual average temperature is about 0 degrees. However, the temperature change is intense as the maximum temperature is 35 degrees and the lowest temperature is -34 degrees. Looking at the average temperature of Ulaanbaatar for 30 years (1971 - 2001) by the World Meteorological Organization, the average of the highest temperatures is the highest in July, then in June. The lowest average temperature is the lowest in January, then in December. In recent years, weather conditions also called abnormal weather are also observed. According to the data of 2014, the temperature of the year is higher by 1.3 to 3.6 degrees in the Gobi area and the grassland area, and by 0.3 to 1.5 degrees in the other area compared to the long-term average temperature. The temperature in February has fallen by about 2.4 degrees while the temperature in January, March, April, and October has been increased by 2.5 to 3.9 degrees compared to the long-term average.

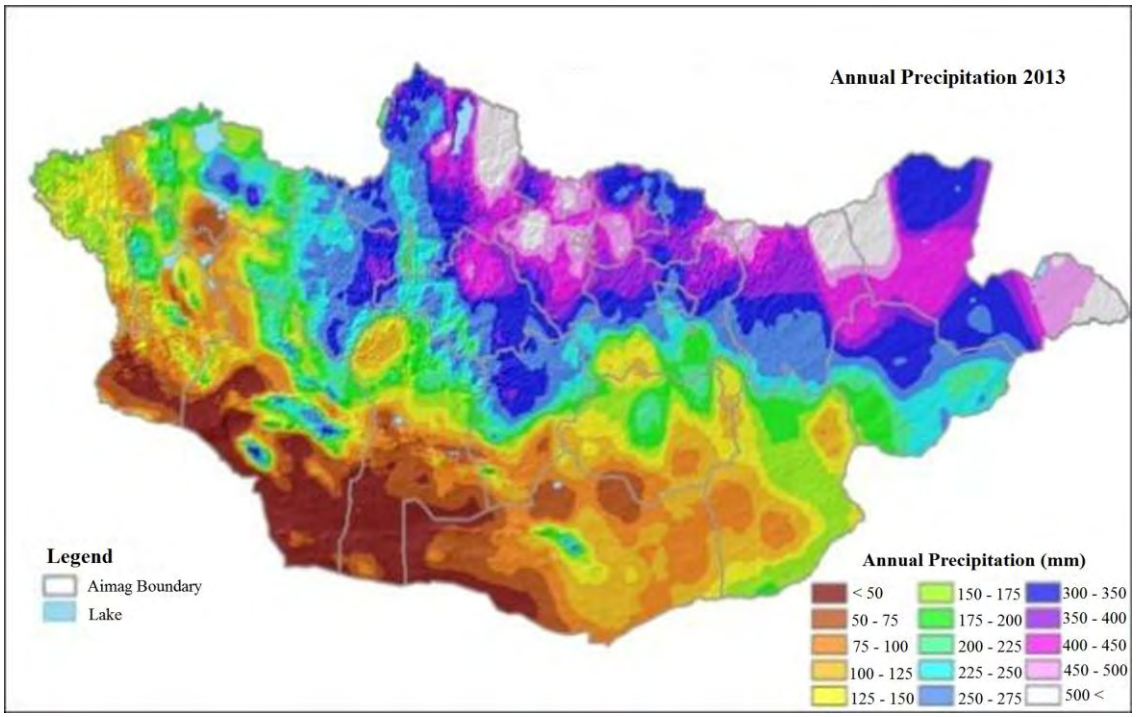
(2) Precipitation

The amount of precipitation is about 270 mm per year. The average precipitation per month is the highest at 76.3 mm in August and the 65.7 mm in July. In contrast, the average precipitation in December, January, and February is very low, about 2 to 3 mm. Among the amount of precipitation, an average of 70 to 90 % of precipitation evaporates, and the rest amount recharges groundwater and river water[39].

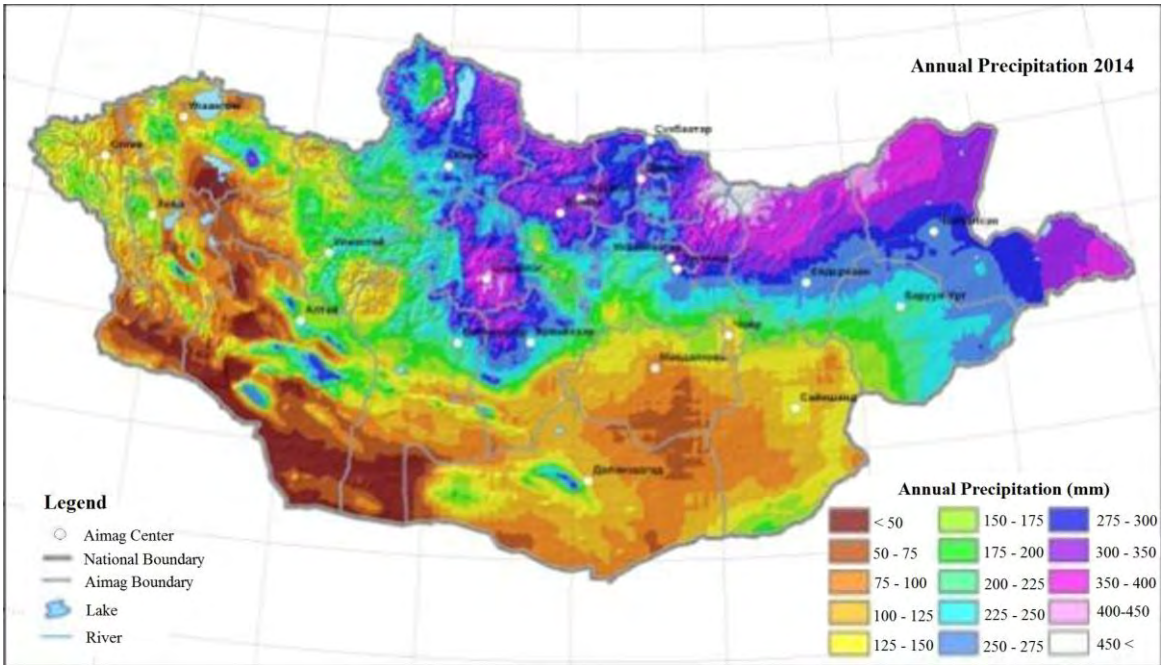
The precipitation directly affects the production of grass and its quantity also changes every year, and it is pointed out that the condition of the pastoral environment is largely influenced by precipitation rather than by "grazing pressure" of livestock. Therefore, it is important for nomads to grasp the change of precipitation spatially and to select the suitable place where grass grows well during that year[40]. Particularly in the permafrost area, it is pointed out that the growth of grasslands is affected by the precipitation in the autumn of the previous year[41].

For growth of grass, it is necessary to have three elements including precipitation, radiation from the sun and temperature. However, in the case of Mongolia, the period in which these three elements are completed is short, then the grass growing period is limited to three months from middle of May to middle of August. For pasture management, such natural conditions should be considered.

[39] "A Handbook of Mongolian Environments 06", Davaa G., Oyunbaatar D., SUGITA M., 2006
[40] "Land Use for Livestock Farming in Post Socialism of Mongolia –Theory of Development and Practice of Nomadism", Akira Kamimura, Tokyo University of Foreign Studies, 2004
[41] "Vulnerability Assessment and Adaptation Strategies for Permafrost Regions in Mongolia", Qinxue WANG, National Institute for Environmental Studies (NIES), 2012-2014



2013



2014

Figure 2.7.1 Precipitation

Source: Ministry of Environment, Green Development and Tourism (MEGDT) "Report on condition of natural environment in Mongolia 2013-2014", published in 2014

2.7.2.3 Land Use Plan

(1) Land use

In the land use plan, the land use for agriculture and pasturing use, urban use, road network, forest, water resources and special protected area are prescribed. Total area for agriculture and pasturing land use is 115,399,856km2 (73.8%). Among them, pastureland is 111,032,541km2 (71.0%), irrigated area is 1,712,303km2 (1.1%), and cultivation area is 1,031,099km2 (0.7%). Figure 2.7.2 shows a plan of agriculture and pasturing utilization land. The agricultural cultivation area is located in Selenge province, Tuv province, Darkhan-Uul province, Orkhon province, along the Selenge River and its tributaries, and along the Herlen River and its tributaries. The unsuitable land for pasture is observed in the parts of Gobi National Park, Khangai Mountain Range, Altai Mountain Range and the national park located in the west of the Khuvsgul Lake. Moreover, the following figure also shows the plan of a pastureland with water. As water is indispensable for pasturing, it is pointed out that livestock concentrates on the pastureland with water. Considering the balance between natural conditions, such as the distribution of water resources and the appropriateness of land, and the utilization the national land use, it is necessary to properly examine the water supply in the pastureland.

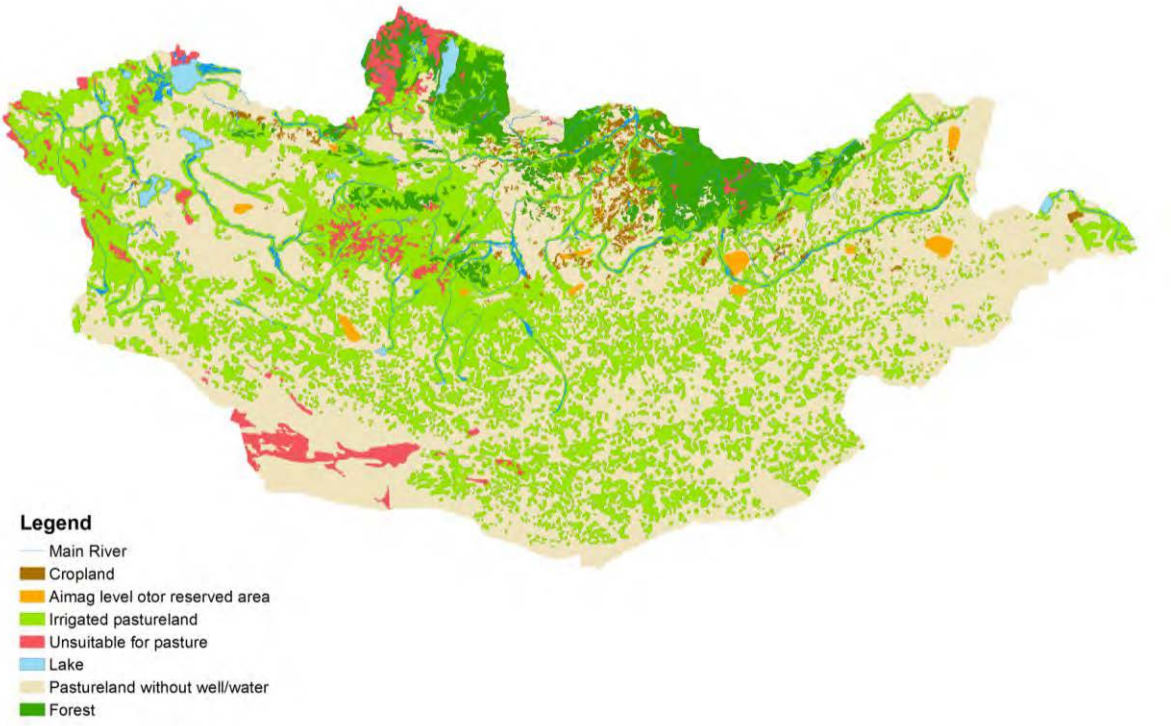


Figure 2.7.2 Plan of Agriculture and Pasturing Utilization Land

Source: Prepared by JICA Study Team based on the database of ULTF, ALAGaC[42]

As to problems related to the land use for agriculture and pasturing, the intrusion of livestock into cultivated lands is pointed out generally. An example of how to deal with this problem is given in the following example of Khovd province. As shown in Figure 2.7.3, the boundary line for the cultivated land is shown only by the pile of the tree in Khovd province and there is no fence to prevent livestock's intrusion. However, there is no conflict between agriculture and pasture. In Mongolia, the period for agriculture can be limited to the warm season from May to September, as it will be severe cold in winter and that climate is not suitable for agriculture. The agricultural lands in Khovd province

[42] ALAGaC is the former Administration of Land Affaires, Geodesy and Cartography (hereinafter "ALAGaC"). This organization name was changed to "Agency for Land Administration and Management, Geodesy and Cartography (ALAMGaC) in accordance with reorganization of the ministries after the change of government in 2016.

are mainly located near the winter pasturing site, and the place for pasturing of livestock in the summer is far away from that agricultural lands. Therefore, the pasturing areas and agricultural areas do not overlap (see Figure 2.7.4). In this way, there are examples to utilize the seasonal restriction on the use of agricultural lands effectively, and the pasturelands and agricultural lands are separated effectively.

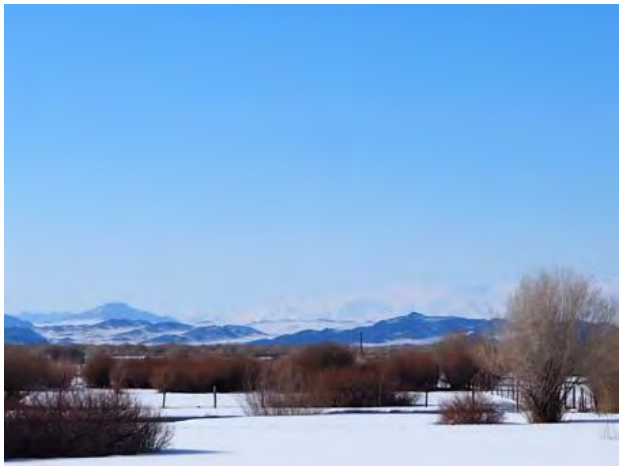


Figure 2.7.3 Boundary Line for Cultivated Lands by Piles of Trees

Source: Prepared by JICA Study Team

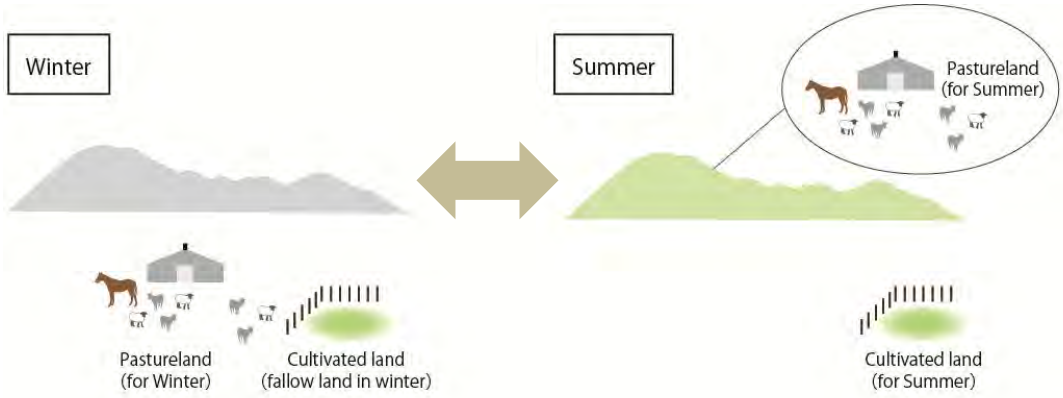


Figure 2.7.4 Segregation of Pasturing Land and Agricultural Land (Example of Khovd Province)

Source: Prepared by JICA Study Team

As to the pasture land, since the natural condition of Mongolia is a large variation, it is desirable for pasturing to take advantage of the natural characteristics of each area according to the season and climate condition of the year. However, the pasture land is managed by an administrative (district) unit currently, and pasturing should be done within the administrative boundary[43]. Therefore, pastureland which is suitable for both winter and summer does not always exist in a district, and there is a trend that there are many damaged (dead) livestock by *dzud* in a district with such an unbalanced natural condition as compared with a balanced district[44]. If there is not suitable pastureland for each season in one district, the contract for the permission to use pastureland is made between neighboring districts so that nomads in a district with unbalanced natural conditions can secure a suitable pastureland for each season. If it cannot be resolved between districts, the contract is made between district and province, and that contract is signed in writing[45]. However, as the number of migrants from other districts increases, it becomes overgrazed and the condition of grassland deteriorates, so there are also conflicts between migrants and natives in that district[46].

Although the response to problems between the natural environment and seasonal movement of nomads have been taken, it is desirable to promote more flexible land use that can cover the seasonal movement of nomads.

In addition, under the Law of Land, "Right of User" is prescribed in the summer and autumn pastureland, and "Right of User" and "Right of Possession" are prescribed in the winter and spring pastureland which has the fixed facilities such as pens or fences for livestock. However, due to the implementation of this regulation, there is a tendency that abundant nomads don't want to move even after spring in order to protect the effect of investment in their winter and spring estate and pastureland. In this way, it has also been pointed out that strengthening of customary land rights in livestock farming by the establishment of statements of literature may lead to suppression of seasonal movement[47]. As a result of such a restriction of seasonal movement, overgrazing surrounding the camp is caused by permanent pasturing, which has led to the deterioration of pastureland condition[48].

(2) Special Protected Area

The special protected areas in Mongolia include Strictly Protected Areas, National Parks, Nature Reserves, and Monuments (National Historic sites). The total area of the special protected area is 2.72 million hectares, accounting for about 17% of the nationwide land.

As to considerations about agriculture/livestock farming in the special protected area, according to the MET, there are no special boundaries such as fences etc. to protect from the livestock's intrusion on the special protected areas, except for sightseeing campgrounds and individual land with special permission for land use. The nomads who lived in that land before receiving the special protected area designation are now being treated specially so that they can do pasturing within the protected areas. However, along with the increase in the number of domestic livestock of nomads in that area, problems of grassland degradation are occurring even within special protected area. Along with this situation, the necessity to prepare rules to regulate pasturing within special protected areas has been recognized, and draft revision of Law of Special Protected Area[49] is being studied.

[43] During the socialist regime, there was not limitation on the area for pasturing use and pastureland was used seasonally to meet the natural characteristics of each area.
[44] JICA. (2016). MONDEP Final Report
[45] Based on the interview to officers at the agriculture and Livestock Farming Bureau of the Province of Khovd
[46] "Land Use and Environmental Consciousness of Grassland Degradation of Mongolian Nomads", Yu Onodera, Hokkaido University, 2009
[47] "Land Use for Livestock Farming in Post Socialism of Mongolia –Theory of Development and Practice of Nomadism", Akir Kamimura (Tokyo University of Foreign Studies), 2004
[48] "Development Law 2014 – Nomadic and Land Ownership in Mongolia", T. Hatori, D. Oka, S, Sato
[49] A draft revision was prepared on November 23, 2016, and as of April 2017, it is awaiting approval of the Diet.

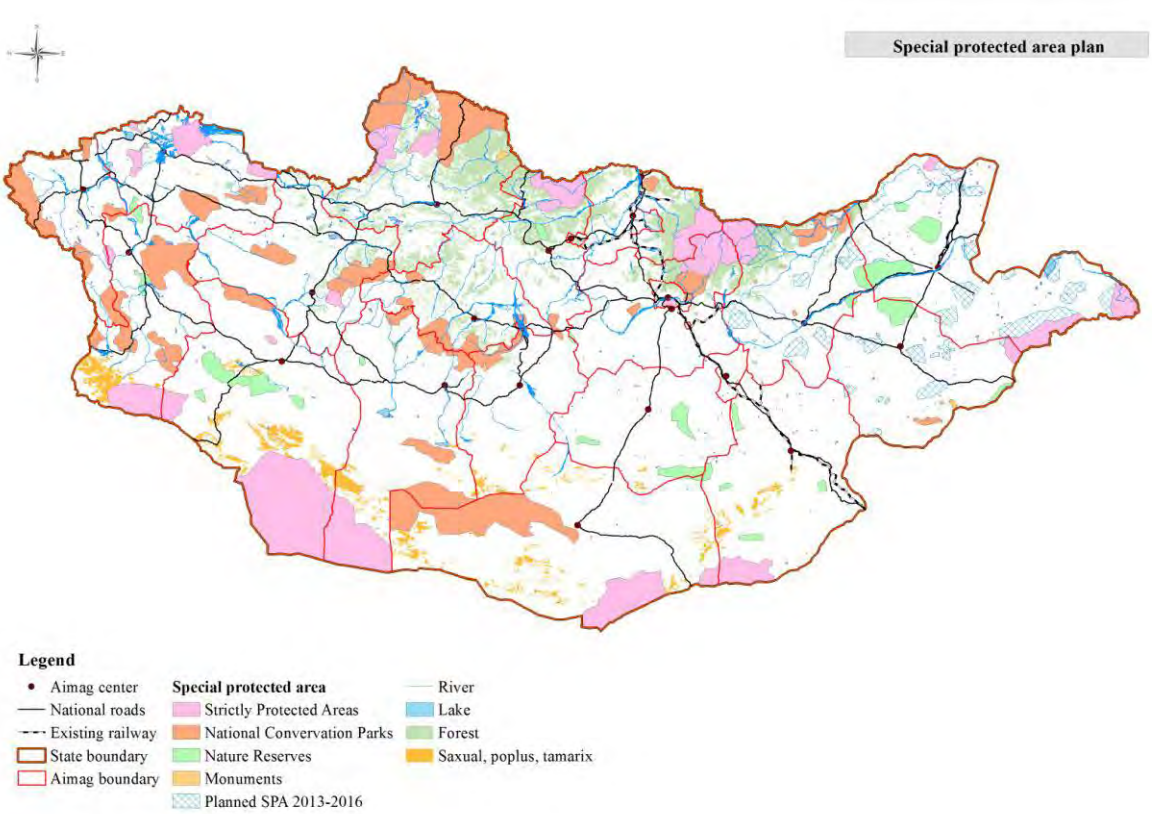


Figure 2.7.5 Special Protected Areas

Source: Prepared by JICA Study Team made based on the database of ULTF, ALAGaC

2.7.3 Regional Potential of Water Resources

2.7.3.1 Amount of Water Resources and Water Demand and Supply Balance

Surface water in Mongolia is relatively concentrated in the northern part of Mongolia as shown in Figure 2.7.7. The total water resources in Mongolia are estimated at 608 billion m^3, of which 346 million m^3 is a river, 500 billion m^3 is a lake, 62.9 billion m^3 is a glacier/permafrost, and 10.8 billion m^3 is a groundwater[50]. Since Mongolia is in a dry area, river water is lost due to evaporation and penetration into the ground and rivers are frozen in winter, the water volume of the river is unstable and there is only a limited flow for a half of the year[51]. Therefore, the impact of seasonal fluctuation of water resources in agriculture and livestock farming in Mongolia is a non-negligible factor.

[50] "National Water Program", 2010
[51] "A Handbook of Mongolian Environments 06", Davaa G., Oyunbaatar D., SUGITA M., 2006

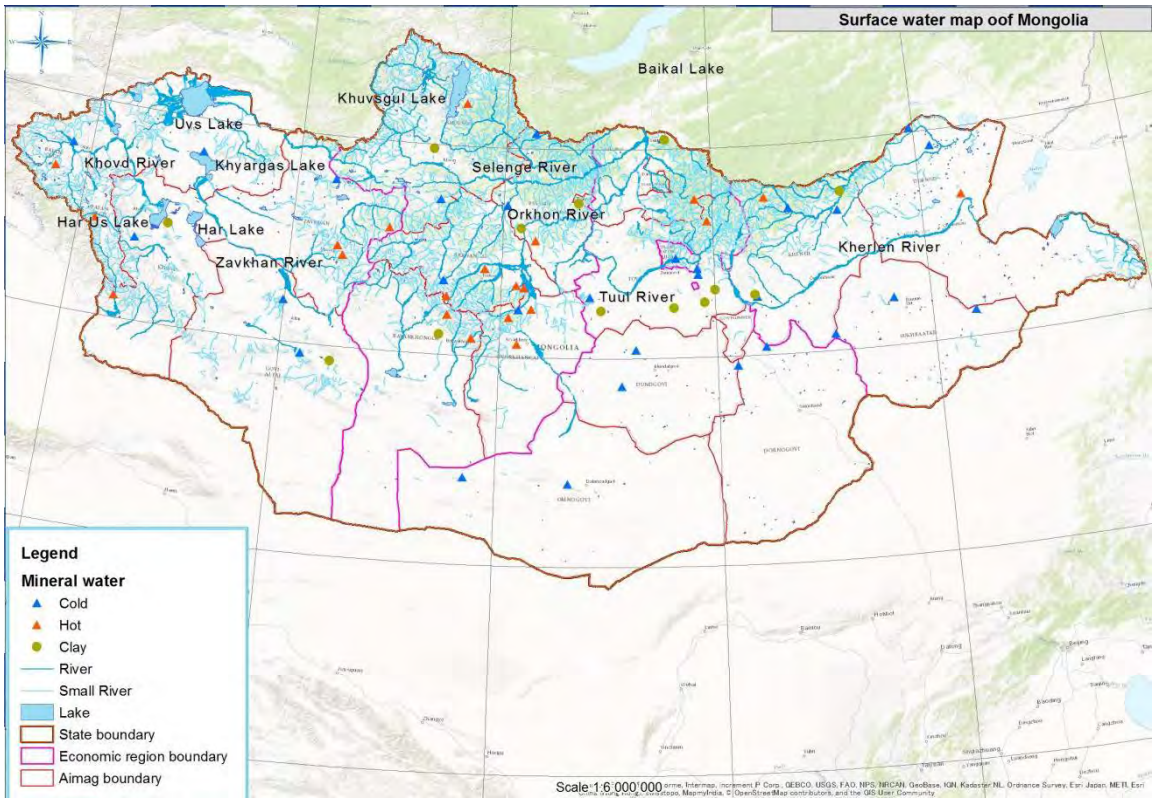


Figure 2.7.6 Surface Water (Lake and River) Map of Mongolia

Source: MONDEP, JICA

As to the amount of water resources in Mongolia, IWMP issued by MEGD which is former MET, in 2013 has an outline about water resources in Mongolia. According to the current MET, the amount of water described in IWMP is an estimated value by a simple survey, after IWMP approval, detailed investigation is carried out in each water basin and plan is being developed. Especially, full-scale surveys were conducted in the Tuul basin where population and industry concentrate and Orkhon basin.

Currently, water resources in Mongolia are managed separately in 29 basins (see Figure 2.7.8). The management of 29 water basin is carried out by 21 administrative offices. These offices conduct natural rehabilitation work in surrounding area and provide information and technical advice to ensure the balance of water in the each basin for rangers in each province and district.

Regarding water management by the province, the example of the Tuv province is introduced below. In Tuv province, water management plans are prepared for each of the five water basin in that province. Surveys on water sources covering all area in the province were conducted every five years, but it has been changed to conduct a survey every year from 2013. In 2016, the sufficient investigation could not be conducted due to lack of budget. However, environmental officers at each district are planning to conduct a survey for wells, irrigation ponds, and spring water in 2017. In the survey, the officer of the provincial environment department directs guidance. Regarding the use of irrigation water, it is necessary to apply to the environmental bureau of the province, then apply from the provincial environmental bureau to the MET, and a specialized consultancy company conducts surveys on necessary matters such as water quality and water volume. After that, consultation between the mayor of district and administration (environment bureau) is carried out to obtain approval for the use of irrigation water. In case of digging a deep well in pastureland, it is necessary to apply to the provincial environmental bureau after 2012, while it would apply to the head of district until 2012. For digging a shallow well, prior application is not necessary, but it is necessary to report it to the district.

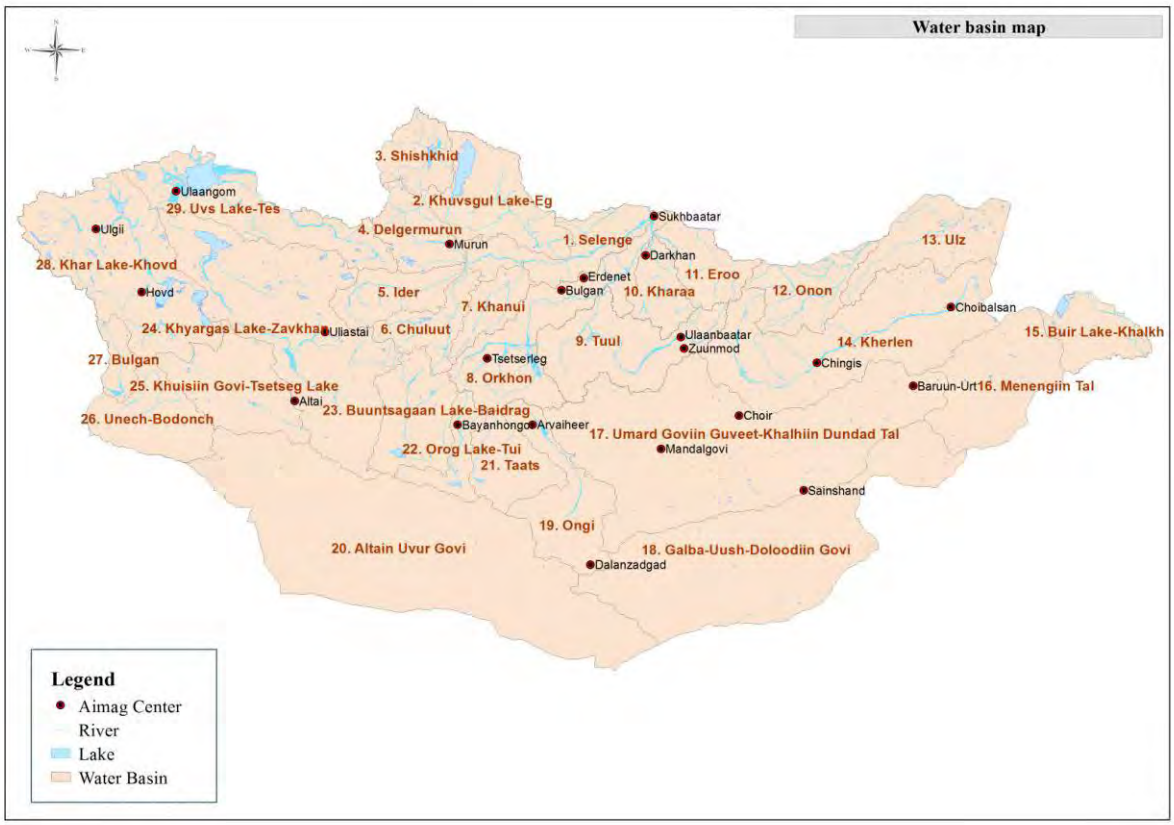


Figure 2.7.7 Water Basin Map

Source: Prepared by JICA Study Team based on the database of ALAGaC

From IWMP, the amount of surface water and groundwater for each basin in shown in Table 2.7.5, and maps are shown in Figure 2.7.9 to Figure 2.7.11.

Table 2.7.6 The Volume of Surface Water and Groundwater by Water Basin

	Water Basin Name	Area (km^2)	Basin	Type	Surface water resources (million m^3/year)			Groundwater resources (million m^3/year)	
					Total Resources	Environmental	Possible use	Potential exploitable	Exploitable resources
1	Selenge	31,395	A	SW	2,133	1,856	277.3	697	90.3
2	Khuvsgul Lake - Eg	41,871	A	SW	2,971	2,570	401.1	432	0.2
3	Shishkhid	20,362	A	SW	519	481	39.0	206	0.2
4	Delgermurun	23,324	A	SW	1,080	999	81.0	229	2.7
5	Ider	23,061	A	SW	710	657	53.3	129	0.5
6	Chuluut	20,078	A	SW	185	171	13.9	86	0.1
7	Khanui	15,755	A	SW	231	217	13.9	96	0.2
8	Orkhon	53,455	A	SW	2,345	2,123	221.6	838.3	26.7
9	Tuul	50,074	A	SW	1,073	1,010	63.1	637.7	142.8
10	Kharaa	17,697	A	SW	432	406	25.9	182	52.6
11	Eroo	22,280	A	SW	1,121	925	196.2	239	0.6
12	Onon	28,241	P	SW	1,480	1,221	259.0	344	0.6
13	Ulz	37,961	P	SW	130	107	22.7	320	26.4
14	Kherlen	107,906	P	SW	567	507	59.5	721	43.9
15	Buir Lake – Khalkh	23,756	P	SW	1,023	920	102.3	198	1.1
16	Menengiin Tal	54,082	P	GW	0	0	0.0	168	0.1
17	Umard Goviin Guveet – Khalkhiin Dundad Tal	180,555	CA	GW	0	0	0.0	433	46.7
18	Galba – Uush – Doloodiin Govi	142,287	CA	GW	0	0	0.0	352	59.0
19	Ongi	39,724	CA	SW/GW	26	25	1.0	294	5.8
20	Altain Uvur Govi	221,156	CA	GW	0	0	0.0	337	65.5
21	Taats	25,425	CA	SW/GW	22	21	0.9	61	0.5
22	Orog Lake – Tui	15,735	CA	SW/GW	66	63	2.6	33	5.9
23	Buuntsagaan Lake – Baidrag	35,622	CA	SW/GW	303	280	22.7	174	2.9
24	Khyagas Lake – Zavkhan	122,315	CA	SW/GW	599	554	44.9	892	10.0
25	Khuisiin Govi – Tsetseg Lake	43,024	CA	SW/GW	0	0	0.0	493	8.1
26	Unech – Bodonch	34,491	CA	SW/GW	66	64	2.7	237	11.3
27	Bulgan	10,155	CA	SW	207	199	8.3	86	0.0
28	Khar Lake – Khovd	88,936	CA	SW/GW	2,317	2,201	115.8	684	12.7
29	Uvs Lake - Tes	54,223	CA	SW/GW	1,578	1,514	63.1	405	6.1
	Mongolia	1,584,946			21,184	19,092	2,092	10,004	623.4

Explanation:

Basin: A = Arctic Basin, P = Pacific Basin, CA = Central Asian Internal Drainage Basin

Type: SW = Surface water, GW = Groundwater

Surface water: Total resources based on surface water which is generated in an average year within the river basin only; inflow from other upstream river basins is not included.

Environmental flow: Davaa and Myagmarjav (1999) estimated the minimum flow requirement in Mongolian rivers. The environmental resources are based on their estimate.
Possible use: total resources – environmental resources

Groundwater: Potential resources based on aquifer properties and renewable resources.
Exploitable resources based on approved groundwater deposits.

Source: IWMP, MEGD

In terms of the basin, the surface water per unit area is large in the "2.Khuvsgul Lag-Eg" basin (from the surroundings of Khuvsgul Lake to Northern area in Bulgan province), "1.Selenge" basin (from the Eastern part of Khuvsgul province to area along the Selenge River including Selenge district and Hutag-Undur district in Bulgan province), "12.Onon" basin (area along the Onon River in Khentii province) and "11.Eroo" basin (area along the Yeroo River in Selenge province). A lot of surface water is present in the northern part of Mongolia, and the amount of surface water tends to be 0 or less in the water basins located in the south (see Figure 2.7.9).

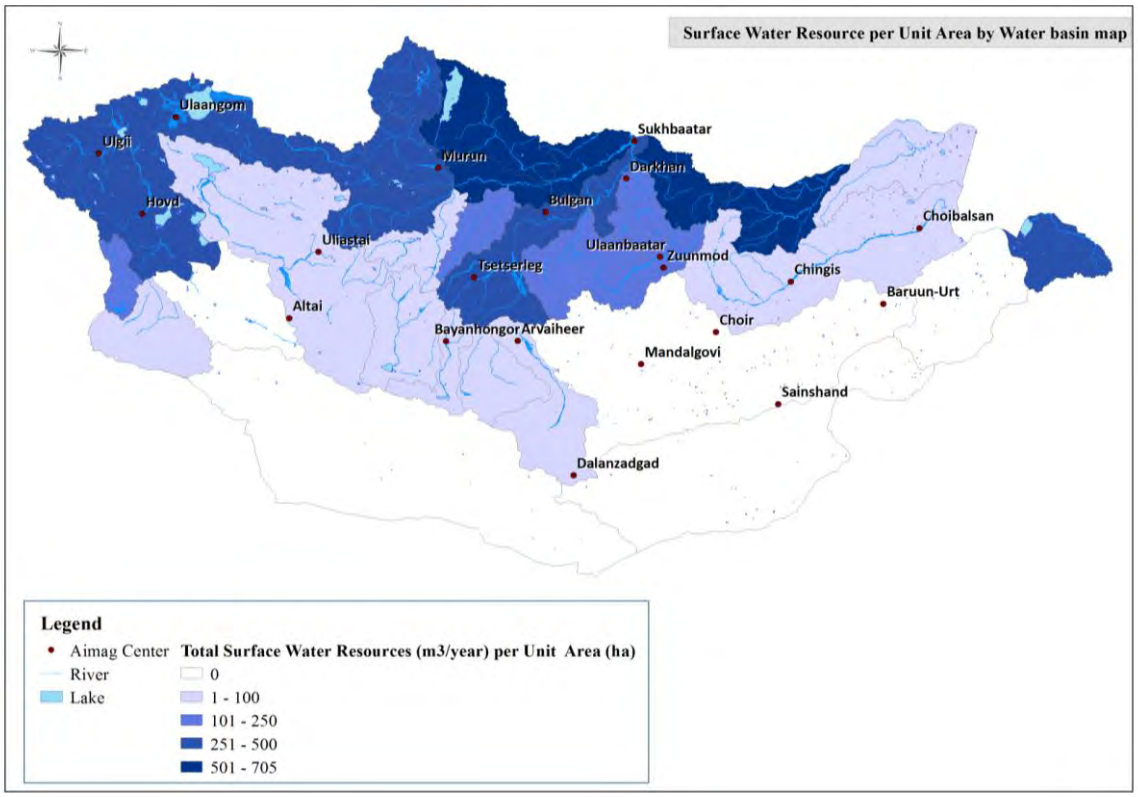


Figure 2.7.8 Surface Water Volume per Unit Area by Water Basin

Source: Prepared by JICA Study Team based on the data in IWMP

On the other hand, the volume of the exploitable groundwater per unit area[52] is "10.Kharaa" basin (around Darkhan City), "1.Selenge" basin and "9.Tuul" basin (around Ulaanbaatar City) as shown in 2.7.10. In the Gobi area where surface water can hardly be used, there is a tendency that groundwater can be used as compared with other areas. Moreover, the potentially exploitable groundwater per unit area exists much in the north part of Mongolia, especially in "1.Selenge" basin and "8.Orkhon" basin (along Orkhon River and its branches including four province center such as Sukhbaatar City, Erdenet City, Bulgan City and Tsetserleg City).

According to researchers at the National Academy of Governance, the main groundwater (aquifer) of Mongolia was made 350 thousand years ago, the youngest one was made 150 thousand years ago. As the volume of these groundwater are limited, it is necessary to take care of using it for the mining industry or agriculture and livestock farming sector.

Figure 2.7.11 shows the total water volume including surface water and groundwater per unit area by each water basin.

[52] It is the amount of groundwater permitted to be used now and there is a possibility that the available amount will increase in the future.

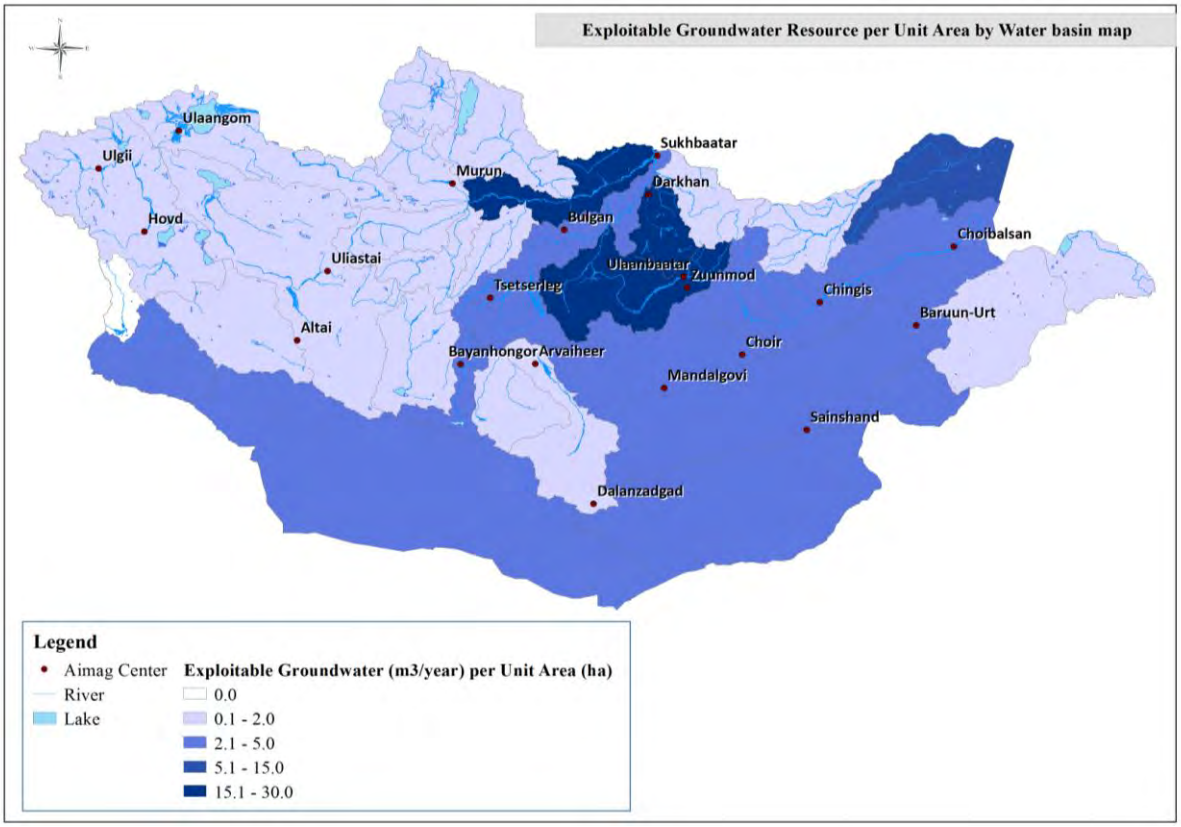


Figure 2.7.9 Exploitable Groundwater Resources by Water Basin per Unit Area

Source: Prepared by JICA Study Team based on the data in IWMP

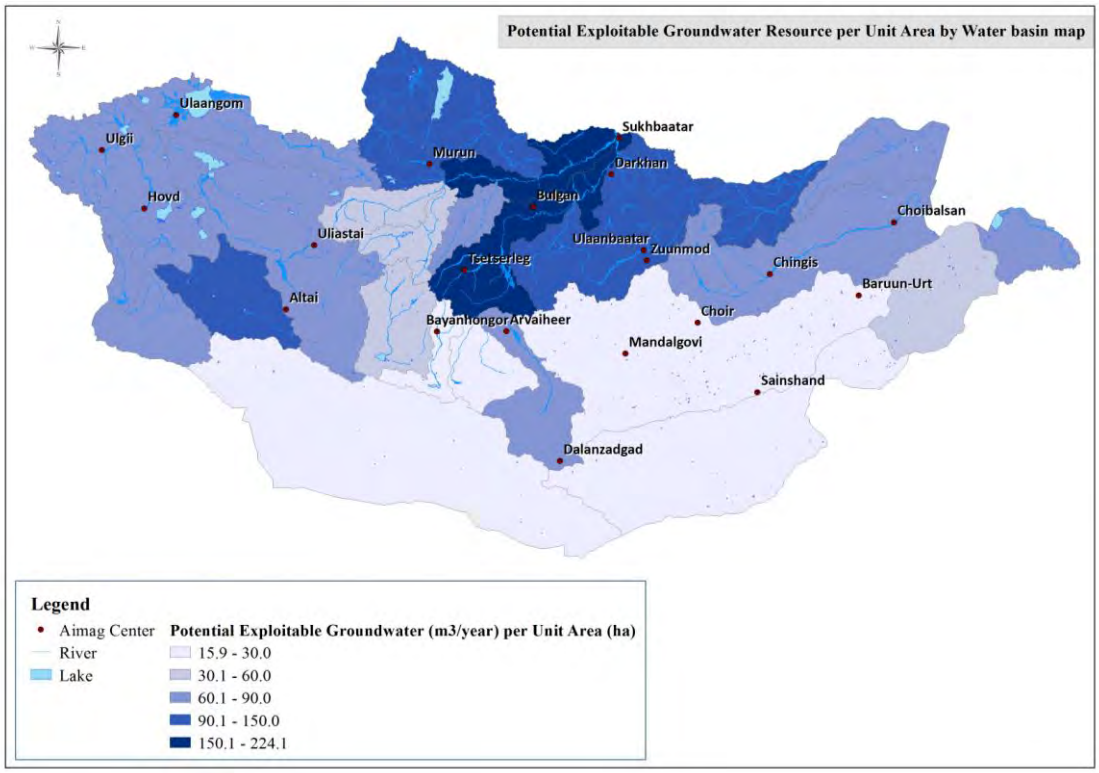


Figure 2.7.10 Potential Exploitable Groundwater By Water Basin per Unit Area

Source: Prepared by JICA Study Team based on the data in IWMP

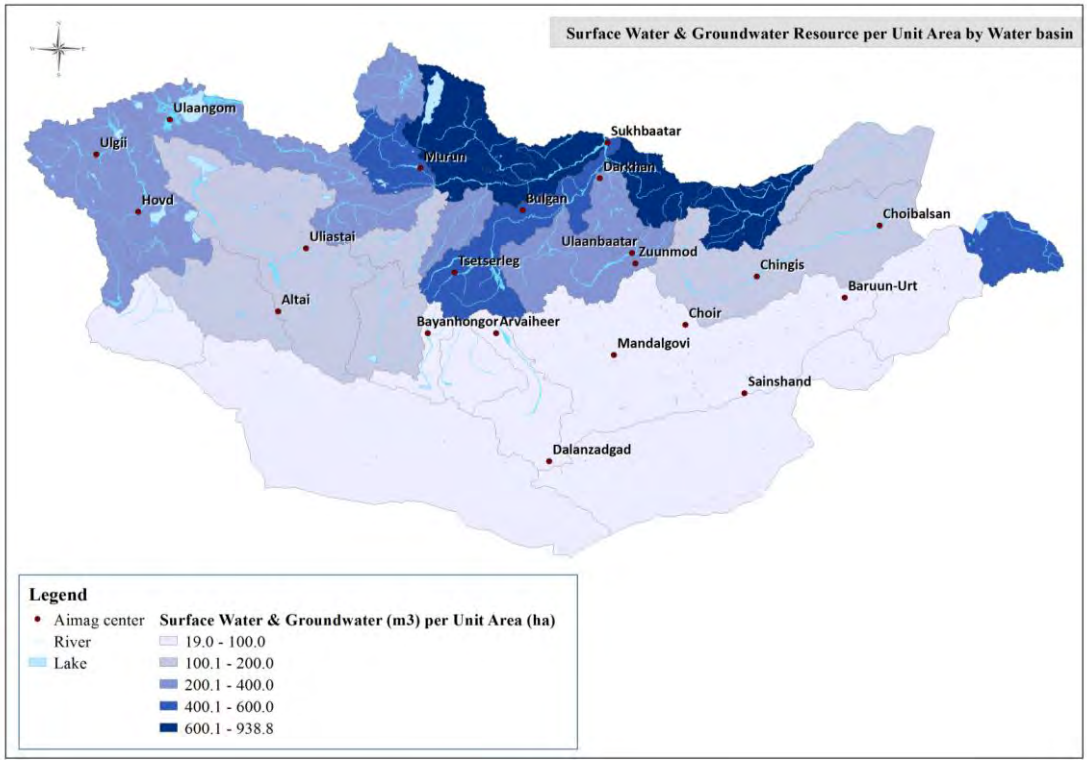


Figure 2.7.11 Total Water Resources (Surface Water and Groundwater) by Water Basin per Unit Area

Source: Prepared by JICA Study Team based on the data in IWMP

Furthermore, in the IWMP, the proportion of water demand by each industry as of 2021 as a percentage of the total water resources by each water basin is calculated as shown in Table 2.7.6, and the result of mapping it is shown in Figure 2.7.13. A medium scenario is used for water demand value in 2021, and the value of dry year which is expected to occur once ten years is used for surface water volume. The ration of water supply and demand in the following areas is much more than 100% such as 2,895% at the "16.Menengiin Tal" basin (located in the eastern part of Sukhbaatar province to the south part of Dornod province), 353% at the "21.Taat" basin (mainly in Uvurkhangai province) and 224% at the "25.Khuisiin Govi-Tseetseg Lake" basin (from the northwest part of Govi-Altai province to the east part of Khovd province). In the "16.Menengiin Tal" basin and "21.Taats" basin, currently there are few groundwater resources which is permitted to be used, and the amount of the demand far exceeds the water resource amount even in 2010. In the "25.Khuisiin Govi-Tsetseg Lake" basin, the water demand for irrigation in 2021 is expected to be 2.6 times as large as 2010, so the demand amount greatly exceeded the amount of water resources. In addition to these basins, there are basins where the demand exceeds 100 % as shown in Figure 2.7.13, however, those basins are water bodies expected to have a large increase in water demand for irrigation, and for 2021, it is necessary to develop new water resources such as making potential groundwater available. Although it does not exceed 100%, both the "9.Tuul" basin (from the western part of Tuv province including Ulaanbaatar and Zuunmod to the southeast part of Bulgan province) and "10.Kharaa" basin are 83.1 %, and the water demand amount in 2021 in those basins approach the amount of water resources. In "9.Tuul" basin, necessary water in the area including the capital city of Ulaanbaatar is supplied. By 2021, in addition to a significant demand increase for domestic water and power plant water, demand for industrial water and agricultural water in the surrounding area is also expected to increase. In the case of a high demand scenario, there will occur water shortage, therefore the development of new water resources is necessary. The "10.Kharaa" basin also supplies water to Darkhan which is the third largest city in Mongolia and the agriculture-flourished zone, and water for irrigation in 2021 is expected to increase by 2.6 times compared in 2010. Therefore, in the case of the high-level scenario

in other water demand, the development of new groundwater resources is also necessary because water resources are insufficient.

As shown in Table 2.7.6, the surface water volume of Mongolia is 2.1 times than the amount of groundwater. However, except for the amount of necessary water for maintaining the environment (Environmental flow), the available water volume is one tenth of the total water volume. In particular, "9.Tuul" basin and "10.Kharaa" basin which have many populations depend heavily on groundwater. It is not clear how much new renewable groundwater resources can be secured in these basins in the future, however, it is no doubt that water demand will continue to increase as a result of population increase and economic development even after 2021. Therefore, it will not be able to satisfy the water demand within the basins. On the other hand, since there is a large amount of available surface water and still considerable margin for water resources in "1.Selenge" basin and "8.Orkhon" basin with Erdenet City which is the second largest city in Mongolia, it is necessary to promote agriculture and livestock farming including irrigation mainly in these basins.

At present, there is no indicator for the water balance between water resources and agriculture, which indicates the appropriate livestock density etc. environmental resource distribution into account. However, the well management officer of MOFALI also commented that there is a need to clarify such indicators as MOFALI. The water consumption of livestock per year by district is grasped at the Freshwater Resources and Nature Conservation Center though data is a bit old as shown in the Figure 2.7.14, it is necessary to analyse from such a viewpoint, In planning the promotion of agro-value chain, it is indispensable to grasp the amount of water resources and water consumption in each region and to make balanced plan.

Table 2.7.7 Water Resources and Demand Balance by Water Basins

	Name	Demand (medium scenario, million m^3/year)									Groundwater availability (million m^3/year)		Surface water availability (million m^3/year)		2021 total demand as % of total resources
		2010			2015			2021							
		SW	GW	Total	SW	GW	Total	SW	GW	Total	Potential	Exploitable	50%	10%	
1	Selenge*	8.5	23.4	32	14.1	29.3	43.4	20.8	36.7	57.5	697	90.3	277.3	165.2	22.5
2	Khuvsgul Lake - Rg	1.5	1	2.5	2.1	1.4	3.5	2.8	2	4.8	432	0.2	401.1	276.2	1.7
3	Shishkhid	0.5	0.3	0.8	0.8	0.4	1.2	1	0.6	1.6	206	0.2	39	29.6	5.5
4	Delgermurun	1.4	1.7	3.1	1.8	2.4	4.1	2	2.9	4.9	229	2.7	81	47.6	9.8
5	Ider	1.7	0.8	2.5	2.5	1.1	3.6	3.3	1.3	4.6	129	0.5	53.3	29.7	15.2
6	Chuluut	1.3	0.9	2.2	1.9	1.3	3.2	2.4	1.7	4.1	86	0.1	13.9	6.2	65.5
7	Khanui	1.6	1	2.6	2.1	1.4	3.5	2.5	1.7	4.2	96	0.2	13.9	11.8	35
8	Orkhon*	16.9	12.1	29.1	27.6	17.4	45	40.3	21.2	61.5	838.3	26.7	221.6	99.7	48.7
9	Tuul	7.9	82.3	90.2	10.4	110.5	120.9	10.5	113.5	144	637.7	142.8	63.1	30.5	83.1
10	Kharaa	7.3	19.8	27.1	11.9	26	37.9	17.4	37	54.5	182	52.6	25.9	12.8	83.1
11	Eroo	2.3	1	3.3	3.6	2	5.6	5.3	3.2	8.6	239	0.6	196.2	112.1	7.6
12	Onon	0.8	0.8	1.6	1.1	1.1	2.2	1.3	1.5	2.9	344	0.6	259	230.8	1.2
13	Ulz	0.7	4.2	4.9	1	12	13	1.3	16	17.2	320	26.4	22.7	3.8	57
14	Kherlen	8.8	14.8	23.6	12.2	20	32.1	16.9	26.1	43	721	43.9	59.5	28.4	59.5
15	Buir Lake –Khalkh	0.6	0.3	0.9	0.6	0.9	1.5	0.9	1.2	2.2	198	1.1	102.3	54.9	3.8
16	Menengiin Tal	0	2.4	2.4	0	2.6	2.6	0	2.9	2.9	168	0.1	0	0	2895.7
17	Umard Goviin Guveet – Khalkhiin Dundad Tal	0	12	12	0	15.9	15.9	0	18.2	18.2	433	46.7	0	0	39
18	Galba – Uush – Doloodiin Govi	0	5.2	5.2	0	26.6	26.6	0	42.6	42.6	352	59	0	0	72.2
19	Ongi	1.9	3.4	5.3	2.7	4.6	7.4	3.7	6.1	9.8	294	5.8	1	0.3	161.1
20	Altan Uvur Govi	0	6.2	6.2	0	10.4	10.4	0	15.1	15.1	227	65.5	0	0	23
21	Taats	0.8	1	1.7	1	1.3	2.3	1.3	1.5	2.8	61	0.5	0.9	0.3	353.5
22	Orog Lake – Tui	2.7	1.4	4.1	4.4	2.1	6.5	6.5	2.6	9.1	33	5.9	2.6	0.9	134
23	Buuntsagaan Lake – Baidrag	3.3	1.2	4.5	5.3	1.6	6.9	8.2	1.9	10.2	174	2.9	22.7	12.9	64.3

	Name	Demand (medium scenario, million m^3/year)									Groundwater availability (million m^3/year)		Surface water availability (million m^3/year)		2021 total demand as % of total resources
		2010			2015			2021							
		SW	GW	Total	SW	GW	Total	SW	GW	Total	Potential	Exploitable	50%	10%	
23	Buuntsagaan Lake – Baidrag	3.3	1.2	4.5	5.3	1.6	6.9	8.2	1.9	10.2	174	2.9	22.7	12.9	64.3
24	Khyargas Lake – Zavkhan	12.6	4	16.5	20.8	5.2	26	31.1	6.2	37.3	892	10	44.9	22.8	113.7
25	Khuisiin Govi – Tsetseg Lake **	5.9	1.7	7.6	10.2	2.2	12.4	15.6	2.5	18.1	493	8.1	0	0	224
26	Uench – Bodonch	0.6	0.6	1.1	0.9	0.7	1.6	1.3	0.8	2.2	237	11.3	2.7	1.1	17.4
27	Bulgan	1.9	0.2	2.1	3.1	0.3	3.4	4.6	0.4	5	86	0	8.3	5.7	87.9
28	Khar Lake – Khovd	12.8	3.8	16.6	20.6	5.3	25.9	30.2	6.4	36.6	684	12.7	115.8	80.8	39.1
29	Uvs Lake – Tes	13.2	2.2	15.4	22	3	25	33	3.8	36.8	405	6.1	63.1	29.8	102.5
	Mongolia Total	117.5	209.6	327.1	184.5	308.9	493.4	264.5	397.7	662.2	10,400.00	623.4	2.091.7	1,294.10	

Explanation:

Groundwater availability: Potential resources based on aquifer properties and renewable resources;

Exploitable resources based on approved groundwater deposits.

Surface water availability: Available resources after subtracting environmental flow: 50% means available in an average year, 10% means available in a dry year with probability of once in 10 years; the surface water resources include the surface water which is generated within the river basin only; inflow from other upstream river basin is not included.

2021 total demand as % of total resources: total resources based on sum of exploitable groundwater resources and 10% surface water resources.

Remarks:

*Demand of Erdenet mine is located in Orkhon river basin but is supplied by transfer from groundwater resources in Selenge river basin and therefore is added to total water demand of the Selenge basin: 15.118 million m^3/year in 2010, 15.5 million m^3/year in 2015 and 16 million m^3/year in 2021.
**Khuisiin Govi – Tsetseg Lake basin has demand from surface water for irrigation but surface water resource was not estimated.

Source: IWMP, MEGD

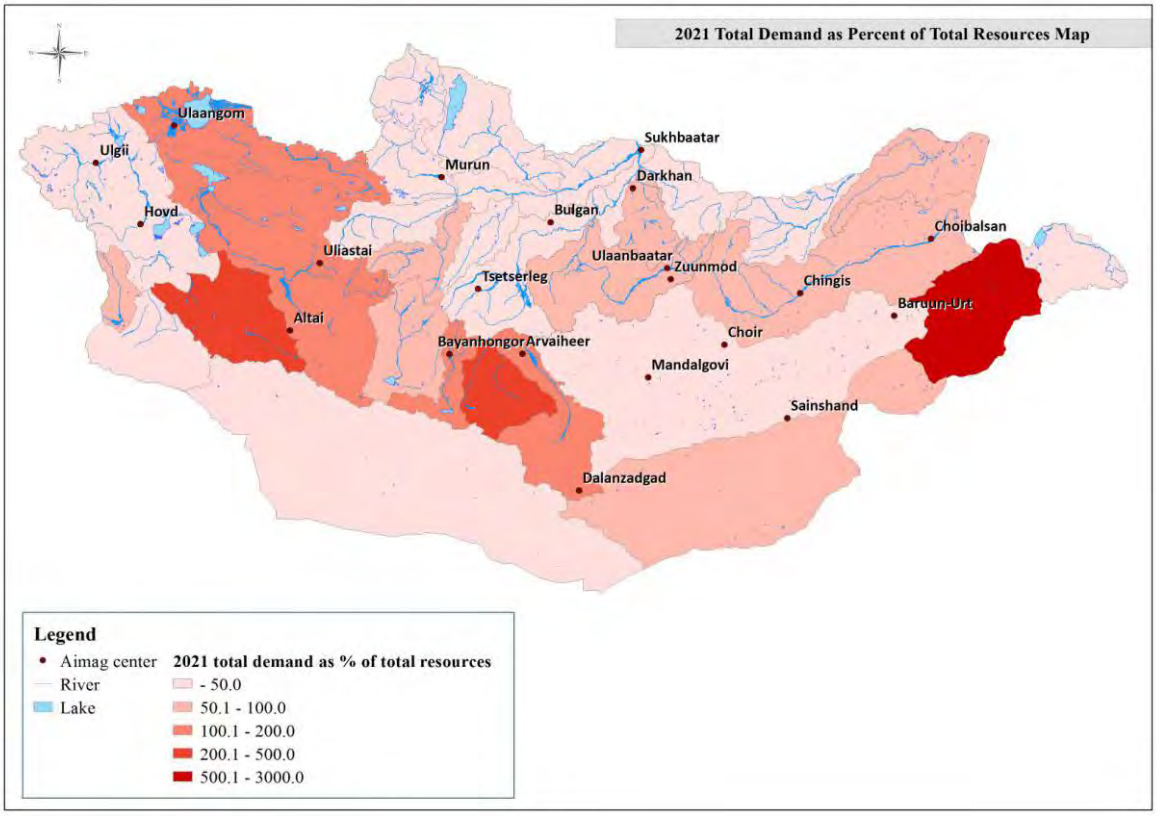


Figure 2.7.12 Percentage of Water Demand in 2021 in Total Water Resources by Water Basin

Source: Prepared by JICA Study Team based on the data from IWMP

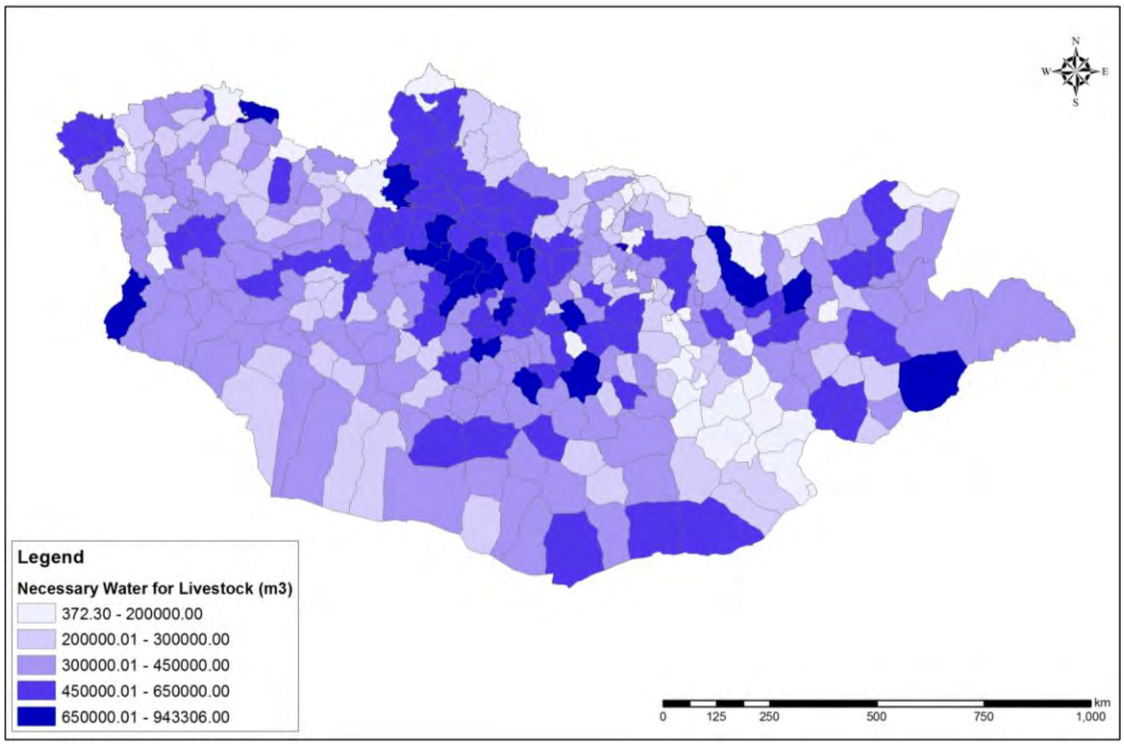


Figure 2.7.13 Water Consumption of Livestock per Year by District (2008)

Souce: Prepared by JICA Study Team based on the data from The Freshwater Resources and Nature Conservation Center

2.7.3.2 Self Clarification of Surface Waters

Figure 2.7.15 shows the self-clarification of surface waters in Baikal Lake basin. The process of dilution of pollutants with the waters of rivers and water bodies is directly dependent on the amount of water mass at each point. For the self-clarification capacity of rivers and waters in Mongolia in Figure 2.7.15, the Khuvsgul Lake and the Selenge River have sufficient capacity for self-clarification. As mentioned earlier, since the Selenge river has a sufficient amount of water, it can be said that area has a high potential for agriculture and livestock development. On the other hand, Tuul River and Orkhon River passing Bulgan province, Arkhangai province and Uvrukhangai province have low capacity for self-clarification. For these rivers crossing borders and connecting to the Russian side. Moreover, it is necessary to seek environmental consideration for activities near the river, so that human production activities do not deprive the self-clarification capacity inherently possessed by the rivers.

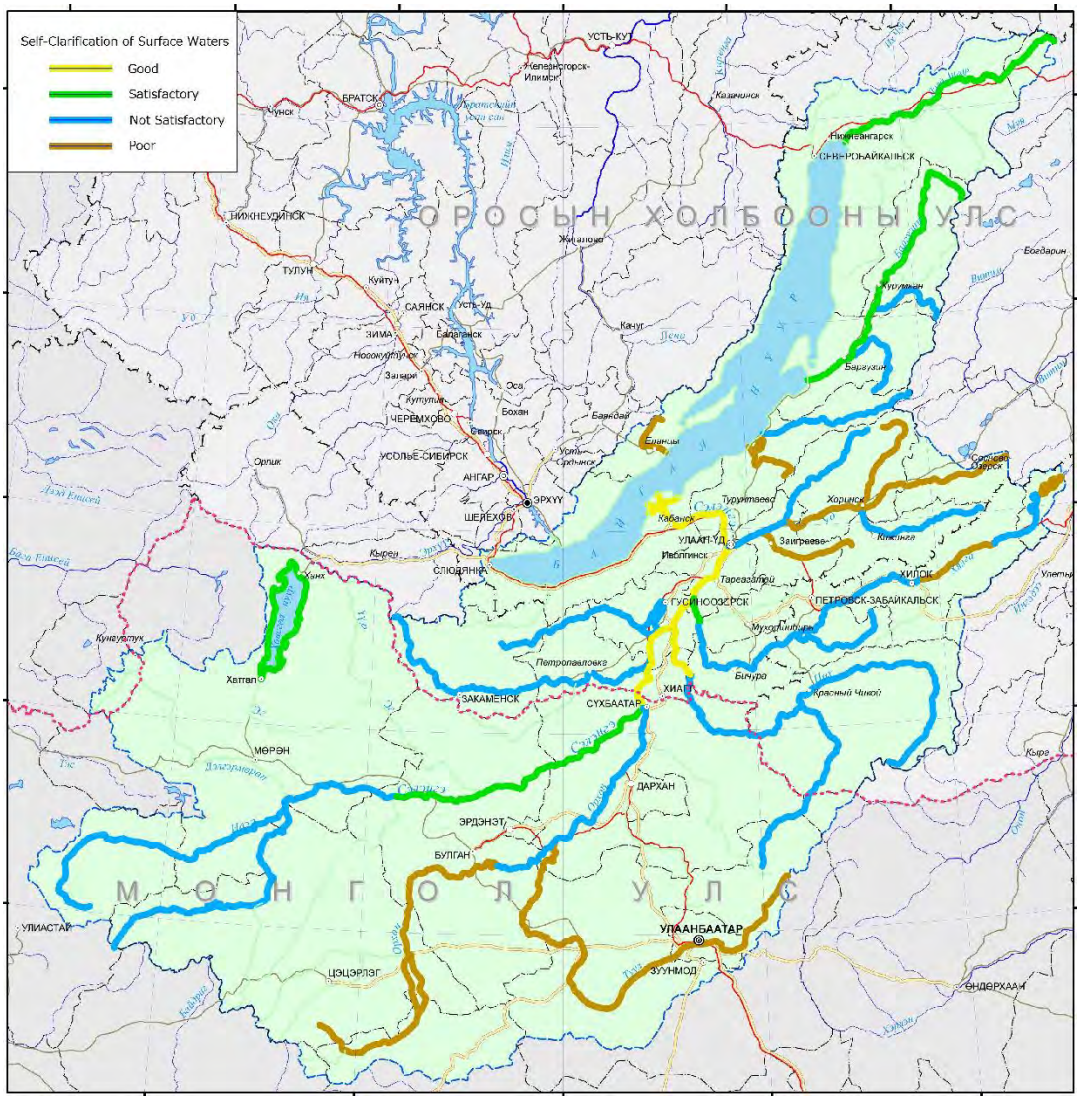


Figure 2.7.14 Self-Clarification of Surface Water

Source: "The Ecological Atlas of the Baikal Basin" UNOPS

2.7.3.3 Management and Facilities of Water Use Related to Agriculture and Livestock Farming

A summary of wells by provinces is shown in Table 2.7.7 and Figure 2.7.16. Information about the wells is submitted every year from each province to MOFALI, and information database is being updated. Currently, as it is a difficult situation to secure the national budget and the province budget, repair of wells is the main items than the new construction of wells. The wells currently in operation are about 90% of total wells and the remaining wells about 10% are left in a condition requiring repair. The well trouble is correlated with nomadic life. As nomads move far away to seek high-quality grasslands for their livestock during the spring to summer, the wells used during the autumn to the winter cannot be managed. Therefore, such kind of no-management situation leads problems including well trouble. MOFALI would like to proceed the repair of the wells which are currently being left broken.

On the other hand, in the case of newly constructing a well, the location of constructing well will be decided based on the discussion at province parliaments etc. with consideration about the situation of grassland devastation etc. As grassland and water are necessary factors for pasturing and grassland deterioration progresses mainly in fields with available water, it is pointed out that the construction of new well has a certain effect on relaxing overgrazing. However, it is also pointed out that expected effects cannot be obtained unless the new well is installed at an appropriate place[53]. Moreover, groundwater recharge is only a few percent of precipitation in Mongolia and the excavation site of the well is limited[54]. As the movement of livestock is affected by the topography, altitude, and grassland condition etc., it is necessary to consider the optimum position for the construction of a well while considering natural conditions and nomadic characteristics.

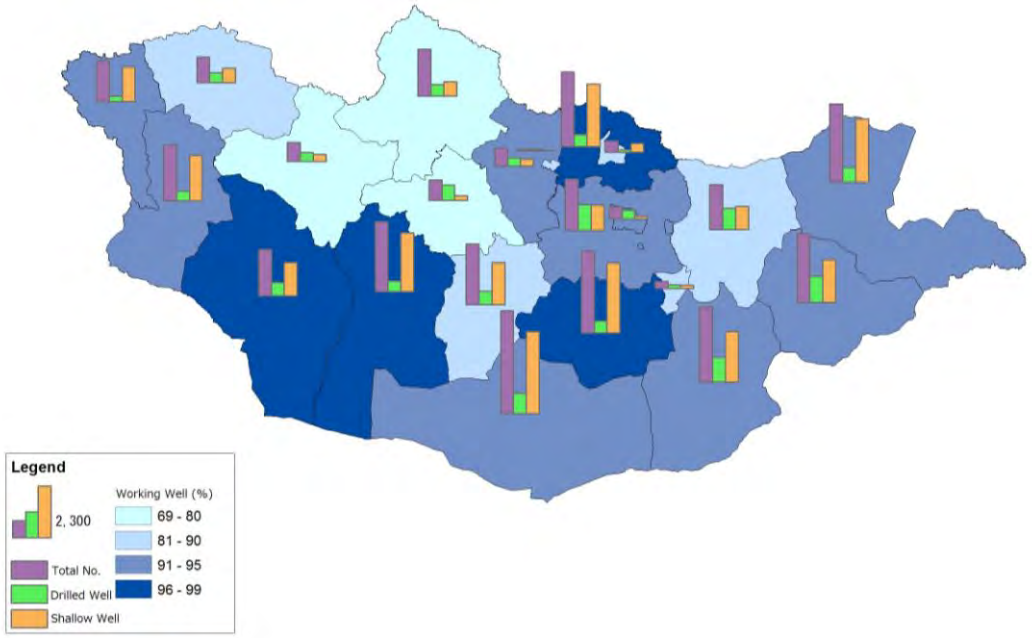


Figure 2.7.15 The Number of Wells by Provinces

Souce: Prepared by JICA Study Team based on data from MOFALI

[53] "Vulnerability Assessment and Adaptation Strategies for Permafrost Regions in Mongolia", Qinxue WANG, National Institute for Environmental Studies (NIES), 2012-2014

[54] "Groundwater Recharge at the Several Monitoring Station Sites in Semi-arid Land – Monitoring Data Analysis in the Study Area of Mongolia-", Ichirow KAIOTSU, Tsutomu YAMNAKA, Shuichi IKEBUCHI, Toshiharu KOJIRI, Department of Natural Environmental Sciences, Sogokagaku-bu, Hiroshima University, Terrestrial Environmental Research Center, University of Tsukuba, 2004

Table 2.7.8 Number of Wells by Provinces

No.	Province Name	Total No. of Wells	Breakdown			Working Well		Water Supplied Households	
			Drilled Well	Shallow Well	Reservoir	No.	%	No.	%
1	Arkhangai	898	686	209	3	758	79.8	15,854	93.1
2	Bayan-Ulgii	1,816	259	1,543	14	1,725	94.7	12,810	86.0
3	Bayanhongor	3,110	485	2,622	3	3,068	98.6	11,364	98.8
4	Bulgan	816	383	325	125	767	90.1	8,221	92.7
5	Govi-Altai	2,056	589	1,467		2,003	97.4	6,533	98
6	Govisumber	311	174	137	3	256	82.3	601	89.3
7	Darkhan-Uul	508	111	396	1	489	88.9	2,408	96.3
8	Dornogovi	3,350	1,103	2,246	40	3,115	93.0	3,794	100
9	Dornod	3,461	653	2,808	0	3,238	93.6	3,119	77.2
10	Dundgovi	3,634	537	3,097	5	3,542	98.4	6,099	97.3
11	Zavkhan	839	401	308	122	575	76.4	7,201	87.2
12	Orkhon	88	71	11	6	79	89.8	886	92.5
13	Uvurkhangai	2,704	594	1,887	20	2,302	85	14,751	96.2
14	Umnugovi	4,572	913	3,659	12	4,156	90.9	4,853	89.0
15	Sukhbaatar	3,044	1,154	1,882	8	2,774	91.1	7,529	100.0
16	Selenge	3,313	526	2,778	8	3,222	97.3	8,475	96.6
17	Tuv	2,291	1,155	1,135	1	2,201	94.1	9,814	93.6
18	Uvs	1,121	433	624	15	991	87.4	10,200	98.1
19	Khovd	2,480	431	2,030	33	2,421	94.8	8,194	98.4
20	Huvsgul	2,081	526	636	7	1,006	68.7	17,448	94.0
21	Hentii	1,992	958	1,034	8	1,806	89.9	6,212	87.0
22	Ulaanbaatar	544	380	118	44	447	94.8	4,011	93.2
Total		45,029	12,522	30,952	478	40,941	89.9	170,377	93.4

Source: MOFALI

In addition to the wells, development of artificial ponds is conducted experimentally in order to use surface water and rain water. This polio project is carried out at permanently frozen land that is difficult to use groundwater and land that is difficult to dig well. Eight reservoirs were constructed including 650,000m^3 in 2013, 127,950m^3 in 2014 and 39,241m^3 in 2015. As a result of it, 714 people out of 173 households in 5 districts and 76,982 livestock were able to have access to water.

Table 2.7.9 Summary of Reservoirs

No	Province, District Name	Name of Pastoral Association	Beneficiary			Volume (m^3)
			Household	Population	Livestock	
Year: 2013			**32**	**122**	**16,796**	
1	Arkhangai,Ugiinuur	Huuvur	17	65	9,794	500,000
2	Govi-Altai,Tseel	Buur	15	57	7,002	150,000
Year: 2014			**87**	**366**	**37,806**	
3	Huvsgul,Tsagaan-Uul		20	65	7,000	51,250
	Govi-Altai,Tsogt	Hosiin hamar	42	214	21,356	45000
5	Govi-Altai, Altai	Modon-Ovoo	25	87	9,450	31,700
Year: 2015			**54**	**226**	**22,380**	
6	Govi-Altai. Tsogt	Altanshargal	23	102	10,380	16,327
7	Govi-Altai/Tseel	Suhant/Mandaliin gol	16	49	6,720	4,074
8	Govi-Altai. Tsogt	Argalchin	15	75	5,280	18,840
Total		**8**	**173**	**714**	**76,982**	

Source: MOFALI

2.7.3.4 Considerations on Water Resource Use

As mentioned above, available water resources are limited at the present time in Mongolia. For considering the development of agro-value chain, it is necessary to make plans for the development of new water resources or location of pastureland, cultivated land, and processing plant based on consideration of the balance between necessary water volume at production/processing stage and water resource volume at each site.

2.7.4 Negative Factors on Water Resource Use

2.7.4.1 Current Situation of Devastation of Grassland

The current situation of desertification is shown in Figure 2.7.17. 76.8% of national land in Mongolia is desertified as of 2015. A level of desertification is classified into four stages as extremely strong, strong, medium and weak. About 22 % of the national land is classified as extremely strong and strong level. Moreover, compared to the research results of the last 15 years, the desertification has progressed, and percentage of the extremely strong and strong level has increased. When comparing the result of 2015 with the result of 2010, the total desertification land is decreased by 1%, the extremely strong level devastated land is decreased by 3.8%, weak level desertification land is decreased by 11.2%, medium level desertification land is increased by 3.9% and the strong level desertification land is increased by 10.2%. In other words, 6.4% of the land which was classified as a weak or medium level in the past five years has become an extremely strong level of devastation and the risk of desertification has risen.

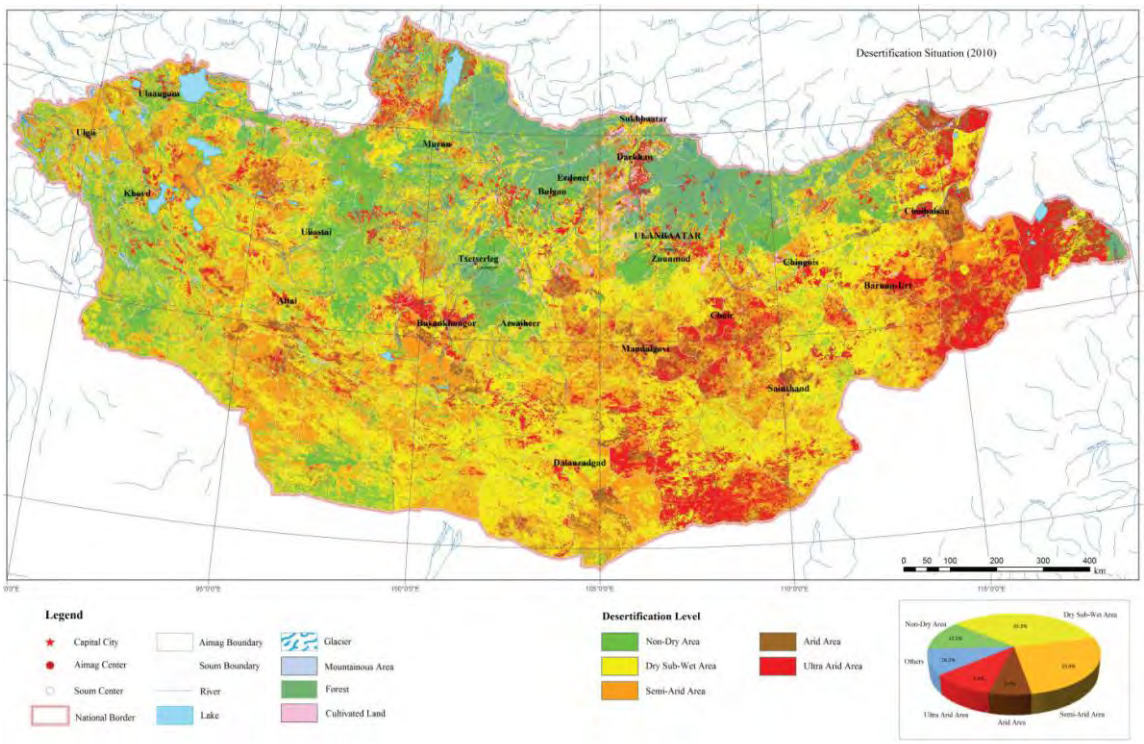


Figure 2.7.16 Desertification Situation (2010)

Source: MET Environmental Database, Desertification Database[55]

Table 2.7.10 Changes in the Desertification Level (2006- 2015)

Year	Desertification Level (%)				
	Weak	Medium	Strong	Extremely Strong	Total
2006	23	26	18	5	72
2010	35.3	25.9	6.7	9.9	77.8
2015	24.1	29.8	16.8	6.1	76.8

Source: MET Environmental Database, Desertification Database

Analyzing factors that affect desertification and soil degradation, 49% of the total land is due to the number of livestock and human activities, and the other devastation is due to natural factors such as drying and climate change. In particular, there are three following factors such as (1) climate change, (2) increase of the number of livestock and expansion of utilization as pastureland, (3) development of underground resources and development of agriculture and Livestock sector, and especially, (1) and (2) are the main factors.

As to (1), it is pointed out that growth of grassland is affected by the loss of water resources due to melting permafrost and the increase of evaporation due to global warming[56].

As to (2), the following three factors are pointed out; (i) intake of grass by livestock, (ii) concentration of livestock in specific area which around the wells, (iii) the concentration of herders into the market and the suburbs of the city[57]

[55] Desertification Database: http://eic.mn/DLDbase/upload/2013/tadesertcontent/jpg/20131021_8432.jpg
[56] "Vulnerability Assessment and Adaptation Strategies for Permafrost Regions in Mongolia", Qinxue WANG, National Institute for Environmental Studies (NIES), 2012-2014

According to the officer in charge of desertification of MET, as to (i), although it is necessary to limit the number of the goat at the Khangai area and the Steppe area, it will not become matter to increase goats in Gobi area since the grassroots are deeply stretched in the Gobi area and goats cannot eat that roots. On the other hand, some herders don't understand an impact by goats on grasslands, and it is pointed out that it is necessary for herders to improve environmental awareness[58]. As to (ii), grassland devastation has occurred in the area shown in red in the following maps (Figure 2.7.18 – 2.7.20) where is with water resources and livestock concentrate. Currently, the Government of Mongolia and provinces work on policy of improvement on pastureland management, and they plan to construct a new well (or repair a broken well) in the area indicated by green, where a well isn't installed or a well is broken, of following grazing capacity maps to intend to disperse livestock.

Referring to the results of calculation of grazing capacity[59] in all areas (see Table 2.7.9, Figure 2.7.18 to 2.7.20), in the area of 60 to 80 % of the whole area, the winter and spring pasturing site are stable, and there is a grazing capacity to accept the migration of livestock from the outside. In the remaining 20 to 40% of the area, there is not enough grazing capacity to allow domestic livestock to spend the winter within that district area. Therefore, it is necessary to prepare for spring and beyond the winter, such as moving to other areas and preparing feed etc. Moreover, in the summer pastureland, 75% of the whole area is stable and 25% is in a drought as of August 20, 2014.

As shown in the Table and Figures below, since Mongolia has different soil condition according to natural conditions depending on the year, the assessment result of grazing capacity varies from year to year.

Table 2.7.11 Grazing Capacity on Winter and Spring Site in 2014 - 2017

Type	2014-2015	2015-2016	2016-2017
Site with Potential for Grazing Capacity	60%	40%	60%
Site with Grazing Capacity	15%	20%	20%
Site over 1-3 times of Grazing Capacity	15%	30%	10%
Site over 3-5 times of Grazing Capacity	5%	5%	5%
Site over Grazing Capacity extremely	5%	5%	5%

Source: MEGDT "Report for condition of natural environment in Mongolia 2013-2014", published in 2014

[57] JICA. (2016). MONDEP Final Report
[58] "Land Use and Environmental Consciousness of Grassland Degradation of Mongolian Nomads", Yu Onodera, Hokkaido University, 2009
[59] The Grazing Capasity is calculated based on information such as pastureland area per bug, head count of livestocks, pastureland usage period etc. For details, refer to "Report for condition of natural environment in Mongolia 2013-2014", published in 2014 by MEGDT.

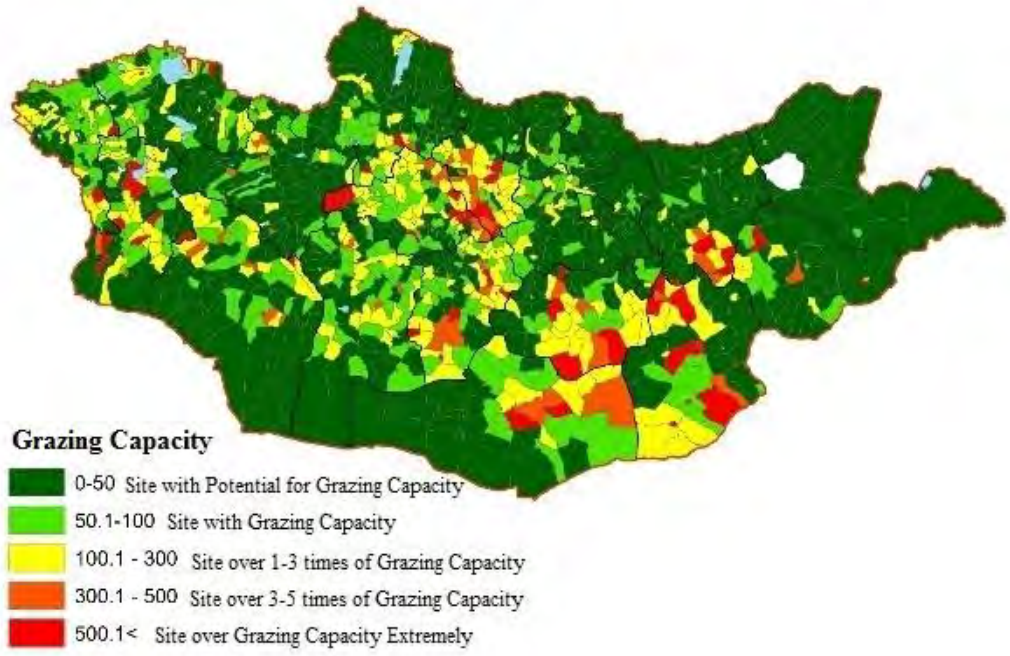


Figure 2.7.17 Grazing Capacity (2014 – 2015)

Source: INFORMATION AND RESEARCH INSTITUTE OF METEOROLOGY, HYDROLOGY AND ENVIRONMENT, National Agency for Meteorology and Environment of Mongolia, 24 August 2014

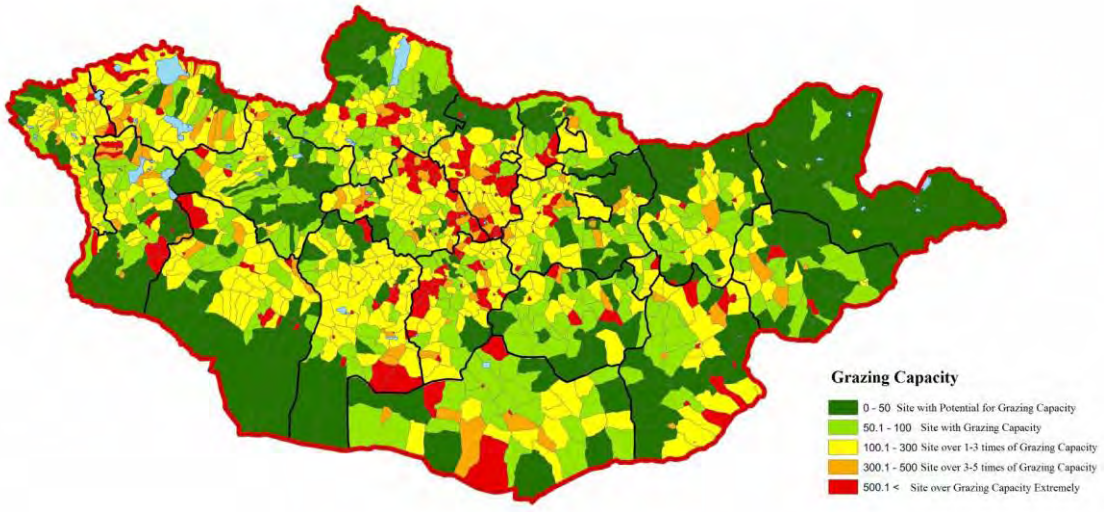


Figure 2.7.18 Grazing Capacity (2015 – 2016)

Source: INFORMATION AND RESEARCH INSTITUTE OF METEOROLOGY, HYDROLOGY AND ENVIRONMENT, National Agency for Meteorology and Environment of Mongolia, 25 August 2015

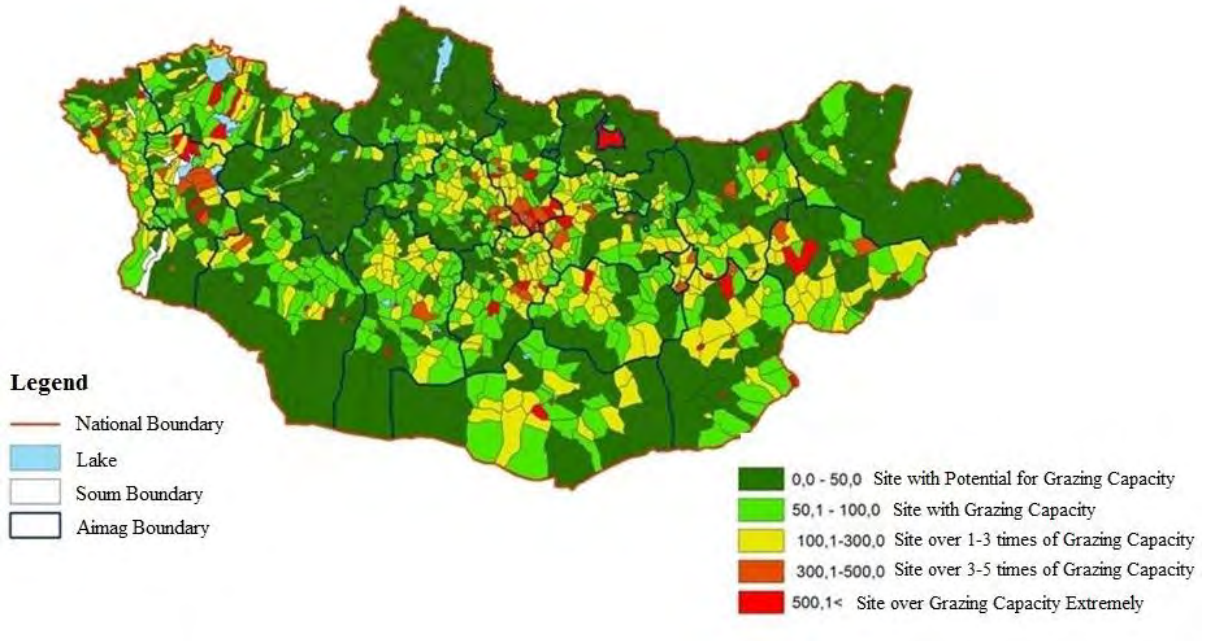


Figure 2.7.19 Grazing Capacity (2016 – 2017)

Source: INFORMATION AND RESEARCH INSTITUTE OF METEOROLOGY, HYDROLOGY AND ENVIRONMENT, National Agency for Meteorology and Environment of Mongolia, 22 August 2016

Based on the above, in order to ease grassland devastation and realize sustainable livestock farming, it is desirable that livestock farming is carried out to be suitable for the natural condition in each area and land capacity. From the viewpoint of development of agro-value chain, it is necessary to settle the problems about excessive concentration of livestock, and it is also necessary to develop wells at the appropriate location and to develop gateway directly connected to the market rationally. For planning these items, it is necessary to fully consider different natural conditions for each area.

2.7.4.2 Dzud (Cold and snow hazard)

The traditional livestock husbandry is affected natural hazards very often, and expected significant impacts. The livestock sector is highly sensitive to extreme weather such as heavy snow, *dzud*, drought, severe dust and snow storm, floods and infectious diseases[60]. Among these harsh weather conditions, *dzud* is bringing the greatest impact on the livestock sector. According to Natsagdorj and Dulamsuren[61], in a traditional understanding of pastoralists, "The *dzud* is natural and weather conditions that cause a significant amount of animal losses, resulted from animal weight losses due to non-accessibility and shortage of pasture forage and water in winter- spring season ". Due to the damage of *dzud* caused by such natural and weather conditions, the mass death of livestock often occurs from winter to spring.

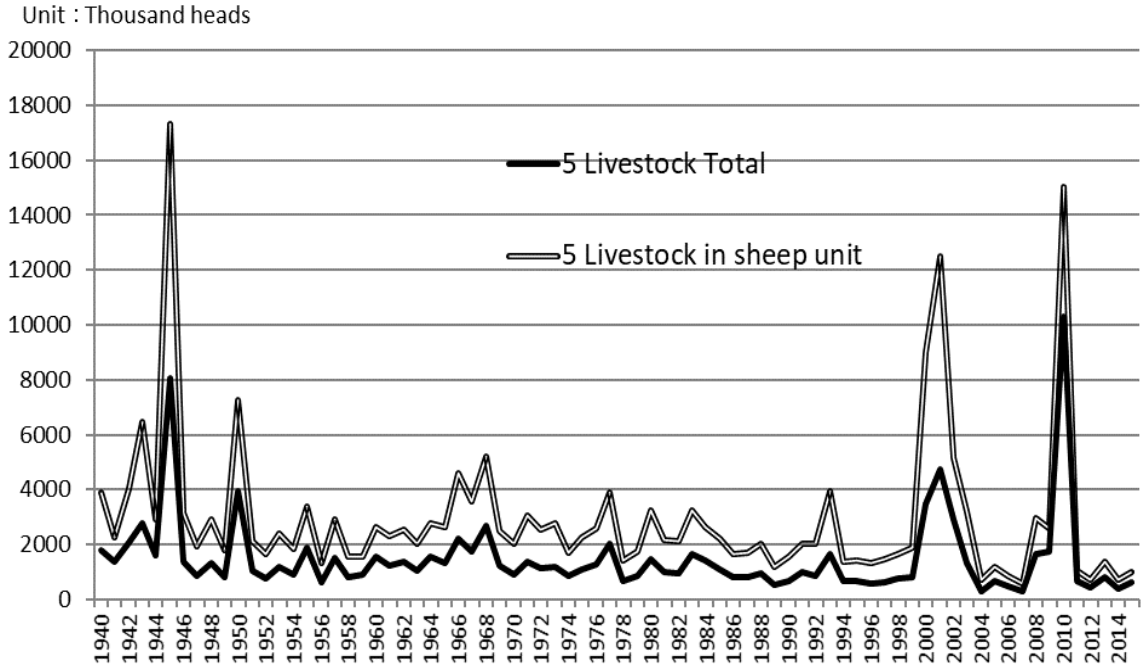


Figure 2.7.20 Losses of Adult Animals from 1940 to 2015 (5 Livestock Total and 5 Livestock in Sheep Unit)

Source: Prepared by JICA Study Team based on the data from National Registration and Statistics Office

[60] Disaster Research Institute, National Emergency Management Agency (2016) Data Book on Natural and Human Induced Hazards in Mongolia 2014, 2015

[61] Natsagdorj, L. and Dulamsuren, L. (2001), Some aspects of assessment of the dzud phenomena, Papers in Meteorology and Hydrology, No.23.3, Ulaanbaatar.

A number of losses of adult animals from 1940 to 2015 can be seen in Figure 2.1.1. There was a big *dzud* damage in 1945, but in the later planned economic era, there was no major *dzud* suffering. However, as a result of the transition to a market economy that began in 1990, freedom of livestock raising became possible, as a result of which the number of pastoralists and livestock number rapidly increased, severe climatic conditions overlapped when overgrazed, record *dzud* damage occurred in 2000-2002 and 2010. Especially in 2010, more than 10 million animals were killed. The average economic loss caused by natural and human induced hazards in Mongolia from 2000-2015 amounted to 89.0 billion MNT per year, which occupies the 3% of Mongolian GDP[62]. Economic loss due to *dzud*damage in 2010 exceeded 6% of Mongolian GDP.

As stated above, two *dzud* suffered after the transition to market economy, as shown in Figure 2.1.2, the number of domestic livestock has rapidly increased again in recent years, already greatly exceeding carrying capacity, when there is no strange situation even if it occurs in the big *dzud* damage. Since *dzud* damage causes social problems such as poverty of pastoralists and population concentration in cities as well as economic loss due to livestock death, it is essential to tackle measures to control the number of livestock to avoid those problems.

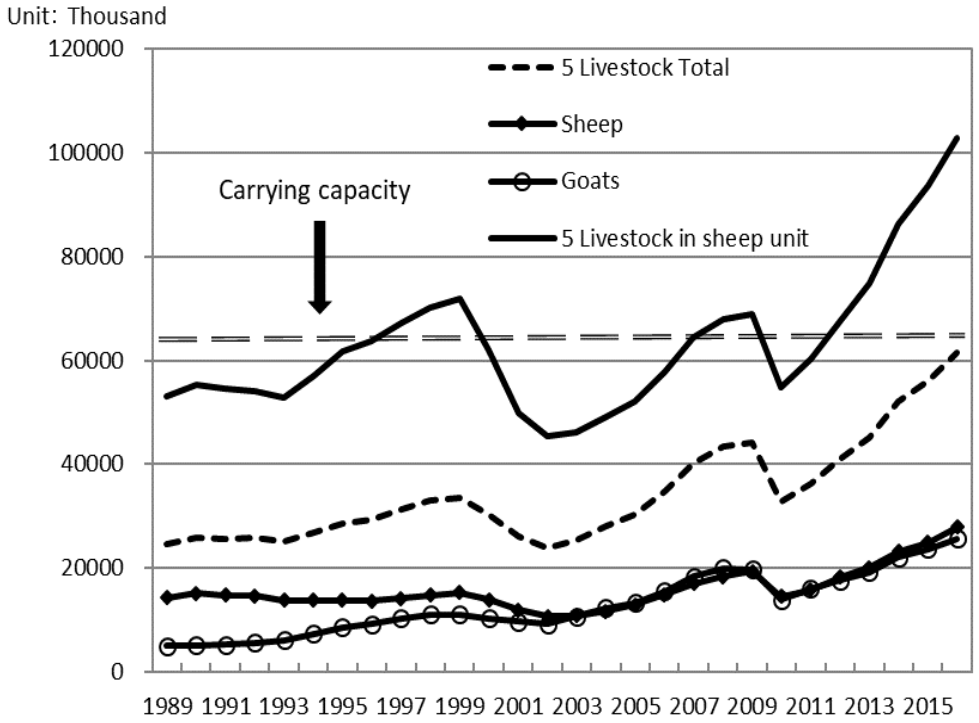


Figure 2.7.21 Transition of the Number of Livestock from 1989 to 2016

Source: Prepared by JICA Study Team based on the data from National Registration and Statistics Office

[62] Disaster Research Institute, National Emergency Management Agency (2016) Data Book on Natural and Human Induced Hazards in Mongolia 2014, 2015

2.7.4.3 Livestock Health

In Japan, Act on Domestic Animal Infectious Diseases Control was enacted for the purpose of preventing the outbreak and the spread of domestic animal infectious diseases. Particularly important diseases are specified as "domestic animal infectious diseases" (diseases designated by law) and "notifiable infectious diseases". As listed in the Table below, nearly 80 diseases are specified by law in Mongolia as well. FMD is significantly important from the view point of its high contagiousness and economic loss[63]. Recently, sheep and goat pox are noticed as re-emerging infectious diseases and Pest des petits ruminants (hereinafter "PPR") which had not been reported in Mongolia first appeared in 2016[64]. It can be said that Mongolia has experienced a huge damage on livestock health. This section describes the current occurrence of FMD, PPR and sheep pox which should be carefully watched.

Table 2.7.12 Domestic Anial Infectious Diseases Specified by Law in Mongolian Law (list of diseases to be kept in isolation)

	Mongolian name	English name	
1	Боом	Anthrax	Domestic[*1]
2	Шүлхий	Foot and mouth disease	Domestic
3	Хонь, ямааны цэцэг	Sheep and goat pox	Notifiable[*2]
4	Өндөр хоруу чанартай шувууны томуу	Highly pathogenic avian influenza	Domestic
5	Дуут хавдар	Blackleg	Notifiable
6	Үхрийн мялзан	Rinderpest	Domestic
7	Ямааны годрон	Contagious caprine pleuropneumonia	Notifiable
8	Гахайн мялзан	Classical swine fever	Domestic
9	Туулайн вируст цусан халдвар	Rabbit haemorrhagic disease	Notifiable
10	Туулайн миксоматоз	Rabbit myxomatosis	Notifiable
11	Шувууны Ньюкасл өвчин	Newcastle disease	Domestic
12	Үхрийн цээж	Contagious bovine pleuropneumonia	Domestic
13	Хорт салст халуурал	Bovine catarrhal fever	Notifiable
14	Гахайн үржил амьсгалын замын хам шинж	Porcine reproductive and respiratory syndrome	Notifiable
15	Бог малын мялзан төст өвчин	Peste des petits ruminants	Notifiable

[*1] Domestic: domestic animal infectious diseases (diseases designated by law)
[*2] Notifiable: notifiable infectious diseases

[63] JICA. (2016). MONDEP Final Report
[64] Morris, R. and Purevsuren, B. (2016). Enhancement of Epidemiological Support for Animal Disease Control Programs in Mongolia. Report for Food and Agriculture Organisation of the United Nations.

Table 2.7.13 Domestic Anial Infectious Diseases Specified by Law in Mongolian Law (list of restricted diseases)

	Mongolian Name	English Name	
1	Галзуу	Rabies	Domestic[*1]
2	Цусан халдвар	Pasteurellosis	
3	Листериоз	Listeriosis	
4	Адууны томуу	Equine influenza	Notifiable[*2]
5	Адууны ям	Glanders	Notifiable
6	Бруцеллёз	Brucellosis	Domestic
7	Энтериобактериоз	Enterobacteriosis	
8	Шөвөг яр	Echtyma	Notifiable
9	Дотрын халдварт хордлого	Enterotoxemia	
10	Сохор догол	Contagious agalactia	Notifiable
11	Аденоматоз	Adenomatosis	
12	Хонь, ямааны Маэди-Висна	Ovine and caprine maedi-visna	Notifiable
13	Гахайн сальмонеллёз	Swine salmonellosis	Notifiable
14	Шувууны гамбора	Gumboro disease (Infectious bursal disease)	Notifiable
15	Шувууны ларинготрахейт	Avian infectious laryngotraheitis	Notifiable
16	Адууны халдварт цус багасах	Equine infectious anaemia	Domestic
17	Үхрийн сүрьеэ	Bovine tuberculosis	Domestic
18	Үхрийн ринотрахейт	Infectious bovine rhinotraheitis	Notifiable
19	Адууны пневмони	Equine pneumonia	Notifiable
20	Үхрийн диарей	Bovina viral diarrhea	Notifiable
21	Адууны иж балнад	Equine salmonellosis	Notifiable
22	Колибактериоз	Colibacteriosis	
23	Адуун сахуу	Strangles	
24	Нохойн гударга	Canine distemper	
25	Иж балнад	Salmonellosis	Notifiable
26	Некробактериоз	Necrobacteriosis	
27	Үхрийн лейкоз	Bovine leukosis	Notifiable
28	Зөгийн үжил	Foulbrood of honey bees	Domestic
29	Зөгийн аскосфероз	Chalkbrood of honey bees	Notifiable
30	Зөгийн варрооз	Varroosis of honey bees	Notifiable
31	Хамуу	Mange	Notifiable
32	Нийлүүлгийн өвчин	Equine dourine	
33	Хонины энзоот зулбах	Ovine enzootic abortion	Notifiable
34	Дэлэнгийн өмрөө	Bovine mammalitis	
35	Сул хоруу чанартай шувууны томуу	Low pathogenic avian influenza	
36	Хэл хөхрөх	Bluetongue	Notifiable
37	Зогсоо	Tetanus	Notifiable
38	Ботулизм	Botulism	

	Mongolian Name	English Name	
39	Адууны вирусын артерит	Equine viral arteritis	Notifiable
40	Ёлом	Erysipelas	Notifiable
41	Туляреми	Tularemia	Notifiable
42	Ку чичрэг	Q fever	
43	Токсоплазмоз	Toxoplasmosis	Notifiable
44	Лейшманиоз	Leishmanosis	
45	Хачигт реккетсиоз	Ricketsiosis	
46	Хачигт энцефалит	Tick-borne encephalitis	
47	Баруун Нилийн халдвар	West Nile fever	
48	Анаплазмоз	Anaplasmosis	Domestic
49	Бабезиоз	Babesiosis	
50	Нохой муурны парвовирусын халдвар	Canine and feline parvoviral infection	
51	Шувууны микоплазмоз	Avian mycoplasmosis	Notifiable
52	Шувууны пуллороз	Avian pullorosis	
53	Марекын өвчин	Marek’s disease	Notifiable
54	Кампилобактериоз	Campylobacteriosis	Notifiable
55	Цахлай	Ringworm	
56	Хулгана яр	Epizootic lymphangitis	Notifiable
57	Адууны хачгийн халуурал	Horse tick fever	
58	Адууны цэцэг	Horse pox	
59	Гахайн бруцеллёз	Swine brucellosis	Domestic
60	Тэмээний амруу	Camel contagious ecthyma	
61	Гахайн миксоплазмоз	Swine myxoplasmosis	
62	Булчин цайх	White muscle	
63	Яс сөнөрөх	Osteodystrophy	
64	Йодын дутагдал	Iodine deficiency	
65	Хар араатах өвчин	Fluorosis	

[*1] Domestic: domestic animal infectious diseases (diseases designated by law)
[*2] Notifiable: notifiable infectious diseases

(a) Foot-and-mouth disease

Although the fatal rate of FMD is not so high, it is highly contagious. Artiodactyla animals such as cattle, buffalos, sheep, goat, swines, and camels can be infected. It is considered to be mainly respiratory infection and excreted virus is transmitted through scattering with water droplets and garbage. In Mongolia, the occurrence is concentrated in the eastern and southern border regions.

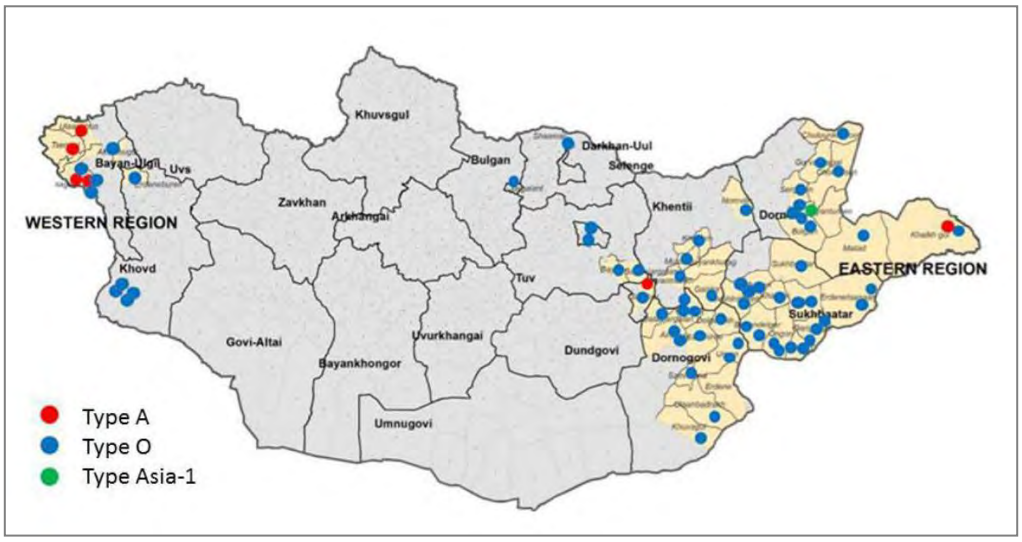


Figure 2.7.22 Map of FMD Occurrence (2000-2016)

Source: Government Implementing Agency--VABA

(b) Peste des Petits Ruminants

PPR is one of the infectious diseases caused by peste-des-petits-ruminants virus. Small ruminants such as sheep, goat and deer can be affected. It is characterized by its quick contagiousness, serious symptoms and expansion by contact infection. In Mongolia, it is occurred in the western region, especially in Khovd province.

Figure 2.7.23 Map of PPR Occurrence (2016)

Source: Veterinary Animals Breeding Agency

(c) Sheep pox

Sheep pox is caused by sheep pox virus regardless of the age, sex, and breed of the sheep. Apart from infection through direct contact and respiratory infection, mechanical infection through insects is also recognized. Since the occurrence in 2013, sheep pox has spread out mainly from the surrounding of Ulaanbaatar to the eastern region. It is difficult to eradicate due to the rapid transmission and lack of vaccines.

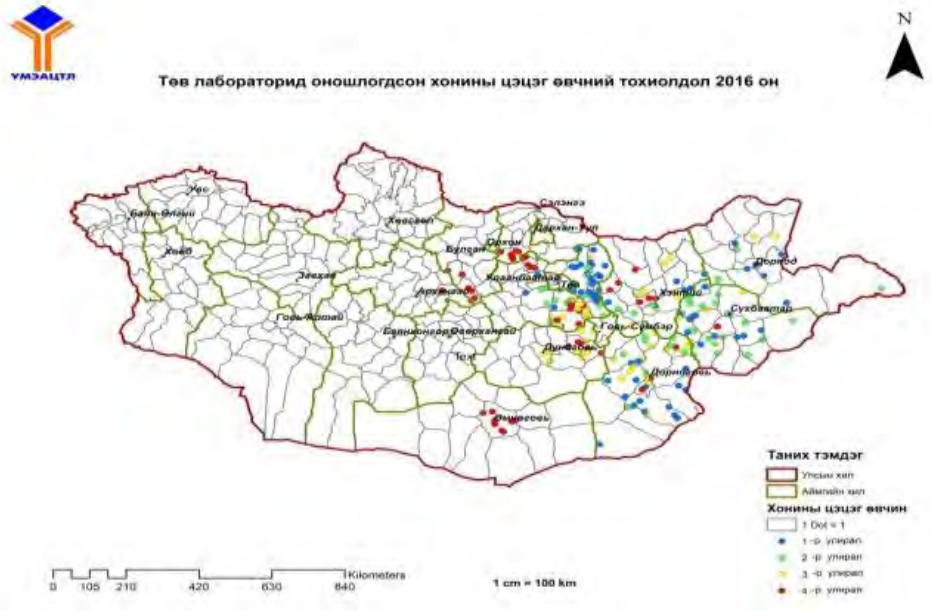


Figure 2.7.24 Map of Sheep Pox Occurrence (2016)

Source: State Central Veterinary Laboratory

Chapter3 General Conditions and Issues of the Mongolian Agro-value chain

This chapter explains the general conditions and issues of the Mongolian agro-value chain through case studies of the related actors in the value-chain from the perspectives of distribution and marketing, agriculture and livestock processing, quality control, analysis on production infrastructure and development of cluster hub sites.

3.1 Distribution and Marketing

In this section, the following themes are analyzed and considered: 1) overview of the agro-value chain, 2) overview of actors in the supply chain, 3) current situations about distribution of agriculture and livestock products, 4) distribution and marketing by products and the value chain structure, 5) current situations about marketing of agriculture and livestock products, 6) issues regarding the situations.

3.1.1 Overview of the Agro-value Chain

The overview of the Mongolian agro-value chain is described through background information of the distribution system after the transition to market economy and classification of the value chain.

3.1.1.1 Distribution of Agriculture and livestock Products After Transition to Market Economy

From the late 1950s to the early 1990s, under the socialist system, "*negdel*" were organized throughout the country. Through *negdel*, the government organized the collection, transportation, and sales of agriculture and livestock products. At the same time, the government paid salaries and distributed living goods to herders and farmers (hereinafter "producers"). During this period of a planned economy, the concept of value chain[1] was not formulated. After dismantling *negdels*, the process of collection, transportation, and sales of agriculture and livestock products was no longer government-led. In addition, state farms were dismantled and privatized, hence the supply chain of those products to the market were created by individual producers[2].

In the form of replacing the distribution system by *negdel*, middlemen started playing into the field of agriculture and livestock sector, and developed their own supply chains[3]. Producers living on grasslands far from the city have earned their income by selling their products directly to middlemen because the transportation infrastructure was not adequately maintained and had no transportation equipment such as trucks. Producers who had no communication tools could not access to the market information. Therefore, they had to accept the middlemen`s price, which often made deals at a lower than the market. In order to sell by themselves, producers had to have direct access to the market, therefore a lot of producers migrated to the cities and/or close to the main roads[4]. This movement which affect the change in the distribution system is considered to be one of the main factors of regional overgrazing leading to grassland degradation.

Although the state farms were privatized and adopted to the independent accounting systems, these companies did not have enough cash flow, therefore a lot of private companies were bankrupted. Then some entrepreneurs entered the agriculture and livestock industry by possessing the bankrupted land[5]. In 2003, the government approved the "National Program for Development of Intensified Farming"

[1] The whole series of activities that create value-added at every process from production, process, distribution, and sales.
[2] Sumiya Gerelsaikhan (2012). The Feature of Mongolian's Livestock. Studies of regional policy (Takasaki City University of Economics Regional Policy Society). 14 (4)
[3] It is mainly the distribution functions that link each process of producing raw materials, manufacturing, processing, and marketing.
[4] Morris Rossabi (2007). Modern Mongolia: From Khans to Commissars to Capitalists. Akashi Shoten
[5] Yuki Konagaya (2010). The History of Agriculture Development in Mongolia: seeking a trade off between development and conservation. Bull Natl Mus Ethnol 35(1):9–138

for the purpose of stable supply of livestock products to urban areas. In addition, the government implemented a number of support program to intensive livestock farming around urban areas[6]. Based on the background of these support, there is some cases where traditional herders or farmers have shifted to intensive farming and cases where urban residents and private companies engaged in other industries have newly entered the field of agriculture and livestock sector in anticipation of the profitability of it.[7].

The new entries to the agriculture and livestock sector from other industries are one of the factors that created diverse supply chains. Under these circumstances, for the future sustainable development of agriculture and livestock sector in Mongolia, not only mere distributions in the socialist era, added value increases at each stage of the supply chain, establishing agro-value chain that leads to interests of stakeholders is urgent.

3.1.1.2 Classification of the Value Chain

The actors in the Mongolian agriculture and livestock sector can be classified by the stages of the process (production, marketing/processing, distribution/sales) they engage in. Table 3.1.1 shows how the classified value-chains are related to each process.

Table 3.1.1 Classification of the Mongolian Agro-value Chain

Classification	Process in the Value Chain					
	Production	Collection	Marketing/ Processing	Distribution	Sales	
					Domestic	Export
Consistent from production to markets	●	●	●	●	●	●
Intensive collection		●		●	●	
Specific products		●	●		●	
Direct sales	●		●		●	
Transactions through middlemen		●		●		

Source: Prepared by JICA Study Team

[6] Ganbat Usukhbayar (2016). The Change in Feed Procurement of Intensive Animal Husbandry in Mongolia : A Case Study of Intensive Animal Farmers in Ulaanbaat. Doctoral thesis. Hokkaido University
[7] Hiroshi Komiyama (2016). Recent trends in agriculture and livestock industry in Mongolia. Nihon to Mongol (Japan and Mongolia).50 (2)

Detailed features of each value-chain are as follow.

1) Consistent from production to markets

The process of primary collection, processing, transportation, and sales are consistent and mainly conducted by large companies and corporate groups. These are operated and managed within the company which enables the whole process from production to sales be completed by the company. As a background, companies are intended to diversify their business and have entered the agriculture and livestock sector. It can be said that it is a form of the value chain unique to enterprises with capital strength.

2) Intensive collection

The value chain includes primary collection, distribution, and sales of products at district levels. The activities are mainly operated by cooperatives and industrial organizations. Advanced processing is rare in this value chain, and fresh foods or raw materials such as wools and leathers are supplied to manufacturing companies.

3) Specific products

Collection, processing, and sales of agriculture and livestock products are conducted in the value chain. The main actors are SMEs who operate a small business. The value chain is limited to a particular stage of the process and specific products.

4) Direct sales

Producers or micro-enterprises directly sell their product. It is a conventional form of the value chain, and though the economic scale is small, it occupies the majority in the number.

5) Transactions through middlemen

Raw materials and processed products are purchased from producers and processors, and sold to markets and companies. Middlemen who trades below the market price is called “Change” [8], infamous for being one of the obstacles of developing the agro-value chain in Mongolia.

[8] Detailed information of “Change” will be stated in the section “Agriculture and Livestock Processing”.

3.1.2 Overview of Actors of Supply Chain

This subsection gives a brief overview of actors of the supply chain with reference to the statistical data (by size, by region, and by industrial sector): namely, large-scale firms and business groups, cooperative and industry-specific associations, SMEs, and individual producers.

3.1.2.1 Distribution by Size

The detail of the actors of the supply chain (e.g, large-sized establishments, small- and medium-sized ones) is estimated with reference to the "Statistical Yearbook 2015" of National Statistics Office (NSO). The number of establishments is shown by employment size in Table 3.1.2. Before the SME Law came into enforcement in 2007, firms with 49 employees and less were defined as SMEs and its definition of SMEs is applied in this part[9]. Since establishments with 49 employees and less make up approximately 98% in 2015 in Mongolia, it is found out that the overwhelming majority of them are small- and medium-sized.

Table 3.1.2 Establishments in the Statistical Business Register

Employment Size Class	2012	2013	2014	2015	Percentage
1 - 9	81,382	90,270	103 791	114,463	90.4%
10 - 19	4,215	4,300	4 576	5,556	4.4%
20 - 49	3,015	3,192	3 356	4,092	3.2%
50 +	1,926	1,841	1 879	2,449	1.9%
TOTAL	90,538	99,603	113,602	126,560	100.0%

Source: NSO (2015) "Statistical Yearbook 2015"

The following Table shows the number of active establishments. In other words, inactive or dormant establishments are excluded from the number. According to the Table above, the total number of registered establishments is 126,560. On the other hand, its equivalent (a total of active establishments) indicated in the Table 3.1.3 is 40,381, which comprises approximately 32% out of the total number of registered ones. It can be argued that about two-thirds of registered establishments are inactive. In 2015, establishments with 50 employees and more constitute only 4.0% (see the following Table). Therefore, those with 49 or less account for 96.0%. It is argued that as for the active establishments, the majority of them are small- and medium-scale.

[9] According to the 2007 SME Law, the definition of SMEs is as follows: [Medium-size] (i) 199 and less in whole sectors [except (ii), (iii) and (iv)], (ii) 149 and less in wholesale sector, (iii) 199 and less in retail sector, (iv) 49 and less in service sector, [Small-size] (v) 19 and less in the manufacturing sector, (vi) 9 and less in trade sector, and (vii) 9 and less in service sector. This definition is different from NSO's definition.

Table 3.1.3 Active Establishments by Employment Size Class

Employment size class	2012	2013	2014	2015	Percentage
1 - 9	28,724	30,269	32,451	34,123	84.5%
10 - 19	1,887	1,897	2,017	2,631	6.5%
20 - 49	1,355	1,466	1,537	2,027	5.0%
50 +	1,177	1,145	1,119	1,600	4.0%
TOTAL	33,143	34,777	37,124	40,381	100.0%

Source: NSO (2015) "Statistical Yearbook 2015"

The following Table shows the number of herder households, that of herders *per se*, and their regional distribution. The number of herders per household is about 1.9[10]. Therefore, it is found out that each household is small-scale. As for their regional distribution, approximately 40% of the households and herders are concentrated in the Khangai region, about 25% to 26% in the Western region, and about 20% in the Central region.

Table 3.1.4 Regional Distribution of Herder Households and Herders (2015)

Province and the Capital	No. of Herder Households	No. of Herders
Western region	38,967	79,220
Khangai region	63,007	123,056
Central region	32,054	58,759
Eastern region	17,805	34,483
Ulaanbaatar	1,252	2,310
TOTAL	153,085	297,828

Source: NSO (2015) "Statistical Yearbook 2015"

3.1.2.2 Distribution by Region

When it comes to regional distribution of establishments, as of 2015, 73.0% of them are concentrated in Ulaanbaatar, about 9.2% in the Central region, 8.5% in the Khangai region, 6.2% in the Western region, and.3.0% in the Eastern region.

[10] (Total No. of herders/Total No. of herder household) = (297,828/153,085) = about 1.9.

Table 3.1.5 Establishments in the Statistical Business Register, by Regions, Provinces and the Capital

Provinces and the capital	2012	2013	2014	2015	Percentage
Western region	5,709	6,478	7,403	7,867	6.2%
Bayan-Ulgii	1,159	1,297	1,443	1,556	1.2%
Govi-Altai	688	760	837	902	0.7%
Zavkhan	1,236	1,359	1,564	1,644	1.3%
Uvs	1,132	1,347	1,591	1,651	1.3%
Khovd	1,494	1,715	1,968	2,114	1.7%
Khangai region	7,711	8,767	10,085	10,812	8.5%
Arkhangai	871	978	1,139	1,249	1.0%
Bayanhongor	877	1,046	1,181	1,297	1.0%
Bulgan	955	984	1,142	1,228	1.0%
Orkhon	2,857	3,138	3,558	3,716	2.9%
Uvurkhangai	1,052	1,233	1,432	1,487	1.2%
Huvsgul	1,099	1,388	1,633	1,835	1.4%
Central region	8,873	9,729	10,894	11,700	9.2%
Govisumber	238	259	303	351	0.3%
Darkhan-Uul	2,504	2,772	3,030	3,196	2.5%
Dornogovi	905	983	1,094	1,181	0.9%
Dundgovi	639	698	762	861	0.7%
Umnogovi	1,194	1,373	1,656	1,797	1.4%
Selenge	2,105	2,215	2,415	2,528	2.0%
Tuv	1,288	1,429	1,634	1,786	1.4%
Eastern region	2,658	2,975	3,472	3,815	3.0%
Dornod	1,092	1,230	1,454	1,636	1.3%
Sukhbaatar	602	667	762	853	0.7%
Hentii	964	1,078	1,256	1,326	1.0%
Ulaanbaatar	65,587	71,654	81,748	92,366	73.0%
TOTAL	90,538	99,603	113,602	126,560	100.0%

Source: NSO (2015) "Statistical Yearbook 2015"

3.1.2.3 Distribution by Industrial Sector

As for the number of establishments, the percentage of the "Agriculture, forestry and fishery, hunting" out of all sectors is 5.2% (see the following Table). The main industrial sectors with high percentage are as follows: "Wholesale and retail trade, repair of motor vehicles, household goods" (37.6%), "Other community, social and personal services" (9.8%), "Real estate, renting and other business activities" (9.5%), "Construction" (8.4%), and "Manufacturing" (8.1%).

Table 3.1.6 Establishments, by Divisions of Economic Activities

Sectors	2012	2013	2014	2015	Percentage
Agriculture, forestry and fishery, hunting	2,877	3,178	3,409	3,351	5.2%
Mining and quarrying	430	401	608	655	1.0%
Manufacturing	4,492	4,177	4,996	5,190	8.1%
Electricity, gas and water supply	242	256	297	251	0.4%
Construction	3,135	3,541	4,770	5,390	8.4%
Wholesale and retail trade, repair of motor vehicles, household goods	20,430	21,640	22,793	24,194	37.6%
Hotels and restaurants	1,965	1,994	2,018	1,951	3.0%
Transport, storage and communications	1,812	1,901	2,294	2,282	3.5%
Financial services	896	927	915	1,037	1.6%
Real estate, renting and other business activities	5,609	5,899	6,045	6,121	9.5%
Public administration and defence, compulsory social security	1,387	1,390	1,433	1,434	2.2%
Education	2,528	2,553	2,659	2,973	4.6%
Health and social work	2,525	2,659	2,900	3,122	4.9%
Other community, social and personal services	3,597	4,404	4,681	6,326	9.8%
Other	13	9	25	24	0.0%
TOTAL	51,938	54,929	59,843	64,301	100.0%

3.1.2.4 The Number of Retail Stores in Ulaanbaatar (2015)

JICA Study Team obtained the data about the number of various types of retail stores (e.g., supermarkets, wholesale markets, and grocery stores) in Ulaanbaatar City from the Mayor's Office of the City Government, while JICA Study Team was not able to gain the national-level equivalent data. According to the City's data (see the following Table), regardless of their size and type of retail store, the total number of retail stores is 4,416 in 2015in the City. Among these, the number of officially-registered retail stores is 3,443, which constitute approximately 78% of the total number.

Table 3.1.7 Number of Retail Stores in Ulaanbaatar (2015)

District	Bayan zurkh	Khan-Uu	Sukhbaatar	Chingeltei	Songinokhairkhan	Bayangol	Nalaikh	Baganuur	Bagakhangai	Total
Department Stores	2	1	2	1	-	2	-	-	-	8
Hyper Markets	3	1	1	-	3	1	-	-	-	9
Shopping Malls	-	-	1	-	-	-	-	-	-	1
Shopping Centers	24	3	17	4	11	24	7	1	-	91
Super markets	35	28	70	2	25	21	4	1	-	186
Mini Markets	53	53	103	64	20	95	9	15	3	415
Grocery Stores	880	286	209	341	805	321	127	45	16	3,030
Merchandise Stores	33	106	159	119	92	78	6	35	6	634
Wholesale Centers	9	2	2	-	2	4	4	-	-	23
Other Types of Markets	3			2	4	3	4	3	-	19
Total	1,042	480	564	533	962	471	161	100	25	4,416

3.1.3 Critical Issues of Physical Distribution/ Logistics

In this subsection, the structure of distribution/ logistics is reviewed in the first part, and the current situations of distribution/ logistics (transportation of cargo and passengers) are discussed in the second part.

3.1.3.1 Structure of Physical Distribution/ Logistics Sector

Mongolian physical distribution/ logistics firms fall across the five following categories. The first category foreign companies are international express cargo transporters (e.g., DHL, TNT, and FedEX. In the second category, there are 40 to 50 freight forwarders, such as company T (one of the largest forwarders) and Landex (local agent of Japan's Kato Transport). Some of them are the members of the Mongolian Freight Forwarders Association[11]. The third group consists of 10 to 15 firms, some of which deliver newspaper and milk and others are moving companies only in Ulaanbaatar City and its suburban areas. The fourth category includes an arm of logistics/ distribution of major Mongolian firms and/or affiliate companies of the major corporate group (e.g., Gatsuurt LLC, APU Trading LLC, and Nomin Logistics) that have a number of trucks of various sizes. In principle, however, they transport nothing but the cargo of their group firms[12]. In the fifth group, there are small-scale companies and individual farmers and herders with only one or a small number of trucks.

[11] According to the MONDEP's survey conducted in July 2015, the association has about 200 members (registration base), while 50 of them have done business on a regular basis. On the other hand, according to World Bank (2009) "Mongolia: Trade and Transport Facilitation Action Plan," there were about 40 freight forwarders and about 15 offices as of 2009. Therefore, the number of freight forwarders has quintupled since 2009.

[12] When JICA Study team conducted an interview with Nomin Logisitics, a logistics/ distribution arm of the Nomin Supermarket group, on 5 April 2017, the Team learned that the firm began to transport other company's cargo.

Table 3.1.8 Structure of Mongolian Distribution/ Logisitics Sector

Category	Contents
1	International express cargo transporters (e.g., DHL, TNT, and FedEX)
2	40 to 50 Mongolian and foreign freight forwarders
3	10 to 15 movers and companies engaged in delivery of newspaper and milk only in Ulaanbaatar City and its vicinity
4	Logistics/ distribution departments of major firms and/or affiliate firms of major corporate groups(e.g., APU Trading LLC)
5	Small-scale companies and individual farmers and herders with their own trucks

Source: JICA Study Team[13]

On 10 February 2017, Mongolian Transport Corporation LLC exchanged cooperation memorandums with the Mongolia Agricultural Commodity Exchange[14]. In accordance with the memorandum, after the transactions at the Exchange, the company transports agriculture and livestock products in the appropriate manners of storage and management.

This may enable farmers, herders, and other manufacturers to transport their products to Ulaanbaatar without middlemen in about 300 districts in the country. In April 2017, 20 group companies of Mongolian Transport Corporation LLC began to transport cashmere and wool products in Ulaanbaatar. In Khentii, Bayankhongor, and Khovsgol Provinces, the company will start transporting products to Ulaanbaatar in 2018. In and after 2019, it has the intention to gradually expand the areas (provinces) from /to which they transport products or other cargo, as well as to diversify the line-up of products and commodities. As a result of a series of these attempts and efforts, the domestic conditions of logistics/ distribution are expected to ameliorate gradually. Stakeholders (i.e., farmers, herders and other manufacturers) may take advantage of potential improvements in the conditions of logistics/ distribution. The expansion of logistics/ distribution network for export is also expected in several years.

3.1.3.2 Current Situations of Logistics/ Distribution of Agriculture and livestock Products

In the following parts, the current situations of logistics/ distribution of agriculture and livestock products: namely, (a) transportation of cargo and (b) transportation of passengers are considered.

(a) Transportation of Cargo (2010-2015)

The shades of purple color indicate the volume of the passage of trucks between 2010 and 2015 in the following Figure. The deep purple color is indicated along the South-North Industrial Growth Corridor (from Zamin-Uud in the south up to Altanbulag in the north) where the traffic volume of trucks is larger. In particular, it is found out that truck passage is heavier in Ulaanbaatar, Tuv, Selenge, and Darkhan-Uul Provinces. Meanwhile, as for the East-West Green Development Corridor, it is also indicated that there is larger traffic of trucks in the areas from Ulaanbaatar to Choibalsan in Dornod Province along its eastbound route, and that traffic of truck is heavy up to Arkhangai and Bulgan Provinces but is less heavy in Zavkhan and beyond in the westbound route of the Corridor.

The bar graphs indicate the daily traffic of trucks by size: medium-sized truck (ocher color) and large-sized truck (brown color). In the area between Ulaanbaatar and Altanbulag in Selenge Province, the traffic of medium- and large-sized trucks are heavy.

[13] JICA Study Team conducted an interview with Amar Express on 6 April 2017.
[14] "Mongoru Tsuushin" (issued on 17 February 2017)

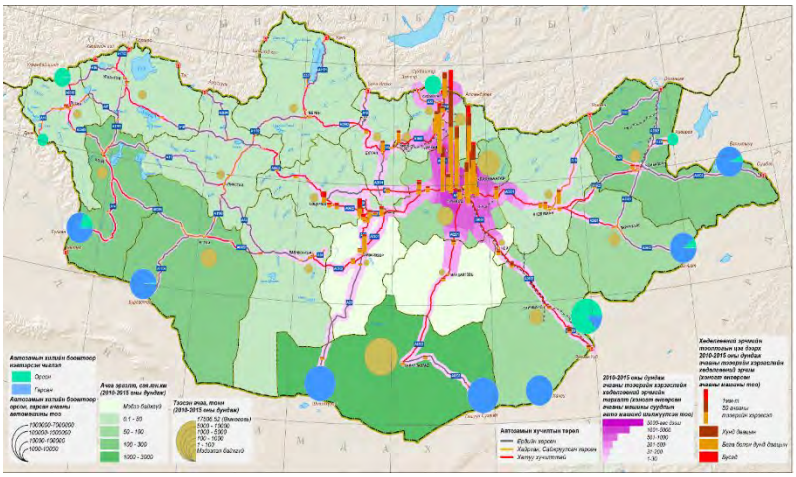


Figure 3.1.1 Map Indicating Traffic of Trucks

Source: JICA Study Team

(b) Transportation of Passengers (2010-2015)

The traffic volume of passenger cars (including bus) between 2010 and 2015 in the following Figure is indicated by the shades of blue color. The difference from the Figure 3.1.1 indicating the traffic volume of trucks is that passage volume of passenger cars is much less between Zamin-Uud and Ulaanbaatar. However, the traffic volume of passenger cars is heavy on the route between Ulaanbaatar and Altanbulag. Along the East-West Green Development Corridor, the volume of them is relatively large from Ulaanbaatar to Bulgan in Bulganamag and Tsetserleg in Arkhangai Province, although the traffic of passenger cars is much less in these cities and beyond in the westbound route. The bar graphs indicate the daily traffic of passenger cars by size: micro bus (yellow color), medium-sized bus (red color) and passenger car (blue color). In Ulaanbaatar and its suburban areas, there are many micro and medium-sized buses.

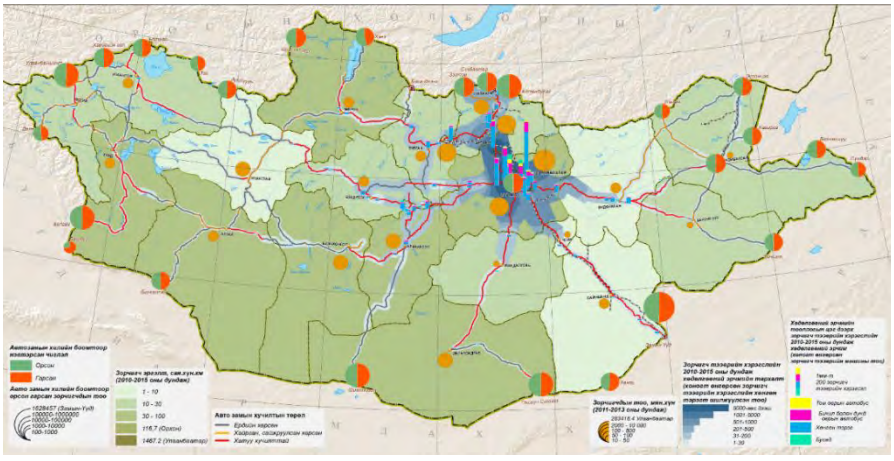


Figure 3.1.2 Map Indicating Traffic of Passenger Cars

Source: JICA Study Team

3.1.4 Distribution, Marketing and Value Chain Structure by Product

In this subsection, the value chains of the major agriculture and livestock products/ commodities are discussed from the viewpoints of procurement [inbound procurement and outbound procurement], sales and marketing, manufacturing (e.g., production capacity, processing, and quality management), and service. On top of these, "price and cost" is also examined as the key indicator of value-added in the main and supporting activities of the value chain.

3.1.4.1 Case of Meat

In the following parts, distribution/ logistics of meat and the structure of its value chain are discussed through analyzing the case of the Khuchit Shonhor Food Market. The reason for focusing on this Food Market is that the majority of dissected meat is shipped from suburban slaughterhouses to the Market and that it is, in practice, viewed widely as the "wholesale market for meat" in Ulaanbaatar City. It is insisted that the analysis of the Market gives us an overview of the value chain of meat.

(1) Overview

The Khuchit Shonhor Food Market, a municipally-operated market, was established in 1981 and was privatized in 1992. Many food markets had its own slaughterhouse inside in the 1990s in Ulaanbaatar City. However, bringing living livestock to the city was prohibited in 2003 by the city ordinance, and all these slaughterhouses were removed. Consequently, the costs borne by middlemen increased after the ordinance came into effect. The reason for the cost increase was that there was a need for them to bear additional costs for car (truck) rental, gasoline, etc. after the 2003 ordinance. Before then, on the other hand, the middlemen spent less because they were allowed to bring living livestock directly to food markets in the city. Currently, slaughterhouses are concentrated in municipalities adjacent to Ulaanbaatar City (i.e., Nalaikh district in the eastern and Emmert district in the western parts). Most pieces of meat dissected at slaughterhouses are transported to the Khuchit Shonhor Food Market, and it functions as a wholesale meat market[15].

As for the type of value chain, in the meantime, this falls across the category of the middleman-dependent value chain. In the meat value chain, middlemen play a central role in a series of transactions. They first purchase meat from individual independent herders, and bring it to the Khuchit Shonhor Market (including within-market transactions) via slaughterhouses.

(2) Main Activities

(a) Physical Procurement (Inbound and Outbound Procurement)

There are two main channels for the distribution of meat. The first one is the route in which middlemen bring living livestock from herders' up to slaughterhouses in the suburban areas of Ulaanbaatar City. After livestock is dissected at the slaughterhouses, pieces of meat are transported from there up to the Khuchit Shonhor Food Market. The left-to-right flow in the upper half of the Figure 3.1.3 refers to this channel.

The second channel is the route in which private meat packers plays a major role, and is indicated by the left-to-right flow in the lower half of the following Figure. According to the Mongolia Meat Association, as of March 2017, it has approximately 70 members (e.g., meat packers, slaughterhouses, universities, and inspection agencies). On behalf of meat meatpackers, agents collect living livestock from herders and give it to the meat packers at the slaughterhouses owned by them. Processed meat is then provided for markets and retail stores in the City. Raw meat was exported to China, Russia, and

[15]Baljinnyam, *et al.* (2006) "Changes and theActual State of Mongolian Meat Market and Distribution System -ACase Study of Ulaanbaatar City's 'Khuchit Shonhor' Food Market-," The Review of Agricultural Economics vol.62 2006 March pp89-97

other countries before it became widely recognized that some Mongolian livestock is infected with murrain such as FMD.

When it comes to the above-mentioned first and second channels, the meat supplied to consumers through the first channel accounts for 80-90% of the City's total demand, while the rest (10-20%) is dealt with by meatpackers by way of the second channel. Although the ratio of these two channels was approximately 50:50 about 11 years ago, that of first one has surpassed over the period. There are two following reasons for the change in the ratio. One of them is that legal requirements for slaughterhouses were relaxed: namely, only transport equipment (i.e., truck) and a storage facility[16]. As a result, meat packers became less advantageous than they had been. Some middlemen attempt to avoid them and bring pieces of meat directly to the Khuchit Shonhor Food Market from slaughterhouses. The other reason is that many Mongolian consumers avoid meatpackers, and prefer the meat which passed through the traditional route[17].

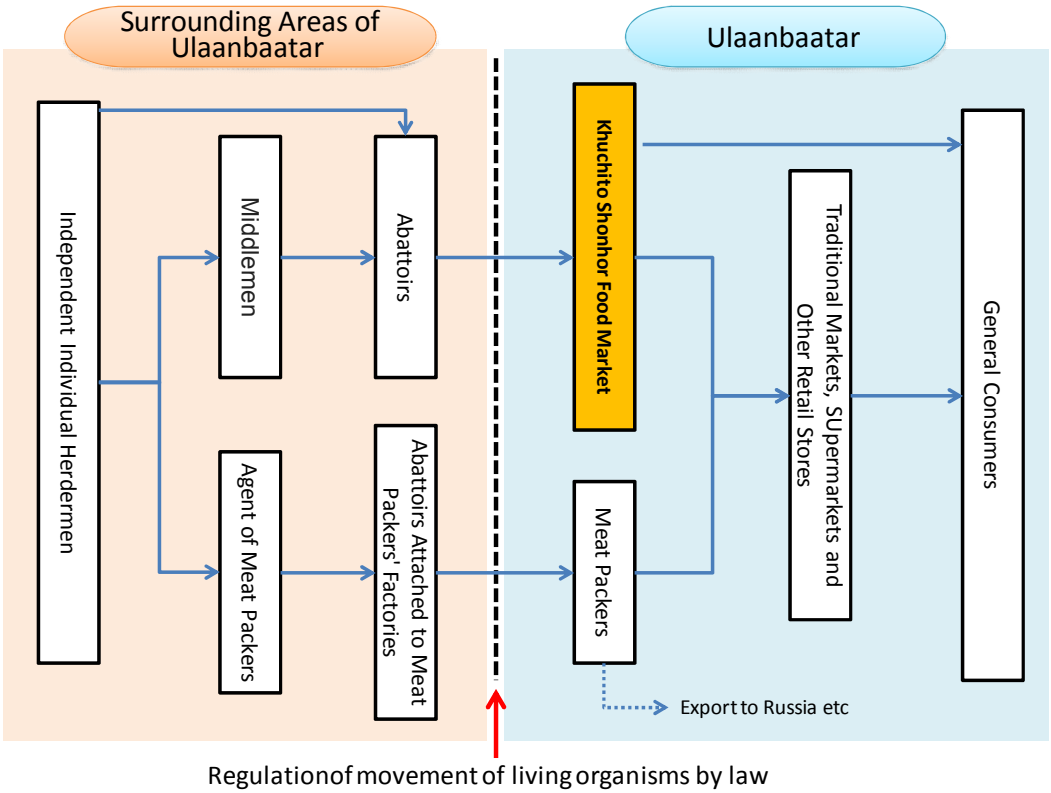


Figure 3.1.3 Distribution Channels of Meat in Ulaanbaatar and its Surrounding Areas

Source: JICA Study Team

[16] Please refer to the results of interviews conducted by JICA Study Team on 13 March 2017, as well as by MONDEP team on 24 March 2015.
[17] The "traditional route" refers to the said first channel or the left-to-right flow in the upper half of the Figure 3.1.3.

The flow of meat within the Khuchit Shonhor Food Market is shown in the following Figure. Most middlemen (and some herders) come from eastern and central parts of the country. They purchase livestock from herders and transport it to slaughterhouses near Ulaanbaatar City[18]. At slaughterhouses, they pay dissection fees to bring the pieces of meat to the Food Market, and sell them to within-market traders. One of the key issues is that cost burdens which middlemen pay are heavier than the ones within-market traders pay. This is because they need to spend more on transportation costs, fees of dissection and of hygiene permission than within-market traders. In the Food Market, these traders sell the meat which middlemen purchased in local provinces.

As for within-market traders, each of them is an individual entrepreneur. They usually sell one head of large-size livestock (i.e., cattle) and 5 to 10 heads of small-size livestock (i.e., sheep and goat) on an everyday basis. In the meantime, they rent a stand in the Market as a tenant. It is also argued that tenant's monthly rent has soared over the past 11 years; it went up approximately 15 times higher from MNT 63,000 in 2006 up to MNT 900,000 in 2017. Regarding the difference in meat distribution between 2006 and 2017 (as shown in the following Figure), it can be pointed out that the direct transactions between middlemen and retailers have increased over the period by skipping those with within-market traders and salespersons[19]. Baljinnyam, *et al.* (2006) insisted that the traders had the price leadership and, yet, their role has been reduced over time according to the results of our survey conducted in 2016 and 2017. Another important issue is that the number of retailers at the far-right rows of the following Figure has increased and their size has also been more diverse. Foreign-owned chains of the supermarket (e.g., E-Mart) have opened its branches in Ulaanbaatar in recent years, and more and more domestically-owned supermarkets (i.e., Nomin and other smaller ones) have also been opened[20].

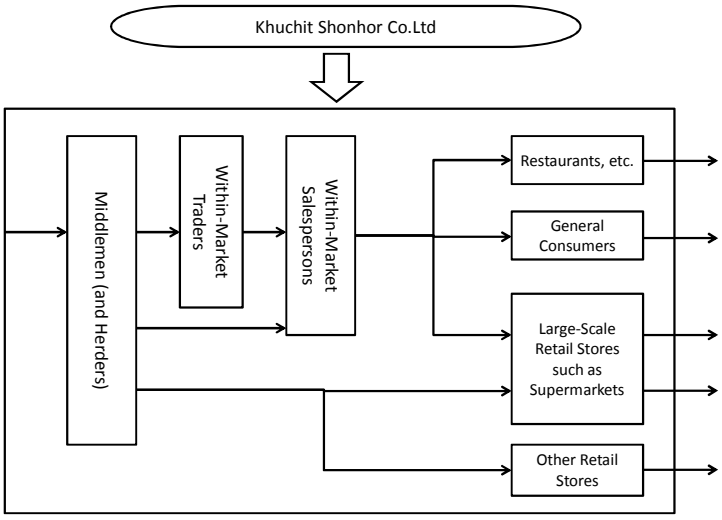


Figure 3.1.4 Distributional Flow of Meat and Main Actors of the Khuchit Shonhor Food Market

*Khuchit Shonhor Co.Ltd mainly offers the transaction place and supervision of transaction inside.

Source: Prepared by JICA Study Team based on Baljinnyam, et al. *(2006)*

[18] Although slaughterhouses were attached to food markets in Ulaanbaatar City in the 1990s, murrain conveyed by animals were rampant. As a result, bringing living livestock to the city were prohibited by the city ordinance in 2003 and all the slaughterhouses were removed. At present, many of them were located in the suburban areas of the city, from which dissected meat is shipped to the Khuchit Shonhor Market.

[19] Please refer to Baljinnyam, *et al.* (2006).

[20] Based on the result of the interviews conducted by JICA Study team on 30 March, 3 and 5 April 2017. For instance, Nomin Supermarket, a locally-owned retail chain, has 26 branches across the country (17 branches in Ulaanbaatar and the rest in provinces).

(b) Price

Unit price (MNT) of meat per kg is shown in the following Table[21]. Middlemen's prices are lower than within-market salespersons'.

Table 3.1.9 Comparison of Beef Price (MNT per kilogram)

	The Khuchit Shonhor Food Market		Other Food Markets and Large-Sized Retail Shop/ Supermarkets			
	Middlemen	Within-market Salespersons	Bars Market	Nomin Supermarket	E-Mart	Merkuri Market
Beef	4,600-5,000	7,000 (Boneless) 6,000 (with Bone)	7,800 (Boneless) 8,000 (with Bone)	8,799 (Boneless) 7,499 (with Bone)	9,500 (Boneless) 7,900 (with Bone)	11,000 (Boneless) 10,000 (with Bone)

Source: JICAStudy Team (based on interviews conducted in Ulaanbaatar on 12 March 2017)

As the supply of meat increases, its prices go down during the peak period (i.e., end of August, October, November, and December) of slaughtering livestock[22]. Apart from the said period, the supply of meat decreases, its prices go up. From the standpoint of middlemen and meat packers, however, prices might be lower unless they purchase meat during the period. Some experienced middlemen attempt to purchase living livestock at the lower price during the period. After having it slaughtered, they keep the pieces of meat in the food freezer until the period is over. It is their intention to sell the meat when prices of meat go up.

Difference in Domestic Beef Price by Portion

At present, when it comes to prices of beef in the domestic market, there are differences between meat with bone and boneless one (see Table above), while there is virtually no difference in price by portion. According to the result of the interview conducted by JICA Study Team on 13 March 2017, there was only one retail store in Ulaanbaatar which tried to differentiate the price of meat by portion: just as, "Leg: MNT 8,990," "Breast: MNT8,690" and "Tongue: MNT 12,500." Except for the store, there was no store which differentiated the price of meat by portion. In the meantime, when JICA Study Team visited the Mongolian Meat Association on 13 March 2017, the director of the association commented, "Several years ago, FAO's specialist prepared the assessment table of meat by portion. Although we have the desire to assess (price) the meat by the portion in line with the table, it is difficult to make it prevalent across the agricultural sector."

(c) Quality Management

In the Khuchit Shonhor Food Market, in-house inspectors usually take a sample test on 200 grams of meat (per head) once a day for the sake of quality management. Given that the sample passes the test, a certificate of inspection is issued[23].

[21] At present, when it comes to prices of beef in the domestic market, there are differences between meat with bone and boneless one (see Table above), while there is virtually no difference in price by portion. According to the result of the interview conducted by JICA Study Team on 13 March 2017, there was only one retail store in Ulaanbaatar which tried to differentiate the price of meat by portion: just as, "Leg: MNT 8,990," "Breast: MNT8,690" and "Tongue: MNT 12,500." Except the store, there was no store which differentiated the price of meat by portion. In the meantime, when JICA Study team visited the Mongolian Meat Association on 13 March 2017, the director of the association commented, "Several years ago, FAO's specialist prepared the assessment matrix of meat by portion. Although we have the desire to assess (price) the mat by portion in line with the matrix, it is difficult to make it prevalent across the agricultural sector."

[22] According to the result of an interview conducted by MONDEP on 24 March 2015, school year begins in September in Mongolia, and some herders try to sell meat at the end of August. As a result, the concentration of transactions (i.e., an increase in the supply of meat) in this period brings about a temporary hike in prices.

[23] For details about quality management, please refer to 3.3 of this Chapter.

(d) Export (and Sales/ Marketing)

Due to the murrain such as FMD, no meat has been exported for the past several years.

(e) Service

It is indicated in the Figure 3.1.4 above that middlemen play a pivotal role in the Market by handling transactions with other actors (or their customers).

(3) Support Activities

(a) Firm Infrastructure (General Management)

As for the price, there is information asymmetry between herders and middlemen, as well as between middlemen and their customers (e.g., retailers). For instance, herders do not know the price at which middlemen sell meat to retailers. Meanwhile, the retailers do not know the details of transactions between herders and middlemen, either. Since asymmetric information on price exists, the middlemen are often criticized. Although the case above is one of the examples, there is much to be improved pertaining to the management of information sharing.

(b) Human Resources Management

There is indeed no system of human resource management among the actors of the value chain of meat. It is apparent, however, that the number of middlemen's customers (i.e., retailers) has increased and their size and types have also been diversified since about 11 years before. In order to keep up with changing business environments, the middlemen must have enhanced capability of sales/ marketing gradually throughout the period by exchanging collected information on new and/or potential customers among themselves.

(c) Technology Development

It is important that thanks to the advancement of information and communication technology (ICT), middlemen have improved their capability of sharing and collecting related information on marketing among themselves. It is also worth noting that new equipment/ machinery for slaughtering livestock was introduced in some slaughterhouses which lie to the east of Ulaanbaatar City[24].

(d) Procurement

From the viewpoint of inbound procurement, middlemen have maintained good relationships with herders for years as sources of procurement. Meanwhile, it was found out that one of the meat packers introduced a large-sized freezer in Khovd Province when an interview was conducted there in March 2017.

[24] Based on the result of interview conducted in May 2017.

3.1.4.2 Case of Milk

This part takes a case-study of APU Company pertaining to the value chain of milk[25]. This value chain falls across the category of the full-fledged value chain managed by a large-sized company.

It is said that there are 246 factories of milk across the country and a total of annual production volume is approximately 690,000 tons. Only about one seventh of the total volume is processed in the factories. Domestic distribution/ logistics of milk takes various forms: from the value chain operated by large firms to the middlemen-driven channels in which they purchase raw milk from herders and the raw milk is sold in the bucket without pasteurization treatment in the factory at the traditional local market. The reason for selecting the case of APU Company from among the said factories of milk is that the company has the nationwide sales network of 6,000 shops. This case falls under the classification of the value chain managed by large firms with consistent processes from production to the market. In the following parts, the case is analyzed with special emphasis on the physical distribution aspect with 6,000 sales shops of APU Company.

(1) Overview

The origin of APU Company can be traced back to the establishment of one of the state-owned enterprises in 1924. After it was established, technical experts were dispatched from the former Soviet Union. Currently, the company has approximately 900 employees. A variety of its line-up of products includes vodka, beer, milk, yogurt, and other beverages such as juice and mineral water.

APU Company, a beverage manufacturer, has its following affiliated firms from (i) to (vi): namely, (i) a manufacturer of bottles, cans, etc., (ii) APU Trading LLC (distribution/ logistics), (iii) a car dealer (South Korean Hyundai's automobiles), (iv) mass media (TV, publishing, etc.), (v) construction, and (vi) investment. In the logistics center of (ii), logistics trucks and forklifts were all supplied by the above-stated (iii). APU Company's products are publicized by (iv). Some of the buildings of APU Company was constructed by the said (v).

(2) Main Activities

(a) Product, Quality, Production Capacity, etc.

The company began production of milk in 2014 and is now a ISO14001- and ISO22000-certified company. Its production capacity is approximately 70 tons per day. Most of its productive equipment was made in Germany. The company began to operate its own dairy farm in northern Tuv Province (150km from Ulaanbaatar City) to coincide with the establishment of the new factory. The farm has about 100 cows that consist of various species. The company plans to increase their milk cattle. In order to give a stable supply of milk, it has collaborated with 300 to 350 dairy farms and/or herders on a contract and has arranged training courses about food safety, quality management, and dairy farm management, etc. for the contracted counterpart.

(b) Price and Cost

APU Trading LLC usually purchases products from its parent firm, APU Company. As is indicated in the Figure 3.2.1, the retail price of APU Company's one-liter milk carton (MNT 2,100 to 2,150) is comprised of the whole sale price of MNT 2,000 and handling charge of MNT 100-150. As mentioned earlier, there are approximately 6,000 sales shops of APU Company in Ulaanbaatar City and all provinces. The company's products are shipped to and sold at the shops. The domestic market is split into the three regions (i.e., central [including the capital], eastern, and western). Since the shipping costs to the three regions are different according to the distance from Ulaanbaatar City, the retail price of the same product is also different among these regions. In the meantime, the retail price of the same

[25] An interview with APU Company was conducted on 28 March 2017.

product is the same in the same region. However, the APU Company's products are sometimes sold at another shop (instead of APU Company's). In the case like this, these products are normally sold at higher prices at others' than at APU Company's because of the difference in various costs.

(c) Sales, Marketing, and Export

The export products account for approximately 10% of the total sales. The destinations of export are eight countries such as China (Hong Kong). The company has responded to customers' voice through its own website and call centers from the standpoint of sales promotion in the domestic market. Some of the voices are reflected in the design and other processes of manufacturing.

(d) Physical Distribution

[Collection of milk to outbound procurement] ((i) to (viii) below takes about 10 hours in total)

(0) Collection; (i) Receipt and inspection; (ii) Storage; (iii) Purification; (iv) Homogenization, (v) Pasteurization and cooling; (vi) Storage; (vii) Bottling; (viii) Inspection; (ix) Outbound procurement (shipping)

Regarding (0) above, APU Company has 12 collecting points. Milk lorries go around and collect milk at the points from farmers and herders. This approach to collect mile is called "Milk Run." This company has three 5-on trucks. The daily quantity it collects is about 60 to 70 tons in summer and 20 to 30 tons in winter. Although the milk lorries go around on an everyday basis, some farmers and herders bring milk to the company. So as to stabilize and diversify the procurement sources of milk, apart from its own dairy farm, the company also procures it from the dairy farm of Nuudelchin Group where there are about 300 milk cows imported from France.

Meanwhile, the above-stated APU Trading LLC, of which there are about 540 employees, is in charge of (ix) Outbound procurement (shipping). APU Company has a total of approximately 6,000 branches nationwide: about 3,000 in Ulaanbaatar City and the rest in all provinces. About 70 employees work for the Logistics Center. After receiving products from the parent company to the Center, they are put in the storage. They are then separated by using made-in-Germany large equipment, and are loaded into delivery trucks to be distributed to 6,000 branches throughout the country. APU Trading LLC has delivery trucks (5-ton trucks and 10- to 15-ton ones). Among these, 40 to 50 of them are for Ulaanbaatar City, and 20 to 30 for local provinces. The advantage of APU Trading LLC is the logistics center established in 2013[26]. The said German equipment is equipped inside the Center. It is able to deal with palettes one by one, on which products are piled up, and to lift them up to the height as high as a nine-story building. When it comes to shipping (outbound procurement), palettes are stored in the trucks only for Erdenet City and Darkhan City, because the capacity of the storages in these cities is large enough and there are folklifts in them. Apart from the trucks bound for the two cities, no palettes are loaded in those for the other regions (provinces).

(e) Service

APU Company has attempted to respond to customers' requests and claims, as mentioned earlier, through its website and call centers. It may be argued thus that this company is one of Mongolia's best firms concerning customer response.

[26] According to APU Trading LLC's staff in charge, among domestic manufacturers of beverage, there are oly several of them (including APU Trading LLC) which have logisiticscenter.

(3) Support Activities

(a) Firm Infrastructure (General Management)

The company has its affiliated firms (e.g., a car dealer, logistics, and mass media), as previously noted, and has managed the value chain in tandem with them.

(b) Human Resources Management

APU Company has attempted to develop human resources in collaboration with its affiliated firms. For instance, there is an exchange of personnel between the APU Company and the APU Trading LLC in order to nurture the staff members who are knowledgeable about logistics/ distribution.

(c) Technology Development

In the logistics center of the APU Trading LLC, there is huge transport equipment with the state-of-the-art technology, which looks like an elevator and is as large as a 9-story building. It can be insisted that the APU Trading LLC is one of the most technologically advantageous in the country because of the logistics center (particularly, of the transport equipment).

(d) Procurement

From the standpoint of the inbound procurement, the APU Company has been able to procure milk almost everyday efficiently by using the said approach called "Milk Run." In the meantime, regarding the outbound procurement, the company makes good use of its nationwide network for sales (i.e., 6,000 branches in all provinces).

3.1.4.3 Case of Vegetables

The value chain of vegetables takes varied forms; for instance, a local farmer transports and sells his/ her vegetables directly at the market in Ulaanbaatar and other major cities; the middlemen purchase and transport them from provinces to the urban market; and so forth. This case study takes a close look at the value chain of vegetable operated solely by Gatsuurt LLC, one of Mongolia's largest firms, of which there are a series of processes (i.e., primary pickup at the district, collection at province center, shipping by a large number of trucks, and sales at its own chain of supermarket).

(1) Overview

Gatsuurt LLC is a major mine developer in the country and, as part of its diversification of business lines, it began to tackle agribusiness (e.g., vegetables and honey) in the 1990s. Particularly in recent years, the company has intended to provide safe vegetables for consumers through extending its own chain of supermarket across Ulaanbaatar.

(2) Main Activities

(a) Products, Processing, and Quality Management

The company has grown approximately 30 kinds of vegetables: that is to say, potatoes, onions, cabbages, carrots, and so forth. Since some of the harvested vegetables are too damaged to be sold during the process of distribution/ logistics, the firm began to recognize that processed vegetables are more suitable for business. It plans to manufacture about 500 kinds of processed vegetables in the near future. When it comes to crops other than vegetables, the company has also grown about 30 kinds of crops such as wheat, buckwheat, rapeseed, alfalfa, corn. Concerning the seeds of vegetables, the firm imports one of the world's highest quality.

In the meantime, to date, the firm has not established its own standards of quality and hygiene for agricultural products.

(3) Physical Distribution and Storage

The company's equipment for loading enables it to stow 10 forty-foot containers with harvested wheat, vegetables, etc. within an hour[27]. Vegetables are normally transported by truck. Freight trains are not used because its time schedule is not very convenient. The firm owns about 200 trucks, including 30 large-sized (25-30 tons) ones and others (i.e., 2-ton, 3-ton, and 10-ton ones). Although there is a need to transport all the harvests within one month between early September and early October, because of limitation on vehicle's weight in Ulaanbaatar City, only 2-ton trucks (and less heavy ones) are eligible to travel to the City. It is necessary for the company to own various trucks (in weight and last-digit number of car license plate) for the smooth transportation of vegetables and crops, because of not only the weight limitation but also traffic congestion and the limitation on the last-digit number of vehicle's license plate.

(a) Physical Distribution

The value chain includes the following processes: namely, (i) cultivation in the districts; (ii) transportation to district-level regional center; (iii) transportation to province-level regional center; (iv) transportation and storage in Ulaanbaatar; (v) selection; (vi) packaging; (vii) sales at retailshops.

Wheat is collected from nine growing areas in districts up to the district-level regional center, and then is transported to the province-level regional center in Selenge Province. In the province-level regional center, most portions of wheat are sold to some other companies (flour processing factories), while other portions are transported to Ulaanbaatar by its own truck. During the busy season, around 400 tons of wheat is transported in one day. In Selenge Province, there is a large country elevator in which temperature and humidity are controlled automatically and 50,000 tons of wheat may be stored. In the Province, there is also a storage with automatic control of temperature and humidity where 20,000 tons of vegetables may be stockpiled. In Ulaanbaatar, there is a storage facility with automated control of temperature and humidity in which 6,000 tons of vegetables and/or wheat can be stockpiled.

(b) Price, Cost, etc.

From a geographical perspective, approximately 95% of sales are for Ulaanbaatar and the rest (5%) are for Erdenet and Darkhan. The prices of wheat and vegetables are fixed in principle. Its wheat and vegetables are sold at the same price not only at its own supermarket but also at Nomin supermarket.

[27] The loadage, or load capacity, of one 40-foot container is approximately 24 tons (including its own weight of 3.3 tons). http://www.e-trade.co.jp/news/?p=7 (access on 7 April 2017)

(c) Sales, Marketing, and Export

As for exportation, only a small amount of rapeseed is exported to China. It is said that honey has potentials for export. One of the candidate destinations of export is Japan. On the other hand, Gatsuurt LLC opened its own chain of supermarket. At present, there are five branches in Ulaanbaatar City. On top of these, the company also supplies its vegetables and other products for 17 branches of Nomin supermarket in Ulaanbaatar[28].

(d) Service

For years, the company has attempted to improve the service provided for consumers on a trial-and-error basis. The criteria for selection should meet the needs of consumers, although vegetables are selected before packaging. If the vegetables are sold without packaging, they can be mixed up with others'. Given that the firm's vegetables mingle with others', it has the difficulty in taking responsibility for product quality. In order to avoid the mixture of its own vegetables and others', the firm introduced equipment for packaging. Nevertheless, packaged vegetables are not much preferred by consumers because they are not accustomed to such products. For example, they do not buy a 50- to 60-gram potato because it is too small, and also try to avoid buying a 100-gram one because it is regarded mistakenly as made-in-China. The company has the intention to continue to improve its service for consumers, although it is difficult to satisfy their demands.

(4) Support Activities

(a) Firm Infrastructure (General Management)

As is mentioned earlier, Gatsuurt LLC owns the huge land of a total of about 50,000 hectares and large storages in Selenge Province and in Ulaanbaatar City, and operates a chain of supermarket across Ulaanbaatar City. It may be argued that the value chain of vegetables is managed by the firm and its affiliated firms (e.g., supermarket).

(b) Human Resource Management

This firm introduced technologically advanced equipment for cultivation and storage than Mongolian competitors[29]. For human resource development, relevant training courses are provided for its employees.

(c) Technology Development

Currently, packaged vegetables are not sold in Mongolia. However, by introducing technologically advanced equipment for packaging, the company has the firm intention to enhance its service for customers.

(d) Procurement

For instance, wheat is collected from cultivation areas in nine districts and is transported to the district- and province-level regional centers by truck. It is insisted therefore that inbound and outbound procurement is operated efficiently.

[28] Based on result of interview conducted on 5 April 2017, Nomin supermarket has a total of 26 branches across the country. 17 of them are in Ulaanbaatar and the others in the provinces.
[29] Based on result of interview conducted on 3 April 2017.

3.1.4.4 Case of Sea Buckthorn

When it comes to the value chain of sea buckthorn, there are two channels, in which the Mongolian National Association of Fruit and Berry has had a vital role to play[30]. The association provides support for primary pickup of sea buckthorn and for its distribution and sales. The value chain of this case belongs the category of the collectively-managed value chain in which an industry-specific association or cooperative plays a leading role. The following parts examine the main and supporting activities in relation to the value chain.

(1) Overview

The Mongolian National Association of Sea Buckthorn Growers and Producers was established in 2007, and was renamed the Mongolian National Association of Fruit and Berry in early 2017. As of March 2017, there are about 230 member organizations (about 12,000 persons) in the association. Its main activities are conducting surveys, implementing projects, cooperating with foreign associations, etc[31]. For example, it implemented the "National Sea Buckthorn Program" in cooperation with MOFALI between 2010 and 2016. The association provides training courses for members and shares related information with them.

(2) Main Activities

(a) Physical Distribution

As stated previously, sea buckthorn is supplied for the market through the two following channels. One is the route through small-scale producers' associations. There are more than 20 such associations across the country. The other is the channel by way of a processing factory. Sea buckthorn-related products (juice, oil, cosmetics, soap, etc.) and meat are sometimes transported by truck of major supermarket chains, such as Nomin, when it has no cargo on its way back to Ulaanbaatar. In some cases, middlemen themselves bring products up to the market in major cities.

(b) Manufacturing and Production Capacity

The production volume of sea buckthorn in Mongolia was about 2,000 tons in 2014 and about 3,000 tons in 2016. It is said that the maximum capacity of whole sector's domestic production is approximately 8,000 to 9,000 tons[32]. Considering the production volume of 2016, the capacity utilization rate is approximately 33 to 38% and Production capacity can be expanded by over 60%. There are over 40 processing factories throughout Mongolia. Among others, a factory of company H has the largest production capacity (about 5,000 tons per year) in the country.

At present, the Fruits and Berries Program has been implemented in cooperation with FAO and MOFALI. This is a small-scale program of technical assistance. Its activities are (i) technical assistance in a reduction in working hours and and labor-saving for picking, (ii) technical assistance in seeding and cultivating apple and plum, and (iii) training course for seeding. Meanwhile, with MOFALI's assistance, the association conducted a survey on the cultivation of fruit tree and consumption of fruit and, in line with the results of the survey, started the cluster development project in 2015. Project sites are Ulaanbaatar, Uvurkhangai, Darkhan-Uul, Selenge, and Tuv Provinces. Stakeholders include the association, universities, a laboratory, an institute of research, and a processing factory. Nevertheless, after the new administration came into office, the budget of the project was reduced by newly-appointed Minister of Agriculture and, as a result, the activities were

[30] Based on result of interview conducted on 28 March 2017.
[31] An international conference of the International Seabuckthorn Association scheduled for 2017 was cancelled because the new administration reduced the related budget in 2016.
[32] According to the documents of MONDEP, nationas's production capacity of 2015 was about 5,500 tons.

suspended temporarily. Despite the budgetary reduction, several activities resumed with financial assistance from some members of the association, although their progress has been slow.

(c) Sales, Marketing, and Export

The export of sea buckthorn began in 2012 and the export destinations were Japan and Russia. Japanese-side counterpart is the Yellow Doctor Japan Co., Ltd. It is reported that a small quantity (about 30 grams) of sea buckthorn was exported in early 2017 for exhibition in Japan and for a sample provision in Germany[33]. An increase in export (including Europe) is expected in the near future.

In the meantime, in collaboration with the Mongolian National Chamber of Commerce and Industry (hereinafter referred to as the "MNCCI"), the Association has analyzed the domestic market, and assisted in quality enhancement and expansion of production capacity at processing factory, as well as in cluster development in Uvs Province.

(d) Service

The great majority of members of the Association is SMEs and individual farmers. Although these members and the secretariat of the Association have the desire to listen to consumers' voices and to reflect their requests in sea buckthorn-related products and services, their intention has not yet been realized to date.

(3) Supporting Activities

(a) Firm Infrastructure (General Management)

As to the above-stated cases of milk and vegetables, both value chains are full-fledged and managed by leading firms of the country. The association has a central role to play in this value chain of sea buckthorn and its secretariat has attempted to totally manage the value chain. However, the association has chronically been short of funds. As for the particular fields of activities, the secretariat requests financial and other forms of assistance to the government of Mongolia and international donors.

(b) Human Resource Management

In the Fruits and Berries Program, training courses about seeding are provided for producers (farmers) who constitute one of the processes of the value chain with the assistance of FAO and MOFALI with the aim of developing their capacity.

(c) Technology Development

As is stated before, technical assistance is provided in a reduction in working hours and labor-saving in the Fruits and Berries Program in association with the said donors.

(d) Procurement

Concerning outbound procurement, the association has attempted to make good use of trucks of a major supermarket on their way back to Ulaanbaatar so as to transport products efficiently and economically.

[33] Based on result of interview conducted on 31 March 2017.

3.1.4.5 Case of Leathers

In Mongolia, approximately 15,000 tons of leathers of five kinds of livestock (i.e., cattle, sheep, goats, camels, and horses) are produced on an annual basis. According to the Mongolian Leather Industry Association, there are 34 members' factories in the country. The members are split into the three following groups: (i) 16 of them have full-fledged factories that have all the necessary processes of leather processing, and are also engaged in sales and marketing. (ii) After purchasing raw materials (skin/ leather), eight firms normally have them processed by Chinese counterpart. (iii) Ten members have such small-scale factories that they have a maximum daily capacity of only 100 pieces of skin.

(1) Overview

As a case study of Mongolia's agriculture and livestock value chain, this part takes a close look at the factory of Mongol Shevro JSC, a manufacturer of leather products. The company is an exporter of half-processed products called "wet blue." This value chain is classified into the category of the smaller-scale value chain from inbound procurement up to sales (export). Mongol Shevro JSC is one of the members that belong to the (i) above.

(2) Main Activities

(a) Products and Quality Management

As for the positioning of the company's products, its half-processed products (wet-blue) are ranked fourth or fifth and its final products are ranked second or third in the domestic market. The company does not deal with horse skins because there are usually many scars of the whip on the surface. Annual production capacity is one million for the skins of sheep and goat, and 150,000 for that of cattle. The company tries to minimize inventories and manufactures products on a build-to-order basis. Approximately 80% of half-processed products are made into final products in the form of belts and bags, and the rest (about 20%) clothes. About a half of these clothes are sold in the domestic market.

The enhancement of product quality is viewed as one of the most critical issues in the company. Currently, defect ratio is approximately 5% to 10%. In order to reduce the ratio, the three following points are important. First of all, skins are easily scarred because about 70% to 80% of them are normally treated manually. Secondly, the skins of sheep are so soft that they could be damaged easily by parasites. Thirdly, herders tend to avoid slaughtering younger livestock. If 2-year-old livestock would be slaughtered, better-quality skins could be available. The majority of livestock, which are slaughtered, are normally 3 or 4 years old. The prices of skins are the same regardless of their age. Approximately 25 million heads of livestock are born every year in Mongolia. In order to gain the skins of younger livestock, it is necessary to slaughter the same number of older livestock as newly-born one. In reality, however, it is extremely difficult to do so. In the meantime, leather products are manufactured in this firm in accordance with the Mongolian standard. It has no plan to earn certificates of international standards such as ISO, because it does not find any necessity to do so because there is no such request from customers.

(b) Price and Cost

The unit prices are: MNT 2,000 for sheep. MNT 40,000 for cattle, and MNT 2,000 to MNT 3,000 for goats (those of furred skins of winter are MNT 20,000 to MNT 30,000). The unit prices of sheep, goats, cattle, and yaks for Italian customers are the same as those for Turkish ones. The unit prices are changed in line with changes in the costs of raw materials. Although prices do not fluctuate widely in a year, there was a sharp fall in them in 2015 and 2016. According to the Mongolian Leather Association, there are two following reasons for the fall. One is changes in the related laws. The other is speculative behaviors of Chinese buyers'. However, the company has a different view on the fall. It is said that fashion trends change about every 13 years. In their view, the reason is that Mongolian firms have not been able to keep up with the changes in market trends since 2015.

(c) Distribution, Procurement of Raw Materials, etc.

A large amount of raw materials (skins) are supplied every year between November and January, and the company purchases approximately 70% of raw materials from five middlemen by the end of every January. According to the company, there are several locations of middlemen's source of raw materials procurement, and it is difficult to specify the main location of procurement source. Although they normally bring 250 to 500 skins of cattle when they come to the company, the firm purchases about 70% of them as a result of the simplified quality inspection. The middlemen often complain about the inspection. Meanwhile, the first 100 skins of sheep are inspected because total quantities are too many, although they bring about 2,000 to 3,000 skins. It is important to examine the quality of raw materials. Nevertheless, if too many materials they bring do not pass the inspection, the middlemen may get angry and bring raw materials to Chinese buyers who purchase the materials regardless of their quality. Consequently, the materials are exported to China and the number of them supplied to the company decrease. The company has found out that the relationship with the middlemen is difficult to maintain.

As for outbound procurement, products loaded in the twenty-foot container are shipped by truck from the factory. When they are exported to Europe such as Italy, there are two channels. One is by truck. A truck travels from Ulaanbaatar up to a destination in Europe via Altanbulag in Selenge Province and Russia. It takes approximately 15 to 16 days to reach the destination to supply products for European customers. Meanwhile, the other channel is by sea (and railway). The company's products are transported from Ulaanbaatar to Tianjin, China by railway (by way of Zamin-Uud and Beijing). In the Port of Tianjin, products are loaded onto a cargo ship. In the port of Geneva, Italy, the cargo is transhipped to a truck and is transported to the final destination. This route takes approximately 45 to 60 days in total.

(d) Sales, Marketing and Export

The main export destinations are Italy, Spain, Turkey, and Vietnam. The firm has exported to Japan. Concerning an Italian customer, an Italian agent is stationed in Ulaanbaatar. The company communicates closely with him in order to discuss the details of the order, and has exported half-processed products to the Italian customer for about ten years. The products are made into bags in Italy. The company has the intention to diversify the line-up of final products and to increase production volume of crust[34].

As for export to Italy, (half-processed) products are graded by the company itself before shipping and there are five following grades: A (95%), B (85%), C (75%), D (50%), and F (45%). The number put in parentheses above indicates the percentage (for instance, 95% of "A" grade) of the area of raw materials' surface used for the half-processed products. These grades are based upon international standards. It has not happened often so far that the customers did not disagree on the grading. The grades "A," "B," and "C" are usually accepted by Italian customers. Different grades are required in a different transaction (contract). According to a contract, for example, the combinational ratio of grades in the twenty-foot container is as follows: 50% of products with A-grade, 30% of those with B-grade, and 20% of those with C-grade. Among the raw materials supplied, those of cattle with acceptable grades (namely, A-, B- and C-grades) account for approximately 70% and goats 80%. When it comes to sheep skins, those with A- and B-grades comprise 20% and those with C-grade 20%. On the other hand, the thickness of skin is is requested separately by customers.

(e) Service

Regarding service, as stated earlier, the firm has attempted to properly meet Italian customers' needs, when necessary, by communicating with a resident agent in Ulaanbaatar.

[34] After the raw materials are put into the tanning process, they are further processed and dried and are made into the half-processed product called "crust."

(3) Supporting Activities

(a) Firm Infrastructure (General Management)

The value chain is totally managed by president of Chief Executive Officer (CEO) of the company from inbound procurement up to shipping (export).

(b) Human Resource Management

The origin of this company dates back to the 1967 establishment of a state-owned enterprise. Shortly after its establishment, a spectrum of technical assistance was provided for the enterprise from former Czechoslovak including made-in-Czechoslovak productive equipment. As the Czechoslovakian equipment became obsolete and outdated, it has been replaced with those from Italy and South Korea with advanced technology in recent years.

(c) Technology Development

Training courses and other technical assistance were provided for employees about how to operate newly introduced Italian and South Korean equipment.

(d) Procurement

Concerning inbound procurement, CEO carefully conducts a quality inspection of raw materials, when five middlemen bring them to the firm. For instance, about 30% of skins of cattle are usually short of the quality standards and thus the company purchases the rest (70%) of them.

3.1.5 Current Status of Marketing of Agriculture and livestock Products

This sub-section is two-fold. In the first part, a range of efforts is shown on marketing development of the country's potential products. The second part examines the impacts of the Economic Partnership Agreement (EPA), which came into effect on June 2016, upon key agriculture and livestock products (i.e., cashmere and honey).

3.1.5.1 Cases of Marketing Efforts on Mongolia's Potential Products

In this part, six cases of marketing efforts made by Mongolian firms are reviewed. Although it is necessary to continue to collect relevant information, Mongolian products, which have high potentials for export as well as for import substitution and sales expansion in the domestic market, are shown in the following Table.

Table 3.1.10 Examples of Made-in-Mongolia Products with Great Potentials (for domestic and foreign markets)

Name	Details	Remarks
(1) "MR" Brand's Leather Products	・ Manufacturer of this product is SRB and it was established in 2012. The products are made from skins of cattle and yak in technical partnership with Mongol Shevro JSC, Darkhan, Nekhii, JSC, Ikh Ergelt Go. ltd. ・ Line-up of products is about 70 kinds of handbags and 30 kinds of wallets/ purses. The company's techniques are positively evaluated by foreign customers such as Japan and Taiwan. The range of prices varies from approximately US$ 20 to US$ 500. ・ The company has a strong preference for the use of Mongolian raw materials (cattle and yak skins) and for a traditional manufacturing process. The problem is, however, that the raw materials get easily scarred through the process. There is a need for the company to establish another manufacturing process to address the problem.	
(2) Divan Beauty Brand's Organic Cosmetics/ Toiletries	・ 35 types of organic cosmetics are manufactured by Divan Beauty Company[35]. ・ Raw materials include sheep tails, sea buckthorn, rock salt, nettle, Thymus vulgaris, and so forth, all of which are native to Mongolia. In particular, a soap, made from sheep tails, sea buckthorn, menthol, lemon, etc., has lately been popular. ・ This firm aims to diversify the line-up of products through new product development, as well as to increase domestic sales and export (especially, Japan and South Korea).	Several kinds of products have been exported through its branch in the Inner Mongolia Autonomous Region in China.
(3) Basaltwool Brand's Heat Insulation Materials	・ This product (materials) are manufactured by Basaltwool Company, and the company attempts to substitute the import of construction materials. Since rock wool, a raw material, has good heat resistance and adiathermancy, it is used not only for construction materials, but also for trains and airplane. ・ Critical issues to be tackled are reduction of manufacturing costs and new product development (especially for import substitution). ・ Currently, development of a new product has been under way. It has more advantages in environment-friendliness, heat-resistance, and waterproof.	This company has so far exported the heat insulation materials in the past.
(4) "Exclusive" Brand's Apparel Products	・ " Exclusive" was established in 2009. ・ One of its flagship products is the "Hunnu-style" coat. It was so popular that its knock-off version product became in vogue in the Inner Mongolia Autonomous Region, China. ・ It is this company's intention to manufacture new line-up of products (e.g., down jackets, down vests) in the near future. ・ This firm has attempted to strengthen the network of domestic sales by opening new branches in three provinces in 2017, and to increase the number of sales representatives throughout the country.	The company plans to export to Japan, China, and Russia.

[35] It is organic cosmetics approved by MNCCI.

Name	Details	Remarks
(5) [Dog Food] Jerky Made from Horse's Achilles Tendon	・ This product is made from horse Acillestendon dried at low temperatures, and is rich in protein. ・ Since horse's Acilles tendon comprises muscle fibers, the product is preferred by dogs because of its chewy texture[36]. It is good for dogs' teeth and gums and is also effective for the prevention and removal of dental plaque. The calorie of horse's Acilles tendon is lower than that of cattle and swine by about 50% to 70%. Since it is also rich in iron contents and the essential fatty acid, it is suitable for health maintenance food for adult dogs. ・ The raw materials of the same product sold in Japan currently is imported from Canada and Australia. This company intends to have the source of import switched to Mongolia.	The company aims to export to Japan.
(6) Production and Export of Halal-Certified Meat (and/or Processed Meat)	・ It is said that the size of the Halal market (i.e., food, cosmetics/ toiletries, and materiamedica) amounts to a total of approximately USD 3.2 trillion[37]. ・ The government of Mongolia began to prepare for the export promotion of Halal-certified meat (and/or processed meat) for Muslim countries. For instance, in December 2016, a symposium regarding the introduction of Halal standards was held at the MOFALI[38]. ・ In Khovd Province close to Kazakstan, there are private slaughterhouses equipped with a freezer where livestock can be slaughtered in compliance with Halal standards[39].	Muslim countries include Iran, Turkey, and Kazakhstan.

Source: JICA Study Team(based on results of interview and literature review)[40]

[36] Please refer to the following URL regarding the current product for sale (access on 8 April 2017). http://plus-1shop.com/products/detail.php?product_id=32

[37] Please refer to the following publication: Mori, Takayuki (2015) "Btsuryu no shitenkaramita ASEAN shijo: Tonanajia no keizaihattenn to butsuryu (ASEAN Market from the Viewpoint of Logistics: Southeast Asia's Economic Development and Logisitics)" Canary Communications

[38] According to "Mongol Tsushin" (issued on 16 December 2016), the symposium was held in cooperation with Turkey's Coordination Agency for International Cooperation.

[39] Based on the interview with Jargalant Shand LLC conducted by JICA Study Team on 23 March 2017.

[40] Cncerning the following items of the Table above please refer to each issue of "Mongol Tsushin." (1) for the one issued on 20 January 2017; (2) for 17 March 2017; (3) for 27 January 2017; (4) for 6 January 2017; (5), (6) and (7) for 6 Arpil 2017, respectively.

3.1.5.2 Key Issues Highlighted by the Marketing Research in China and Japan

As part of this data collection survey, the marketing research was conducted in China (on 17-19 May) and in Japan (on 25-27 May) with a view to considering the promising directions of marketing strategies of Mongolia's agriculture and livestock products. As a consequence of the research, the following issues have been raised by Mongolian, Japanese, and Chinese participants:

1) Strengthening and upgrading of processing technology
2) Strengthening and upgrading of packaging technology
3) Diversification of product line-up
4) Planning and executing marketing strategy (e.g., concentrating managerial resources on the specific segment)
5) Expansion of product line-up particularly for the Halal market

The above-stated 1) and 2), various assistance by the government is expected to facilitate technological and other forms of partnership with foreign firms. As to 3) and 4), it is argued that effective and workable marketing strategies should be devised and implemented. The purpose of the strategy is to emphasize characteristics and uniqueness of Mongolian products in the foreign market, to concentrate on the particular (niche) segment, and to differentiate Mongolian products from Inner Mongolia's. Concerning 5), Mongolian firms' entry into the Halal market should be more and more encouraged (e.g., export of meat for Turkey, Iran and Kazakhstan) in parallel with government's initiative in the development of standards of hygiene and quality.

3.1.5.3 Impacts of the Enforcement of the EPA

More than one year has passed since the Economic Partnership Agreement (EPA) came into enforcement in June 2016. In the following parts, first of all, changes in export and import of Mongolia are reviewed. In the second place, it is examined how the EPA has had its effects on major agriculture and livestock products (i.e., cashmere and honey). Thirdly, the import trends of passenger cars are also discussed.

(1) Overview of Mongolia's Export and Import

According to the December 2016 Statistical Bulletin (tentative) of Mongolia's NSO, as the following Table indicates, there was an increase in export by 5.3% from the previous year and the value was approximately USD 4.92 billion. By contrast, the import went down by 11.6% and the value was 3.36 billion. Philippines' trade balance has been in the black for three consecutive years (between 2014 and 2016).

Table 3.1.11 Export and Import of Mongolia (2014-2016)

	Export		Import		Trade Balance
	Value (USD million)	From Previous Year (Previous Year: 100)	Value (USD million)	From Previous Year (Previous Year: 100)	
2014	5,774.3	135.3	5236.7	82.4	537.6
2015	4,669.3	80.9	3,797.5	72.5	871.8
2016	4,917.3	105.3	3,357.9	88.4	1,559.4

Source: NSO's Monthly Bulletin of Statistics (December 2016)

(2) Impacts of EPA Enforcement on the Export of Major Agriculture and Livestock Products for Japan

The value of total export of Mongolia climbed up by 5.3% in 2016 from the previous year as is shown in the Table above. The following parts attempt to examine the impacts of EPA on agriculture and livestock products, among others, cashmere and honey products. The reviews of both products are based on private firms' comments and the statistical data.

(a) Cashmere

Since Japan's preferential tariff duties are applied to Mongolia, there was no import tariff before EPA came into effect in June 2016. Although tariff duties (6% to 11%) were imposed on cashmere products (e.g., clothes), they were abolished after the enforcement of EPA.

For exportation, it is necessary to obtain the certificate of origin for tariff exemption. As of July 2016 when about one month passed after the enforcement of the EPA, more than 40 certificates of origin were issued upon requests from over 20 companies and individuals.[41] Among those who made a request for the certificate, the majority of them are manufacturers of cashmere and wool products. It appears that a number of Mongolian firms intend to take advantage of the EPA. Another manufacturer of cashmere points out that the number of business negotiations for export to Japan has increased since June 2016. One of the Japanese customers sent an inquiry to the Mongolian manufacturer.[42] Given that the manufacturer purchase textile spinning equipment from one of the Japanese customers, more orders are placed on cashmere products.[43] According to another exporter of cashmere products, its sales turnover increased by 25% on a year-on-year basis as of the end of August 2016, and it also expected a 30% increase in annual sales from the previous year. It can be argued thus that exportation of cashmere and other products has been accelerated by the enforcement of EPA.[44]

While the preceding part attempted to examine the impacts of EPA by listening to private firms, the impacts are reviewed from the viewpoint of analysis of the statistical data in the subsequent part. When it comes to Mongolia's export of cashmere (volume and value), there was an increase in the volume from the previous year by 23.6% in 2015 and by 8.5% in 2016. By contrast, the value decreased from the previous year by 11.9% in 2015 and by 2.4% in 2016. In the meantime, it is found out that the value of export per ton has been on the decline for three consecutive years: USD 55.5 thousand in 2014, USD 39.5 thousand in 2015, and USD 35.6 thousand in 2016. As a result of the continuous fall in the price of greezy cashmere, export value continues decreasing despite an increase in export volume.

Table 3.1.12 Export of Greezy Cashmere (2014-2016)

(Unit: Tons and USD thousand)

Year/ Commodity	2014		2015		2016	
	Volume	Value	Volume	Value	Volume	Value
Greezy Cashmere	4,035.4	223,815.4	4,988.2	197,181.0	5,413.5	192,534.6

Source: NSO's Statistical Yearbook 2016

On the other hand, the export of cashmere products and raw materials for Japan is shown in the following matrix according to data provided by the Customs Bureau of Ministry of Finance of Mongolia. The volume and amount of export in the July-December periods between 2015 and 2016 are compared a year-on-year basis in the matrix. When it comes to combed cashmere as one of the raw

[41] Based on "Mongol Tsushin" (issued on 5 August 2016).
[42] JICA (2017) "Data Collection Survey for Investmetn Environment and Promotion in Mongolia"
[43] *Ibid*
[44] *Ibid*

materials, its export volume increased by 91.1% and its export value increased by 98.6% on a year-on-year basis. In the meantime, the tariff duties on cashmere products were repealed owing to the EPA. Export volume of women's and girls' overcoat increased by 86.9% and its export value increased by 83.5% on a year-on-year basis. Likewise, the export volume of jerseys and cardigans increased by 107.1% and its export value increased by 150.6% on a year-on-year basis. On the other hand, both export volume and value of dresses, skirts, and trousers decreased in the same period.

In summary, as far as several cashmere products (i.e. women's overcoat, jerseys and cardigans) are concenred, positive effects of EPA are observable to a certain extent as of the end of 2016. EPA is expected to impact upon a wider variety of products from now onward.

Table 3.1.13 Export of Cashmere (raw materials and products) for Japan

(Unit: thousand USD)

Year/ Commodity	2015 (July to December)		2016 (July to December)	
	Volume	Value	Volume	Value
Combed Cashmere (kg)	6,069.7	456.3	11,596.6	906.4
Women's or girls' cashmere overcoats (unit)	1,130.0	140.8	2,112.0	258.4
Dresses, of goat cashmere (unit)	885.0	58.3	777.0	64.3
Skirts, of goat cashmere (unit)	93.0	5.2	58.0	3.2
Trousers, of goat cashmere (unit)	6,505.0	208.5	1,924.0	90.2
Jerseys and cardigans, of goat cashmere (unit)	17,897.0	746.1	37,067.0	1,869.7

Note: Comparison of the July-December period of 2015 and 2016

Source General Customs Office, Ministry of Finance (2015 and 2016)

(b) Honey[45]

The following tables indicate changes in export and import of honey between 2014 and 2016.[46] Although the export volume was 259kg in 2014 and 54kg in 2015, the volume jumped to approximately 240,000kg in 2016. The main destination of export is China. Meanwhile, there was a sharp fall by about 50% in the import volume in 2015, and then the volume was on the upturn to over approximately 313,166.8kg in 2016.

Table 3.1.14 Export of Honey (2014-2016)

(Unit: Kg and Thousand USD)

Year/ Commodity	2014		2015		2016	
	Volume	Value	Volume	Value	Volume	Value
Honey (Export)	663.7	2.2	233.9	23.3	238,636.7	37.8

Source: Customs gereral administration's "International Marchandise Trade Statistics"

[45] Based on interviews conducted by JICA Study Team.
[46] For the details of the trade of honey, please refer to 3.4 of Chapter 3.

Table 3.1.15 Import of Honey (2014-2016)

(Unit: Kg and Thousand USD)

Year/ Commodity	2014		2015		2016	
	Volume	Value	Volume	Value	Volume	Value
Honey (Export)	368,393.6	1,456.7	184,566.8	1,223.4	313,166.8	1,322.6

Source: Customs gereral administration's "International Marchandise Trade Statistics"

When it comes to export of honey from Mongolia to Japan, only one case (weight base: over 100 kg) has so far been reported as of the end of May 2017. Regarding "natural honey," although one ton was allocated in the first year after EPA came into effect in June 2016, this exportation was the first and only case during the period. The "Quota Certificate" was issued for this honey in early May 2017. The term of its validity is six months. The honey arrived in Japan on 11 June 2017, and was inspected to find out that it satisfied the requirements of "natural honey" to which EPA was applied. Since the volume of the honey was small in the first case, it was exported by air. However, if the volume of transaction of honey increases, considering shipping costs, it will be transported first by railway (presumably from Mongolia up to Tianjin, China) and then by sea (from Tianjin, China up to Japan). The government of Mongolia is in the position to decide to which firm the tariff quota is allocated, and all Japanese side has to do is just to wait for the application from its counterpart. The quota is allocated on a first-come-first-served basis. In conclusion, there seems to be no positive impact on export of honey for Japan because only one case has been confirmed as of early June 2017.

(3) Impacts on Import of the Major Industrial Products from Japan

Every year, automotive products and/or components comprise normally approximately 60% to 70% out of a total of imported products from Japan. When the June 2016 EPA came into enforcement, the tariff (its rate (5%) on completed motor vehicle of 4,500cc-displacement manufactured after June 2013 was abolished immediately. When it comes to the import of completed passenger cars, there is an increase in value by approximately 4.7% from the previous year, while the import amount (value) from Japan increased by about 2.6% as is shown in the following matrix. It seems that positive impacts are partially observable, while the details (e.g., year of manufacturing) of imported cars from Japan are unknown.

Table 3.1.16 Import Amount of Passenger Vehicle from Japan(2014-2016)

(Unit: USD Thousand)

Year	2014	2015	2016	Growth Rate
Passenger Car	245,021.2	180,346.0	185,117.3	2.6%

Source: NSO's Monthly Bulletin of Statistics (December 2016)

3.1.6 Key Issues of Marketing of Agriculture and Livestock Products

In this subsection, the four following critical issues of marketing of Mongolia's agriculture and livestock products are discussed considering the relevant cases with potentials not only for export promotion but also for import substitution and domestic sales expansion.

(1) Flexible Use of a Combination of "Market-in" and "Product-out" Strategies

First of all, it appears that the "product-out" approach is dominant among Mongolian farmers, herders, and manufacturers of the sector, although it is vital to flexibly combine "product-out" and "market-in" approaches in principle. Instead of the dichotomy between the two approaches, it is generally considered to be effective to combine them on a case-by-case basis by using the market-in approach to grasp the manifested demands as well as the product-out approach to discover the latent demands in the market. Likewise, the same is applicable to the development of Mongolia's value chain. A good blend of the two approaches should be employed in the light of the market conditions.

One of the cases in which Mongolian firm adopted the "Market-in" strategy is M company, a meat packer. By obtaining HACCP in 2011 and ISO in 2014, this company managed to meet the demands of hygiene- and quality-conscious foreign consumers, and was able to export meat.[47] On top of that, the company was successful in exporting sheep meat for Muslim nations where a large quantity of sheep meat is consumed. In these nations, religiously-correct treatment (called "Halal") is required when livestock is slaughtered. In Mongolia, there are Kazakhstan-Mongolian residents in the western part of the country, and the company employed Kazakhstan-Mongolian staff specifically for Halal-certified treatment.

Another is the case of the Vidan[48], a manufacturer of bottled fruits and vegetables. This company first distributes the seeds of vegetables (e.g., onions and cucumbers) about 20 to 30 contracted farmers. The firm then buys the vegetables cultivated by the farmers, and processes and bottles them. The sales price of a 500-gram bottled vegetable is about MNT 2,000 (worth less than USD 1), which is affordable from the standpoint of general consumers. Since storage facilities and warehouses with a refrigerator are short in Mongolia, apart from imported ones, consumers have the difficulty in eating domestically-cultivated vegetables during the off-season (between January and July). This product satisfies such consumers' needs.

As shown in the Table 3.1.10, the instances of market-in strategy are Exclusive brand's apparel and sachet bottle of SUU JSC. On the other hand, the product-out strategy is suitable for those companies with hit products and/or with a leading position in the market. The examples of this approach include Basaltwool brand's heat insulation materials and pet foods of the company M. It is argued that more and more Mongolian farmers, herders, manufacturers and other stakeholders should take the market-in approach.

(2) Strengthening and Improvement of the Distribution Processes of the Value Chain

The second issue is that the poor maintenance of and a shortage of physical infrastructure are an obstacle to sales promotion and have negative effects on the product quality and hygiene. According to the interview conducted by JICA Study Team in Khovd Province in March 2017, its farmers and manufacturers have an adequate production capacity of potatoes. In 2015, although potatoes were exported to Russia once, they were not able to continue to export because the shortage of storage facilities and warehouses in the province brought about the deterioration of product quality[49]. Another reason is that, as stated previously, the road, which stretches approximately 250 km, is not paved

[47] However, this company has not been able to export in recent years because of the murrain such as FMD.
[48] Based on interview conducted in April 2015 as part of MONDEP study.
[49] Problems are that trucks are poorly maintained and are deteriorated, and that only a small number of trucks are equipped with refrigerator and other necessary equipment.

between Bayankhongor and Gobi-Altai Provinces. In other words, the 250-km unpaved areas have been an obstacle to the promotion of sales for the neighbouring provinces. It is argued therefore that shortcomings in the value chain bring about the opportunity cost of sales promotion of Khovd Province's agriculture and livestock products. Meanwhile, there is much to be improved regarding the pickup (or collection) of agricultural products. In the said case of milk, what is called the "Milk Run" functions smoothly, in which the core company (APU Company) plays a major role in picking up milk from contracted producers. Similarly, in the case of sea buckthorn, the Mongolian Fruits and Berries Association has helped its members in the collection, transportation, and sales promotion. Yet, unlike these cases, it can be observed that the poor conditions of and the lack of physical infrastructure have been an impediment to sales expansion and have negatively affected the product quality and hygiene.

In order to improve or supplement functional shortcomings of distribution/ logistics, the three following points are vital. The first is to develop, upgrade, and rehabilitate the related infrastructure (e.g., trunk and feeder roads, storage, and district-level collecting points). One of the examples of this is to improve the feeder roads (or farm-to-market roads) that connect production areas to the trunk roads. Another issue is to increase the number of storage facilities and warehouses in key districts, which are suitable for cold weather regions. This sort of facilities is used in the "Project for Increase of Farmers' Income by Development of Agricultural Produce Marketing and Soil Improvement" (JICA's grassroots technical cooperation) implemented in Bornor District, Tuv Province. An increase in the number of such storage facilities is significant from the viewpoint of efficient distribution/ logistics of agricultural products, as well as of quality management of them. The diffusion of districts' direct sales outlets promoted in the said grassroots technical cooperation project may be regarded as the diversification of sales channels. It is also critical to facilitate coordination and/or cooperation among stakeholders. Inter-ministerial cooperation and information sharing are vital, among others, between MOFALI and Ministry of Transportation. For instance, the poor conditions of roads and storage facilities have negative effects directly on the quality of agricultural products. In the meantime, public-private partnership (PPP) is also crucial. In particular, MNCCI and sector-specific industrial associations (e.g., Mongolian Fruits and Berry Association) are expected to have a pivotal role to play so that their members may collaborate smoothly with the relevant governmental agencies.

The second is to diversify logistics/ distribution service, to enhance its quality, and to enlarge the target area of the service. Since the number of forwarders and transporters is small in Mongolia's transportation and distribution sector, there are limitations on the varieties of service and target areas. As is stated earlier, however, the news is a hopeful sign that Mongol Teever Negdel plans to extend the areas of business and activities in cooperation with the Mongolian Agricultural Commodity Exchange. In the said case of sea buckthorn, the delivery trucks of large-scale supermarket chain were referred to as an example. The Mongolian Fruits and Berries Association made arrangements for its members so that meat and sea buckthorn-related products may be carried by the truck on its way back from provinces to Ulaanbaatar. In particular, when it comes to fresh produce (or perishables) such as meat, it is extremely important to secure transportation means with refrigeration equipment in view of quality management. According to the result of interviews conducted by JICA Study Team, one of the large-scale firms prepares to start a business of transporting other firms' cargo. On the other hand, it should be emphasized that the middlemen, called "Change," have played a vital role in compensating for the said shortcomings since the 1990s. If the role played by them is valued more positively, it should be pointed out that they have filled the "missing link of distribution/ logistics," caused by the collapse of *negdel* in the 1990s, in the way that has not been necessarily effective. There is a need to strengthen the various functions of distribution/ logistics including cooperation with the middlemen.

The third is to enhance the functions of local chambers of commerce and of industry-specific associations. They are expected to play a critical role as a coordinator in collaboration with related governmental organizations. Especially, the Mongolian Fruits and Berries Association has provided its members with assistance in pickup of products and sales. It is argued that the strengthened business associations may contribute to complementing functional shortcomings in the value chain.

(3) Building up Reputation of Mongolian Brands in the Foreign Markets

The third issue is the inadequate reputation and/or recognition of names of Mongolian firms and products/ services in the foreign markets. There are two approaches to address the issue. One of them is to provide products for foreign markets through outsourced manufacturing or original equipment manufacturing (OEM), while improving the low recognition in the market. Since it normally takes a long time to improve brand recognition, these measures (i.e., outsourced manufacturing and OEM) enable the firms to obtain information on market trends and related technologies, and, in parallel, to intensify marketing capability. Simultaneously, however, it is also vital to boost the "brand recognition (or reputation) as a nation" and, in order to do so, what matters is not only the above-stated firm-level efforts but also a range of governmental assistance. For instance, a number of the Japanese local governments have made varied attempts to enhance the recognition of locally-made products and/or services by means of new product development and its publicity.

The second is to heighten brand reputation through improving quality and hygiene management capabilities continuously. As suggested in the marketing survey conducted this May in China, the stabilization of product quality and the upgrading of processing and packaging technologies are also key issues to be tackled. It is also suggested that Mongolian manufacturers should upgrade the above-stated technologies through the transfer of technology in cooperation with foreign counterpart (e.g., the Inner Mongolian firms). In the survey, Chinese interviewees commented that many Chinese consumers have an impression that China's Inner Mongolian agriculture and livestock products are good for the health, and the products meet the recent market trends of health-consciousness. It was also suggested therefore that Mongolia's product development should follow the same trends as Inner Mongolia's. There is a need for Mongolian companies to differentiate their products from Inner Mongolian competitors' in the future. However, in parallel with the development of quality and hygiene standards, they should address the firm-level key issues (i.e., stabilization of product quality and upgrading of processing and packaging technologies) for the coming years ahead in close association with the public sector. Meanwhile, during the survey in May, Mongolian participants admired and made positive comments on the varied line-up of dairy products (e.g., cheese). In partnership with a foreign counterpart, Mongolian manufacturers are expected to enhance processing and packaging technologies through introducing advanced productive equipment, as well as to enrich know-how about product development. So as to support these efforts on the part of the private sector, the government of Mongolia is required to provide them with a variety of appropriate assistance.

(4) Raising Corporate and Consumers' Awareness of Hygiene and Product Quality

The fourth issue is to raise the awareness of the product quality and hygiene on both parts of companies and consumers. For example, in the case of meat of this Chapter, there is a tendency for the Mongolian general consumers to prefer the middleman-dependent traditional channel of meat to the one by way of meatpackers. Consequently, they have more opportunities to eat the meat without necessary treatment of hygiene and quality management. This is because the socio-cultural values and views have taken root deeply among the consumers that the meat distributed via meatpackers is not delicious.

Not only is it difficult to change such values and views, but also it takes a long time to do so. Nevertheless, there is a strong need to raise the awareness of product quality and hygiene on the part of Mongolian firms (in particular, SMEs). With a view to supplying consumers with fresh agricultural products as immediately and efficiently as possible, it is critical to the sophisticated management of hygiene and quality in the distribution/ logistics processes. It is effective that the government provides incentives for those SMEs that invest in productive equipment for product quality and hygiene management. Such governmental support is expected to increase the number of such SMEs. It may also be workable to disseminate the information on the cases of successful SMEs as good practice.

Meanwhile, from a medium- and long-term perspective, there is a need to raise consumers' awareness of hygiene and product quality continuously by involving not only the government but also the private sector (especially, MNCCI and its members), as well as by utilizing the mass media such as the Internet and television effectively.

3.2 Agriculture and Livestock Processing

3.2.1 General Information on Agriculture and Livestock Processing

In primary activities of agro value chains, the processing is, by definition, important. The mechanism that generates profit margin by adding the value to farm produce to set a price for consumers is the essence of the agro-value chain, and the processing forms the backbone of it.

For instance, in the case of cashmere, one of the most profitable commodities in Mongolia, based on a field study dealing with cashmere[50], over 60% of the value of the end-product is captured by the knitting, wholesaling, and retailing activities. Thus, the retail price is quadruple the farm gate price, and in the case of some boutiques abroad, the price they charge could be 1,100% higher than the farm gate price. Also, due to its rarity, limited production and high demand, cashmere is placed a higher value[51].

By contrast, in Mongolia except for cashmere almost all the agricultural value chains are formed by rather low margin products such as meat and traditional dairies. Figure 3.2.1 illustrates how value is added at each link in beef and milk value chains in Mongolia. Neither of them shows dramatic value added functions generating a huge difference between the farm gate price and the retail price, which is the case of cashmere. Nevertheless, each value chain is unique and contains a distinct combination of links under different conditions such as seasonality, climate, and infrastructures as well as logistics.

In fact, in developing countries at times the limitations the processing industry faces are more strongly linked with infrastructure such as road conditions than with processing techniques in and of themselves[52]. It is common to hear that traders and/or processors offer farmers a low price, being exploited occasionally because of high transportation costs[53]. Thus, in some countries the government sets a commission rate to avoid such a situation[54]. In Mongolia, however, this has not been the case to date.

Based on the dialogues made with a variety of related professionals from the agricultural sector as well as producers during this survey, we have oftentimes heard that some middlemen and traders charge other stakeholders in the value chain a preposterous economic rent[55]. According to the beef value chain shown in the Figure 3.2.1, however, it would be hard to say that middlemen are explicitly taking advantage of farmers or retailers[56]. By contrast, in the case of the milk value chain implemented by larger processors as depicted in the Figure 3.2.1, a majority of the dairymen sell directly to processors which make the price difference small. In this section, based on the information gathered from the field survey and related documents, the Mongolian agro-value chains is reviewed by focusing especially on the matters that relate to processing (Table 3.2.1).

[50] J. E. Austin Associates. (2001). Competitiveness Interventions: A Review of J. E. Austin Associates' Global Experiences. USAID.
[51] Nomura Research Institute. (2009). Fortification for Asian industry infrastructure: possibilities of introduction of accreditation and quality control system for Mongolian cashmere (conducted in 2008).
[52] Minten, B. and Kyle, S. (1995). The Effect of Distance and Road Quality on Food Prices, Marketing Margins, and Traders' Wages: Evidence from Zaire. Department of Agricultural, Resource, and Managerial Economics Cornell University, Ithaca, New York 14853-7801 USA.
[53] Dragusanu, R. *et al*. (2014). The Economics of Fair Trade. *Journal of Economic Perspectives* **28**: 217–236.
[54] Haq, A. *et al*. (2013). Who is the "arthi": Understanding the commission agent's role in the agriculture supply chain., International Growth Center, Pakistan.
[55] According to the comments made by various local people we met during the suvey.
[56] Please note here that the farm gate price is based on the live animal weight while the price the middlemen or processors charge is based on the carcass weight, which is roughly half the live weight. Thus, obviously, middlemen, processors, or even wholesalers have to double the price minimum otherwise they will be lost.

*Middlemen (traders) and Processors

Figure 3.2.1 Revenue for Each Component of Beef and Milk Value Systems

Source: Based on the report of MONDEP[57], and interviews conducted with herders, middlemen, processors, retailers, and supermarkets during the survey (n=20-30).

Table 3.2.1 Parameters of Agriculture and Livestock Processing

	Commodities	Production costs	Universal rarity	Availability	Uniformity in quality	Marketability Domestic / int'l	Processing techniques		Storage	Profitability	Trend in Investment
							Refinement	Capacity			
Livestock	Meat	-	-	++	++	+/-	-	-	++	+	-
	Milk	ML	-	V	++	+/ML	ML	-	-	V	ML
	Dairies	ML	-	ML	++	+/—	-	V	++	+	+
	Wool	-	-	++	+	+/ML	-	ML	++	-	-
	Cashmere	-	++	+	++	++/++	+	ML	++	++	+
	Leathers	-	-	++	++	+/+	ML	-	++	ML	-
Crops	Cereals	+	-	V	+	+/ML	ML	+	+	ML	ML
	Potatoes	+	-	V	+	+/-	-	-	+	ML	ML
	Vegetables	+	-	V	+	+/-	-	ML	-	ML	ML
	Fruits	+	-	V	+	+/-	-	ML	-	ML	ML
Others	Sea buckthorn	ML	+	V	ML	+/+	ML	ML	ML	+	+
	Honey	ML	ML	ML	++	ML/+	ML	ML	++	+	+
	Herbs	ML	+	ML	ML	+/+	-	-	+	+	+

-: None or low, **ML**: medium or hard to be defined, +: High, ++: Very high, **V**: not stable or highly seasonal such as very high in summer and very low in winter.

[57] JICA. (2016). MONDEP Final Report

The following are the complementary explanations for the parameters of the Table above. Some examples of processing plants or dialogues made with related stakeholders are given where necessary.

(1) Production costs

Although fluctuation in the production cost at the farm level has nothing to do with processors directly, they are highly aware of it because the production cost is proportional to the costs for buying raw materials from farmers. In the countries where intensive farming is practiced, farmers have long been trying to lower the costs for land acquisition, feed, animal replacement, fossil fuel, and the like. In this regard, although the work as a herder is physically demanding, the mobile livestock-keeping in Mongolia, which is based on the vast communal grassland, is so unique in that virtually herders do not need payment for land and feed (grass)[58]. Thus, in general, the production cost is very low. This peculiar point, however, is one of the great advantages Mongolia has because they do not depend on imported feeds, especially grain feeds as is often the case with other countries including Japan[59]. By contrast, in the case of wheat and potato farmers, and semi-intensive dairy farmers in suburban areas, the picture is different. They have to manage the payment for the production items such as seeds, feeds, and machinery.

(2) Rarity

As mentioned above, in Mongolia there are some rare agricultural commodities such as cashmere. In addition, sea buckthorn and some medicinal herbs could be considered rare items. In Mongolia, however, since most of the agricultural products are very common, the crucial point is how to add the value to them by processing more differently and creatively.

(3) Availability

According to the census in 2015, the total number of domestic animals has reached 56 million, a record high in Mongolia[60]. Thus, it is safe to say that availabilities of livestock products such as meat, fiber and hides are, in general, high. By contrast, due to harsh climatic conditions in Mongolia, availability of milk and some agricultural commodities are highly seasonal. Also, the main crop farming in Mongolia, namely, wheat and potatoes are currently facing some negative impacts derived from monoculture[61], thereby resulting in production being with high fluctuation: in some years more than self-sufficiency rate and in others requiring imports for compensation[62]. All in all, availability of raw materials in Mongolia, in general, is affected by climate and season[63].

(4) Uniformity in quality

The definition of "uniformity" in quality of agricultural produce is subject to a variety of criteria. Thus, it would not be fair to say that the uniformity is low in general in Mongolia. Nevertheless, based on the dialogues made with related professionals and producers during the survey, we could find one point very clear about the uniformity in quality. It is the difference in perceptions about the uniformity between producers and processors. For instance, almost all the products including crop farmers expressed their ideas saying that "processors are very choosy in buying my products, and, complaining

[58] JICA. (2016). MONDEP. *Op. cit*.
[59] Even in Mongolia, in the case of intensive factory farming such as pig-raising and chicken raising, they use imported feeds as well (please refer to each section).
[60] NSO "Statistical Yearbook 2015".
[61] Konagaya, Y. (2010). The History of Agricultural Development in Mongolia: seeking a tradeoff between development and conservation. *Bulletin of National Museum of Ethnology* **35**: 9–138.
[62] JICA. (2016). MONDEP. *Op.cit*. Please note that in the case of wheat and potatoes, they may be imported not only to compensate for the shortage. We will come to this point later in the section *3.3.2.2. Agricultural processed products*.
[63] Please note that, concerning *availability*, due to the almost fixed slaughtering season in autumn, meat, fibers (wool and cashmere), and hides are not being provided from herders constantly. Nevertheless, since good amounts of those commodities are in stock, they are available all the year around.

about size and shape, they do not accept (buy) the entire crop." Conversely, processors who are very strict about the refinement of their end-products, consequently, would be more demanding in the selection of raw materials coming directly from farms. Such situations were observed especially in the value chains of cashmere (thinness, colors, and dirt), hides (blemish), and vegetables (size and length) suggesting that even in Mongolia, some processors are very careful about the uniformity and the techniques and refinement of processing of these processors are improving.

By contrast, the relationship between herders and middlemen/processors is quite old-fashioned. In the majority of the cases, they do not care "quality". Things they take into account seriously are the numbers, the number of animals, the price to pay or paid, and some other issues such as bigger or smaller, or any recognizable symptoms of some diseases. Thus, in general, uniformity is low in the meat value chain. Nevertheless, since even in Mongolia, modernization is tangible, such selectivity observed in the value chains of cashmere, hides, and vegetables appear to be implemented in other value chains as well. These systematic changes, we think, should be introduced into the industry not as insurmountable requirements but as a good opportunity for making Mongolian agricultural value chains more efficient. For this, establishing trust between actors in the value chain is essential. In this regard, a grading system could be a good option to start with. If a processor sets a strict standard without grading, then farmers can sell only a small portion of their products which meet the requirements.

In Bayankhongor, an NGO called Agronomes Veterinaires Sans Frontieres Mongolia (AVSF) is currently trying to implement a grading system for herders to sell their cashmere fiber[64]. The system requires herders to select the fiber based on the sex of goats, dirt, and age. In return, they can sell some of their cashmere fiber at a higher price (premium). Thus, this system could be an ideal mechanism for herders both to learn more about the characteristics of cashmere fiber and, as long as they abide by the rule, to get more profit.

Linked to these issues about the grading system, as an aside, practical usefulness of changes, as likened to a necessary evil, lies in exactly these points. In Mongolia, most changes dealing with, be it, meat, cashmere, wool, hides or other crops, except the entire produce regardless of size, color, or any other quality while modernized processors are highly selective about the product. Thus, although they know they could sell their product a bit higher to the modern processors, a good number of farmers who have long been used to the transaction with changes tend to avoid doing business with modern processors such as cashmere plants or tanneries. Conversely, those who take pride in their products have a tendency to find traders (processors included) who attach more importance to quality than to quantity. During the survey, we have witnessed such cases in potato farming.

(5) Marketability at the domestic and international level

Almost all the agricultural commodities coming from the grassland of Mongolia have long been there in the market. Thus, they are all, one way or another, marketable at least domestically. Internationally, however, this is not the case with a few exceptions such as cashmere, sea buckthorn and some medicinal herbs. As mentioned in the chapter of Rarity, the recommendations are how to improve the products to add the value. Concerning honey, since this is one of the agriculture and livestock items registered in EPA, some Mongolian beekeepers are trying to import their products into Japan. That is why honey's international marketability is marked with "+" in Table 3.2.1. Also, some Mongolian dairies, especially yak cheese[65], and building insulation materials made of wool[66] are both currently under negotiation in search of the market in Japan. Thus, they go with not "-" but "ML".

[64] According to the information we got during the symposium: Sustainable cashmere-looking at achievements and perspectives with stakeholders, which was held in Ulaanbaatar on April 6, 2017 under the sponcership of AVSF. Some experts, in conjunction with local herders in Arkhangai and Bayankhongor, are tyring to introduce a practical grading system.
[65] According to Mr. Michael Morrow, Executive Director of Mongolian Artisan Cheesemakers Union (MACU).
[66] *Mongol Tsuushin*. (2017). No. 1, **590**: 3.

(6) Processing techniques

Since the great majority of the processors, be they small or large, prepare or manufacture primary products alone, the processing level in Mongolia would never be considered as advanced in general. Of course, this does not mean that no processors invest anything in their business. For instance, in the case of large milk plants or cashmere factories, some of them have achieved accreditation of international standards such as ISO22000 and HACCP suggesting that they have invested a lot to improve their processing techniques and management of quality control. Internationally, however, it should be mentioned that none of these techniques and management are noticeably high or unique.

For instance, even in the cashmere factories, which have by definition one of the most sophisticated processing lines in Mongolia, are still technically dependent on Japan to complete a process for making a felt coat[67]. In reply to our question about this point, the president, one of the most successful entrepreneurs in Mongolia, mentioned that it is possible to complete all the process in his factory as long as he purchases the specialized machinery for felt making. But, considering the current demand, he does not think, the investment would be paid off. This point of view alone appears to reveal a trend in investment in Mongolia nowadays.

In summary, poor processing techniques, which is one of the most commonly pointed out weaknesses, do not necessarily mean that Mongolia has no capacity for that. Rather, there is no such climate in which people in the business including processors think about investing more to improve or sophisticate, say, their production line. What is more, this may create a vicious cycle where there are neither improved techniques, nor opportunities to be trained as skilled technicians[68]. Possibilities of mass-production would be hindered as well in this vicious cycle.

(7) Storage

As mentioned earlier, due to arid and cold climatic conditions, in Mongolia a majority of agricultural activities are hampered during long winter. In terms of storage, however, this climatic conditions could be advantageous because the land itself serves as a huge natural "refrigerator". In fact, in late autumn herders usually slaughter and butcher animals for winter consumption, storing the meat in sheds since the ground remains frozen until well into spring. Nevertheless, technically speaking, the commercial use of this natural refrigerator is not appreciated. Also, in some cases, we observed a situation where processors did not take advantage of the intrinsic nature of some farm produce. For instance, although they are perishable, meat and potatoes can be stored for several months without spoilage if treated properly, and grains are by nature apt to be stored.

In the case of commercial meat packers, they slaughter a huge amount of animals from August through December and store carcasses. Then, they gradually start to release their stored meat regulating supply in an effort to increase prices. According to a marketing manager from one of the large packers in Mongolia, they commonly store beef carcasses for a year and sheep for half a year. Nevertheless, storage conditions are not ideal, thus, causing serious freezer burn. In fact, this is one of the recommendations pointed out by a Japanese mission team in 2004[69]. In reply to a question about this, the manager gave us an explanation: "Due to a recent FMD break out in Sukhbaatar, we can't export our product and we don't know when to resume, let alone invest in machinery."

According to the president of Mongolian Fruit and Vegetable Processing Association, one of the crucial limitations in vegetable and fruit processing industry is a lack of quicker freezing technology. In reality, however, the situation appears to be exactly the same as the case observed in the cashmere factory. Thus, the problem is not the technique itself, but socioeconomic conditions that prevent processors from investing in high-tech machinery. By contrast, although there is still some room for

[67] JICA. (2016). MONDEP. *Op.cit*.
[68] JICA. (2016). MONDEP. *Op.cit*.
[69] JICA. 2005. Report of meat processing techniques in Mongolia. JICA.

improvement, dairies, animal fibers, hides, honey, and dried medicinal herbs are all apt to be stored for a long time. Thus, these advantages should be kept in mind in establishing a new value chain.

(8) Profitability

Based on a unit price (MNT), say, per one kilogram, cashmere is the only agricultural commodity that is highly profitable. For instance, the average prices per one kilogram for the main commodities such as meat (beef), milk, wool fiber, wheat, and cashmere at the farm level are 3,200, 600[70], 850[71], 480[72], and 75,000 (range: 60,000-90,000) [73], respectively. Of course, the gross production may vary a lot depending on a variety of factors at each household[74]. Thus, in terms of net income per commodity, cashmere is not necessarily the top generator. All in all, however, by definition cashmere is one of the most important cash commodities for herders. Concerning the profitability of meat and milk, as shown in Figure 3.2.1, their prices vary a lot with seasonality, resulting in higher profitability in winter and lower in summer. Thus, beef and milk are marked with "V". Considering this seasonality, in urban areas of Ulaanbaatar, there are some semi-intensive dairy farmers who try to get more production during winter to sell milk at a higher price by giving manufactured feed and synchronizing reproduction cycle[75]. In addition, although their market share is still small, sea buckthorn, the unit price of honey, and medicinal herbs are relatively higher and thus profitable.

(9) Trend in investment

In the previous sections, we have already discussed issues relating to investment. Summarizing the dialogues made, especially with processors, be they, small or large, they are currently reluctant to invest in business especially costly machinery because they don't think the market is stable. The only exception is a cashmere plant which is definitely one of the most powerful factories in Mongolian cashmere industry. We visited the factory on April 3, 2017, and coincidentally it was the day for the inaugural ceremony of a new sewing production line. According to the president, with this installed modernization, the plant will have a capacity of manufacturing 100,000 coats per year, thus, again suggesting that profitability of cashmere is incomparable. Other commodities that could be a niche market are sea buckthorn, honey, and medicinal herbs as repeatedly mentioned before.

3.2.2 Agriculture and Livestock Processed Products in Mongolia

3.2.2.1 Livestock Processed Products

(1) Meat products

Without a doubt, Mongolia is one of the biggest meat eaters in the world. In reality, however, getting hold of the exact amount of meat production is no easy task. According to the FAO statistics, on the one hand, the total amount of meat produced in 2014 is 245,000 tons. Nevertheless, on the other, Mongolian Meat Association (hereinafter "MMA") says that it ranges between 240,000 and 280,000 tons. Furthermore, again according to the MMA, the total amount of meat from animals slaughtered in abattoirs would be 10% at the very most, meaning that a great majority of meat consumed in Mongolia comes from meat killed through non-abattoir processes (Figure 3.2.2). In addition, in the case of small

[70] Please refer to Figure 3.2.1 for meat and milk.
[71] According to Mongolian Wool Association.
[72] Bayarsakhan, D. (2016). Ph. D thesis. Farm Management Study on the Productivity of Wheat Production in Mongolia. Graduate School of Tokyo University of Agriculture.
[73] According to Mongolian Wool Association and some herders. In addition, farm gate prices for camels and yaks are on average 6,500MNT/kg and 15,000 MNT/kg, respectively. Thus, they are more profitable than wool.
[74] According to Mongolian Wool Association, the harvest amounts of wool and cashmere per animal are on average 1,000g and 250g, respectively.
[75] According to an intensive dairy operation in Tuv, whose owner is one of the largest mining companies, they synchronize their cows so animals calve in autumn in order to get more milk in winter. Consequently, they are selling milk for a price much higher (*ca* 1,000MNT/L) than in summer (*ca* 500MNT/L).

abattoirs, they do not provide with necessary equipment such as enough space for waiting, and waterers, as well as animal health inspection (Figure 3.2.3), thereby causing every negative consequence, such as food poisoning[76], deterioration of meat quality by stress[77]. Thus, unless it is exclusively for household consumption, the traditional killing and storing of animals should be corrected properly in the future.

Figure 3.2.2 Sub-standard Slaughtering (on a request basis)

Figure 3.2.3 Small Slaughterhouse (note dirt and blood stains on walls and pillars)

In the same way, getting the precise information about how and where all the meat slaughtered in abattoirs are processed further would be difficult because, except for large scale meat packers in and around Ulaanbaatar, most of the small and medium sized abattoirs are available only in autumn. According to MMA, there are approximately 70 meat plants nationwide, but not all the plants are members belonging to MMA. Thus, there are some plants whose general information is not known even by MMA. Therefore, based on available information gathered from the survey, we tabulated and depicted factual data about 61 meat plants into Table 3.2.2 and Figure 3.2.4, respectively. In Figure 3.2.4, the color grading shows the density of livestock population. It is obvious that the number of plants is proportional to the number of animal. Concerning the storage availability, more than 80% is concentrated in provinces belonging to the central region: Ulaanbaatar, Tuv, Selenge, Bulgan, Darkhan-Uul, and Orkhon.

[76] Tungalag, C. (2006). Main microorganisms causing classical food poisoning in Mongolia. *Bulletin of the Faculty of Agriculture, Niigata University* **58**: 140-141.
[77] Chulayo, A. Y. *et al.* (2012). Research on pre-slaughter stress and meat quality: A review of challenges faced under practical conditions. *Applied Animal Husbandry and Rural Development* **5**: 1-6.

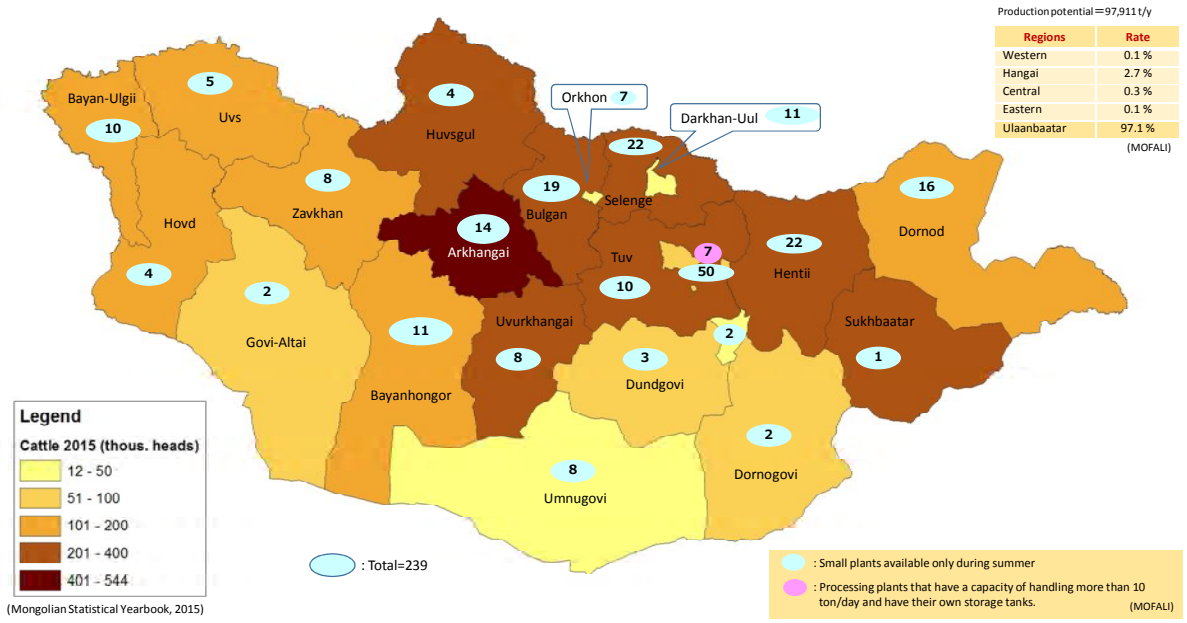


Figure 3.2.4 Number of Meat Plants and Density of Livestock Population by Province

Table 3.2.2 General Information on Meat Packers and Meat Processors (cont'd to the next page)

#	Districts	Membership of MMA	No. of employee	Grading system	Animal species			Season ality	Type of processed products					Recycle of by-products *2	Standardization				Own laboratory (+/-)	Design section (+/-)	Feedback system (+/-)	Capacity (t)		Storage (t)		Domestic market share			Information as importer		Logistics	
									Primary			Secondary			ISO		HACCP	National *4 (+/-)													
					Large (camel, horse, cattle)	Small (sheep, goat	Imported		carcass	dismemb erment	freezing and storing	Ham and sausage	cooked		22000	9001						Large/day	Small/day	Freezing	Deep freezing	UB (%)	Local (%)	others (%)	+/-	Destined countries	packer-owned tracks	out-sourcing
1	UB	+	220	B	+	+	Pig fat	+	+	+	+	+	+	B, C	+	+	+	+	+	+	+	—	1,200	8,000	50	90	—	10	+	China, Iran, (Japan in negotiation).	12	
2	UB	+	370	B	+	+	Pig fat	+	+	+	+	+	+	C	-*3	+	-	+	+	+	+	240	2,000	10,000	120	n/a	n/a	n/a	+	Russia, China, Iran (currently suspended	+	
3	UB	+	30	n/a	+	+	n/a	+	+	+	+	+	+	A	-	-	-	+	+	n/a	-	80	250	260	30	100	0	0	+	Russia and Iran		+
4	UB	+	25	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	+	210	300	300	12	n/a	n/a	n/a	-		4	
5	UB	+	15	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	-	250	1,200	900	30	n/a	n/a	n/a	n/a			
6	UB	+	15	n/a	+	+	n/a	+	+	+	+	+	+	C	-	-	-	+	+	n/a	+	50	200	200	15	100	0	0	+	China		+
7	UB	+	17	n/a	+	+	n/a	+	+	+	+	+	-	n/a	-	-	-	+	+	n/a	+	50	250	200	15	100	0	0	+	China	3	
8	UB	+	10	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	n/a	50	100	300	10	100	0	0	+	China	1	
9	UB	+	10	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	-	50	300	200	5	100	0	0	-		1	
10	UB	+	n/a	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	+	n/a	n/a	1,000	n/a	0	0	0	+	Russia and Japan		+
11	UB	-	n/a	n/a	+	+	n/a	+	+	+	+	-	-	B	-	-	-	n/a	n/a	n/a	-	n/a	n/a	n/a	n/a	100	0	0	-		2	
12	UB	-	n/a	n/a	+	+	n/a	+	+	+	+	+	-	n/a	+	+	+	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	95	n/a	5	-	Vietnam in negotiation	8	
13	UB	-	n/a	n/a	+	+	n/a	+	+	+	+	-	-	B	-	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	n/a	n/a	n/a			
14	UB	-	n/a	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	+	China		
15	UB	-	n/a	n/a	+	+	n/a	+	-	-	-	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	0	0	-		8	
16	UB	-	n/a	n/a	+	+	n/a	+	+	+	+	-	-	C	-	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
17	UB	-	n/a	n/a	+	+	n/a	+	-	+	-	-	-	A	-	-	-	n/a	n/a	n/a	+	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		2	
18	UB	-	n/a	n/a	+	+	n/a	+	-	+	-	-	-	C	-	-	-	n/a	n/a	n/a	+	n/a	n/a	n/a	n/a	100	n/a	n/a	n/a			
19	UB	-	n/a	n/a	+	+	n/a	+	-	-	-	+	+	D	-	-	-	n/a	n/a	n/a	-	n/a	n/a	n/a	n/a	100	n/a	n/a	n/a		3	
20	UB	-	n/a	n/a	+	+	n/a	+	-	-	-	+	-	C	-	-	-	n/a	n/a	n/a	-	n/a	n/a	n/a	n/a	80	n/a	20	+		10	
21	UB	-	n/a	n/a	+	+	n/a	+	-	+	+	+	-	B	-	-	-	n/a	n/a	n/a	-	n/a	n/a	n/a	n/a	90	n/a	10	+	Russia (canned), China (cooked), Korea (broth)		
22	Arkhangai	+	12	n/a	+	+	n/a	+	-	+	+	+	+	n/a	-	-	-	+	+	n/a	n/a	100	400	400	30	80	n/a	20	+			
23	Bayankhongor	+	n/a	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	n/a	n/a	280	n/a	n/a	n/a	n/a	n/a			
24	Bayan-Ulgii	+	10	n/a	+	+	n/a	+	+	+	+	-	-	C	-	-	-	+	-	n/a	+	70	300	300	10	n/a	n/a	n/a	+	China, Russia, Iran, kazafkstan, Vietnam	+	
25	Bayan-Ulgii	+	5	n/a	+	-	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	n/a	50	n/a	300	7	n/a	n/a	n/a	+			
26	Bayan-Ulgii	+	15	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	n/a	80	250	260	30	n/a	n/a	n/a	n/a			
27	Bayan-Ulgii	+	5	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	50	200	200	5	n/a	n/a	n/a	n/a			
28	Bayan-Ulgii	+	5	n/a	+	-	n/a	+	+	+	+	+	-	n/a	-	-	-	+	+	n/a	n/a	40	n/a	200	3	n/a	n/a	n/a	n/a			
29	Bayan-Ulgii	+	5	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	60	200	60	10	n/a	n/a	n/a	n/a			
30	Bayan-Ulgii	+	5	n/a	+	-	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	60	n/a	120	6	n/a	n/a	n/a	n/a			
31	Bulgan	+	10	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	+	n/a	n/a	80	250	300	30	n/a	n/a	n/a	n/a			
32	Bulgan	-	5	A	+	-	n/a	+	-	+	+	-	-	B	-	-	-	+	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
33	Darkhan	+	20	n/a	+	+	n/a	+	+	+	+	+	-	n/a	-	-	-	+	+	n/a	n/a	250	1,200	1,500	30	n/a	n/a	n/a	+	n/a		
34	Darkhan	+	20	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	240	1,300	3,300	100	n/a	n/a	n/a	n/a			
	Rate or Average	79%	24.4		60/60	52/56		All	87%	95%	93%	23%	11%	A=3	3%	5%	3%	36/36				146	604	799	25	75.9	19.33	3.25		China, Russia, Iran, Kazafkstan		
	Max		370											B=4								1,200	2,400	10,000	120	100	100	20		Vietnam , Japan		
	Min		4											C=9								40	100	40	3	0	0	0				

n/a: not available, no answer or not applied.

*1 A: Grading system similar to the one in Japan, B: Not sophisticated, C: none.

*2 A: Culled, B: Recycled, C: For sale

*3 According to *Mongol Tsuushin* (No. 15, 604, 2017), accredited ISO22000.

*4 Inspected and accredited by General Agency for Specialized Inspection (GASI)

Source: Arranged by the mission team by reviewing the information gathered from Mongolian Meat Association, MOFALI, and several meat markets

#	Districts	Membership of MMA	No. of employee	Grading system	Animal species			Season ality	Type of processed products					Recycle of by-products *2	Standardization				Own laboratory (+/-)	Design section (+/-)	Feedback system (+/-)	Capacity (t)		Storage (t)		Domestic market share			Information as importer		Logistics	
					Large (camel, horse, cattle)	Small (sheep, goat	Imported		Primary			Secondary			ISO		HACCP	National *4 (+/-)				Large/day	Small/day	Freezing	Deep freezing	UB (%)	Local (%)	others (%)	+/-	Destined countries	packer-owned tracks	out-sourcing
									carcass	dismemberment	freezing and storing	Ham and sausage	cooked		22000	9001															
35	Dornod	+	15	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	+	n/a	n/a	240	2,400	300	90	n/a	n/a	n/a	n/a			
36	Dornod	+	n/a	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	n/a	n/a	1,000	n/a	n/a	n/a	n/a	n/a			
37	Gobi-Altai	+	n/a	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
38	Khentii	+	10	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	+	n/a	n/a	80	250	280	40	n/a	n/a	n/a	+	n/a		
39	Khentii	+	15	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	120	300	250	15	n/a	n/a	n/a	n/a			
40	Khovd	+	10	n/a	+	n/a	n/a	+	+	+	+	+	-	n/a	-	-	-	n/a	n/a	n/a	n/a	80	n/a	60	5	n/a	n/a	n/a	n/a			
41	Khovd	+	5	n/a	+	n/a	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	42	n/a	60	5	n/a	n/a	n/a	n/a			
42	Khovd	+	5	n/a	+	n/a	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	40	n/a	40	4	n/a	n/a	n/a	n/a			
43	Khovd	-	4	n/a	+	+	+	+	+	+	+	-	-	n/a	-	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	60	40	0	-		1	+
44	Khuvsgul	+	10	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	+	n/a	-	250	600	500	30	0	100	0	+	China, Russia		+
45	Orkhon	+	15	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	n/a	150	400	500	30	n/a	n/a	n/a	+	n/a		
46	Orkhon	+	10	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	+	250	1,200	500	30	n/a	n/a	n/a	+	Russia	6	
47	Orkhon	+	15	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	n/a	250	1,200	500	30	n/a	n/a	n/a	+	n/a		
48	Orkhon	+	n/a	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	n/a	-	n/a	n/a	n/a	n/a	200	n/a	n/a	n/a	n/a	n/a			
49	Selenge	+	15	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	+	n/a	n/a	1,200	250	900	30	n/a	n/a	n/a	n/a			
50	Selenge	+	10	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	+	n/a	n/a	200	800	300	20	n/a	n/a	n/a	n/a			
51	Sukhbaatar	+	10	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	+	n/a	n/a	80	250	260	30	n/a	n/a	n/a	n/a			
52	Sukhbaatar	+	10	n/a	n/a	n/a	n/a	+	-	+	+	-	-	n/a	-	-	-	+	+	n/a	-	50	100	100	10	100	0	0	+	Suspended		
53	Tuv	+	10	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	+	n/a	n/a	200	1,000	500	15	n/a	n/a	n/a	n/a			
54	Uvs	+	12	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	n/a	120	500	500	15	n/a	n/a	n/a	+	n/a		
55	Uvs	+	15	n/a	+	+	n/a	+	+	+	+	+	+	C	-	-	-	+	n/a	n/a	+	100	350	300	10	10	90	0	+	Russia	4	
56	Uvs	+	10	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	n/a	80	250	260	30	n/a	n/a	n/a	n/a			
57	Uvurkhangai	+	10	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	+	n/a	n/a	80	250	500	20	n/a	n/a	n/a	n/a			
58	Zavkhan	+	20	n/a	+	+	n/a	+	+	+	+	-	-	A	-	-	-	+	n/a	n/a	n/a	250	1,200	500	30	60	40	0	+	Russia		+
59	Zavkhan	+	10	n/a	+	+	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	-	70	300	100	10	n/a	n/a	n/a	+	China, Russia	1	
60	Zavkhan	+	15	n/a	+	n/a	n/a	+	+	+	+	-	-	n/a	-	-	-	+	n/a	n/a	n/a	100	n/a	380	30	n/a	n/a	n/a	n/a			
61	Zavkhan	+	10	n/a	+	+	n/a	+	+	+	+	-	-	C	-	-	-	+	n/a	n/a	+	50	250	200	10	80	20	0	+	China Russia	2	
	Rate or Average	79%	24.4		60/60	52/56		All	87%	95%	93%	23%	11%	A=3	3%	5%	3%	36/36				146	604	799	25	75.9	19.33	3.25		China, Russia, Iran, Kazafkstan		
	Max		370											B=4								1,200	2,400	10,000	120	100	100	20		Vietnam , Japan		
	Min		4											C=9								40	100	40	3	0	0	0				

n/a: not available, no answer or not applied.

*1 A: Grading system similar to the one in Japan, B: Not sophisticated, C: none.

*2 A: Culled, B: Recycled, C: For sale

*3 According to *Mongol Tsuushin* (No. 15, 604, 2017), accredited ISO22000.

*4 Inspected and accredited by General Agency for Specialized Inspection (GASI)

Source: Arranged by the mission team by reviewing the information gathered from Mongolian Meat Association, MOFALI, and several meat markets

Concerning the truly processed products, which have been modified in order to either improve its taste or extend its shelf life, only a small fraction of the total amount of meat reaches this stage. As shown in Table 3.2.2, 23% of total meat is secondary products such as ham and sausage, and only 11% are elaborated products such as ready meals. Thus, a great majority of the meat is in the market treated just simple mechanical processes such as cutting, grinding or mixing. Also important is that as observed in the "domestic market share" cell of Table 3.2.2, even meat packers located in rural areas far away from Ulaanbaatar send a good portion of their products to the capital. In fact, according to MMA, at least 70% of total meat processed in rural areas, they say, is entering into Ulaanbaatar. Conversely, taking advantage of its geography and ethnic culture[78], meat plants of Bayan-Olgii export their products not only to China or Russia but also to Kazakhstan, thus, forming virtually their own economic corridor.

Lastly, we would like to touch on an inspection in which we checked some of the recommendations made by the JICA mission as mentioned earlier. In 2004, the mission team pointed out the following issues to be improved[79]. Thus, we visited two meat plants in Ulaanbaatar and verified what progress has been made during the past 13 years.

Table 3.2.3 Progress in Improvements of Meat Plants

No.	Recommendations	Plant *A*	Plant *B*
1	Killing without stunning, and insufficient bleeding	No change*	No change*
2	Poor foundations for frost heave	No change	Remodelled
3	Poor storage for carcasses causing early oxidation	No change	Remodelled
4	Inappropriate management of refrigerator (Figure 3.2.5)	No change	Remodelled
5	Poor facility and old buildings (Figure 3.2.6)	No change	Remodelled
6	Lack of repair parts due to imported equipment	Fairly remodelled	Remodelled
7	Inappropriate plumbing for freezing systems	No change	Almost
8	Lack of motivation among workers including managers	Fairly remodelled	Remodelled
9	No opportunities for on-the-training	Fairly remodelled	Remodelled
10	Lack of awareness for sanitation	Fairly remodelled	Remodelled

*In Mongolia, animals are killed by cutting directly the carotid artery without stunning, and this is derived from their tradition. Technically, however, this method causes poor meat quality due to poor bleeding. Thus, the good news is that in the Plant A, they practice occasionally electrical stunning, at least, for large animals such as horses and cattle.

[78] The westernmost province in Mongolia, and the country's only Muslim and Kazakh-majority province.
[79] JICA. 2005. Report of meat processing techniques in Mongolia. *Op.cit*.

Figure 3.2.5 Frosted Refrigerator (indicative of low storage efficiency)

Figure 3.2.6 Bumpy Floor of Waiting Room (may cause a fall)

Plant *A* in Table 3.2.3 is one of the oldest meat packers, which was state-owned factory during the socialist era. Based on the dialogues made with retailers and shoppers at various markets in Ulaanbaatar, it appears that the products made by Plant *A* are still most renowned as finest deli meats in Mongolia. Thus, the prices are set slightly higher than the other products. In terms of infrastructure at the plant level, however, as shown in Table 3.2.3, progress in Plant *A* is not as noticeable as in Plant *B*. Here, among others, inappropriate management of refrigerator (see "4" in Table 3.2.3) could be, we think, one of the most crucial weaknesses in the meat industry of Mongolia. In general, Mongolian consumers prefer fresh meat to reserve meat (frozen meat) because they find fresh meat to be tastier than frozen meat[80]. This "distaste" for frozen meat, which could be likened to the tendency the Japanese had had for raw fish (sashimi) in the past when their freezing technique had been very poor, might be not because meat is frozen but, as was the case with Japan, the freezing technique is inappropriate.

[80] Byambabaatar, I. and Thrift, D. E. (2015). Who eats quality meat?: Consumers and the national meat reserves program in Mongolia. *Health Environment* **1**: 1-15.

Plant *B* was established years after the visit of the mission. Curiously, however, the main dignitaries of Plant *B* are ex-officers of Plant *A*, and they improved almost all the recommendations made by the mission team in 2004 in their own plant, thus, achieving accreditation of international standards such as ISO22000 and HACCP. Plant *B* has been trying to extend its operations into China and Iran as well as Japan with their new product: pet food. Concerning their proactive attitude, for instance, one of the commendable things we observed is that they have done their homework to gather information about their future clients and surrounding issues about, say, export protocols, and then started to have a talk with the prospective clients, putting their cards on the table. As such, some meat packers in Ulaanbaatar are well equipped for robust business. As a whole, however, the great majority of meat packers remain rudimentary in Mongolia.

(2) Milk and dairies

Along with meat, Mongolian traditional everyday dishes include milk and dairies as well. In the same way again as in the meat industry, only a fraction of milk is treated in modern milk processing plants equipped with necessary hygienic conditions. According to the FAO statistics in 2014, the total amount of milk production is 690,000 tons while MOFALI estimated that the total amount of milk processed in 246 small and large milk plants nationwide would be 98,000 tons in 2016. In Mongolia, it is very common to spot hawker-like retailers in market places selling raw milk by weighing (Figure 3.2.7). Thus, it is only natural that the majority of raw milk is in circulation without any hygienic treatment. Concerning the price range of unprocessed milk, it is considerably lower than the packed milk as shown in Figure 3.2.1. Curiously, however, the farm gate prices, be they for retailers or processors, are comparable ranging between 200 and 500 MNT/L in summer, and 800 and 1,000 MNT/L in winter. In addition, cows are not the only milk givers in Mongolia. In fact, all the other domestic animals provide milk. Roughly, cows (yak included), goats, sheep, horses, and camels (concentrated in the desert areas), account for 60%, 31%, 5%, 4%, and less than 1% of the total amount of milk production, respectively[81].

Figure 3.2.7 Raw Milk Selling (by weight)

Figure 3.2.8 depicts the distribution of aforementioned 246 milk plants with the color grading being the cattle population density. The number of plants appears to be proportional to the number of cattle. According to the information we gathered from MOFALI and National Dairy Development Board of Mongolia (NDDBM), however, a great majority of plants except for seven located in Ulaanbaatar are small sized and in operation only for several months during summer with a capacity of less than 1 ton per day. Thus, almost all the pasteurized milk and dairies are provided by these seven and some other modernized plants in and around Ulaanbaatar.

[81] According to National dairy development board of Mongolia.

Table 3.2.4 shows general information about aforementioned seven and some other plants. In spite of the strong seasonality, all the plants are in operation all the year round because they get milk even in winter, which is not the case with other small plants. In Mongolia, since all the female animals give birth in early spring, and by nature, feed (grass) is scarce in winter, they are practically not available for milking in winter, thereby preventing processors, especially smaller ones, from operating their plants. By contrast, larger processors import dried milk (mainly from New Zealand) for compensation. "Dried" in the cell of "Suppliers" in Table 3.2.4 indicates this operation.

Concerning the dried milk supply, the information we gathered is quite limited, but, according to the NDDBM, "All the larger plants must be imported dried milk." In terms of the purpose, however, each plant uses it in its own way. Some plants reconstitute the dried milk to sell as fresh milk while others use it only for processed dairies such as yogurt and ice cream. Speaking of dairy products, almost all of them are primary and ordinary products such as pasteurized milk, Ultra-High Temperature processing (UHT) milk, cheese, yogurt, and ice cream. In the case of milk plants, however, though primary products such as UHT milk, requirements for machinery and procedure, for which ISO and HACCP would be necessary standards are far more sophisticated than those for meat packers. Considering those particular facts, it would be quite natural why larger milk plants set a wholesale price that seems a bit expensive, which approximate 2,000 MNT/L all the year round.

As a case in point in Mongolian dairy industry, the operation method of SUU Company and APU Company should be mentioned in this chapter. SUU, providing about 60 to 70 percent of processed milk at modern plants, and APU, by definition one of the most powerful conglomerates, practice somehow vertically integrated strategies, from collection of milk at dairy farms by milk lorries to nationwide distribution of goods by trucks as shown in the cell of "Plant-owned logistics" of Table 3.2.4. SUU has been working with approximately 2,500 contracted dairy farmers in Bulgan, Orkhon, Tuv, Selenge, Darkhan-Uul, and Henti while APU has 350 households contracted as well mainly in Tuv. Since lack of logistics has long been a serious constraint in Mongolia, the operation method of these companies is ideal. Also, highly commendable point is that ordinary herders are participating in this operation as dairymen, thus, helping establish an integrated production cycle in which Mongolian traditional herders and modern technocrats work together complementarily[82].

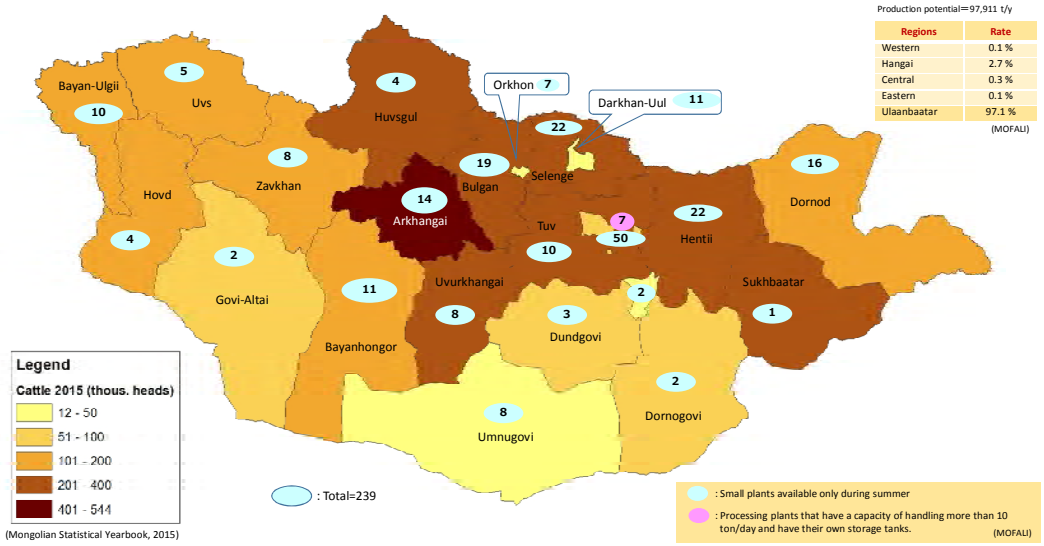


Figure 3.2.8 Number of Milk Plants and Density of Cattle Population by Province

[82] Neo-traditionalism. A concept that was proposed by MONDEP. A production cycle based on a combination of both traditional mobile livestock-keepingand modern insentive marketing system. As indicated in the main body, SUU company has been operation this way in various provinces.

Table 3.2.4 General Information on Large Milk Processing Plants

#	Districts	No. of employees	Suppliers			Seasonality	Types of processing and products								Accreditation				Analysis*2		Own Labo	Nutrition facts label*3		Design dept.	Feedback system	Annual capacity (tons)	Daily capacity (t)		Domestic markets			Importation		Plant-owned logistics			
							Fresh milk								ISO																					
			Herders	Middlemen	Imported (dried)		Pasteurized	UHT*	Ice cream	Yogurt	Sour cream	Butter	Cheese	Others	22000	9001	HACCP	Domestic*1									Summer	Winter	UB (%)	Local (%)	Others (%)	+/-	Amount (t/year)	+/-	Trucks	Direct selling	out-sourcing
1	UB	350	+	-	+	+	+	+	+	+	-	+	+		-	+	-	+	+	B	+	+	A	+	+	45,000	<100	<30	50	50		-		+	>100	+	+
2	UB	35	+	-	n/a	+	+	+	-	+	-	-	-	Whey Based Beverage	n/a	n/a	-	+	+	n/a	+	+	A	n/a	n/a	250	> 10	n/a	n/a	n/a		n/a		n/a	n/a	n/a	n/a
3	UB	900	+	-	+	+	+	+	+	+	+	+	+		+	-	+	+	+	B	+	+	A	+	+	45,000	100-150	<100	50	—	Nationwide	+	n/a	+	<100	+	+
4	UB	130	+	-	n/a	+	+	+	-	+	+	-	-		+	-	+	+	+	n/a	+	+	A	n/a	n/a	13,200	> 10	n/a	n/a	n/a		n/a		n/a	n/a	n/a	n/a
5	UB	19	+	-	n/a	+	+	+	-	+	-	-	+		-	-	-	+	+	n/a	+	+	n/a	+	n/a	5,000	> 10	n/a	n/a	n/a		n/a		n/a	n/a	n/a	n/a
6	UB	23	+	-	n/a	+	+	+	-	+	-	-	+		-	In applying	-	+	+	n/a	+	+	n/a	+	n/a	600	> 10	n/a	n/a	n/a		n/a		n/a	n/a	n/a	n/a
7	UB	100	+	-	+	+	+	+	-	+	-	+	+		-	+	-	+	+	A	+	+	A	+	-	5,000	30-50	5	70	30	Darhan	-		+	30	-	+
8	UB	10	+	-	n/a	n/a	+	-	-	+	-	+	+		-	-	-	+	+	A	+		B	n/a	+	400	n/a	n/a	n/a	n/a		+	online sales	+	n/a	-	+
9	UB	n/a	+	-	n/a	n/a	+	n/a	-	+	-	-	-		-	-	-	+	+	n/a	n/a		n/a	n/a	n/a	9500	n/a	n/a	n/a	n/a		n/a		n/a	n/a	n/a	n/a
	Rate or Ave.	195.875	100%	0	3/3	7/8	100%	88%	22%	100%	22%	44%	67%		25%	2/5	22%	100%	100%	A=2	8/8					13,772.2			56.7	40							
	Max	900																		B=2						45,000.0			70	50							
	Min	10																		C=0						250.0			50	30							

n/a: Not available, no answer or not applied.

*1 Inspected and accredited by General Agency for Specialized Inspection (GASI).

*2 A: Alcohol test and density, B: A+antibiotic residues test, C: B+somatic cell count, etc.

*3 A: With details such as Type of food (fresh, processed, additives, etc.), Ingredients, Type of additives, Nutritional facts, Shelf life, Allergen, Country of origin, GMO, etc., B: With some information, C: None.

Source: Arranged by the mission team by reviewing the information gathered from MOFALI, National Dairy Development Board of Mongolia, and several meat markets.

Lastly, we would like to mention briefly some topical issues about Mongolian dairy industry. As mentioned in the previous chapters, *Meat and Milk Campaign*, which is currently being implemented by the government, has the intention of setting up 60 plants to manufacture dried milk. In reply to a question: why dried milk needed when even fresh milk supply is insufficient?, a senior officer from Department of Coordination for Food Production Policy Implementation of MOFALI, explained that "In summer, at times supply exceeds demand, thus, causing a plunge in the farm gate price, and consequently many herders stop selling their milk[83]. As a whole, however, the total production does not meet the domestic demand. Therefore, by setting up milk plants nationwide to convert milk in surplus temporarily, we could manage to offset milk shortages in winter. This way, logistics would be much manageable since dried milk is not heavy nor perishable. In addition, we would not be dependent any more on the imported dried milk. What is more, if those plants are available all the year round, then, herders must be motivated, trying to milk their animals more even in winter. So, we think we could get more milk eventually."

One other thing very laudable about this issue is that the government, though procuring some imported hi-tech machinery, is planning to implement this scheme by utilizing as many already existing facilities as possible to cut the costs. The fact that the government takes the initiative in establishing a new value chain by sharing its clear vision with each stakeholder in the chain, such as traditional herders, processors, we think, should be most appreciated as a big step towards ideal state building.

Lastly, we would like to mention some potential niche marketing in Mongolian dairies, namely, *airag* (fermented mare's milk) and *aaruul* (traditional Mongolian dairy, fermented dried curd). Although *airag* might be the most internationally renowned products among Mongolian dairies, its value chain has been basically on a locally-produced, locally-consumed basis. Recently, however, though small-sized, an innovative dairy processor in Bulgan, the capital of *airag* in Mongolia, has developed a plastic bottled *airag* and launched it on to the market (Figure 3.2.9). Another innovation could be *aaruul*. As mentioned above, this is a traditional product and kind of an acquired taste with a strong sourness. Some dairy processors, of which MACU is one, however, now manufacture a milder version of *aaruul* with the intention of capturing a wider range of consumers (Figure 3.2.10)[84].

Figure 3.2.9 Manufactured Airag (fermented mare milk in 500ml plastic bottle)

[83] Setsgee Ser-Od, T. and Ugdill, B. 2009. Mongolia: Rebuilding the dairy industry *In* Smallholder dairy development – Lessons learned in Asia, Morgan, N. (ed.). FAO Regional office, Bangkok.

[84] During the survey, we made a visit to The Japan Imported Cheese Promotion Association in Tokyo with the intention of promoting a Mongolian dairy, *aaruul*. No sooner had he tasted it than he said "No way!". Nevertheless, he also said that "there is no such thing as overnight success in our business. To succeed, just keep running. Meet people, ask people and try people to improve your products."

Figure 3.2.10 Traditional Mongolian Dairy: Aaruul (fermented dried curd)

(1) Wool

In Mongolia, wool, a sheep product, has long been in use for a variety of everyday life, especially for *ger*, a portable, round tent covered with skins or felt and used as a dwelling by herders. As a commodity, however, although the amount of production per animal, which is about 1,000 g, would be much higher than cashmere, 250 g per goat on average, wool is not profitable at all. According to the chairman of the Mongolian Wool Association (MWA), currently there are approximately 360 plants for processing the fleece (grease wool), of which 158 are in Ulaanbaatar and its surrounding area with the remaining some 200 plants being spread all over the country. Almost all of small and medium plants, however, after the harvest and washing activities in spring, stop operating. Concerning larger plants, which have a capacity of over 1,000 tons per year, seven are located in Ulaanbaatar and the remaining spread nationwide.

Figure 3.2.11 shows the distribution of the aforementioned larger wool plants with the color grading being the sheep population density. The number of plants appears to be proportional to the number of sheep. According to the MWA, in 2016 the annual production of wool reached 15,677 tons, and by province, Hovsgul is the top producer with a total amount of 1,518 tons. It should be noted, we think, that the president of MWA explicitly stated that “The number of plants for primary treatment such as washing and sorting, and how those plants are distributed nationwide are still suitable requiring no change.” Concerning the type of processing methods that the larger plants in and around Ulaanbaatar operate, a breakdown is shown in Table 3.2.5.

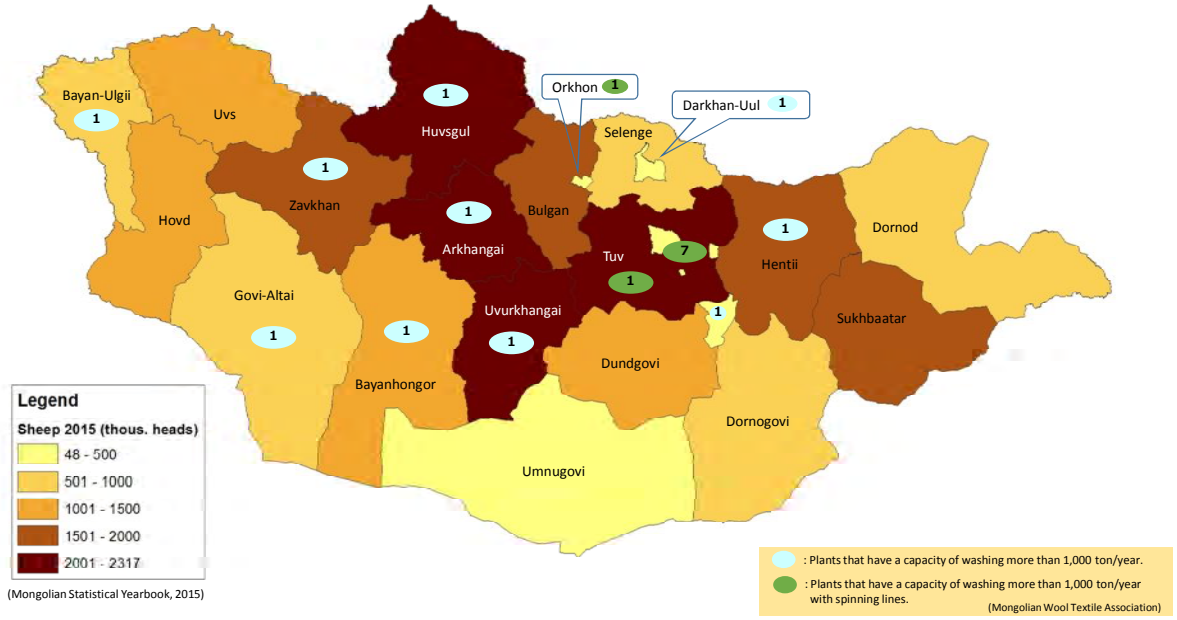


Figure 3.2.11 Number of Wool Plants and Density of Sheep Population by Province

Table 3.2.5 Breakdown of Processing Methods of Larger Wool plants in and around Ulaanbaatar (*n*=158)

Types of operation	Carpet	Building insulation material	Felt goods	For machinery	Wool goods	Primary treatment	Felt shoes	Sewing	Fabric	Spinning	Washing	combing	Yarning	Common type felt
n	1	1	1	1	2	2	3	5	6	7	9	9	54	57

As might be expected, the great majority of plants execute operations for quite primary products such as yarning, common type felt. In this regard, as mentioned above, the use of wool for the building insulation material appears to be very promising in Mongolian wool industry[85]. Having done a series of homework, a wool company in Mongolia have landed on a long-awaited deal with its Japanese client. Mongolian wool could not have been able to enter the market in Japan. The reason why it was rejected is not that the material itself was of poor quality, but scouring, the process of cleaning the greasy wool, was not sufficient. The company, after installation of cleaning machinery imported from China, has succeeded in adjusting the quality of their products to the standard required by Japanese clients. What is more, they now receive orders placed by other countries, such as, Russia, Czech Republic, Australia, Hungary, and Romania[86]. Lastly, another point linked to this wool value chain for foreign markets is its intrinsic privilege. Concerning the facts that made this deal possible, in addition to the business process of the company, export protocols for wool as well as hides are not so strict as other materials such as raw meat and offal because they are chemically treated products, thereby, eliminating the possibility of spreading epidemics, especially, FMD.

[85] *Mongol Tsuushin*. (2017). No. 1. *Op.cit*.
[86] According to the interview at Eco-Wool Company.

(2) Cashmere

As mentioned in this report, cashmere is so profitable that the cashmere industry in Mongolia, in terms of the level of the processing technique as well as the capacity of processing, is by definition at the top. Figure 3.2.12 shows the distribution of cashmere plants with the color grading being the sheep population density. Curiously, except for Ulaanbaatar, the number of plants and their distribution are not proportional to the population density of goats, especially in Bayan Khongor where the goat population is high, but there is no processing plant at all. In term of this disparity, it was explained that cashmere is, as material, lightweight in comparison with other ordinary commodities in Mongolia, thus, making it much easier for not only herders but also for other stakeholders in the cashmere value chain, such as traders and processors to transport it from the production site to processing facilities. In addition, the great majority of larger plants possess their own transportation means, thus, buying and bringing the raw fiber directly from herders to their plants bypassing the local small cashmere plants. Therefore, they don't need any more processing plants there in the remote areas[87]. In terms of the number of stakeholders in the cashmere value chain, although almost all the larger cashmere plants execute vertically integrated operations, the industry has many stakeholders resulting in a highly divided labor and manufacturing systems, such as washing, dehairing, spinning, knitting, and sewing[88].

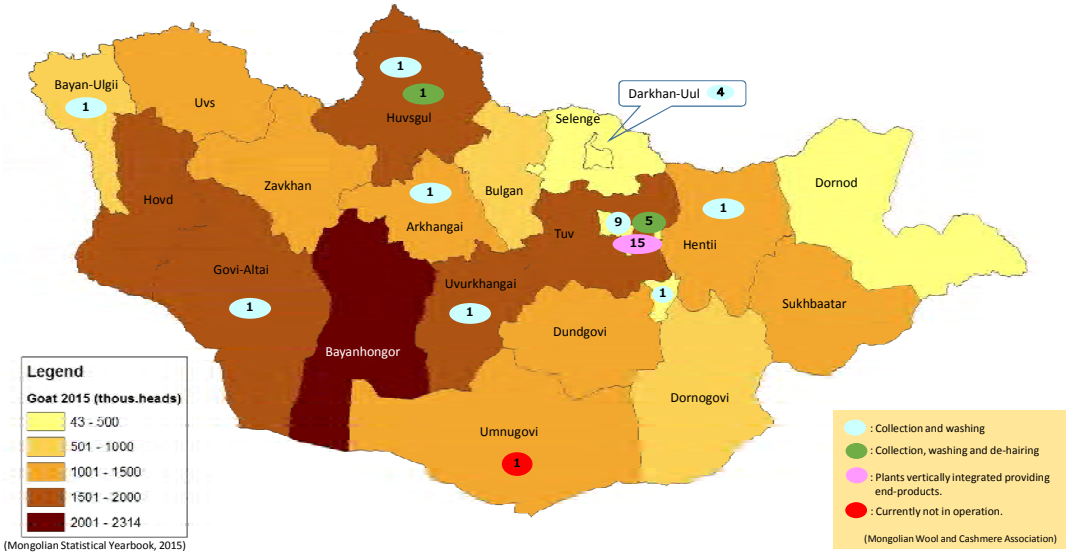


Figure 3.2.12 Number of Cashmere Plants and Density of Goat Population by Province

In the case of those smaller plants, which are mainly located in rural areas as shown in Figure 3.2.12 in light blue, they usually do only primary treatment such as collection and washing, and then sell semi-processed materials to other downstream stakeholders in the value chain. By contrast, larger plants conduct the whole process consistently. General information on representative 15 plants is given in Table 3.2.6. Except for one, all the plants are in Ulaanbaatar and its surrounding area. One of the advantageous features the Mongolian cashmere industry has is its ability to manufacture OEM products. One of the advantages for the OEM is that it enables to rely on the foreign clients for arranging the protocols for exportation/importation such as customs issues, consignment, and unloading.

[87] Based on the interview with Mongolian Wool and Cashmere Association (MWCA).
[88] J. E. Austin Associates. (2001). *Op.cit.*

Table 3.2.6 General Information on Cashmere Processing Plants

Districts	Membership of association	No. of employees	Breakdown of suppliers							Certification for cashmere fiber		Accreditation of standards			Own labo	Waterwaste treatment	Design dpt.	Grading system *2	Capacity					Share (%)	
			Herders	Middle men	other companies	Sewing	Processing		OEM	+/-	Methods	ISO	HACCP	Domestic *1					Washing (t)	De-hairing (t)	Spinning (t)	Knitting (m/year)	Weaving (sheet/year)	Domestic	Export
							Fabrics	Cloth																	
UB	+	1700	+	-	-	+	+	+	+	-		+	-	+	+	+	+	B	1500	600	260	770,000	270,000	60	40
UB	+	800	+	-	-	+	+	+	-	-		-	-	+	+	-	+	B	1000	599	400	n/a	450,000	65	35
UB	+	900	+	-	-	+	+	+	+	-		-	-	+	+	+	+	B	900	240	150	250,000	500,000	60	40
UB	+	500	+	-	-	+	+	+	-	-		-	-	+	+	+	+	B	n/a	n/a	200	n/a	250,000	65	35
UB	+	80	+	-	-	n/a	n/a	n/a	-	-		-	-	+	-	-	n/a	B	n/a	n/a	90	n/a	40,000	70	30
UB	+	150	+	-	-	n/a	n/a	n/a	n/a	-		-	-	+	-	-	n/a	B	900	200	n/a	n/a	40,000	60	40
UB	+	100	+	-	-	+	-	-	n/a	-		-	-	+	-	-	n/a	B	900	200	n/a	n/a	180,000	65	35
Erdenet	+	n/a	+	-	-	+	+	+	-	-		-	-	+	+	-	n/a	B	900	160	90	n/a	60,000	80	20
UB	+	30	+	-	-	+	+	+	-	-		-	-	+	-	-	n/a	B	900	70	70	120,000	n/a	50	50
UB	+	60	-	-	+	+	+	+	-	-		-	-	+	-	-	n/a	B	30	75	80	n/a	15,000	70	30
UB	+	40	+	-	-	+	-	-	n/a	-		-	-	+	-	-	n/a	B	n/a	n/a	40	500,000	n/a	n/a	n/a
UB	+	20	+	-	-	n/a	n/a	n/a	n/a	-		-	-	+	-	-	n/a	B	n/a	n/a	35	n/a	n/a	n/a	n/a
UB	+	n/a	-	-	+	+	-	-	-	-		-	-	+	+	-	n/a	B	n/a	n/a	70	400,000	600,000	80	20
UB	+	n/a	-	-	+	+	-	-	n/a	-		-	-	+	-	-	n/a	B	n/a	n/a	90	n/a	60,000	50	50
UB	+	25	-	-	+	+	-	-	-	-		-	-	+	-	-	n/a	B	900	110	90	n/a	30,000	100	0
Rate or Ave.	100%	367	73%	0%	27%	12/12	7/12	7/12	13%	0%		6%	0%	100%	40%	20%	4/4	A=0	881	250	128	408,000	207,917	67.3	32.7
Max		1700																B=100	1,500	600	400	770,000	600,000	100	50
Min		20																C=0	30	70	35	120,000	15,000	50	0

n/a: Not available, no answer or not applied. n/a: Not available, no answer or not applied.

*1 Inspected and accredited by General Agency for Specialized Inspection (GASI).

*2 A: Grading system with premium, B: Selection based on quality, C: None

Source: Arranged by the mission team by reviewing the information gathered from Mongolian Wool and Cashmere Association, and cashmere processing plants.

Lastly, we would like to touch on the grading system, which is, as mentioned above, now underway on the initiative of AVSF Mongolia with herders in Arkhangai and Bayankhongor. The fact that herders will be paid according to the quality of raw fiber of cashmere (thinness, sex, dirt, etc), we think, would be most promising in term of establishing a new value chain, especially for livelihood improvement of herders. In addition, we are sure that in the case of the cashmere supply system in Mongolia, some potential negative impacts, such as "squeezing-out" of small farmers from the scheme, would be most negligible because, firstly, in Mongolia the great majority of cashmere fiber is in the hands of ordinary herders, and, secondly, regarding the quality of cashmere fiber, be it from rich, large scale herders or poor, small scale herders, there is no difference, thus allowing all the herders equally to joint in the scheme as long as each participant bothers doing some chores for selection of the fiber according to the requirement.

As an aside, but it should be noted that there exists some difference in the quality of cashmere fiber depending on the region[89]. In a nutshell, however, in terms of fiber quality, the fact that makes cashmere what it is the harsh climate of Mongolia. In this regards, the comments made during the visit to the MWCA explained a lot: "the severer and colder in winter it is, the higher the quality of cashmere fiber is"[90]. Thus, the bottom line is that every herder, as mentioned just before, as long as he or she does chores for selection, they could be better off, and so are the other stakeholders in the value chain, thus, as a whole, leading to both improvement and fortification of the Mongolian cashmere industry. We really do hope that as many herders and processors as possible participate in this scheme with an understanding of this concept.

(3) Hides and leathers

Hides, a byproduct of the livestock industry, has long been one of the most important commodities. In Mongolia, on average, the production of hides from five main species reaches an amount of 15,000 tons. As shown in Figure 3.2.14, however, the number of tanneries and their distribution are not necessarily corresponding to the number of animals nor to the number of meat plants (Figure 3.2.4). Answering our question as to why there are not enough plants in the provinces with high animal population densities or a good number of meat plants, the president of Mongolian Association of Leather Industry (MALI) explained saying that "Concerning the issue about a new set-up of a tannery, nowadays, even in Mongolia, you cannot get it overnight. Since we use a chromium solution for tanning, which is said to be one of the environmental polluters, wastewater treatment issue is so crucial[91] that, due to the poor treatment system, one of the old plants has not been in operation, let alone new tanneries." With regard to the plant, which is currently out of service is shown in a red circle in Figure 3.2.14.

Also very important is a re-emerging disease caused by larvae of a species of parasitic fly, posing a major threat to the leather industry in Mongolia because those parasites burrow into the exposed flesh, thus leaving skins damaged with blemishes[92] and, thus, without value. The reason why they call it re-emerging is that the ailment was systematically under control during the social era because veterinary service including deworming was fully equipped thanks to the *negdel*. Nevertheless, due to the collapse of the *negdel*, the problem came into the scene again (Figure 3.2.13).

[89] Tsedev, K and Tserenbat, S. (2000). Magnificent cashmere: a look into the luxurious fiber of Mongolia. High Plains Publishers, Inc. USA.
[90] According to the interviews at Mongolian Wool and Cashmere Association, and some cashmere processors.
[91] European Commission. (2003). Integrated Pollution Prevention and Control (IPPC): Reference document on best available techniques for the tanning of the hides and skins. EU.
[92] Promer consulting. (2011). Report on agriculture and livestock industries in Mongolia. Program for free trade agreement survey in 2011.

Figure 3.2.13 Blemishes due to Burrowing of Parasites (larvae of a parasitic fly)

Regarding the tanning techniques, it would be safe to say that in general, at least in the case of larger plants, their quality will never be below the standard. For instance, one of the highly renowned tanneries in Mongolia, where we visited during this survey, constantly exports 80% of the "wet blue" products (semi-processed hides by chromium salts) to Italy, Spain, Turkey, and Vietnam, and according to the chairperson of the company, their foreign clients are all content with its products.

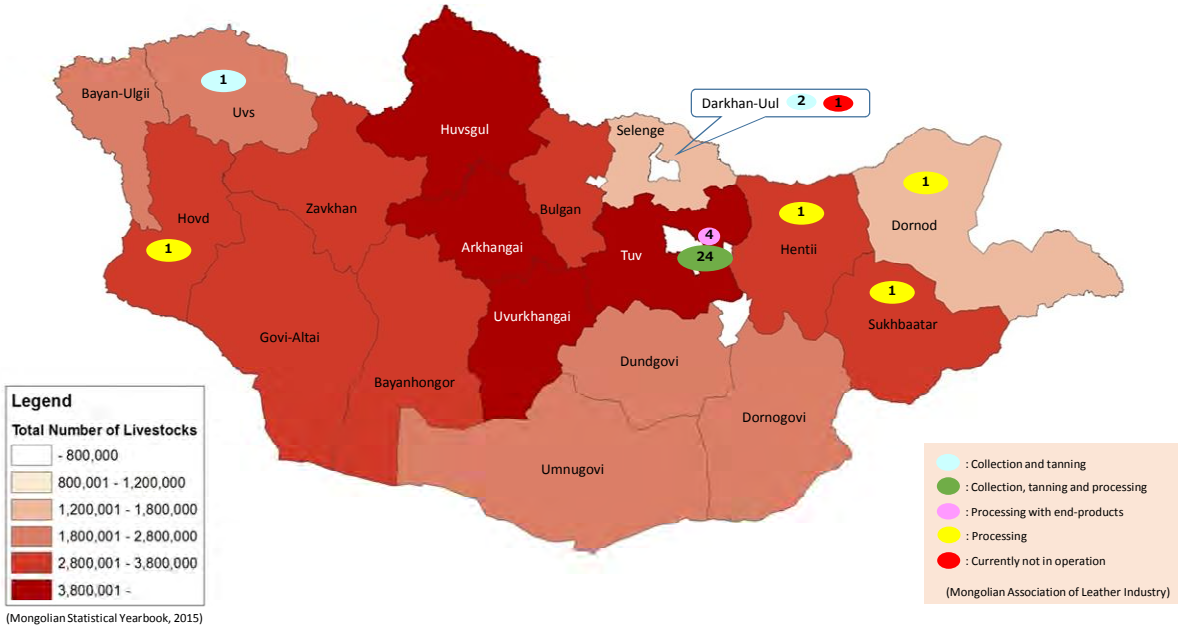


Figure 3.2.14 Number of Tanneries and Density of Livestock Population by Province

As mentioned in the section of Wool, since they are treated by chemicals, export protocols for hides are not as strict as raw meat. Thus, in search of possibilities for export into Japan, we visited some tanneries located in Sumida ward of Tokyo, one of the traditionally recognized areas for tanning industry, with samples from Mongolia, such as wet blue, leathers in different colors, and leathers treated by both chromium salts and tannins, to ask the tannery owner in Tokyo to appraise them. The comments are given in Table 3.2.7.

Table 3.2.7 A Review by a Japanese Tannery Owner

Categories	Comments
General	On the whole, the products are good. They should have been done by those qualified people. Concerning the evaluation of leathers, however, there are things that you cannot tell good or bad just checking the end-products. Also, there are some defects from raw hides that an experienced craftsman can fix up while some others are never treated. Thus, it would be ideal to check all the process including raw hides. In addition, the general conditions for storage of raw hides are essential for the good finish of leathers[93].
Specific	-Smell is unpleasant. This could be due to the use of chromium solutions. At least, I can tell that no one from my colleagues would use those semi-treated products. -Due to most probably dying methods, the finish is so rough and corrugated. -Due to most probably incomplete bleeding at abattoirs, I can see some tissue lines somehow lifted up which should not be there. Of course, there are some craftsmen intentionally use such materials. Thus, this could be a matter of choice.
Others	-Should Mongolian tanneries think about importing their products into Japan, in addition to improving their semi-products and/or leathers, it would be ideal to find reliable business partners first. -Nowadays, working in this industry, it is crucial to consider environmental issues, especially, of the chromium use[94] if you think about trading with foreign clients. In this regards, I strongly recommend all the Mongolian tanneries to do their job without chromium.

Figure 3.2.15 A Pile of Hides (in front of a local slaughterhouse)

(4) Other livestock activities

In Mongolia, livestock species except for main five animals account for only a small fraction. In some regions, especially in the large cities and their surrounding areas, however, there are some small and large enterprises dealing with swines, poultries and even bees for honey. General information about these activities is as follows:

[93] In Mongolia, it is common to spot piles of hides in front of abattoirs or just along the main road as shown in Figure 3.2.15. It appears that such treatment deteriorates the quality of hides.

[94] For instance, lack of knowledge about difference between chromium (III) and chromium (VI) (Tegtmeyer, D. and Kleban, M.; A balanced view of facts on chromium and scientific information. International Union of Leather Technologists and Chemists Societies.

(a) Swine raising

According to the FAO statistics, the population size of swines in Mongolia swiftly increased between 1987 and 1990, reaching its peak of 192,000 head. After the collapse of socialism, however, the number had ranged between 20,000 and 30,000 head, and recently started increasing again peaking at 50,000 head in 2013, and plunged down to 30,000 head 2015. Almost all of them are raised under intensive swine production operations in which sows and boars for breeders as well as pigs and hogs for fattening are kept systematically. One of them, which is the largest operation, has a total of about 7,000 sows. Their markets are mainly larger cities, Ulaanbaatar being by far the biggest one. The prices are usually set 10 to 20% higher than those for beef. Thus, by definition pork is profitable as a commodity, at least, in large cities. Nevertheless, this intensive operation may cause problems the traditional mobile livestock-keeping would never face: the higher feeding cost and manure management.

(b) Poultry raising

In Mongolia, poultry raising, in common with swine raising, is still unusual and under intensive farming operations. In terms of the managerial system, however, the poultry raising industry boasts the sheer level of high-tech operations, quite comparable to those practiced in developed countries from a viewpoint of poultry raising. Table 3.2.8 gives a set of general information about the three largest representative poultry raising plants in Mongolia. Among them, plant *A* is by definition most sophisticated: windowless barns and fully automated operations (feed, water, light, temperature, humidity, as well as egg collection). Thus, caretakers enter the barns in case of emergency only, such as, to get rid of dead poultries and to repair some unusual breakdown of equipment.

Concerning Plant *C*, which is the only broiler operation established in 2012, according to their own source, they currently supply about 50% of the national consumption. Having created their own brand for their chicken meat, they have set the price for it a bit higher than those for imported products, and it has been successful in the market. Of this, the executive director has no doubt at all that "Most Mongolian consumers prefer domestic products to imported ones in consideration of food safety, and that's why our brand is popular in the market." Currently, about 80 % of the total production goes as fresh chicken meat and the remains for further processing.

Concerning the marketing strategies practiced by those companies, although each company goes with its own method or approach, conceptually there are features they have in common: Efficiency-orientedness and Market awareness. Thus, they are always trying to make their procedures more and more efficient with a minimum of waste. Also, all of them are quite willing to accept market feedback, be it positive or negative. For instance, according to the dialogues made with top executives, Plant *B* is now trying to develop a new product by recycling culled poultries, and to set up their own plant for preparing their concentrate to cut the feed cost. In addition, a business with a company in Japan by utilizing poultry litter (manure included) for making organic fertilizers is underway[95].

Table 3.2.8 General Information on Representative Poultry Raising Plants

Plants	Districts	Type	Size	Feed*	Type of processing		ISO	HACCP	Feedback
A	UB	Layer	300,000	D + E	Egg	Liquid eggs	9001	In applying	+
B	UB	Layer	250,000	D + E	Egg	Selenium-fortified egg	In applying	----	+
C	UB	Broiler	1,500,000	D	Meat	Ham, pate, etc.	9001	In applying	+

*D: Their own concentrate mix, E: Imported

[95] According to an article published in Hokkaido shinbun on February 5, 2017.

(5) Bee-keeping

Surprisingly, bee-keeping is one of the agricultural activities that have long been practiced since the Soviet era[96]. As of 2014, approximately 400 bee-keepers have spread over 14 provinces except for desert regions, Selenge being by far the highest in number, exactly, 169 bee-keepers with 2,653 beehives[97] (Figure 3.2.16). In Table 3.2.9, general information on bee-keepers is given. All of them except for one (No.2) are keeping bees, collecting and processing honey, and then selling it on a family-owned basis. The same is true of the remaining smaller beekeepers. Honey is a substance produced and stored by bees, and bees collect honey from flowers native to, or grown in the Mongolian grasslands. In this regard, bee-keeping in Mongolia, like mobile livestock-keeping, highly depends on Mongolian natural environments. Additionally, one of the most important and indispensable roles the bee plays in terms of crop production is its function as pollinator. In fact, as shown in the Table 3.2.16, and Tables 19 to 21, which will be shown later, the distribution of beehives is exactly proportional to the densities of the production of the several crops. Thus, bee-keeping appears to have a variety of functions, and it is easy for it to combine with other agricultural activities[98].

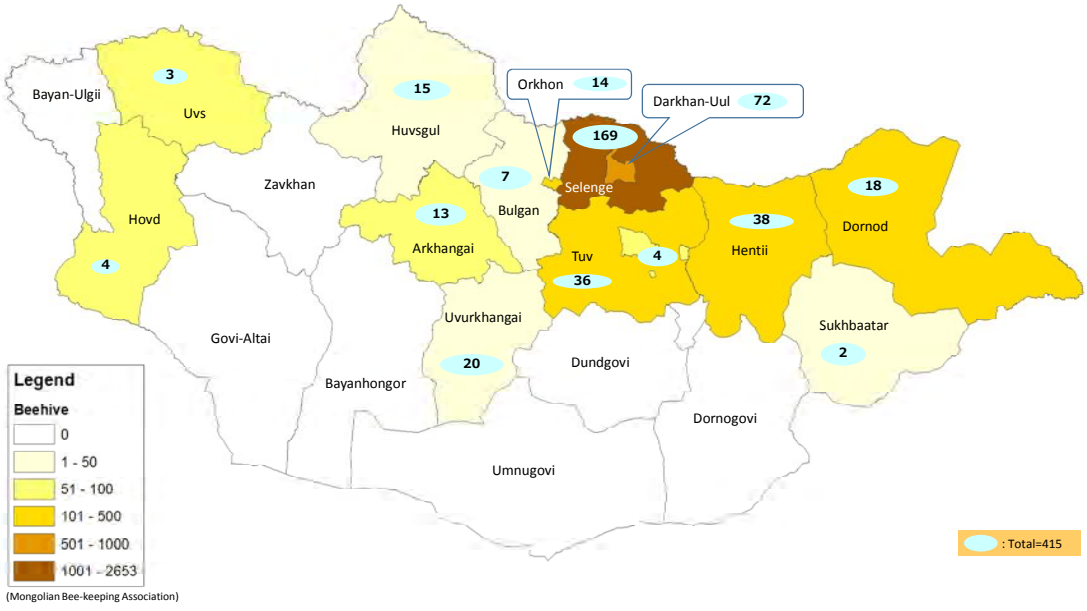


Figure 3.2.16 Number of Beekeepers and Density of Beehives by Province

[96] Nishiyama. (2016). Bee-keeping in Mongolia: current situation and outlook. *Japan and Mongolia* **50**: 10-19.
[97] Nishiyama. (2016). *Op.cit*.
[98] Nishiyama. (2016). *Op cit*.

According to Mongolian Women Farmers Association (MWFA), whose main activity is livelihood improvements through rural development, mentioned that of about 1,000 small scale households, at least 20% farmers keep bees. Another point to add to the advantages of bee-keeping is, as mentioned above, its long storage capability at room temperature, thus allowing small scale farmers to handle it without any costly equipment. On the flip side, however, this could be one of the main reasons why an institutional quality control system keeps failing to take root, thus preventing the Mongolian honey industry from developing more commercially as a whole. Figure 3.2.17 portrays a situation as to how local bee-keepers handle and sell their honey. In view of this, a JICA-funded project has started to improve bee-keeping, focusing on quality control and marketing, at grass-roots level[99].

Figure 3.2.17 Honey for Sale along the Main Road (lack of uniformity)

[99] JICA Partnership Program "Generation of Rural Income through Beekeeping Development"

Table 3.2.9 General Information on Bee-keepers

#	Districts	Management methods	General information		Types of processing				Nutrition fact label*3		Additives inspection	General inspection *4	Quality control				Design department	Feedback system	Marketing methods*5	Capacity of bottling	Exportation		Own distribution methods			Processing and Marketing strategies
			Ranges	No. of hives	Collection	Packing	New products	Underway					Sugar Content	Random sampling survey	Certification for retailers	MNS					+/-	Amount per year	+/-	Vehicles	Others	
1	UB	Family-owned	Tuv	100	Own	Own	I: segregation by the nectar source (the blossoms). II: honey with pine nuts.	Honey cocktail	+	A	-	B	+	+	n/a	+	Out-sourcing	+	A	150kg	+	150kg (recent sales figures)	+	1 mini truck		Bottles are imported from China. Once they have put their products on display at FOODEX in Japan.
2	UB	Ltd	n/a	n/a	out-sourcing	Own	n/a	n/a	+	A	-	A	+	n/a	n/a	+	Labelling	n/a	A	Max 200 t/year (currently, 20 to 50 t)	-	underway	+	200 trucks	Beekeepers incur the transport	Listening to the voice of consumers*6 ,they modified the bottling system.
3	Selenge	Family-owned	Selenge	n/a	Own	Own	n/a	n/a	+	B	n/a	C	n/a	n/a	+	+	Out-sourcing	n/a	A, B	n/a	n/a		n/a			
4	Selenge	Family-owned	Selenge	n/a	Own	Own	n/a	n/a	+	B	n/a	C	n/a	n/a	+	+	Out-sourcing	n/a	A, B	n/a	-		n/a			
5	n/a*2	Family-owned	Selenge	90	Own	Own	n/a	n/a	+	B	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-		n/a			

*1The magnitude of the company No. 2 is totally different from other home-owned beekeepers.

*2n/a: Not available, no answer or not applied.

*3With details such as Type of food (fresh, processed, additives, etc.), Ingredients, Type of additives, Nutritional facts, Shelf life, Allergen, Country of origin, GMO, etc., B: With some information, C: None.

*4A: Own labo, B: Some basic apparatuses, including refractometer, C: Out-sourcing.

*5A: Selling to wholesalers and retailers, B: Direct marketing, C: Others (via Web)

*6In Mongolia, in the case of bottled honey, an amount of 1000g or 700g has long been most common. Consumerwise, however, the less the better.

Source: Arranged by the mission team by reviewing the information gathered from JICA Partnership Program "Generation of Rural Income through Beekeeping Development" and related companies.

3.2.2.2 Agricultural Processed Products

Crop farming in Mongolia, though using only a fraction of the total land, which is less than 0.5%, accounts for 13% of the agricultural GDP[100]. In this regard, it would be highly efficient in comparison to mobile livestock-keeping. Among others, it produces wheat, potatoes, vegetables and some fruits, all of which are very important commodities for everyday dishes in Mongolia. Figure 3.2.18 shows the recent production trends of these crops. Between 2009 and 2014, Mongolia was self-sufficient in the production of wheat and potatoes[101]. By contrast, the production of vegetables and fruits is far less than needed, thus, becoming highly dependent on imported products. The following section will focus on the agricultural processed products, especially, derived from the crops mentioned above.

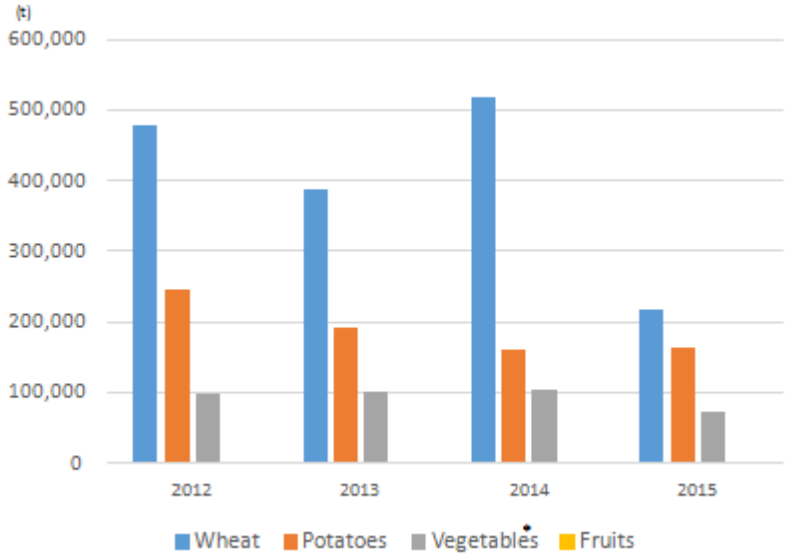


Figure 3.2.18 Main Crop Production

*Vegetables: Onions, carrots, turnips, cucumbers, cabbages, tomatoes, water melon, etc.

Source: NSO "Statistical Yearbook 2015"

(1) Wheat

Establishing national food security, especially through wheat production has long been at the top of the agenda since the Soviet era. In those days, state-owned farms, which were spread strategically in 32 points over the nation, were in charge of wheat supply[102]. Afterwards, in the transition from a centrally planned economy to a market economy, main suppliers of wheat were shifted from the government to private farmers. Virtually, almost all of them are large scale business organizations with their land for cultivation ranging between 500ha and over 1,000ha. In the case of the company No.2, which was mentioned in the bee-keeping section, and in reality, should be called a station, they boast their 30,000ha lands in various districts[103]. This shows a striking contrast in comparison to the traditional mobile livestock-keeping, in which, although there are currently some large owners with a huge number of animals, the great majority of livestock (over 70%) still belongs to the small and medium scale herders with 50 to 500 animals[104]. In Mongolia, there are 70 wheat-processing mills, of which 47

[100] NSO "Statistical Yearbook 2015".
[101] JICA. (2016). MONDEP. *Op.cit*.
[102] Davaasuren, T. and Niinuma, K. (2008). The Development Changes in Mongolian Agricultural Management during the Transition to Market Economy : A Case Study of the Intensive Dairy Sector. *Rural Study* **106**: 96-107.
[103] Bayarsakhan, D. (2016). *Op.cit*. and the interview in some large companies.
[104] JICA. (2016). MONDEP. *Op.cit*.

are in operation. Figure 3.2.19 shows the distribution of the mills in operation with the color grading being the main cereal production density. Here, in Mongolia, since wheat accounts for 97% of the total amount of cereals production[105], it would be safe to say that the color grading mainly reflects the wheat production. A concentration of wheat production in Selenge and Tuv is obvious, and the same is true of potatoes and vegetables (See the following sections), thus, as mentioned above, causing some negative impacts such as soil degeneration due to monoculture and continuous cropping[106]. In terms of logistics and marketing, especially in view of the large cities, however, why both the production sites and the distribution of processing plants became what is seen in this figure is quite understandable.

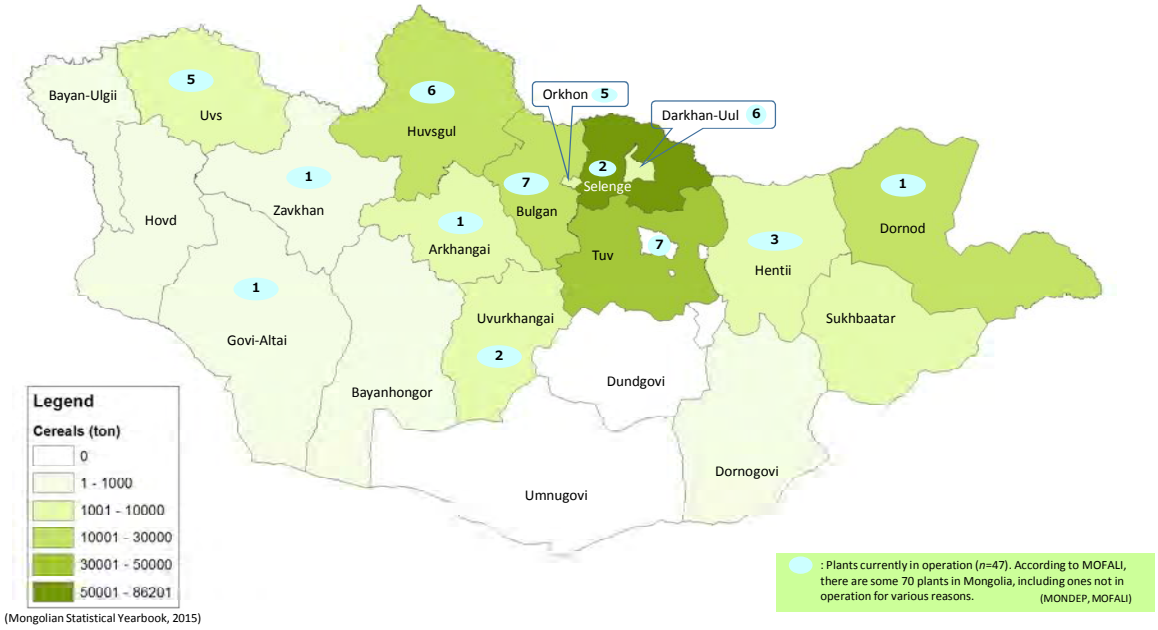


Figure 3.2.19 Number of Flour Milling Plants and Density of Cereal Production by Province

Concerning some controversial issues surrounding the wheat processing industry, which is inextricably interwoven with the national agricultural policy, Dr. Bayrsakhan (2016) studied extensively[107]. The basic structure of the wheat supply chain was set by the "3rd campaign to bring virgin lands under cultivation" in 2008, which includes some agricultural subsidies, such as minimum support prices at the farm level. Here, the most important aspects for processors are both gluten content and water content while farmers try to fetch a higher price. In reality, however, according to the study conducted by the aforementioned expert, a farm gate price is being fixed rather roughly with minimum consideration for the nutritional facts[108], thus causing notable uniformity in raw materials. Therefore, as a countermeasure, there are some processors that import quality raw materials. In fact, this is the case mentioned in the cell of "Availability" of Table 3.2.1, namely, importation not due to shortage of supply. This incident, as discussed in the cashmere section (raw fiber collection system), illustrates, we think, the need for a crop-wise and market-wise grading system in the Mongolian agricultural value chain as a whole.

[105] NSO "Statistical Yearbook 2015".
[106] Konagaya, Y. (2010). *Op.cit*.
[107] Bayarsakhan, D. (2016). *Op.cit*.
[108] The only requirement is as follows: the minimum gluten content of 18% and the maximum moisture content should not exceed 15%.

(2) Potatoes

In addition to wheat, potato is one of the most indispensable staples in Mongolia, and ensuring potato supply has long been the top agenda as well[109]. However, the production volume of potatoes was considerably unstable until 2009[110]. Mongolia became self-sufficient in potato production through the achievement of the Mongolian Potato Project (hereinafter "MPP") [111] run by the Swiss Agency for Development and Cooperation (hereinafter "SDC"). Thus, Mongolian producers face surplus produce at present. Here, one might think that excess of potatoes could be processed further or stored until needed. In Mongolia, however, this could not be the case, at least for now, due to the following reason.

According to Delger Uyanga Potato Company, where he cultivates a total of 100ha of land, and used to be working as an agronomist in a state-owned agricultural station in the Soviet era, all the potato varieties cultivated in Mongolia are consumed exclusively as fresh potatoes (table use). They are not suitable for processing. Depending on the purpose, potatoes can be classified roughly into the following three types: table use, starch production, and food processing[112]. In Mongolia, however, since MPP had done an intensive selection by focusing on the varieties for table use, none of the surviving could be useful for other purposes. In fact, MPP had also tried to invent another use for excess potatoes but ended in failure mainly due to extremely low starch content[113]. Considering this situation, it was only natural for us to make a question: "How about planting varieties for starch production or food processing?" In reply, the agronomist explained to us stating that "During the first years of the MPP project, we checked whatever types of potatoes, be they table use, starch production or food processing, for adaptation to the Mongolian environments, and only a few varieties (5 to 6), all of which are table use types, could take root successfully. Thus, it would be possible to say that the starch production type and the food processing type are not adaptable to our land." Nevertheless, this is not the end of story. He added a word to the comments as his conclusion: "Nowadays potato breeding technologies are well advanced, and so are the cultivation techniques in Mongolia. Therefore, I am very positive about future progress."

Concerning potato imports, in common with wheat, some processors have to buy from abroad even in years when Mongolia is self-sufficient in production in order to assure potato materials for starch production or food processing. Also important is, as mentioned above, the long storage capability of potatoes. As commonly practiced in Japan, in a storage shed, such as a basement, by ensuring both adequate relative humidity levels and a suitable temperature range, potatoes can be kept fresh for a longer period until needed. In Mongolia, however, at times, overproduction, coupled with falling prices and lack of good storage facility, has led to huge losses of potatoes[114]. Regarding overproduction, the company explained that some proactive farmers always try to check both climate outlooks and market trends in order to avoid wasting the product. Nevertheless, he says, it is never easy to forecast. Thus, the fact that Mongolia currently has no processing plant for potato would be linked with the situation mentioned above (see Figure 3.2.20). In the past, however, in Jargalant of Tuv, some organizations were planning to establish a plant for starch production, but, due to supply problems of raw materials, they halted. In addition, T company, one of the largest food processing companies that mass-produce potato chips, was eager to set up a plant for starch production because they had had to import a good amount of starch mainly from Germany. Nevertheless, for the same reason as mentioned above, and due to financial constraints for machinery, they have to give up. Still another point to add is mashed potato. Mashed potato is a very common everyday dish in Mongolia,

[109] Davaasuren, T. and Niinuma, K. (2008). *Op.cit*.
[110] FAOSTAT.
[111] Guenat, D and Tsegmid, B. (2015). Cost benefit analysis of the Mongolian Potato Project (MPP), 2004 – 2014. Swiss Agency for Development and Cooperation.
[112] Murakami, N. (2011). Latest potato varieties. *Agriport* **93**: 1-2.
[113] In general, required starch contents for both the starch production and the food processing are 17 to 25%, and 22 to 35%, respectively. Nevertheless, in the case of Mongolian potatoes, which is for the table use, the starch contents range from 12 and 14%.
[114] During the survey, we heard much the same story at the Khovd provincial office.

and prepared by using domestic potatoes. Thus, one may think for this purpose, the Mongolian potato could be successful. According to the company, however, it could be used for homemade foods but no good for the commercial purpose.

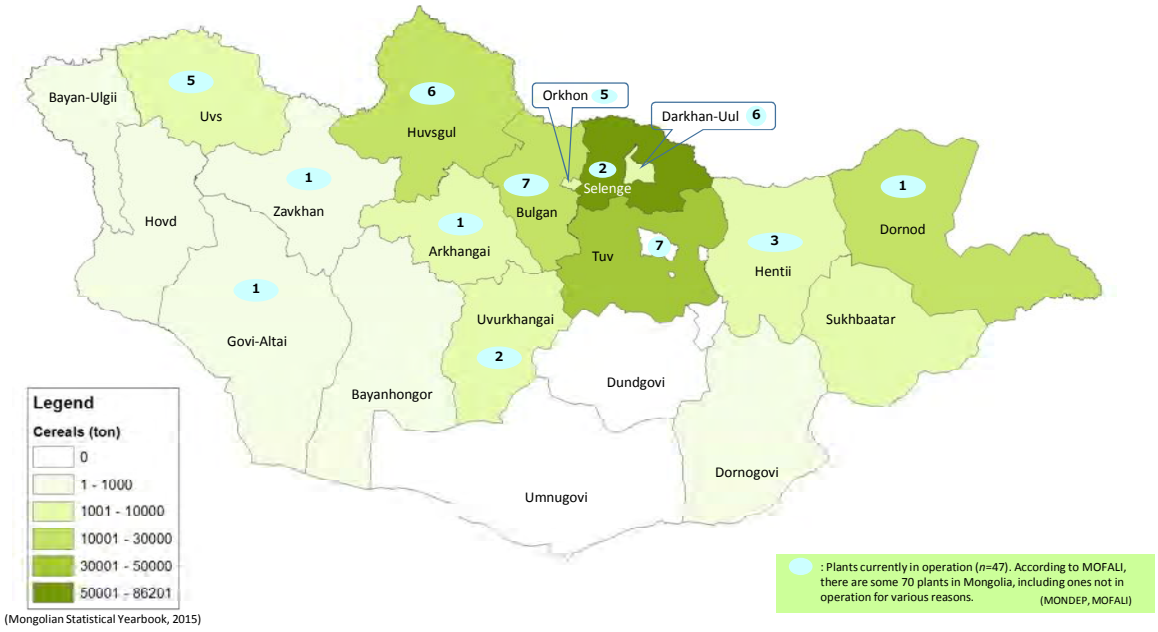


Figure 3.2.20 Density of Potato Production by Province

Lastly, regarding the "Uniformity in quality" mentioned in Table 3.2.1, some interesting observations of middlemen were made by the company. Middlemen are considered as nothing but a nuisance, exploiting both farmers and consumers. Currently, in Mongolia, the average farm gate price for potatoes is 300MNT/kg, and consumer prices range between 800 and 1,000MNT/kg. Therefore, the price the middlemen charge the consumer is, roughly, three times higher than the price they pay the farmer for potatoes, and this is why, the company explains, the middlemen are taking advantage of other stakeholders in the potato value chain. However, it remains to be seen whether it is reasonable to conclude that middlemen are exploiting. For instance, in Japan, between 2013 and 2015, the average prices of potatoes for farmers and consumers are 84JPY/kg and 330JPY/kg, respectively, thus, the latter being about four times higher than the former[115]. Nevertheless, it is understandable that they insist to introduce a grading system into the agricultural value chains in which produce, products, and end goods are priced and traded according to their quality. To us, his accusation against middlemen of exploitation does not seem necessary to lie in the price issue itself. Rather, we got the impression that what he took an instant dislike to was the attitude middlemen treat his potatoes anyhow at all, for which the company put a lot of energy and enthusiasm as well as care and love. In fact, the emphasis he put upon the introduction of the grading system is based on the lack of classification, which he thinks should be established by the government and practiced by middlemen. The proactive attitude as a farmer towards the reforms, we think, would be most appreciated because, firstly, we are witnessing a farmer growing competitive, and, secondly, those technically and rationally mature farmers are usually willing to talk with other stakeholders in their value chain and, after sensible consideration, try to reach an agreement for the benefit of every stakeholder[116].

[115] Ministry of Agriculture, Forestry and Fisheries (MAFF), Food and Industry Department for Policy Implementation. (2017). Establishment of processing and marketing structure for stable trading of farmers (in Japanese). MAFF.
[116] Love and Paul. (2012). Pricing produce and products for fair profit based on cost of production. *Entrepreneur's Toolbox* **ET-13**: 1-5.

(3) Vegetables

Although the production is not prominent like wheat or potatoes, as depicted in Figure 3.2.18, a variety of vegetables such as onions, carrots, turnips, cucumbers, cabbages, tomatoes, watermelons is grown nationwide in Mongolia, the central region being more concentrated than the other regions, yet disparity is not as accentuated as observed in wheat and potatoes. In terms of production, major crops are carrots and turnips[117]. Curiously, in Mongolia, Khovd is one of the most renowned provinces as horticulture, especially watermelon farming. According to officers of the provincial office, in Khovd, since its population size of Kazakh relatively higher, and the great majority of them have long been cultivating their land, crop-farming is traditionally one of the common practices. Nevertheless, in terms of processing and storage, due to lack of facilities as well as human resources for that, at times they waste excess vegetables in Khovd.

Concerning vegetable processing in general in Mongolia, Ms. Urtna, the president of Mongolian Fruit and Vegetable Processing Association (MFVPA) as well as the CEO of Vidan Company for vegetable processing has stated that currently there are only five modern processing plants in and around Ulaanbaatar, and the other plants are all a small business, a so-called cottage industry, which is available only a limited period of the year, and they sell their products such as a variety of pickles[118], to a local market or by operating a booth along the main road. By contrast, according to Ms. Byatshandaa, the president of MWFA, the farmers with whom she has been working sell most of their produce to middlemen, and only a fraction will be processed into quite primary products such as pickles. Thus, MFVPA has started to organize a small scale training program for making dried vegetables or vacuum packing, though still rudimentary.

Concerning general information about those five modern processing plants, which all undergo the GASI inspection periodically, they have farmers contracted or semi-contracted. Thus, in terms of supply of raw materials, they are relatively stable. Another point, which is highly laudable, is that they have their rules[119], though not so strict, for what products they will buy. For instance, in the case of cucumbers or carrots, by length, and, onions by diameter, they check the product, and then, if approved, buy them. What is more, in this system, farmers still can sell their "rejected" produce to other buyers, including middlemen, or traders without wasting, yet the price could be lower. This could be, we think, an ideal prototype for a practical grading system that is based on the mutual understanding between farmers and processors. Lastly, concerning the capacity of Vidan Campany, they are able to manufacture, approximately, 10,000 bottles of pickles made of cucumbers, carrots, onions, turnips, etc. per day, and the average production per year is 500,000 bottles.

[117] FAOSTAT.
[118] There are some, though only a few, cottage industry type *kimchi*, Korean pickle, processors, for instance, in a couple of districts of Selenge. According to the provincial officers, some of locals there who were working in Korea have started making kimchi in their hometown and, now they sell into Ulaanbaatar occasionally.
[119] Please note here that "a fixed price" does not mean it never vary all the year around. In fact, it does depending on the market, but the company always let the farmers know beforehand.

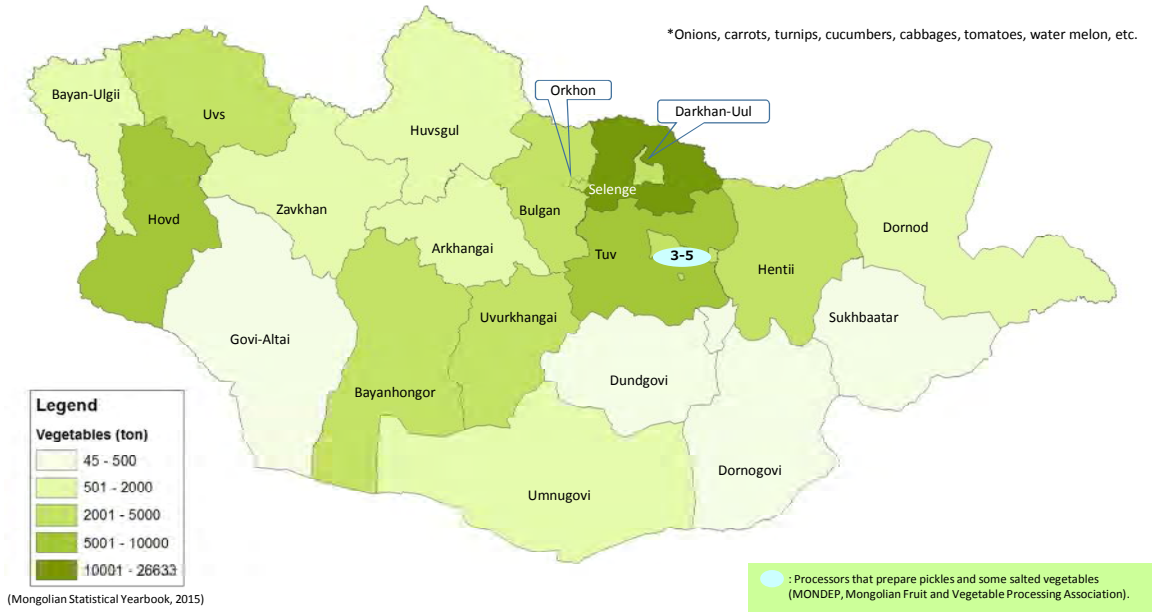


Figure 3.2.21 Number of Plants and Density of Vegetable* Production by Province

(4) Fruits

As shown in Figure 3.2.18, in terms of production, fruit farming is almost negligible. Regarding the number of plants, however, as shown in Figure 3.2.22, there are 40 processing plants not only in the central region but also in the western region with a total capacity of 2,000 tons per year[120]. Those include cottage industry type plants as well, and almost all of them process sea buckthorn or blueberries for juice and jam. However, their capacities are so limited: in Uvs, a total of 128 tons of 14 plants per year, in Khovd, a total of 206 tons from 8 plants per year, and Bayan-Ulgii, although the number of plants is only two, the amount is the largest: a total of 1,500 tons from 2 plants per year.

Another point to add to this section is the fact that those five modern processing plants described in the previous section are actually manufactured various fruit juices as well. In terms of the source of raw materials, however, three companies use exclusively imported materials, including concentrates. The types of processing are quite primary such as juice or jam. In Mongolia, on the other hand, the dried fruit is so popular, especially with consumers in large cities, and this is one of those primary fruit products as well. Nevertheless, in Mongolia currently there is no plant that processes fruits into dried products. Regarding this point, the president of MFVPA explained to us saying that "First of all, both production and varieties are so limited in Mongolia. Thus, I don't think the investment will get paid off." In addition, she continues, as described above, in Mongolia, frozen foods, be they fruits or vegetables, can be kept with minimum deterioration. Nevertheless, due to a lack of quicker freezing technology and machinery, the Mongolian processors are unable to complete a refrigeration process without damage to the vegetable or fruit cell membranes. Here, for the same reason that almost all the processors are reluctant to invest as described above, no plants in the fruit industry will consider about investing a huge amount of money for high-tech machinery under the present unstable "climate" unless the right support is given.

[120] JICA. 2016. MONDEP. *Op.cit*.

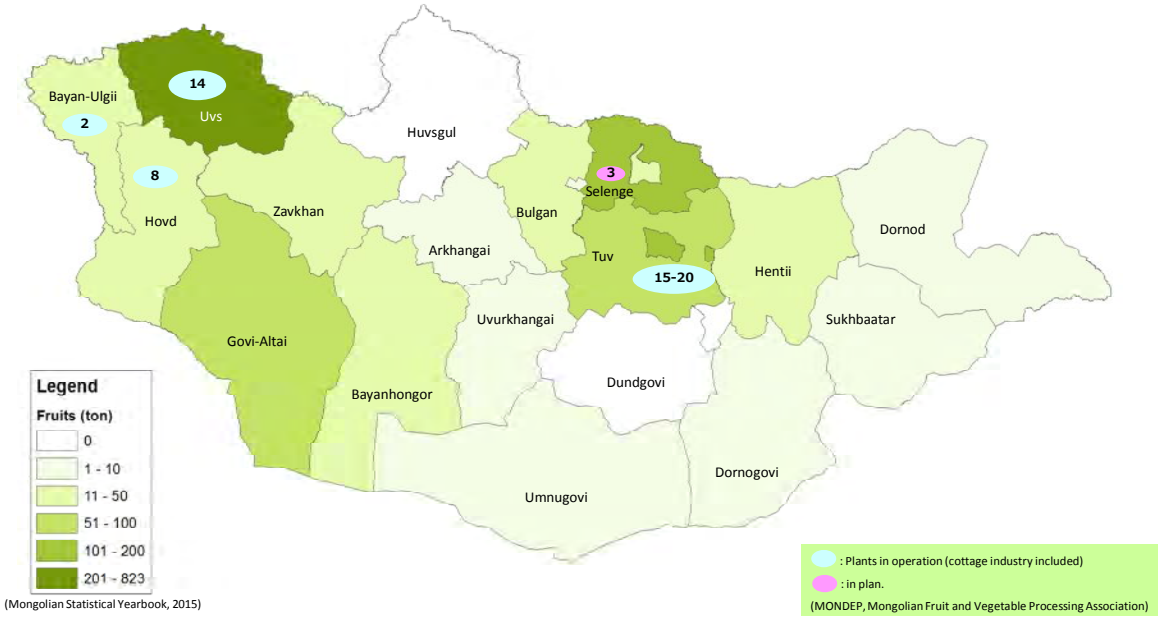


Figure 3.2.22 Number of Plants and Density of Fruit Production by Province

(5) Others

Apart from commodities already mentioned above, oilseed rape, forage crops, and buckwheat are relatively common in Mongolia. Oilseed rape production reached 10,000 tons in 2011, and then, with a little fluctuation, it has stayed at almost the same until recently[121]. The great majority of harvested oilseed rape is being sold to a commercial refinery, which is the only facility of its kind in Mongolia. Nevertheless, according to some sources of information, at times, depending on the market price, some farmers sell their produce directly to Chinese traders, thereby preventing domestic processors from running their production line. Also, this commercial mill produce animals feeds by recycling their own by-products. As mentioned repeatedly, in Mongolia, mobile livestock-keeping has long been independent of grain feeds (purchased feed included). This is why the animal feed industry has not taken root fully in Mongolia. As a result, almost all the intensive farmers who need concentrate feeds[122] have become highly dependent on imported feeds. Some experts strongly suggest that there be domestic feed plants as soon as possible[123] to ensure stable semi-intensive livestock and multifaceted development in agriculture in Mongolia[124]. Also important to the recent Mongolian agricultural industry is buckwheat. Some private companies have started doing their buckwheat business in Dornod since 2015[125].

Lastly, we would like to touch briefly on medicinal herbs. According to available literature, in Mongolia, over 800 plants have long been in use as medicinal herbs[126], such as Chinese liquorice[127]

[121] FAOSTAT.
[122] For animals that were bred for intensive operations, such as dairy farming, pig-raising, and chicken-raising.
[123] Banbat, U. and Sakazume, H. (2012). Development of concentrated feed production and distribution channels in Mongolia: A case studyof Company A. *The Review of Agricultural Economics* **67**: 105-112.
[124] Komiyama, H. (2007). Current trends in intensive livestock farming in Mongolia. Proceeding of the workshop on Mongolian vegetation, January 2007, P. 13-14., University of Tsukuba.
[125] JICA. (2016). MONDEP. *Op. cit.*
[126] Batugal, P. *et al.*, (eds.). (2004). Medicinal plants research in Asia-Vol I: the Framework and project workplants. International plant genetic resources institute.

(*Glycyrrhiza uralensis*, also known as *Kanzo* in Japanese). During the survey, we visited a small company and got factual information from executives. According to them, they commercially plant 100ha of medicinal herbs, such as Milkvetch (*Astragalus mongolicus*), Joint-pine (*Ephedra sinica*), and Lycium chinense (*Lycium ruthenicum*) as well as Chinese liquorice in their own fields in Govi Altai, and, after some treatment, export their products[128]. Another aspect that is striking and should be much appreciated about medicinal herb cultivation in Mongolia is that for growing medicinal herbs, those desert regions such as Govi Altai, Bayanhongor, and Umnugovi where, in marked contrast to the fertile northern region, Mongolian people commonly recognize as harsh and unsuitable environments for agriculture, are most advantageous. Adding to this point, one of the executives explained saying that "The severe climate conditions play an extremely important role in making those medicinal herbs what they are. As the saying goes: no pain, no gain. You cannot get really efficacious herbs from rich soils." Therefore, they do not utilize any fertilizers, trying to keep their fields as natural as possible. In reality, however, even without fertilizers and with minimum care, the executive says, the yield goes down gradually. In fact, a study says that Glycyrrhizin, a medicinal component of Chinese liquorice, occurs less in cultivated Chinese liquorice in comparison to the native plant[129].

Concerning the business aspects of the medicinal herbs, although they did avoid telling us everything openly, we got some relevant information as follows. They sell dried *Lycium chinense* at a price ranging between 400 and 500USD/kg. To get a kilogram of dried *Lycium chinense*, an amount of about 10kg of fresh plant would be needed, yet cultivation of this herb is not easy. Thus, in terms of profitability, medicinal herb cultivation seems to be promising, and, as mentioned above, the fact that this business could be an alternative for establishing a new agricultural value chain in the regions where farming activities are of minor importance is by definition good news.

3.2.3 Consumption and Import of Agriculture and livestock Processed Products

In addition to the production of both commodities and processed products, consumption and import of those products as well as retail sales of major agricultural products are also relevant from a point of view of demand and supply relationship. Nevertheless, we must preface this chapter by saying that as to sales information, although we asked almost all the companies visited, except for SUU Company[130], our attempts were all unsuccessful. Thus, with this being said, and, though based on highly limited sources of information, we would like to give an overview mainly about consumption and import of most basic commodities. As an aside, we think it would be ideal for Mongolia to establish a governmental agency analogous to the Consumers Affair Agency in Japan.

Concerning the relationship between production and consumption, especially in the light of demand-supply balance, an extensive study conducted by Tumurtogoo[131], including the trends during the late Soviet era, and estimations by the National Statistical Office of Mongolia[132] are most relevant. They include basic data and interrelated discussions on representative agriculture and livestock commodities such as meat and milk as well as wheat, potatoes and vegetables. A descriptive summary of these data is given in Table 3.2.10.

[127] Marui, A. *et al.* (2011). Cultivation Research for High–glycyrrhizin Licorice by Applying Low Temperature and Ca^{2+} Ion as Environmental Stress Based on Field Investigation. *J. Fac. Agr., Kyushu Univ.*, **56**: 367–371.
[128] Please note that in Mongolia, all the processors who consider about cultivating medicinal herbs for the commercial purpose, are responsible for obtaining the necessary permissions from the Ministry of Environment and Tourism.
[129] Kiyotomo, H. *et al*. (2012). Comparison of Quality of Licorice (*Glycyrrhiza uralensis*) under Different Groundwater Levels and Soil Conditions. *Journal of Arid Land Studies* **22**: 275-278.
[130] The sales figures by year from 2012 to 2015 are 10,900 tons, 13,700 tons, 15,200 tons, and 13,100 tons, respectively. Please note that they are far less than the company's capacity of 45,000 tons per year.
[131] Tumurtogoo, E. 2009. Food demand and supply of Mongolia. Mongolian State Univesity of Agriculture.
[132] Mongolian Statistical Yearbook, 2015.

Table 3.2.10 Description of Production and Consumption of Major Products

Periods	Meat	Milk	Wheat	Potatoes	Vegetables
Late Soviet era	$P >> C$	$P > C$	$P >> C$	$P \geq C$	$P << C$
Upon breakup of Soviet era	$P = C$	$P = C$	$P = C$	$P < C$	$P <<< C$
Up to 2000	$P >> C$	$P > C$	$P << C$	$P << C$	$P << C$
Up to 2008	$P \leq C$	$P \leq C$	$P << C$	$P \geq C$	$P << C$
Up to 2015	$P \leq C$	$P < C$	$P \geq C$	$P \geq C$	$P << C$

P: Production, C: Consumption

Source: Prepared by the JICA team based on the study done by Tumurtogoo and estimations by National Statistical Office of Mongolia)

Since the late socialist era until 2008, the consumption volume of all agriculture and livestock products has increased steadily at a rate of 1.0 to 1.3% per year[133], which seems to correspond with the population growth[134]. A sudden change or a swing in the relationship between production and consumption is presumed to be attributable not to downstream situations of the value chain, i.e. consumers, but to upstream situations, that is, production sites. Particularly, the most influential factor is the breakdown of *nedel*, the mega-system for centrally controlled production and nationwide distribution system[135]. In fact, during the socialist era, Mongolia was basically self-sufficient in the production of all the major products shown in the Table above except for vegetables. By contrast, upon the fall of the socialist era, the production-consumption relationships are quite different depending on the product. For instance, meat has stably been self-sufficient except for the years affected by disastrous dzud. As to a notable change about meat especially in the last decade, in which the consumption is at times higher than the production, it is not because domestic supply is insufficient, but because demand for imported meat especially chicken has increased significantly[136]. By contrast, regarding the production-consumption balances of milk, wheat and potatoes, their trends were all reversed. Nevertheless, amounts of time taken to reach a point of change are different from each other. According to the aforementioned expert, the following is the explanation for this situation. In the case of wheat and potatoes, the production plunged suddenly when the state-owned mega-farms collapsed because the supply system itself had been totally dependent on the state. As to milk, however, although the supply system belonged to the state (*negdel*), as was the case with wheat and potato supply, herders and specialized cows, of which the *negdel* consisted, still continued working as such for a longer period even after the collapse[137]. Adding to the milk supply, especially in the case of Ulaanbaatar, the supply has been in deficit for the past several decades, thus being highly dependent on import. As of 2014, as a result of the significant rehabilitation of milk industry, for which the SUU Company's contribution had been enormous, the dependency on imported milk was relatively low (ca 56%)[138], but in the years between 1998 and 2002, the rate was as high as over 90%[139].

Considering all those points mentioned above, it is only natural that in Mongolia all the commodities that cannot be fully supplied domestically have been fulfilled by import. The main agricultural products that are being imported to Mongolia are shown in Table 3.2.11. Major countries of origin are China, Russia, the USA, New Zealand, and Australia. These products, we think, could be categorized into the following three types: 1) Products that are not allowed to be grown in Mongolia due to climatic conditions such as some tropical vegetables or fruits, 2) Products that used to be supplied domestically such as dairies, and 3) Products whose counterparts which belong to the same family exist in Mongolia, but that, due to its low quality or different quality, thus being unsuitable for a specific purpose, cannot be supplied domestically, such as wheat or potatoes. Here, as to the category 1), as long as there is a domestic demand, Mongolia

[133] Tumurtogoo, E. 2009. *Op.cit*.
[134] On average, from 1989 to 2000, from 2000 to 2010, from 2010 to 2014, are 1.5%, 1.4%, and 2.1%, respectively (JICA. (2016). MONDEP. *Op. cit*.).
[135] JICA. (2016). MONDEP. *Op. cit*.
[136] Odsuren, T. and Nyamaa, N. (2013). Conjoint analysis on Mongolian meat consumption. *Journal of Agricultural Science* **11**: 133-137.
[137] Davaasuren, T. and Niinuma, K. (2008). *Op.cit*.
[138] Bazarragchaa, I. *et al*. (2015). Milk consumption and supply of Ulaanbaatar city. *Asian Journal of Agriculture and Rural Development* **5**: 263-270.
[139] Davaasuren, T. and Niinuma, K. (2008). *Op. cit*.

should go on with the same policy just checking the balance. Concerning the other two, however, we think, it all depend on what the agricultural policy would be like in the future, such as maintaining status quo, or import substitution industrialization.

Table 3.2.11 Major Imported Agriculture and livestock Products (2015)

Imported products	Livestock products								Agricultural products					
	Chicken and offal	Pigs and chicken fat	Powdered milk	Condensed milk	Butter	Cheese	Chicken eggs	Honey	Wheat	Potatoes	Onions and garlic	Cabbages	Citrus fruits	Apples
(t)	5,826	3,189	3,137	1,483	224	924	66	184	21,070	17,058	8.623	24,487	2,077	16,521

Source: NSO "Statistical Yearbook 2015"

3.2.4 Supply of Raw Materials

Concerning sources of raw materials, basically major processors and retailers purchase from domestic suppliers, such as herders, farmers, middlemen, and some others. In the case of fruits for processing, and some special ingredients or equipment indispensable for processing, however, they import from other countries. Those include, for instance, casings for making sausages, rennet and starters for cheese or yogurt, and chromium for tanning. Table 3.2.12 shows a summary of those sources.

Table 3.2.12 Sources of Raw Materials for Processing/Retailing

	Processors	Breakdown of suppliers				
		Herders	Farmers	Mid.	Others	Import
Livestock products	Meat plants (Packers)	++		++	Abattoirs	-Pig fat -Casings -Machinery
	Milk plants	++ Large plants		+ Small plants		-Powdered milk -Machinery
	Dairy plants	++		++		-Rennet -Starters
	Wool plants	++		++	"Upstream" actors	-Machinery
	Cashmere plants	++		++	"Upstream" actors	-Machinery
	Tanneries	+		++		-Chromium
Agricultural	Flour mills		+			-Seed -Fertilizers
	Potato	#	+	+		
	Vegetables	#	+	+		-In winter
	Fruits		+	+		-Frozen –Concentrate
Others	Sea buckthorn		n/a		Farmers (vertical)	
	Honey	n/a	+	n/a	Bee-keepers (vertical)	-Containers (glass bottles)
	Medicinal herbs				Certified producers	

*In Mongolia, mixed farming in which crop and livestock are combined is not common. Recently, however, some donors through their livelihood improvement projects[140] have been trying to integrate crop-farming into mobile livestock-keeping, thus drawing attention.

It is now widely recognized that to create a best-selling agricultural product, 1) Carefully selected raw materials, 2) Quality management, and 3) Feedback from consumers, are fundamentals. In fact, it appears that most successful processors, regardless of their country of origin, have, one way or another, completed those practices in their operation. In this regard, in Mongolia, based on the information and dialogues made with herders, processors and related individuals, we think, only a fraction of processors consider those aspects seriously. As observed above, uniformity of raw materials is extremely low, and the great majority of them are sold via unofficial routes to processors, where management methods of most processors are very poor. Thus, at present, it might be a little early for them to consider feedback system. Nevertheless, even in Mongolia, some modernized processing plants, especially in the large cities, boast their methods to purchase high quality raw materials, reliable management, which is corroborated by the accreditation of universal standards such as ISO or HACCP, and efficient feedback systems by which they hear the voice of their consumers to improve their products or to create a new product. On the one hand, such a movement seen among advanced plants is obviously contributing to the improvement of the Mongolian agricultural value chain as a whole, but on the other, only a fraction of traditional herders or farmers are integrated into these modern production cycles. In this regard, as mentioned above as a good practice, cluster-like approaches conducted by SUU or APU Companies, two of the most modern processors, are highly appreciated because traditional small-scale herders, of whom the great majority of Mongolian producers consist, are combined into these approaches completing an organic whole. As mentioned repeatedly in this report, of Mongolia's total land area, 80% is under pasture, and due to arid and cold climatic conditions, its potential for general crop-farming is extremely low. Thus, this is why, in Mongolia, the mobile livestock-keeping, based on this vast grassland, is indispensable, and, above all, any approaches for rural development that do not consider

[140] *Mongolia Livestock and Agricultural Marketing Project (2014 to 2017)* or *Integrated livestock-based livelihoods support program (2012 to 2016)* run by World Bank and FAO could be one of them.

this aspect, without doubt, may cause devastation of the grassland, which is by definition the nation's both spiritual and economic mainstay[141].

3.2.5 Issues in Agriculture and livestock Processing

The following issues are pointed out from the perspective of agriculture and livestock processing and the supply of raw materials for that processing.

(1) Difficulties in ensuring robust raw material supplies

Strictly speaking, this recommendation should not be directed toward the processors, but toward those producers. In reality, however, without raw materials supply, no processors could get down to business, as a whole, thus, this issue remains here to be discussed. As already indicated above, seasonality is by definition the most influential factor in every sense of the word. Nevertheless, it is also true that, regardless of the season of the year, general instabilities in supply quantity and prices are obvious. Therefore, "stable market" is urgent need of the processing industry, incorporating those producers within it.

Here, stable market means, be it for meat, milk, or any other agricultural commodities, leaving the details, a trading mechanism that guarantees constant participations of both producers and processors under mutually agreed conditions and requirements about crucial issues, such as prices, delivery form, quantity and quality. Here, the basic premise is, as repeated frequently above, the integration of both the ordinary herders, as the traditional component, and the modernized, but sustainable production system (Neo-traditionalism). This type of integration should be considered as the bottom line for any Mongolian agricultural value chains. In fact, all those examples as a good practice in this report, such as the cluster-like approaches conducted by SUU Company and Vidan as well as a promising scheme recently proposed by Yan (2015)[142] for establishing a new meat value chain all include this "Neo-traditionalism" concept.

(2) "Quantity" is more important than "Quality"

This could be again supposedly on the producers' side. Nevertheless, in the case of countries like Mongolia, where the manner of processing a great majority of commodities seems rather primitive, the quality of a variety of produce coming from producers exert a direct and strong influence on the products made by processors. Thus, it gives us all the more reason for improvement in quality. In terms of quality control, however, this does not mean all the products should be ranked as an "A". For instance, let us suppose that milk fat content must be higher than 3.5%, thus, now dairymen are not allowed to sell their milk if they do not fulfill this condition. A system like this, we think, would never be practical for the current situation in Mongolia.

With a cucumber value chain, Figure 3.2.23 to Figure 3.2.25 illustrate some possible systems how to improve quality of raw materials not only for the benefit of the processors but also of the producers. Firstly, Figure 3.2.23 shows, more or less, the current situation in which processors accept raw materials regardless of quality, such as size and shape. This system only can be reasonable in a particular setting where all the stakeholders in the value chain pay attention only to quantity but not to quality. Consequently, raising awareness to improve quality, as a whole, will be least expected.

Secondly, in the case of Figure 3.2.24, as shown above in the case of milk, processors have strict rules for what produce (cucumber) they will accept. In this case, they accept only, say, medium typed cucumbers. Thus, the processors find it much easier to handle for making their products, and

[141] JICA. (2016). MONDEP. *Op.cit*.
[142] Yan, W. *et al*. (2015). Planning an agent-based network for livestock production and meat distribution in Mongolia. *Proceedings of the Trans-disciplinary Research Conference : Building Resilience of Mongolian Rangelands*. Ulaanbaatar Mongolia. June 9-10.

consequently, uniformity of the products will be ensured, and further value might be added as well. By contrast, the producers (cucumber farmers) will be facing a problem of disposal of the remains, which could be sold before. Here, although there may be a few farmers who could adjust to the new system, most probably, the great majority of the farmers will not be able to handle the situation, thereby, intensifying the farmers' dependency more and more on middlemen.

Lastly, Figure 3.2.25 depicts a system in which the processors, although they pose a rule, accept a wider range of products according to the quality such as size, color, length, and blemishes. Thus, processors still find it easier to handle for processing. Also relevant for this system is that the amount of rejected cucumbers will be minimum. In terms of workload for farmers, since now they have to classify their cucumbers based on the requirements their clients pose, the chore may double; however, now they know, as long as they bother separating their cucumbers into some groups, pay-off accrue to them from it. What is more, through these chores, for sure farmers will have a good eye for checking their cucumbers and, eventually, quality of their products will improve as a whole.

All in all, we think, although there can be some advanced farmers such as Mr. Boldbaatar, the potato farmer mentioned above, who might be more interested in the Figure 3.2.24, the system depicted in Figure 3.2.25 would be, at present, most ideal and practical for the majority of the producers (herders and farmers) in Mongolia. Also important is that both Figure 3.2.24 and Figure 3.2.25 systems have a policy of disclosure of information, especially, pricing. It is now widely accepted that information asymmetry causes a negative impact on the ignorant party, mostly producers in this context[143] while processors or middlemen, on the other side of the ignorant, take advantage of the situation. The grading system introduced by AVSF Mongolia, mentioned above, and recommendations made by Mr. Boldbaatar are, we think, a springboard for integrating a most ideal and practical grading system into the Mongolian agricultural value chain.

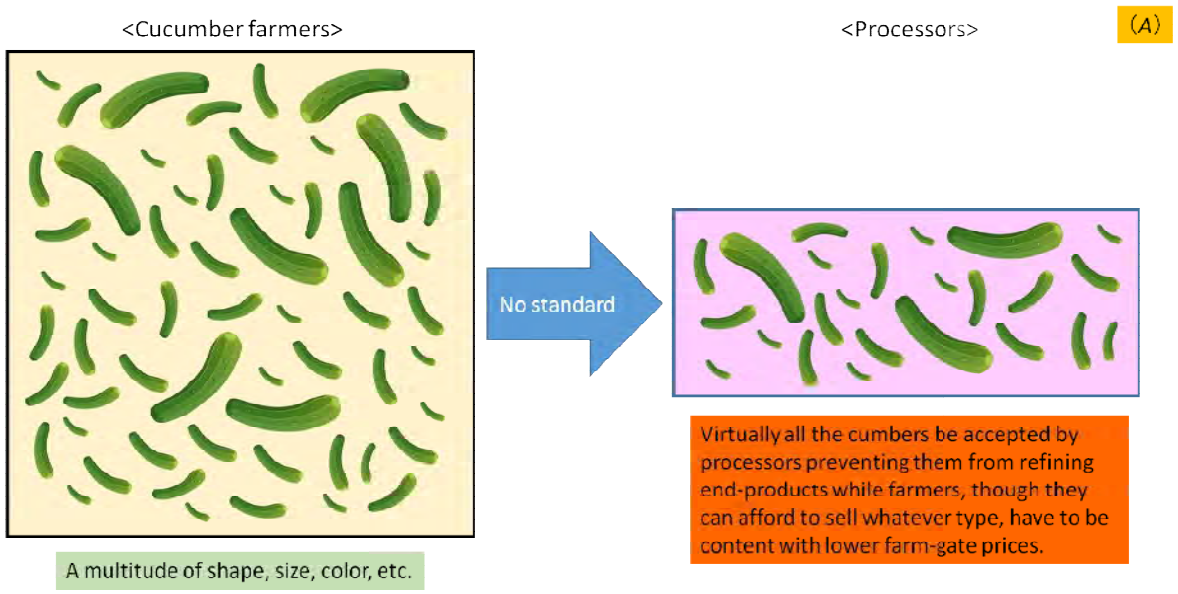


Figure 3.2.23 Relation between Raw Material and Processing (current situation)

[143] Mitchell, T. (2011). Middlemen, Bargaining and Price Information: Is Knowledge Power?, London School of Economics and Political Science.

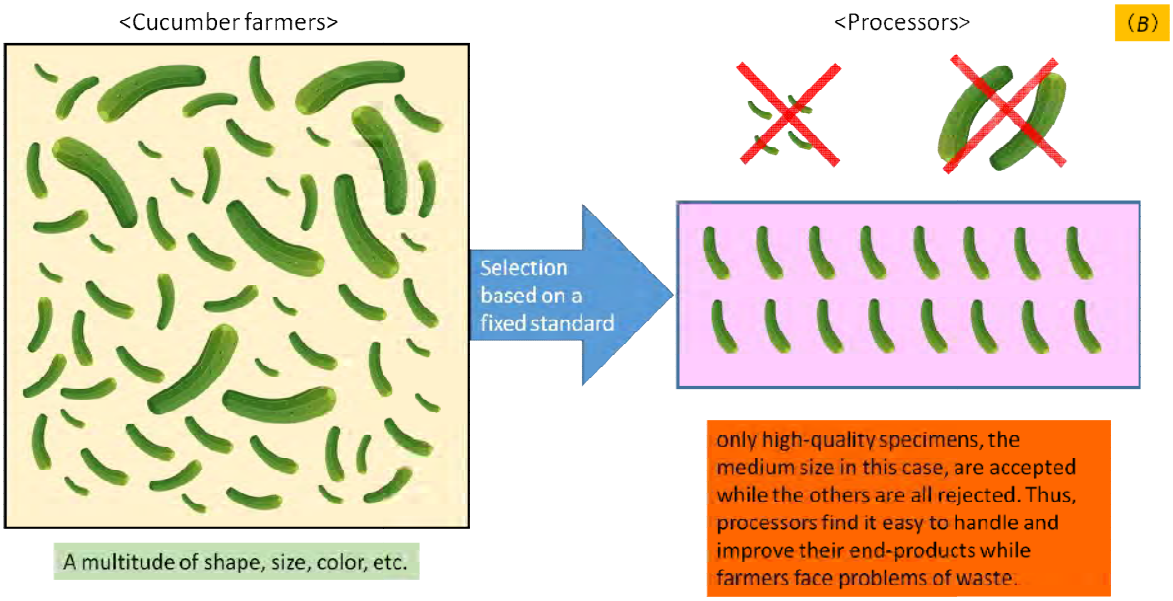


Figure 3.2.24 Relation between Raw Material and Processing (standardization I)

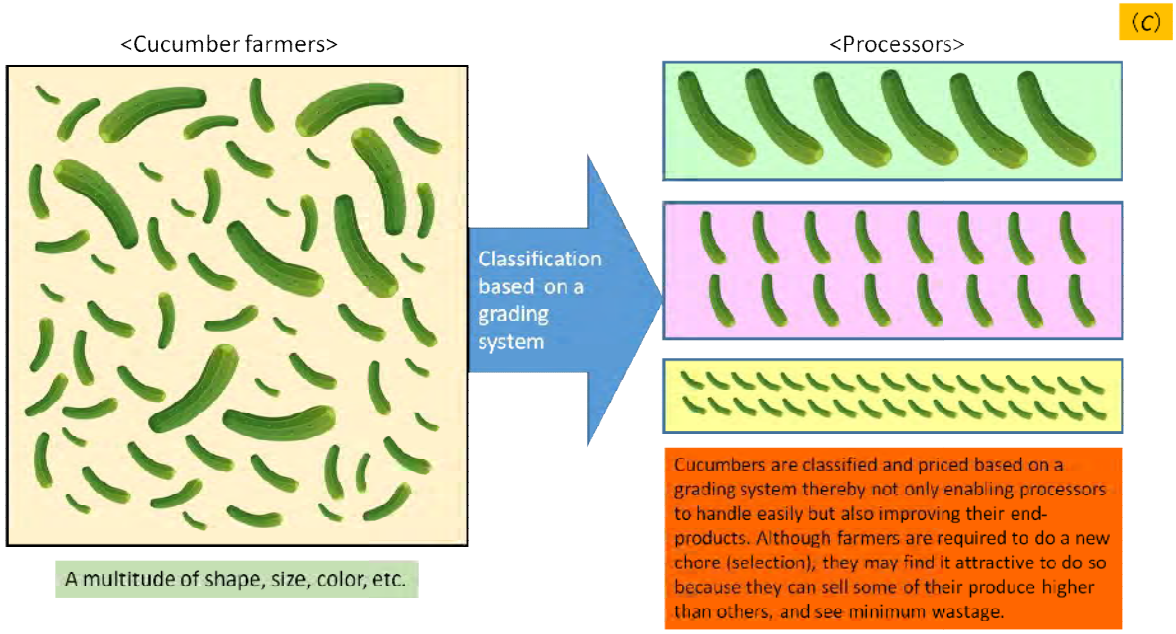


Figure 3.2.25 Relation between Raw Material and Processing (standardization II)

(3) Lack of feedback system

This is a recommendation directed exclusively to processors. The message is that, conceptually speaking, their marketing method should not be "Product out (=make and sell)", which is the most common method among the majority of the processors, but "Market in (=make to sell)", which focuses on discovering and meeting the needs and desires of their customers[144]. As described in the report mentioned above[145], during visits to meat processors, the mission team observed a lack of market oriented awareness not only among workers on a production line but also even among managing directors. To the team, those processors did not seem to care about improving quality nor enhancing palatableness of their products, such as hams and sausages. This tendency appears to be consistent with the result of the survey about the availability of "feedback system", in which the great majority of processors do not provide the system. By contrast, some processors such as SUU Company, APU Company or some intensive poultry raising operations (both layer and broiler), are very attentive to the needs of consumers through their own feedback system with a view to improving quality of their products or developing a new brand. Honestly speaking, during the visits, we felt as if we had been in other countries where well-developed marketing concept was established. In the case of SUU Company, much to our surprise, they use the feedback system not only for their consumers but also for producers (dairy herders) to share the information when necessary. Among others, the sachet type pasteurized milk (milk bag) of SUU Company, which is one of the popular products, could be a case in point. This product, since it is packed in a plastic bag, the bag sits awkwardly in the fridge once opened. Thus, listening to the voice of the consumers, they have invented a plastic pitcher for the milk bag[146]. Thus, it is only natural to hear that SUU Company has recently been awarded a prize for being "Best Consumer Supporter in Food Processors in 2017"[147].

(4) Lack of understanding about "Poor infrastructure and low technology"

Having gleaned a number of studies, reports and personal communications in the agriculture and livestock industry in Mongolia, it appears that poor infrastructure and low technology of the processors are causing a bottleneck, thus, reducing the capacity of the whole chain. In fact, it is true that in Mongolia poor infrastructure and low technology are obvious in general. In reality, however, as discussed in this report repeatedly, we do not consider the poor infrastructure and low technology as the most causative factors. The most crucial one, we think, would be the present socio-economic climate in Mongolia, under which no processors except for a few have the intention of investing heavily in infrastructure. As shown above, in some processors that have achieved accreditation of international standards, in Mongolia it is technically and financially possible for some processors as well as related institutions to find necessary information from abroad, bring in modern technologies, invite foreign experts, or install high-tech machinery. In fact, according to the dialogues made with some managing directors, some meat plants purchased a set of machinery under the condition that authorized mechanics go to the site upon purchase to give special operating instructions to the workers at the meat plants. In general, however, as mentioned above, almost all the processors are very reluctant to invest prohibitive costs in renovations or improvements, such as the flash freezing techniques, the plant for starch production or the refinery because they do not find the economy favorable to do so.

Again, the most crucial factor is to establish the stable market. For that, Recommendation I as well as Recommendation II should be in consideration. Once established, then, exactly what kind of

[144] Please note that here, since we are focusing on the lack of feedback system among the Mongolian processors in general, the "Market in" is being the principal idea. Nevertheless, as discussed in the chapter 3.2.3.2. Recommendations on marketing, the "Product out" approach might be most appropriate depending on the circumstances.
[145] JICA. (2005). Report of meat processing techniques in Mongolia. *Op.cit*.
[146] This pitcher is commonly seen in countries where the bag milk (sachet) is popular. Nevertheless, it was invented for the first time in Mongolia based on the voice of the consumers.
[147] *Mongoru Tsuushin*. (2017). No. 15, **604**:3.

processing techniques would be really necessary and how to prioritize those items will be identified naturally, thereby leading to a "to do list" for a practical action plan.

(5) No appreciation of the first-rate work of its kind

Concerning the following comment, although we are sure that it would be extremely important to the processors, we have to preface this recommendation by saying that it might be rather a subjective point of view. That is, we have been wondering if the Mongolian processors really know how they can process their raw materials better, or more likely, how they can convert, revamp, mould or transform the familiar materials, with a lot of dedication, into something extraordinarily beautiful, tender, soft, pleasant to touch, exquisite, gorgeous, or gourmet. For instance, as shown above, regarding the leather samples we got from the Mongolian tannery, although they had chosen their finest ones, according to the Japanese counterpart, the samples were, unfortunately, not top-notch. Equally important is the following case we heard when we made a visit to KE'KEN Textile Testing & Certification Center in Tokyo whose mission is inspection and certification for fabric products. According to one of the dignitaries of the aforementioned center, one of the members of a Mongolian delegation of cashmere industry with a view to expanding into Japanese markets, got totally upset, so furious at the comments made by a Japanese expert from one of the most renowned textile companies in Japan. The expert, though for the future benefit of the Mongolian processors to sell into Japan, was very candid about expressing his critical thoughts of the Mongolian cashmere goods. Unfortunately, the expert was only a mean critic to the Mongolian member who was one of the most famous cashmere plants in Mongolia. Of course, there is no need for every processor to be a master. Nevertheless, we do think that it would be ideal for them to have an opportunity to observe, feel, smell, taste, hear and appreciate the first-rate work of their products.

In conclusion, as mentioned above repeatedly, we do not think, at present, poor infrastructure and low technology of the processors themselves is the bottlenecks in the processing industry. The stable market based on improvements of raw materials, which are favorable for processing, and fortification of the supply system, would be in urgent need of the Mongolian agriculture and livestock value chain. Then, exactly what kind of processing techniques would be really necessary or should be imported will be identified naturally.

3.3 Hygiene and Quality Control

For agriculture and livestock products including foods and clothes, "safety" measure is the most important feature. Securing safety is the first obligation for manufacturers and producers and it is, especially for foods, a critical condition. The same is applicable for international trade as well as domestic one. In the case where there are some risks, the transaction may be sometimes restricted. If manufacturer or producer fails to conduct safety control, it is possibly hit hard in the market.

A range of acceptable risks of safety depends on the set norms of the country or society, and developed countries such as Japan and Europe often show much sensitivity towards safety. If a company put mislabelling or caused food poisoning incidents in Japan, for example, it would provoke a very sharp reaction and might make the company bankrupt. If there is any suspicion of harmfulness in goods or mislabelling, it may result in postponement or cancellation of the transaction. To secure the safety of goods, hygiene control is necessary for each process of production, i.e. raw material production, processing, distribution, and sales. Especially, in the case of export, some importing countries are very strict to accept the risk and exporting company should meet the quality standards required by the importer, which is sometimes so high. To meet such high level of safety needs, exporting country should improve the whole system of quality control in the country.

Quality control contributes 1) to maintain social livelihoods by preventing distribution of unqualified goods, 2) to give a sense of stability and safety to consumers and customer by providing stable quality constantly, 3) to facilitate processing and distribution by providing homogeneous raw materials and 4) to differentiate from competitors by setting and following standards. We can, in other words, gain the confidence of the market and appeal our products to the consumer by adopting quality control, gain value-added by processing, and offer with high price by standardization and differentiation.

As seen above, hygiene and quality control plays an important role to prevent depressing the value of the products and to make price higher.

3.3.1 Law and Institutions on Hygiene and Quality Control

What laws and Government organizations are applicable for hygiene and quality control? In this section, firstly, main laws and Government system related to food safety are overviewed, emphasizing on hygiene control because ensuring the safety of the people is a Government function.

3.3.1.1 Laws Related to Food Safety

There are 90 laws and regulations related to food, agriculture and livestock products. Food hygiene is controlled mainly by the Food Law whose amendment was enforced win 2013 and the Food Safety Law which was enforced in 2013. Additionally, according to the Food Safety Law, there are several concerned laws (Table 3.3.1).

Table 3.3.1 Main Laws Related to Food Hygiene Control

Name of laws	Outline	Enactment/ Revision
Law on Hygiene	To regulate obligation to practice hygiene regulations, to ensure labor safety and to give education on hygiene to employees, etc.	2016
Animal Health Law Law on Genetic Improvement	To regulate both veterinary and animal breeding issues. The law lacks regulation of disease diagnostics and surveillance, etc. And in order to improve the animal health protection, independent law on "animal health" including aspects of animal and public health are submitted to Parliament. Animal Health Law, Law on Genetic Improvement is discussed.	Revision under discussion
Law on State Supervision and Inspection	To regulate legal framework, purpose and measures of national inspection and monitoring activities. To let inspectors conduct on-site inspections, snap inspection, etc. to maintain the health of the population, healthy society, and healthy environment.	2010
Law on Plant Protection	To regulate diseases control of pasture and crops, damage control from rodent and weed control, etc.	2007
Law of Mongolia on Hazardous and Toxic Chemical	To regulate the treatment of toxic chemicals and hazardous at business operations such as import and export, production, storage, transaction, shipping, utilization and waste management.	2006
Law on Quarantine and Inspection for Transferring Animals, Plants, Raw Materials and Products with Their Origin through the State Border	To regulate quarantine at the national border.	2002
Law on Cultivate Plant Seeds and Sorts	To regulate genetic resource, seed inspection and seed production of crops.	1999

Source: Prepared by JICA Study Team based on Food Safety Law, interviews with GASI and "FOOD SAFETY AND AGRICULTURE INSPECTION DEPARTMENT"

(1) Food Law

The amended Food Law was enforced in March 2013. This Law is intended to supply safe and quality food stably to people.

In addition to the food security, the Law requires food business operators to conduct internal audits strictly in order to control hygiene and quality of food. The Law also requires consumers to select safe foods of which production area are confirmed, to learn correct knowledge and information on foods and to introduce good habits preventing food poisoning. On the other hand, National Government is required to introduce subsidy system to ensure food security and conduct investigation on quality and nutrients of foods, monitoring, and quarantine.

(2) Food Safety Law

Food Safety Law was enforced in March 2013, aiming to secure the safety of food including raw materials in all the stages of the food system. It is stipulated in this Law that securing food safety is the duty of food business operators and it should be kept and maintained based on scientific research and investigation.

The Law recommends food business operators to introduce traceability system as well as Good Agricultural Practices (hereinafter "GAP") in the agricultural production process, Good Manufacturing Practices (hereinafter "GMP") in the manufacturing process and Good Hygiene Manufacturing Practices (hereinafter "GHP") in all the process. The Auditing authority, GASI, is supposed to prepare the guidelines such as for GMP. Addition to that, the Authority should conduct training of food business operator on the guidelines, monitoring, investigation and public announcement of causes of food accidents. In the Law, it is required that food business operators undertake the obligation of recall, in the case of mislabelling, causing the incidence of food poisoning or supply of substandard food, etc., following the judgment of the Authority.

The designation and roles of National Reference Laboratory (hereinafter referred to as NRL) are also stipulated in the Law.

Outline of GMP/GHP

I. Food manufacturing plants and service facilities
   i. Design of plant and its' construction
   ii. Design of inside of plant
   iii. Facilities and supplies (water supply, waste management, cleaning and disinfection, dressing room and toilet, quality control laboratory, ventilation system, lighting, storage facility)
II. Food equipment and tools
   i. Equipment
   ii. Tools
   iii. Equipment and glassware used for quality control process
   iv. Short term storage of non-waste and food related ingredient
   v. Storing equipment
III. Raw materials and auxiliary materials (water, ice and evaporation, packaging material)
IV. Production stage of processing technology (requirements for raw materials and packaging specifications)
V. Final food product
VI. Food packaging and labeling
   i. Packaging
   ii. Labeling
   iii. Temperature control
VII. Record keeping in food manufacturing and certification
VIII. Storage, transportation, distribution
IX. Food contamination
   i. Cleaning and washing/sanitation (physical, chemical, combined method)
   ii. Sterilization / Disinfection (physical sterilization, extreme heat disinfection, chemical disinfection, factors affecting disinfection, final disinfection evaluation)
   iii. Pesticides and pest control
   iv. Waste management and disinfection
X. Individual hygiene and health requirements
   i. Medical examination
   ii. Infectious disease
   iii. Becoming a sick and accident
   iv. Personal hygiene
   v. Hand washing procedures
   vi. Hygienic practices
   vii. Protective gloves
   viii. Visitors
XI. Training and education program for staffs
XII. Public communication (Media and Advertising, complaints)
XIII. Recall, recycling and disposal of products
XIV. Internal control system

3.3.1.2 Institutional Outline of Food Safety Administration

In 2013, the National Committee for Food Security was established. The Committee has responsibilities for securing food and food safety, storage and transportation facilities for food exclusive use, promotion of intensive agriculture and livestock, development of food industry, etc. as well as for conducting an investigation on food poisoning risks and food-origin infective diseases. When food accidents occur, related organizations should take necessary actions in collaboration with each other. According to the interview with personnel, Department of Coordination for Food Production Policy Implementation, MOFALI, all the governmental organizations related to food safety participate in the Committee and MOFALI plays the role of coordination. The Committee holds a meeting in every half year with the Prime Minister as a Chairperson. The last one was held on 2nd February 2017 and limitation of import and export of food in FY2017 were discussed[148].

The roles of ministries are policy formation. MOFALI and the Ministry of Health, which has the Department in charge of food safety, establish the cross-ministries working group, deliberate and formulate policy related to food safety as necessary.

On the other hand, MASM, GASI, and authorized inspection agencies play the main role to manage food safety day-to-day. Deputy Prime Minister has direct control over MASM and GASI.

MASM issues the Mongolian National Standard (hereinafter "MNS"), which covers product standard including food, inspection standard and management standard.

There are many inspection agencies accredited by MASM. Main institutes are NRL under GASI and State Central Veterinary Laboratory (hereinafter "SCVL") under MOFALI and they are responsible to submit scientific data for monitoring.

Food business operators bear primary responsibility for food safety and GASI bears the responsibility to supervise them. Inspection Department of Food Security and Agriculture, GASI, proposes inspection standards on foods, agriculture and livestock products and veterinary, reviewing monitoring results. Then, afterwards, discussions in the Risk Management and Strategic Planning Department, GASI and decision of Deputy Prime Minister takes place, they are set. Inspection standards including inspection check lists and evaluation of high- medium-law risks will be updated once 3-5 years. They are updated, however, on at the time of formulation or during the revision of concerned laws/regulations, and recently, they are being updated every year.

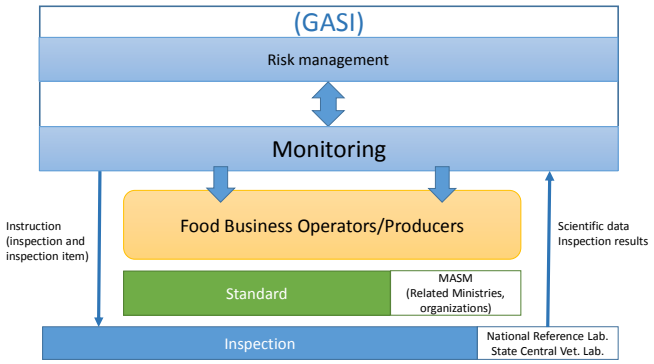


Figure 3.3.1 Food Safety Management System

[148] Mongoru Tsuushin No. 2017-6

3.3.1.3 Standard and Management

Food business operators are responsible for food sanitation control and standard management, by following the system as mentioned above. GASI gives trainings to food business operators.

(1) International Standard

As the domestic hygiene and quality control system has been established, companies' interests in obtaining ISO standards are increased. According to International Organization for Standardization (ISO), there were 18 companies/departments in 2015, total 184 companies/department accumulated from 1997, obtained ISO9001[149], related to, quality management and there were 7 in 2015, making total 27, obtained ISO22000 related to, food safety management.

There are 77 companies/departments for having ISO9001 including 17 companies/departments related to agriculture and livestock and 3 companies for with ISO22000, certified by MASM, in operation during 2015.

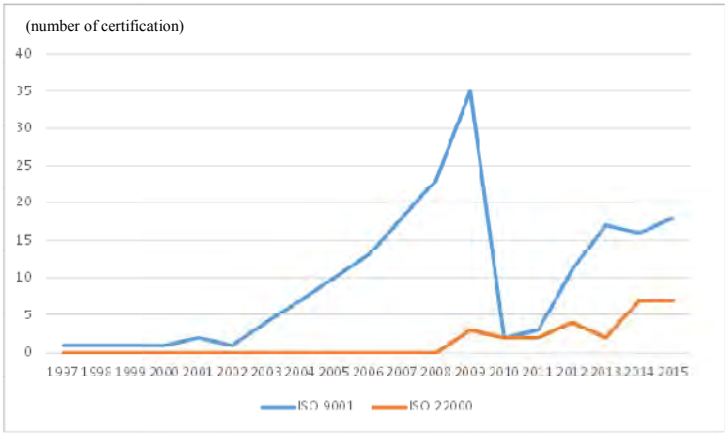


Figure 3.3.2 Number of ISO Certified Companies/Departments

Source: Prepared by JICA Study Team based on ISO Survey of Certifications to Management System Standard

In the last two decades, some companies have obtained quality management certification like ISO and HACCP, and more and more companies have been interested in quality control and introduction of some idea related to such management systems.

There are 86 food testing laboratories with ISO17025 accredited by MASM, not only in Ulaanbaatar but across the whole country. As mentioned earlier, all districts have GASI Laboratory and Veterinary Laboratory and, playing a role as an accredited laboratory. Recently, international networks have been established and mutual accreditation of certification body and laboratory to unify certification standards and to ensure comparability even in the case where certification is done in a different country, because international standards have become widespread and many organizations and companies are used to obtain such standards. MASM also participates in international networks, became a member of Asia and Pacific Laboratory Accreditation Cooperation (hereinafter "APLAC") in 2003 and the International Laboratory Accreditation Cooperation (hereinafter "ILAC") in 2007, and then joined the Mutual Recognition Arrangement (hereinafter "MRA") of both organizations in 2012. There are some accredited laboratories by ILAC under MRA and one of them is SCVL. Additionally, MASM applied to Pacific Accreditation Laboratory Cooperation[150]. Mongolian country establishes environment for

[149] Not limited to agriculture and livestockfields
[150] According to MASM web site and interview with MASM. Information of ILAC mutual accreditation of SCVL is based on the interview with SCVL.

international standard management. In 2016, private certification company for ISO management system was born in Mongolia and under application to MASM .

In principle, accreditation body and certification body should be independent each other to ensure neutrality. In Mongolia as well, now private certification body was born and certification section would be apart from accreditation section near future.

(2) National Standard

National standards, MNS, cover many fields including product, management and laboratory test. All the products referred in MNS list are required to obtain certification of MNS. MNS list covers the entire range of mass-production products. Business operators must proceed for the certification process independently. The procedures are as follows; 1) check the products at MASM accredited laboratory, 2) apply MNS certification to MASM, attaching result sheet of the test, 3) conduct screening by MASM, 4) retest, if in doubt, 5) gain approval on the usage of MASM number, if passed. After getting approval, business operators can sell their products with MNS number. Product certification of MNS is valid for 1-3 years, during this period, the business operator is supposed to conduct a necessary inspection by own burden and comply the standards.

Activities of MASM in provinces are important. On the other hand, it seems to be difficult to ensure comparability of certification level. Continual efforts such as constant information sharing and capacity development of staffs in provinces are needed.

(3) Conformity and Hygiene Control

As mentioned, GASI monitors conformity by inspections including on-site inspection. The responsibility of GASI includes prevention of hazard. They play very important role in hygiene control in Mongolia.

Table 3.3.2 Inspection Target by GASI (Agriculture and livestock Products and Food)

Field	Main items
Veterinary	Control and prevention of animal infectious disease; quarantine; animal movement and disinfection; quality, safety, hygiene and quarantine of animal originated food and non-food products; veterinary and hygiene confirmations and preventive measures of veterinary units and laboratories, etc.
Veterinary drugs	Storage, transportation, procurement, usage and price of drugs procured by the state budget; monitoring veterinary drug manufacturers, suppliers and pharmacies; special license for production and import of veterinary drugs and medical equipment; drug residue in animal originated raw materials and products, etc.
Animal breeding	Storage, usage, marking of semen and embryo, gene bank; registration of breeding animals generation; assessment of breeding activities, etc.
Plant protection and quarantine	Plant protection technological activities, safety and laboratory activities for plant protection; chemical, biological and mechanic disinfection; quality, safety, storage and transportation of vegetable originated products, etc.
Crops and seeds	Seed production, quality of internal and imported seeds; storage and protection of genetic fund, registration and storage of created sorts in genetic fund, etc.
Food production	Technological activities; standards, rules, regulations on production, transportation, storage, labeling and internal auditing; GMP implementation; preliminary inspection of new production, etc.
Public catering	Prevent probable risks; quality and safety of raw materials; quality, safety and transportation of prepared food, etc.
Food trade	Each step of food trading; conformity of laws and institutions; authorized entities of alcohol and tobacco, etc.

Source: "FOOD SAFETY AND AGRICULTURE INSPECTION DEPARTMENT", GASI

For example, GASI Dornogovi province office consists of 1st Inspection Department (education, health, food, quarantine, veterinary) and 2nd Inspection Department (construction, mineral resource, environment, labor), and Laboratory as well as Administration Department. According to bylaw January 2016, 40 personnel shall be staffed, 36 personnel including 5 researchers in Laboratory and 23 National Inspectors are assigned actually. In FY2016, they conducted 208 on-site inspections, provided 102 times of guidance and responded 10 accidents including food poisoning. Additionally, they implemented surveys, preventive inspections and trainings. In FY 2017, they have a plan to conduct 193 on-site inspections and to provide 98 times of guidance. They will also conduct surveys and trainings and take necessary response to application of approval and license and emergency accidents. There were 51 cases of violation related to veterinary and imposed fines on 21 cases of them, including 12 cases of violation on origin certificates and 5 cases of violation on handling methods to infectious diseases[151].

subdistrict governor recommends official of subdistrict government as an inspector in subdistrict and responsible Department of GASI Headquarter, in the case food and agriculture and livestock products, Inspection Department of Food and Agriculture who concurrently is in charge, examines documents and if he/she is qualified, give a license to inspect. There is no written or practical examination. The subdistrict inspectors have a duty to make and submit activity report at the end of the year and GASI headquarter checks the report. The valid term of the license of subdistrict inspector is three years. The valid term can be extended, on the other hand, it can be shortened in the case that the inspector makes an unqualified report. As some person of Dornogovi GASI complained that there seemed to be problems in the capability of subdistrict inspectors, staffing of appropriate person is difficult because some subdistrict governor recommend personnel without consideration on right person-right place or many people don't like to work in rural areas and there is no alternative person.

3.3.1.4 Laboratories

Monitoring activities of GASI are based on scientific inspection. Food business operators also need to check their products and raw materials and confirm their inspection results to control sanitation and quality.

Food business operators have a responsibility for hygiene and quality control of food and agriculture and livestock products by themselves and many of big companies and markets have laboratories in their own facilities. Accredited laboratories confirm the results of private laboratory tests and check the products in terms of conformity with the standard. The accredited food testing laboratories include 29 laboratories of food manufacturers, 4 laboratories in markets and 6 laboratories in research institutes or universities, largest laboratories are 2 kinds of national laboratories, GASI laboratories including NRL and veterinary laboratories including State Central Veterinary Laboratory (hereinafter referred to as SCVL).

NRL and GASI laboratories are in charge of food and agricultural products and SCVL and veterinary laboratories are in charge of livestock products.

(1) NRL and GASI Laboratories

GASI has laboratories attached to the branch office in each province and NRL. NRL is under GASI but remains rather independent and designated as only National Reference Laboratory in Mongolia by 15th Article of the Food Safety Law. According to the Food Safety Law, NRL has the responsibilities for 1) conducting food safety test and submitting the result to concerned administrative organizations with necessary suggestions, 2) making a database of the results of test conducted by accredited laboratories and managing them, 3) defining safety of food and gaining approval from concerned administrative organizations, 4) approving risk assessment policy, 5) developing and authorizing test methods and conducting technical inspections, 6) coordinating among accredited laboratories and providing technical

[151] Interview with Dornogovi GASI (17 March 2017) and "DornoGovi Aimag Specialized Inspection Department 2017", Dorno-govi GASI

guidance and trainings to accredited laboratories, 7) making recommendations on food sanitation management and technical rules, and 8) providing guidance on food testing and sampling and cooperating sampling in the case of food poisoning accidents.

The official name of NRL includes "food", however, NRL tests not only food but also water, cosmetics, medical supplies and construction materials. NRL has 141 staffs including 80 researchers.

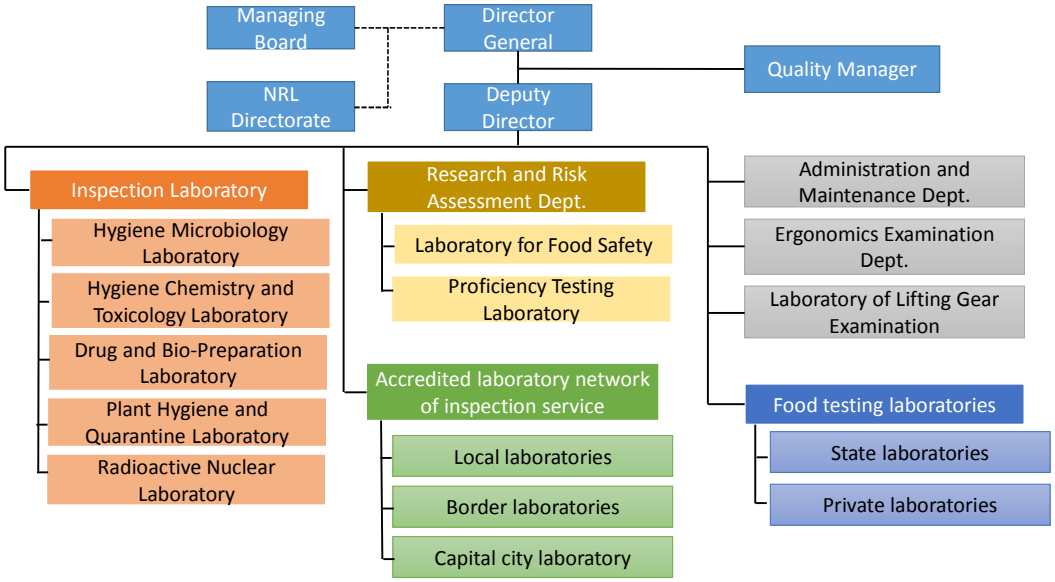


Figure 3.3.3 NRL Organizational Chart

Source: Prepared by JICA Study Team based on the NRL brochure and interviews to NRL

Basically, food business operators are supposed to take responsibility and inspection methods are up to each company, on the other hand, NRL approves inspection methods and sometimes conduct tests in response to companies' requests. Additionally, NRL is supposed to manage the safety of imported food. The total numbers of test samples are usually 32,000-35,000 in Chemical and Toxic Laboratory, 2,000-2,500 in Medicine Pharmaceutical Laboratory and 3,000-3,500 in Plant Protection Laboratory[152]. According to statistical data, in FY2014, test of imported food accounts for 58% of total number of test, test of domestic products in response to private companies and GASI inspectors accounts for 42%, in FY 2016, test of imported foods accounts for 20 % and test of domestic products accounts for 70-80%[153]. It tells the activation of management of private companies and inspection of GASI.

There are GASI laboratories in each province, in districts of Ulaanbaatar and national border, under NRL. Each laboratory has 3-7 staffs and consists 3 departments, 1) Plant Protection, 2) Chemical and 3) Micro Organism. GASI laboratories are supposed to send the results of tests to NRL.

For example, GASI laboratory in Dornogovi province conducts the test in 18 fields such as construction, tourism, and livestock. In the field of livestock, tests on import and export of meat, wool, cashmere and others are conducted. In FY2016, they conducted 2,258 tests on 4,517 test items, equivalent to 17,615,000 MNT. About 40% were conducted based on the request from private company or accident and their inspection fee were paid by the clients or companies who were responsible for the accident. The remaining 60% were GASI's own inspection and the inspection cost was borne by GASI themselves. Last year, they detected 158 non-compliance cases, 7% of total case of testing[154].

[152] NRL brochure
[153] Interview with NRL (14 March 2017)
[154] Dornogovi province Specialized Inspection Department (2017)

(2) SCVL and Veterinary Laboratories

In the field of veterinary, SCVL plays a role as Central Laboratory and there is a Veterinary Laboratory in each province. The main task of SCVL and Veterinary Laboratories is an analysis of disease property to prevent livestock infection.

SCVL has 52 staffs including 30 researchers, 6 departments under Director, 1) Transboundary Animal Diseases, 2) Parasitic Diseases, 3) Disease caused by Environment, 4) Epidemical Monitoring, 5) Food Sanitation and Chemical Residue and 6) Financial Affairs. Main activities of SCLV are 1) diagnosis of animal disease and disease control, 2) Veterinary research of raw material of animal origin and imported food and 3) capacity development of veterinarian across the country.

A nationwide information network system of veterinary was introduced into SCVL in July 2016 and into veterinary laboratories in every province in November 2016. In principle, veterinary laboratories in provinces are supposed to conduct research and tests on animal diseases and in the case that they cannot test in provinces, the samples should be sent to SCVL. The information network system contributes smooth sharing information on test results and occurrence status of animal diseases in rural areas among SCVL and all the veterinary laboratories.

SCVL also conducts tests of livestock products responding to GASI inspectors' requests or private companies' orders. Most of these products are imported one. If the products are a violation, SCVL is supposed to report GASI and GASI are supposed to decide the penalty. SCVL can analyze about 40 chemical or antibiotic residue and they often analyze according to the request from GASI laboratories at border ports.

As observed above, system related to hygiene and quality are established and concerned parties play each role. There are more than 500 standards listed as MNS related to agriculture and livestock and more than 600 related to food. Addition to the list, there are designated test methods on veterinary and livestock products for veterinary laboratories and inspection checklists for GASI inspectors. Every standard concerned parties established and each role they play should be harmonized.

3.3.1.5 Import and Export

(1) Quarantine

GASI Border Quarantine Department is responsible for quarantine. There are 36 checkpoints in Mongolia with a total of 326 inspectors (2014).Of which, 20 ports are border quarantine stations including 4 airports, 15 road ports and 3 railway ports (2 railway ports concurrently work for the road as well). The remaining 16 points are under control of inland customs. Main quarantine stations are Buyant-Ukhaa, an international airport in Ulaanbaatar, Zamiin-Uud of railway and road port, the national border with China, and Sukhbaatal of railway port, the national border with Russia (Figure 3.3.4)[155]. Transaction volume of Zamiin-Uud quarantine station is the largest (Table 3.3.3).

Figure 3.3.4 Quarantine Station

Source: GASI Border Quarantine Inspection

[155] ADB (2014): Modernizing Sanitary and Phytosanitary Measures to Expand Trade and Ensure Food Safety 2nd CAREC Trade Facilitation Learning Opportunity: Sharing the Baltic Experience- Proceedings: Mongolia, 6-8 October 2014

Table 3.3.3 Inspection at Border Port Laboratories (2016)

Name and Type	Totally inspection	Border passing	Inspection at border port	Inspection at Ulaanbaatar	Transit	By country to export							By custom			
						Russia	China	Germany	Poland	Japan	Korea	Other	Sukhbaatar	Zamiin-uud	Buyant-ukhaa Airport	Other
Live animals	360	345	299	43	3	104	162	4	0	1	13	76	4	53	95	208
Livestock raw materials and products (Meat and meat product, chicken, milk and dairy product, egg, honey, animal hair, leather, etc.)	2,099	1,970	722	1,236	13	99	1,672	4	9	34	36	244	29	1,591	172	307
Plant (wild plant, cultivated plant, seed and seedling, etc.)	572	567	480	84	3	0	559	0	0	5	5	3	0	96	13	463
Agricultural product (vegetable, potato, fruit and berry, pine nut, cereal, tea, forage, wooden product, etc.)	11,343	11,224	1,868	1,255	8,101	355	10,926	1	0	24	8	23	19	9,272	28	2,020
Processed food (chocolate, juice, alcohol beverage, drinking water, etc.)	327	312	261	23	28	32	209	11	0	12	14	48	1	77	105	144
Total	14,701	14,418	3,630	2,641	8,148	590	13,528	20	9	76	76	394	53	11,089	413	3,142

Source: Prepared by JICA Study Team based on Inspection at Zamiin-Uud Border Port Laboratory (2012-2016), GASI

Main activities of quarantine stations are; 1) inspection of foods and animal feeds to prevent diseases, 2) residue check (chemical and veterinary drug), 3) check of labeling on food and additive substances, 4) analysis of raw materials, and 5) confirmation of conformity with national standards and rules. Imported goods are divided to three categories such as high-risk, medium-risk and low risk, and according to the risk, necessary actions are taken. Imported goods categorized as low-risk are sent to customs clearing and others are sent to document inspection. Imported goods categorized as high-risk as well as goods suspected of the defect are sent to laboratory analysis. If necessary, NRL supports laboratory analysis. There were 5,744 test objects including 3,550 low-risk goods which were not the target of the test. Remaining 2,194 goods were checked, of which, 558 were categorized as medium-risk and took document inspection and 1,636 categorized as high-risk took document inspection, visual inspection and laboratory analysis[156]. Inspection items are described in Table 3.3.4.

Table 3.3.4 Main Inspections at Quarantine Laboratories at National Border

Commodity	Chemical/toxicology test	Plant quarantine	Microorganism test
Vegetables	physical damage, pH, nitrate, antioxidant, niacin, thiamine, riboflavin, Phosphate organic pesticides, organochlorine pesticide (for medicinal plants)	sensory analyses, bacterial disease, viral disease, foreign plants disease, domestic plant disease	salmonella, E.coli, fungus
Fruits	physical damage, pH, nitrate, antioxidant, niacin, thiamine, riboflavin, Phosphate organic pesticides, organochlorine pesticide, patuline	sensory analyses, bacterial disease, viral disease, foreign plants disease, domestic plant disease	
Honey	sucrose, reducing sugar, moisture, solid, ashes, acidity, tetracycline, sulfonamid, chloramphenicol, aflatoxin	–	–
Milk[*1]	fat, acidity, density, moisture, urea, melamine, aflatoxin, tetracycline, sulfonamid, chloramphenicol	–	salmonella, E.coli, B. cereus, enterotoxemia, general bacterial number,
Meat[*2]	Fat, moisture, ash, nitrate, nitrite, pH, phosphate organic pesticides, organochlorine pesticide, melamine, aflatoxin, tetracycline, sulfonamid, chloramphenicol	–	salmonella, E.coli, O157, campylobacter, listeria

[*1] Including dairy products for microorganism test

[*2] Meat except for poultry, pork and bushmeat and including meat product for microorganism test

Source: Zamiin-Uud Quarantine Station

Ports according to commodities are written in Governmental Resolution No. 173 passed in 2003 (Table 3.3.5).

[156] ADB (2014)

Table 3.3.5 Port by Commodity

Commodity	Port	
	Province	Quarantine station
Seeds, seedlings	Ulaanbaatar	Buyant-Uhaa
	Dornogovi	Zamiin-Uud
	Selenge	Sukhbaatar、Altanbulag
	Uvs	Borshoo
	Dornod	Ereentsav、Bayan-Hoshuu
	Bayanurugii	Tsagaan-Nuur
	Khovd	Bulgan
Animal, breeding cattle (import)	Ulaanbaatar	Buyant-Uhaa
	Dornogovi	Zamiin-Uud
	Selenge	Sukhbaatar、Altanbulag
	Uvs	Borshoo
	Dornod	Ereentsav、Havirga、Ulihan
	Bayanurugii	Tsagaan-Nuur
	Khovd	Bulgan
	Khuvsgul	Hankh
	Zavkhan	Ats-SUUri
Animal semen, samples (export)	Ulaanbaatar	Buyant-Uhaa
	Dornogovi	Zamiin-Uud
	Selenge	Sukhbaatar、Altanbulag
Raw meat, by-products of meat (export)	Ulaanbaatar	Buyant-Uhaa
	Dornogovi	Zamiin-Uud
	Selenge	Sukhbaatar、Altanbulag
	Uvs	Borshoo
	Dornod	Ereentsav、Havirga、Ulihan
	Bayanurugii	Tsagaan-Nuur、Ulgii
	Khovd	Bulgan
	Khuvsgul	Hankh
	Zavkhan	Ats-SUUri
Raw meat, by-products of meat (import)	Ulaanbaatar	Buyant-Uhaa
	Dornogovi	Zamiin-Uud
	Selenge	Sukhbaatar、Altanbulag
	Bayanurugii	Tsagaan-Nuur、Ulgii
	Dornod	Ereentsav
	Sukhbaatar	Bichigt
Seeds, seedlings, breeding cattle (export)	Sukhbaatar	Bichigt
	Dornod	Bayan-Hoshuu

Zamiin-Uud Quarantine Station[157]

Zamiin-Uud Quarantine Station, the largest in the country, was established in 1956 as a veterinary station. They started quarantine inspection from 1959, consisting of Administration Department and Inspection Department. The number of staff is 99, 15 for administration and 84 for inspection including 10 researchers in laboratory. They operate their works cooperating with inspection organization in Ereen-Khot in China. 1 in charge of disinfection, 4 inspectors and 1 supervisor, total 6 staff are dispatched to Khangi border port where is 250km away from Zamiin-Uud. Main inspection object at Khangi port is sheep meat.

Customs amount per day of Zamiin-Uud is 100-200 of cargo trucks, 600-800 passenger vehicles and 2,500-3,000 persons. Peak period is during August to September. Traveling and transportation of goods increase according to beginning of new school term in September. Addition to that, tourists increase in summer.

Inspection Department conducts disinfection of vehicles and inspection of cargoes. However, disinfection method of vehicle conducted in winter is to let vehicles run on mat with disinfectant and is not enough as compared to international standard, spraying disinfectant at vehicles from three directions. The object of cargo inspection is only goods categorized as high-risk, accounting for 38.4%.

Laboratory consists of Chemical Inspection Division, Plant Protection Division and Microorganism Inspection Division. Many plant origin commodities are categorized as high-risk. Inspection rate of plant origin commodity is about 70% and violation rate is about 0.87%. Chemical Inspection Division mainly analyses melamine, aflatoxin, mycotoxin, and antibiotics of imported goods as well as chemical residue of vegetables. They can analyse 25 kinds of agricultural chemicals but only existence or non-existence. They cannot perform quantitative analysis of chemical residue. If they detect any chemical, they send the sample to Ulaanbaatar. It takes a time and the commodity comes onto the market during inspection. In this circumstance, it is difficult to conduct quantitative analysis in an appropriate timing. They cannot analyse heavy metals. Laboratory is placed in the building of custom office. The building is decrepit and not for exclusive use of laboratory. Testing equipment is insufficient and also degraded and necessary to renew. Testing methods introduced are based on international standard and they exchange MOU with inspection organization in Ereen-Khot.

Many export goods such as wool, cashmere and leather pass custom. In the case of meat, Mongolia can export only horse meat as raw. Regarding others like sheep meat, goat meat and beef, they need to be processed. Inspection methods of export commodity are document examination, checking label and quantity of goods in compared as export certification. If actual cargo same as the certification, they check the cargo by X-ray in the case of truck. After inspection, custom office check document again. In the case of rail, cargoes are inspected in Ulaanbaatar and the car is sealed up. At border, document is only checked.

[157] Interview with Zamiin-Uud (16-17 March 2017)

Table 3.3.6 Actual Inspection at Zamiin-Uud Quarantine laboratory
(food and agriculture and livestock products)

Products	2012			2013			2014			2015			2016		
	Domestic	Imports	Total	Domestic	Imports	Total	Domestic	Imports	Total	Domestic	Imports	Total	Domestic	Imports	Total
Meat and meat products	20	3	23	20	2	22	23	4	27	2	9	11	30	5	35
Milk		12	12	3	18	21	1	11	12		8	8		6	6
Dairy products		6	6	2	13	15	6	1	7		13	13		7	7
Flour			0		6	6			0			0			0
Flour products	12	10	22	14	14	28	22	1	23	37		37	27		27
Other cereals		78	78		81	81		81	81		61	61		42	42
Sugar		17	17		16	16		2	2		2	2	1		1
Potatoes		30	30		11	11		36	36	1	52	53	1	9	10
Vegetables		4,591	4,591		4,800	4,800		3,653	3,653	4	2,441	2,445	3	2,711	2,714
Fruits and berries		1,087	1,087		1,173	1,173		702	702		721	721		1,187	1,187
Eggs			0			0			0			0	2		2
Edible Oil		2	2		3	3		2	2			0			0
Drinking water	18		18	27		27	30		30	3		3	25		25
Juice		2	2			0	1		1			0			0
Alcohol beverage		1	1		6	6		5	5	5		5		17	17
Seed		5	5		1	1	1	7	8		3	3		28	28
Others	14	297	311	11	314	325	17	192	209	9	163	172	23	115	138
Total	64	6,141	6,205	77	6,458	6,535	101	4,697	4,798	61	3,473	3,534	112	4,127	4,239

Source: Zamiin-Uud Quarantine Station

(2) Export Procedure

GASI, MNCCI, laboratories, and MASM are involved in the export procedure. MNCCI issues certification of origin, MASM issues certification of quality and GASI issues sanitary certificates. SCVL analyze livestock products and NRL analyze agricultural products and food.

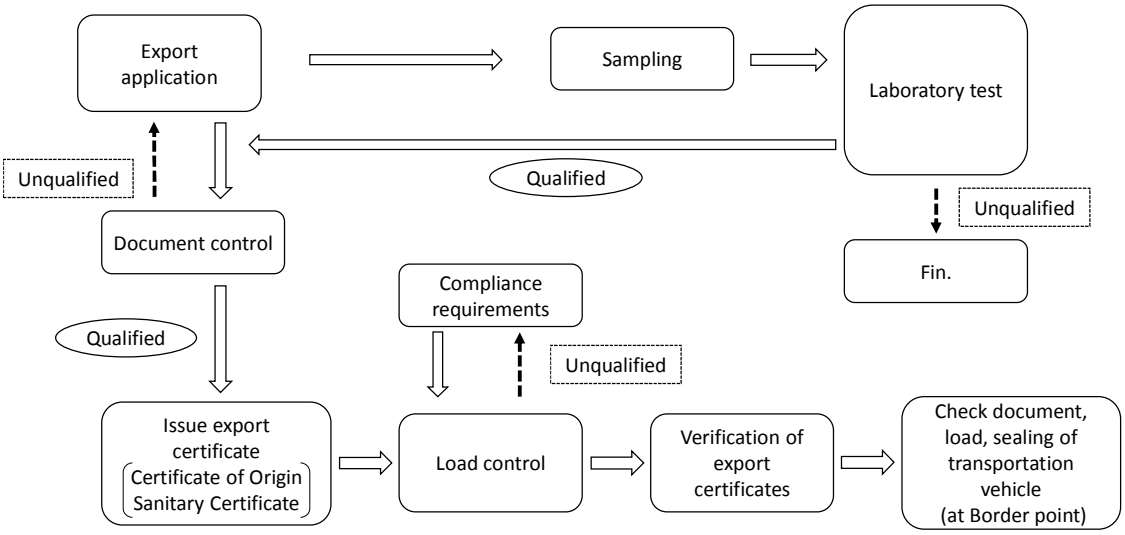


Figure 3.3.5 Export Procedure

Source: Prepared by JICA Study Team based on the "Examination for customs"(GASI) and ADB (2014) p.28

The export procedure of meat is as follows[158]:

Analysis at laboratory	Submit sample to SCVL, and receive transcript of inspection result (after 7-10days)
↓	
Acquisition of certification of origin	Submit transaction contract, delivery slip and invoice, company register and license for quality to MNCCI, and receive certification of origin
↓	
Acquisition of certification of conformity	Submit transaction contract, transcript of inspection result, certification of origin, GASI sanitary certificate and MASM certification of quality to MASM, and receive certification of conformity
↓	
Acquisition of veterinary certificate	Submit certification of origin, GASI sanitary certificate, MASM certification of quality, export license and permission from authorized organization of importing country to GASI, and receive veterinary certificate

[158] ADB(2014)

On the other hand, in the case of honey of Mihachi LLC, the customs office did not ask for any documents issued by MASM[159]. Requests vary depending on the departments and necessary documents and directions are sometimes different. Exporting companies are required to submit similar or same documents more than once during the procedure. They are often sent from one place to another because the tasks are segmentalized into many divisions. They must send a representative to explain again from the beginning if the new person is appointed. Additionally, it takes about a week to analyze samples and it takes 12 to 24 days to check documents[160]. These time spent and efforts made are hidden costs for companies. Simplification of the procedure, centralization of information management, strengthening of collaboration among related organizations and sharing information through digitization are necessary.

In any event, it takes a long time to gain necessary documents especially for the first case. Some exporting companies mentioned that if they build credibility with concerned parties after several experiences, the procedure would go on smoothly. Additionally, depending on contract types like OEM, an exporting company can get support from a business partner (importer).

3.3.2 Current Situation of Hygiene and Quality Control

As mentioned in the last section, food business operator bears a primary responsibility to control hygiene and quality and governmental organizations and inspection institutes monitor. Although overlapping and confusion are observed, it may be said that the system for hygiene and quality control of Mongolia has been established.

In this section, we analyze the current condition and clarify problems and challenges through detailed case analyses.

3.3.2.1 Current Condition of Hygiene and Quality Control in the Value Chain

Firstly, general management situation would be overviewed, e.g. how to control quality in each process.

(1) Production Phase

(a) Livestock

It is required to attach Origin Certificate issued by a veterinary to all the livestock products and live animals whenever they are transferred to out of subdistrict. The objects animal of Origin Certificate are swine, poultry, dog, cat, honey bee and deer (reindeer) as well as traditional five kinds of livestock and the objects product are meat and meat products, milk and dairy products, leather and skin, animal hair and eggs, etc.

Herders make a contract with a veterinarian in the subdistrict and ask the veterinarian to diagnose animal diseases, prescribe veterinary drugs and administer vaccines. Herders occasionally buy veterinary drugs from other than contracted veterinarian such as sales outlet in province center. Contracted veterinarian checks herders' usage condition of veterinary drug and confirms expiring of residue period, and then, issues the certificate. One sheet of Origin Certificate is issued with respect to each transaction regardless of the number of head or amount of transaction.

According to the interviews with herders near Darkhan, subdistrict veterinarian in Selenge province and Cashmere manufacturing company, Origin Certificates are actually issued to meat or live animals for meat only and are not issued to milk or animal hair. The Origin Certificate was attached to eggs in a

[159] Interview with Director General of Mihachi LLC on 16 April 2017
[160] ADB (2014)

retail shop in Ulaanbaatar. Only in Shaamar subdistrict in Selenge province, Origin Certificates are issued to honey.

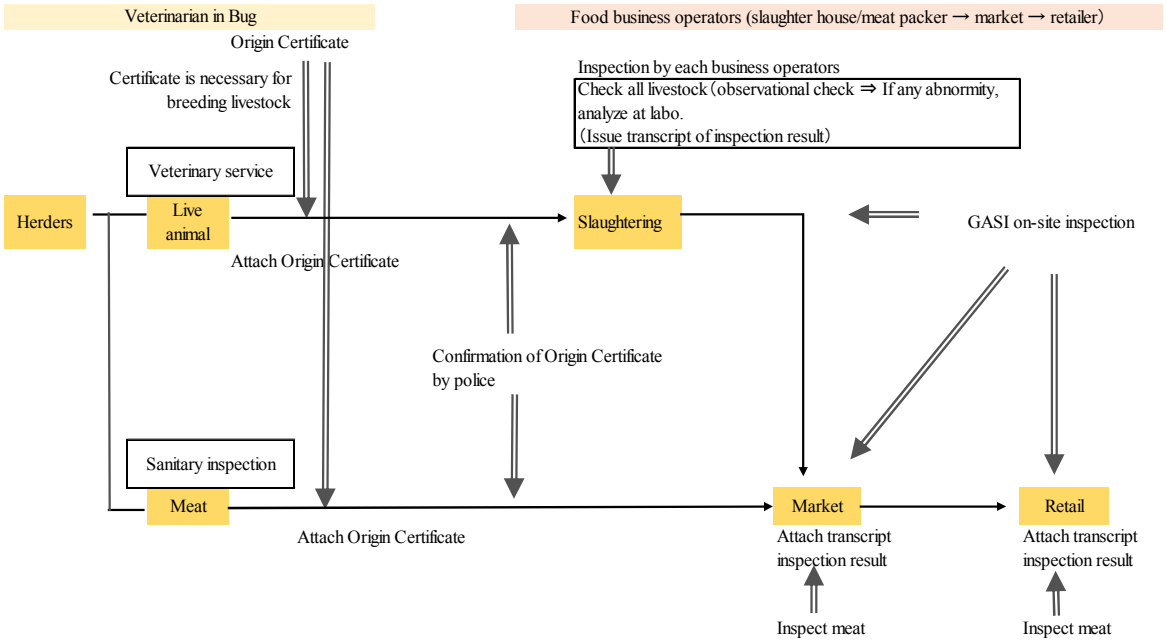


Figure 3.3.6 Inspection and Control in Meat Value Chain

Source: Prepared by JICA Study Team based on interviews

In the case of meat, an Origin Certificate is first attached to an live animal for meat when the animal moves out of the subdistrict. The slaughterhouse collects it at receiving the animal and attaches a second certificate which is a transcript of inspection result. There are private laboratories in both slaughtering areas of Emert and Naraikha near Ulaanbaatar, veterinarians of the laboratories have contracts with slaughtering companies and conduct visual inspection all the head of live animals before slaughtering and the meat after slaughtering. If any abnormity is found, veterinarian conduct laboratory analysis. After inspections, veterinarian issue the transcript of inspection result as a second certificate. After slaughtering, meat goes to markets with it and are inspected at the market. Second certificates are removed at market and 3rd certificate, transcript of inspection result issued by the market are attached for it. Third certificates are attached to the meat if retail shops or restaurants require. Original numbers written on Origin Certificates are taken over during this procedure.

Police check Origin Certificate during transportation, especially entering points into market or slaughterhouse. If there is no Origin Certificate or wrong one to be attached, police can order to stop the transaction. One meat processing company the Study Team interviewed emphasized that we can stay out of trouble if we carry correct Origin Certificate always. It is inferred that there are many cases to be charged with violation of Origin Certificate. Additionally, the inspector of GASI who showed slaughterhouses in Emert also mentioned a large volume of meat were distributed to the market without veterinarian's inspection. In Mongolia, the system for hygiene and quality control have been introduced but operation of the system is under development.

On the other hand, in many cases of leather or animal hair like cashmere, Origin Certificate are not issued. According to Mongolian Wool and Cashmere Association and cashmere manufacturing company, almost nobody implements grading nor sorting when the middlemen buy.

(b) Agricultural Products

The process of quality control for vegetables is generally the same as that of livestock.

When farm transfers vegetable to out of subdistrict, subdistrict Governmental official in charge of agriculture issues Origin Certificate. It is necessary to attach Origin Certificate to the vegetable at all the time during distribution because police checks it.

Recently, many farming companies sort products by size, appearance or damage, etc. For example, Gatsuurt LLC started processing business of irregular products.

(2) Distribution Phase

Each business operator takes a responsibility for controlling quality of agriculture and livestock products. Therefore, more and more business operators including markets have own laboratories to control the quality.

Markets surveyed, Mercury Market, Bars Market and Saruul Market in Ulaanbaatar, send goods to in-house laboratory to conduct inspection (in the case of Mercury Market, they ask Saruul Market's laboratory to inspect). In Saruul Market, they conduct an observational inspection, sensory inspection detecting odor and laboratory analysis such as pH, nitrate for vegetable and nitrite for ham (Table 3.3.7). Inspection methods of each item are specified in MNS. For vegetables, inspections are conducted once a month in Mercury Market and Saruul Market and every time when new vegetable come into the market from a warehouse in Bars Market. In Mercury Market and Saruul Market, they inspect meat of each head and dairy product of each product in the laboratory every day. Retailers in both markets attach a transcript of inspection result issued by the laboratory to their goods. The laboratories of Barc Market and Khuchit Shonhor Food Market are accredited by MASM.

Processing and packaging companies sort raw materials and do not purchase defective goods nor possible harmful materials to ensure the safety and quality of final products.

Table 3.3.7 Inspection in Saruul Market

	Contents
Inspection objects	Meat and meat product, dairy product, fish, fruits and vegetables
Inspection/checking item	Expiration date, presence of abnormity by observational and sensory inspections, pH, decay and deterioration, diseases, nitrate (vegetable), nitrite (meat product)
Frequency of inspection	・Every day or each product (meat and meat products, dairy products) ・Once a month (Fruits and vegetables)
Reject ratio	0-5%
Correspondence to defection	・Chemical treatment (disposal) ・Utilization as feed
On-site inspection by GASI	2-3 times/year (GASI had ordered to improve business and imposed fine previously)

Source: Prepared by JICA Study Team according to interview with Saruul Market

If MASM approved, business operators can use MNS certification number to their goods. After getting approval from MASM, business operators have a responsibility for the quality of their goods. The system is same as Origin Certificate. Many companies, especially large business entity, introduced management system and their laboratory and improved their hygiene and quality control. If we observe market distribution, however, we can find many goods below standard. Three years passed after enforcement of Food Safety Law. Although the Law recommends the introduction of GAP, GMP and

GHP for food business operator, 46.6% of companies recognized about that recommendation on GAP, 83.3 % on GHP and 68.8% on GMP respectively. Only 15.65% of companies introduced GAP, 82.15 % introduced GHP and 63.8% introduced GMP. As the biggest reasons of difficulty to introduce, 43.2% of companies in Ulaanbaatar listed "it is not required for our business", on the other hand, companies in provinces listed a shortage of human resources and knowledge (22.7%) and inaccessibility to necessary information(19.1%)[161]. More information and supports in rural area are necessary. To raise the whole level not only for companies in Ulaanbaatar but also in rural areas, it is important to activate monitoring activity, on-site inspection, training and educational activities of GASI across the country.

In next section, problems by commodity, honey, meat, milk, cashmere and leather would be analyzed more specifically.

3.3.3 Issues of Hygiene and Quality Control from Case Studies

Quality control introduces a pyramid framework or hierarchy into the products. Standards distinguish one thing from another and these differentiations are reflected to price and dignity of goods (Figure 3.3.7). To introduce hierarchy, stable distribution of mass and general products is needed.

After setting standards, first of all, it is important to minimize loss capability. It is possible to decrease irregular products through improvement of production technologies and to process irregular product by the development of new processing technologies or new products.

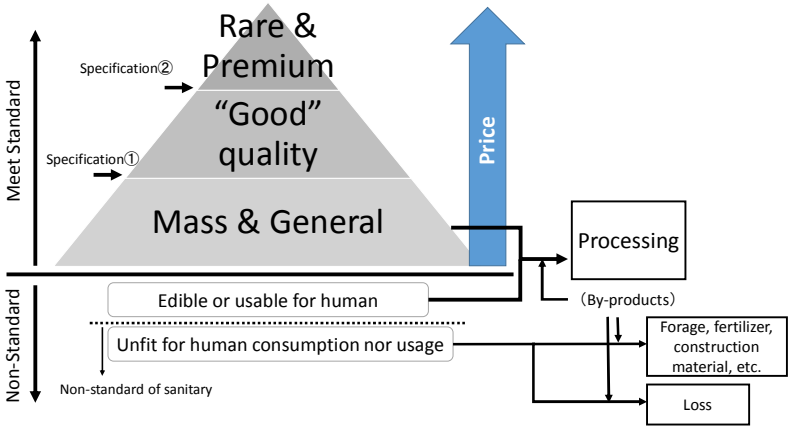


Figure 3.3.7 Principle Idea of Quality Control

Based on the perspective, in this section, we would analyze problems of hygiene and quality control, taking honey as an example. The reasons for taking honey are as follows; 1) although domestic market is at immature stage, exporting to Japanese market is in progress, 2) easy to understand the problems because of simple distribution and rather small sized production, 3) we can find similar problems with traditional livestock in Mongolia because most producers in both fields (herders and beekeepers) are small-scale and 4) production management system and check system of production stage were introduced to in some part of the country.

After studying the case of honey, we would overview the problems related to meat, milk, cashmere and leather.

3.3.3.1 Honey

At first, the latest situation on quality management would be outlined and then problems at each phase would be analyzed.

[161] IFC(2015)：Survey Report-Food Safety Law Awareness and Compliance

Value chain of honey are divided into one for domestic market and another for international market. Mainly three phases, such as 1) beekeeping, 2) filling/processing honey, 3) retail shop/consumer, compose value chain for the domestic market. Mainly four phases, such as 1) beekeeping, 2) sending to importer sample (1st screening), 3) exporting and customs clearing, 4) filling/processing honey in importing country, compose value chain for the international market (See Figure below). In Mongolia, today, in both chain, most honey is sold by beekeepers directly to retail shops/consumers or importer. In the most cases, small scale and family-run beekeeping operation sell their honey long-standing customers to their order by telephone or sell honey to consumer face-to-face at events held in autumn. Demand continues to outstrip supply recently, and more and more persons start beekeeping year by year. Some agricultural companies also started beekeeping, hiring beekeepers or entrusting their bees to beekeepers. Last year, Gatsuurt LLC, one of the largest agricultural business entity in Mongolia, opened their own plant of honey filling, started to their honey manufacturing business and collect honey from beekeepers.

(1) Management System of Honey in Domestic Market

At present, JICA is implementing "Generation of Rural Income through Beekeeping Development" in Shaamar subdistrict, Selenge province. This project introduced management system of the production process to beekeepers' production phase. Through the management system, beekeepers are required; 1) to use chemicals or drugs appropriately following instructions and remove honey after using chemical/drug (prohibit to use honey with chemical/drug), 2) to avoid agricultural chemical in apiary, 3) to disinfect honey bottle, hive box and hive tool and keep them hygienic. They are production rules for beekeepers who participate in the project activities in Shaamar subdistrict. Beekeepers must record 1) usage of chemical and drug (kind of chemical/drug, period and method of use) and date of honey removal after using chemical/drug, 2) environmental situation of apiary, 3) disinfection method and date of honey bottle, hive box and hive tool, 4) content of lot according to honey harvesting and storage condition and 5) occurrence of bee diseases.

Veterinarians in the subdistrict who had a contract with the beekeeper are supposed to check the records of the beekeeper. If the veterinarian can confirm that the beekeeper follows production rule, he/she issues Origin Certificate Additionally. The veterinarian has a duty to check hive boxes of contracted beekeepers, occurrence situation of bee diseases and beekeeping management, twice a year. Beekeepers can get certificate mark and seal it to their product, honey bottle, after receiving Origin Certificate. The mark informs consumers that the honey sealed it is the production of Shaamar subdistrict and produced under the production rules.

On the other hand, beekeepers are supposed to send their honey to the laboratory to be checked if the honey meets the standard of MNS. Retail shops demand beekeepers to submit a transcript of inspection result issued by the laboratory, once a three month to one year depending on the shop. In the laboratory, content of reducing sugar (MNS standard: no less than 80%) , moisture content (MNS standard: less than 21%), sucrose content (MNS standard: 10% or less), viable bacterium (MNS standard: 1×10^4/g or less) heavy metal (MNS standard: 1.0mg/kg or less of Pb, 0.5mg/kg or less of arsenic, 0.05mg/kg or less of Cd) should be analysed.

According to Gatsuurt LLC, they check apiary of each beekeeper in beekeeping phase. They demand beekeepers to send their honey to SCVL for above analyses before delivery. When collection, they check the sugar content of honey sampled every container and if the sugar content of honey, they reject.

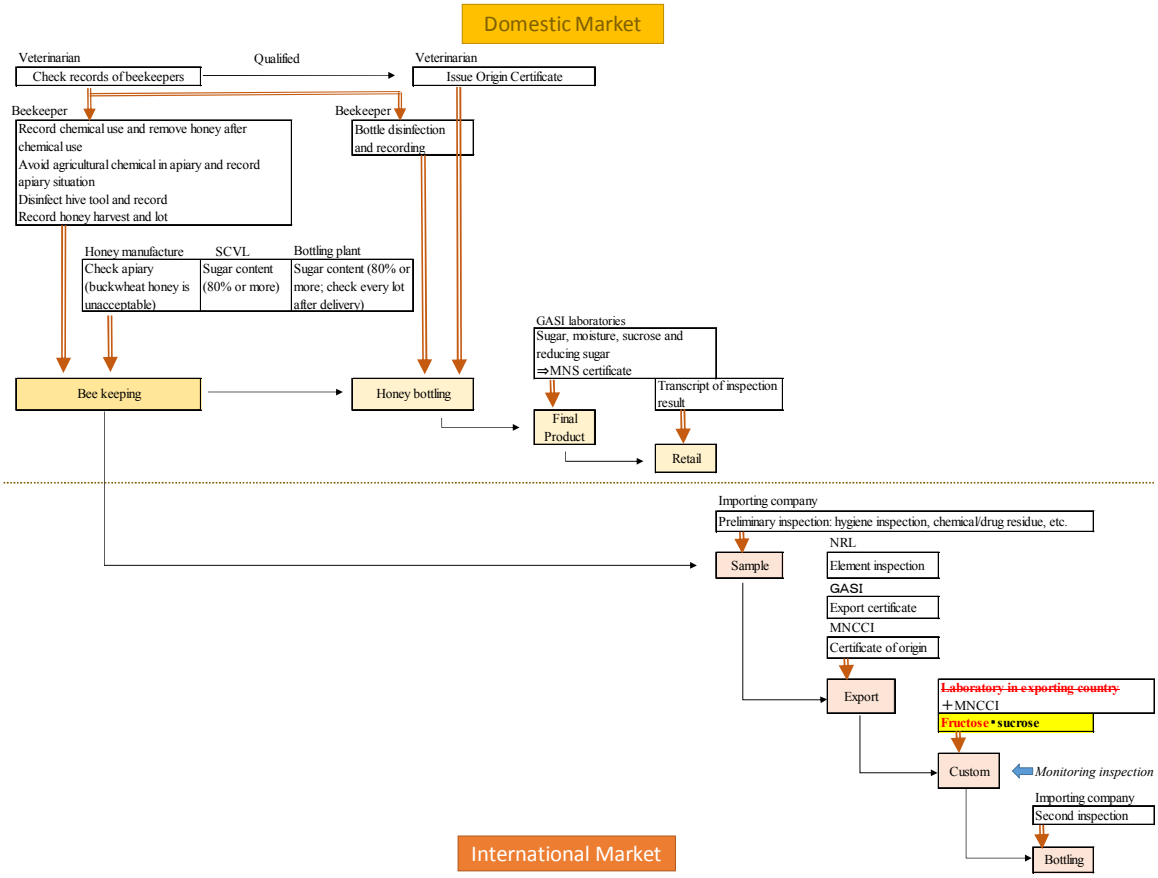


Figure 3.3.8 Situation of Quality Control of Honey

(2) Management System of Honey for Export and Customs

In the case of exporting, the quality control must meet the standard and social situation of importing country. Now, export of honey to Japan is under process, and in this report, we would study the case exporting to Japan.

Developed countries including Japan adopt positive list to control residue of agricultural chemicals and veterinary drugs and set residue standard of 0.01ppm or less for the chemical/drug out of the list. At the quarantine in Japan, if they detect a violation of residue standard, in some cases make public about product name, exporting country and importer. Therefore, Japanese importer hopes to avoid the risk of violation and control the residue very strictly.

In the case of honey, about 90% of the distribution in Japan are imported honey and every professional honey manufactured in Japan have own laboratory with high capacity. Some companies can analyze several hundreds of chemical/drugs residue.

In this exporting case, the importing company "J" received samples from six lots of Mongolian honey beforehand and conducted a preliminary check at own laboratory in Japan.The result was the detection of one kind of veterinary drug from one lot. This case was not a violation because the amount of residue was less than 0.01ppm. However, J Company mentioned the possibility of not purchasing the lot if it exceeds the detection limit, in order to prevent any small risk even there is nothing officially illegal.

There are difficulties at customs as well. Japan imports natural honey in distinction from artificial honey. Tariff rates are different from each other, 25.5% for natural honey, 50 % for artificial honey and 12.8% for natural honey under Mongolia-Japan EPA. If exporter in Mongolia export honey under EPA, which

is to say by 12.8% of tariff rate, they are required to submit necessary documents, transcript of inspection result certifying 1) sucrose content is 5% or less of total weight, 2) fructose content is more than 30% of total weight and more than 50% of total sugar content. However, exporting company could not find any laboratory to be able to assay fructose in Mongolia. Therefore, the sugar analyses of honey were conducted in Japan, in this case, after arriving at the port in Japan and the transcript would be submitted to Japanese custom office (the honey was under analysis as of 20 June 2017).

After custom clearing, the importing company will conduct a second check and the bottling to sell, if they do not detect any abnormity.

(3) The Problem on Quality Control of Honey

The specific problems would be described in this section.

(a) Beekeeping Phase

There is no registered chemical nor veterinary drugs for bees in Mongolia. Beekeepers import from China or Russia and use freely. Instruction written in the chemical/drugs is Chinese or Russian. Sometimes, there are several kinds of goods with the same chemical component. It is strongly doubtful whether beekeepers understand chemical component and instruction of usage. It is serious problem for safe production. Regarding the veterinary drug detected in Japan, the exporting company "M" had never used the drug. Incorporation route is still unknown. M Company imported the bee colony with the hive box from Russia last spring, it was likely to be caused by the imported hive box. However, the drug generally is used for human as well as livestock and the possibility to be incorporated into water resource or honey plant is undeniable. At first, it is strongly necessary to determine the incorporation route. Additionally, most important and immediately feasible thing is to let beekeepers use chemical/drugs very carefully to reduce risk, especially in the circumstance that veterinarians' activity on beekeeping and laboratory analyses of agricultural chemical and veterinary drugs are limited.

Level of beekeeping technology in Mongolia is low in general and productivity of honey is also low. These problems on production have negative effects on production process management. Beekeepers are reluctant to discard honey even after using chemical because production volume is limited. They also are not willing to use honey for the process with reasonable price. These behaviors of beekeepers is one of the reasons of constraint for the emergence of high valued honey. Additionally, veterinarians have little knowledge on beekeeping and cannot give beekeepers appropriate guidance. The appearance of production group who introduce a new standard to produce high-quality goods, for example, with premium generated by scarce as well as stable and mass distribution of honey with stable quality and price are expected[162].

Low level of beekeeping technology may be conducive to importing bee colony. It is possible to allow entrance of bee infectious diseases and chemical/drug residue. Today, only documentary inspection is conducted at the quarantine station. Inspector never opens hive boxes. Some beekeepers told that the documents issued by Russian veterinarian were often irresponsible. It is needed to control diseases and chemical/drug use under cooperation with Russia and China.

(b) Honey Bottling and Processing Phase

Mongolian Beekeepers Association worries about effects of consumers concern about mislabelling such as false information of production area or mixing of sugar on the domestic market. Introduction of

[162] Gatsuurt LLC requests beekeepers to deliver honey harvested from natural pasture, not from agricultural fields. They desire to produce top brand, "Limited" honey harvested from scarce and unique flowers.

traceability, accumulation and distribution of correct data and analysis of sucrose can contribute to clear up consumers' doubts[163].

Plastic bottles or containers are often used for selling or storing honey. If they are not appropriately manufactured for food, toxic substance may leak out of plastic. Gatsuurt LLC is going to introduce metallic cans for collection and storage and would provide the cans to the contract beekeepers from next season.

Gatsuurt LLC demands beekeepers not to mix buckwheat honey. This is because many people evaluate buckwheat honey bad taste because buckwheat honey has peculiar smell and taste. Gatsuurt LLC turn their attention to that to improve the quality of their products by removing buckwheat honey. Addition to that, buckwheat honey has a high content of ash and not fit to feed for bees. On the other hand, however, buckwheat needs insects including honeybees for pollination. For agricultural production, it is desirable for honeybee to go buckwheat field. If this goes on, although large amount of buckwheat honey are produced every year, it will be loss and beekeepers must discard. In Poland, they produce honey wine from buckwheat honey. In Japan, in some cases, buckwheat honey are used for processing using technology to remove color and smells from honey. They are used for juice, confectionary and cosmetics, etc. For mass production, the technology of homogenization is necessary to stabilize quality and quantity. If any manufacturer introduced new technology for processing, they can utilize buckwheat honey for processing in future.

(c) Retail Phase

Beekeepers are required to submit the transcript of inspection result of their products when they start a transaction with retailers. The transcript is unnecessary for each lot. The retailers require submission once in three months to 1 year only, and some beekeepers, especially small scale beekeepers deliver irregular products without consideration. Many of them, as well as inspectors in rural areas, do not understand the rule correctly. According to GASI laboratory in Selenge province, even in the case that the inspection indicates irregular results, the inspectors are not capable to give necessary instructions to the beekeepers and thus just let beekeepers send their product to laboratory again. It is very difficult to improve in such circumstance. In fact, JICA Study Team observed irregular honey, such as honey with many foreign matters, very low sugar content or fermented one.

It is also necessary to improve inspection ability. We found the transcript of wrong inspection result[164]. Some researcher could not detect their mistakes. There are rules and systems to control quality, but they are not functioning well. Additionally, there are problems of cost. For laboratory analyses, beekeepers need to pay and submit a sample, one of cost. Now, laboratory requires 150-500g of honey for each analysis. Necessary analysis reaches to 7 items and more than 2kg of honey are needed [165](Table 3.3.8).

Table 3.3.8 Necessary Sample for Honey Inspection

Inspection	Necessary sample	Inspection	Necessary sample
Bacteria	300g	Heavy metal	300g
Fungus	150g	Radiation	500g
Toxicity	250g	For storage	300g
Chemical	300g	All	2.1kg

Source: Extracted by JICA Study Team from "Necessary sample for sanitary inspection" GASI laboratory in Selenge province

[163] International market including Japanese market also very much concern about fake honey produced by feeding bees by isomerised sugar not flower or mixing isomerised sugar to honey and develop new technology to detect such fake products. Now we can detect such products if isomerised sugar were used.
[164] It reported sugar content 87.6% and moisture content 23.5%.
[165] Sales price of honey is about 20,000 MNT/kg recently. The cost of 2kg of honey is rather big for beekeepers.

There is a problem at retail. Many shops sell sugar added honey with natural honey in same shelves. Although sugar added honey is labeled with information of sugar added, the letters on label information is too small for consumers to understand. It is no wonder that many consumer doubt of honey quality. Color and taste of honey differ depending on the type of flower, but, in many cases, beekeepers sell a huge variety of honey in same bottle and same price with no information. These situations confuse consumer as well.

In Ulaanbaatar, we can find much imported honey that are bottled rather than packed in small containers. Many beekeepers, however, still sell their honey in big containers with 750g or 1kg. Producers can not follow to change in consumers' preference because of divided information situation.

(d) Exporting Phase

Recently, the international market is concerned about production place deceptions and residues of chemicals and drugs. Honey manufacturers are sensitive about production place deception especially because it is said that exporting honey with wrong information on production country deliberately increase.

In this case exporting to Japan, J Company, importer in Japan, requested for expansion of trade in future; 1) to introduce management system of production process by producer, 2) confirmation of the management by independent third-party such as Veterinary Department and introduction of traceability and 3) to issue Origin Certificate to honey across the country.

In Mongolia, today, a few laboratories analyze only about 40 kinds of chemical/drug residue. Importers must conduct preliminary check in Japan before import, however, improvement of analyses ability including chemical residue analyses leads to reduce the risk of importers and make importers try to import easier. The number of agricultural chemicals and veterinary drugs distributed are so huge that laboratory can not analyze all. Importing countries usually list up the chemicals/drugs as prioritized items and exporting country is better to collect information before and analyze following to interests of importing countries.

Currently, there is no laboratory to be able to analyze fructose quantitatively[166]. This is a bottleneck for honey export to Japan. In the transaction between M Company and J Company, M Company sent their sample to the laboratory in USA where was designated Japanese Ministry of Health, Labour and Welfare for sugar analyses and submitted the transcript of inspection result with MNCCI's stamp to Japan. However, Japanese custom did not accept it. Japanese custom demand to submit the transcript issued in exporting country or issued in Japan. Although M Company paid expensive inspection charge, all was lost. In this case, sugar analyses were conducted in Japan. The inspection cost about USD 450/lot, totally USD1350. Analyses take about two weeks and storage at the port during the period also is costly. There is a risk of the ship back depending on the result of analyses. Production amount of Mongolian honey is very small and very expensive in compared to other countries. The cost burden of laboratory analyses is so heavy because the volume per lot is also so small. An urgent solution of this problem is critically important for continuous exporting of honey to Japan.

It is also necessary to harmonize domestic standard with CODEX, international standard and standards of exporting countries. If there are different, exporters must conduct similar inspection many times.

To export, exporting country should establish the system meeting to importing country's requirements.

[166] According to interview with Director General of Mihachi LLC in March 2017. Laboratories analyse total amount of fructose and glucose only.

3.3.3.2 Meat

In Mongolia, meat is very important products. 240,000-280,000t dressed meat is distributed per year. It is said only about 10% of them are processed in a proper slaughterhouse[167]. Nearly all of the meat are slaughtered by herders themselves for self-consumption and consumption in neighboring areas or distributed by middlemen, unofficial channel. As previously mentioned, contract veterinarians are supposed to control the sales to out of subdistrict. However, contract veterinarians witness only transactions and condition of slaughter and storage after slaughter are uncertain. Transactions inside of subdistrict and actual conditions of direct selling are unclear.

The official distribution channel is through meat plant including slaughterhouse and meat processors. According to Mongolian Meat Association, there are about 70 meat plants in Mongolia. The Association has information of 61 companies of which. Current situations of hygiene and quality control of 49 plants, which belong to the Association, are summarized in the Table 3.3.9.

Table 3.3.9 Situation of Hygiene and Quality Contol of Meat Plants in Mongolia

Control	Number of company	Share
own a laboratory in plant	18	36.7%
ISO22000 certified	1	2%
ISO9001 certified	1	2%
HACCP certified	1	2%
Domestic certification certified	35	71.4%
With feedback system	9	18.4%

Source: JICA Study Team

As mentioned in Section 3.2 “Agriculture and livestock Processing”, in the official distribution channel, many meat plants, especially in and around Ulaanbaatar, have own laboratory and are certified by MASM. In general, the veterinarian, employee of the plant, check if there is anything wrong, holding animals alive for 48-72 hours after receiving animals. If there is nothing wrong, livestock is sent to the succeeding process, slaughtering. After slaughtering, veterinarians check head, inner parts and meat of all heads of livestock by visual inspection. If there is no abnormity, the meat goes into distribution.

According to the Association, they introduced grading system of meat. Veterinarian classifies meat to three grade by fat condition. In the retail phase, however, many price differentiation is caused by to be bone or not, or frozen or not mainly. A few retailers sell the meat with different price by parts. JICA Study Team found only one company who classify the meat by meat quality.

Meat retail shop in Mercury Market emphasized they sold raw meat (not frozen) only. The frozen meat recognized in one of the meat plants was temperature-controlled but not humidity-controlled. The meat in the frozen warehouse was scattered without being packaged. These conditions result in quality deterioration. Consumers have a demand for “tasty” food. It is necessary for food manufacturers to meet the needs by appropriate quality control.

[167] FAO(2016)：Enhancing Meat Exports for Mongolia

Case study 1
X Company is one of largest meat processing company. They has their own laboratory in the plant and the laboratory was accredited by MASM. They analyze all the necessary inspection including bacteria test and nitrite residue test by themselves excepting products for export. They have own grading system of meat for processing, classifying "high", "1st" and "2nd", and utilize for the process corresponding the grade of the product.

Case Study 2
Five veterinarians of "Y" Company conduct several inspections before and after the slaughtering. After slaughtering, three of them check visually in the case of small sized livestock. One veterinarian supervises whole, one checks inner parts and one check carcass. In the case of largely sized livestock, they designate three points, the conditions of holding places before slaughtering, heads and inner parts after slaughtering, as CCP (critical control point). Additionally, they set unclean area before peeling of skins and clean area after peeling. But there is no partition or wall, human and things move freely. They have veterinary laboratory and laboratory for the product. During operation, GASI inspector conducts on-site inspection every day. Especially export products, they inspect all the time. Veterinarians of importing country (Russia and Iran) come to check sometimes.

About export, 18 companies of which 61 companies have experience (1 company are under preparation). Y Company we visited had stopped export cloven-hoofed animal meat because of FMD occurrence. FMD is a critical problem for exporting meat as many experts and concerned parties pointed.

To export, exporters are required to establish meat plant met to requirements of importing country and gain approval from importing country. They must prepare facilities, staffs and procedural manual, etc. and invite official inspectors from importing country to be confirmed.

In the case of export to Japan, the designated standard on animal health requirements for hear-processed meat and its products derived from cloven-goofed animals.

Main requirements for exporting to Japan
・ The Ministry of Agriculture, Forestry and Fisheries of Japan designate the approved processing facilities for the term of two years in principle as the facilities where the meat and its products derived from cloven-hoofed animals are entitled to be hart-processed to be exported to Japan. Japanese animal health authorities conduct an on-site inspection of the facilities at the expenses of the exporting country to confirm whether they meet the designation standard. ・ It has to be confirmed that the cloven-hoofed animals for the production of heat-processed neat and its products are free from any animal infectious diseases as a consequence of ante – and post-mortem inspections conducted by official inspectors of the national government of the exported country at the slaughter facilities where are approved by the national government of the exporting country. ・ Heat processing is the treatment according to the standards for Heat Processing Stipulated by the Ministry of Agriculture, Forestry and Fisheries ; ・ The meat and viscera (excluding digestive tract, uterus and bladder) derived from cloven-hoofed animals must have been heat-processed after being completely deboned by heating through either of the following two ways; 1) to keep the temperature at the centre of the meat and its products at temperature of 70 degree Celsius or higher for one minute or ore by boiling or exposing them to heated steam in excess of 100 degree Celsius, 2) to keep the temperature at the centre of the meat and its products at temperature of 70 degree Celsius or higher for 30 minutes or more by heating in a water bath, drying in hot air or other ways. ・ The sausage, ham and bacon derived from meat and viscera of cloven-hoofed animals must have been kept more than for three days without freezing after being completely deboned and processed by means of curing or in other similar ways, then heat-processed by either of ways mentioned above. ・ Designated standard for designated facilities are as follows; ・ The designated facilities shall have a preheating area which is exclusively for treating raw materials furnished with necessary equipment, and a post-heating area which is exclusively for treating heat processed products furnished with necessary equipment, and both area are shall be completely isolated from each other to prevent cross-contamination. ・ The preheating area shall have facilities for storage, treatment and inspection. ・ The post-heating area shall be walled off completely from the outside and have equipment or instruments for inspection, cooling, storage or packing after heat-processing ・ Floors, walls and ceilings shall be smooth and easy to clean; floors shall be made if impermeable materials, sloped properly and provided with drainage and can be easily disinfected. ・ The designated facilities shall be equipped with facilities for decontamination as well as water supply facilities which can supply sufficient water for cleaning. ・ Procedural manual for preventing the occurrence of sanitary hazards and ensuring proper quality in a series of ore-heat-processing, heat-processing, and post-heat processing shall be equipped. ・ Personnel who supervise the compliance of the series of procedure are posted.

In Mongolia, National Strategy for FMD was developed according to OIE Terrestrial Animal Health Code and approved by the Cabinet in May 2015. The strategy was endorsed by OIE World Assembly of Delegates as an official control program for FMD of Mongolia in May 2016. Animal Health Law, Law on Genetic Improvement and Law on State Supervision and Inspection will be revised soon.

On the other hand, it is far from controlled following international standard because many of livestock are slaughtered out of official slaughtering channel. Residue inspection of veterinary drugs is limited for times and varieties of medicines and is not enough. In production, herders often use drugs without prescriptions issued from veterinarians and it is necessary to review usage rules depending on medicinal substances, e. g. introduction of prescription medication[168]. The collaboration, sharing information and smoothly commands among concerned parties including MOFALI as registration agency, SCVL as a research agency and GASI as inspection agency are also necessary.

[168] The institution to designate the drugs required legally veterinary prescription for obtaining. For example, in Japan, many of antibiotics, hormonal agents, vaccine are designated.

In 2016, PPR occurred in Khovd province. Affected 1,830 heads of goat and sheep with PPR in 11 subdistricts were reported[169]. It was a first in Mongolia and a new threat. Enhancement of surveillance system as well as conducting epidemiological survey is strongly needed.

Regarding export of meat, Mongolia constantly has a risk of infectious diseases of livestock and importing country demands strict requirements. Exporters must process uninfected livestock following designated rule and standard and prevent cross-contamination consistently. On the other hand, the domestic market requires a much lower level of control than that of exporting market and to deal the meat for exporting separately from the meat for the domestic market is a realistic way.

3.3.3.3 Milk and Dairy Products

In the case of fresh milk, 7 companies of 8 surveyed have own laboratory, at least 3 laboratories of 7 are accredited Laboratory of MASM in some analysis items. And 1 company obtained ISO 9001 certification, and 2 obtained HACCP and ISO 22000.

Of which, the quality control process of APU is: (0) collecting milk; 1) accepting milk and inspection, 2) storage, 3) cleaning, 4) homogenization 5) disinfection and cooling, 6) storage, 7) filling, 8) inspection, 9) shipping. The company provides guidance on safety and relief of food, quality management and farm management to 300-350 contract herders.

According to the herder contracted with SUU JSC near Darkhan, the contract condition is more than 29% of milk fat ratio, no contamination of foreign matter, and fresh milk. SUU Company checks the freshness of milk every time of purchasing and reject if the milk is old. They also check milk fat once several days. Cooling mild is important for transaction and herders can not sell very freshly expressed milk because SUU JSC purchase only lukewarm or cold milk. Although checking methods at purchasing milk are imprecise, such as to mix milk with concentrated alcohol, to judge by tactile impression, they seem to do their best as possible. Such company's behavior influences herders, and herders also attempt to deliver sanitary and high-quality milk, e. g. the herder surveyed told that she kept milk cooling by water from the well during storage in summer. SUU JSC manages milk by lot, they analyze milk fat, alcohol, specific gravity and residue of at least 11 chemical agents and 13 veterinary drugs after acceptance in the own laboratory.

For dairy products as well as honey, finding residues of veterinary drugs are critical issues. If the milk are contaminated with residues, the whole milk in the tank will be of disposal or loss. It is a significant matter for milk companies. However, checking before mixing to tank are limited due to the ability of analyses. Under this circumstance, the most important thing is to avoid residue of chemicals and drugs. So it is necessary to introduce GAP or production process management o beekeeping industries.

There are milk and dairy products sold in a bucket on the roadside. In Mongolia, brucellosis breaks out with high frequency and milk should be heated thoroughly. Herders milk by their hand, do not have a refrigerator in many cases. Recently, more and more milk are processed in a nontraditional way, and consumption of non-processed and natural cheese is increasing. Thus, the more time spent on distribution are extended, the more difficulty of hygiene control is severe. Considering these change in distribution and consumption, disinfection and storage methods should be improved. Provision of training, information sharing, educational activity on food safety and veterinarians' instruction are important.

Separately from hygiene control, new approach on quality control will be possible. In Mongolia, "milk" does not mean only cow milk. In Mongolia, "milk" can be referred to as the milk of sheep, goat, horse, yak and camel. Cow's milk is mainly sold in the supermarket, etc., in addition to it, alcoholic

[169] Sixth Meeting on Strengthening on Transboundary Animal Diseases and Emerging Infectious Diseases by Mongolia, China and Russian Federation

fermented horse milk and a small amount of fermented camel milk are distributed. Traditionally, however, Mongolian people use several kinds of milk. These kinds of milk must have own taste, smell and function. If these characteristics are clarified scientifically, it is possible to create business opportunity in future. In Mongolia, people often say that qualities of dairy products are so high because plants in pasture lands are good. In that case as well, a scientific approach should be introduced to strengthen market influence.

3.3.3.4 Cashmere

Much Mongolian cashmere is exported as raw materials. According to Mongolian Wool and Cashmere Association, herders seldom or never sort raw hair and broker buy all the hair including good and bad quality one. Although large integrated cashmere manufacturers purchase raw cashmere from contracted herder according to the grade, to have the mindset of quality management, depending on color, character or length, are difficult for herders because they can sell all of their raw cashmere to broker.

To export cashmere, inspection at SCVL and MASM certifications are necessary, and in addition to them, for international markets, the information on diameter of fiber, average fineness, average fiber length and mixture ratio are required. In Mongolia, testing centers of the wool and cashmere research institute in Mongolian University of Science and Technology analyzes according to the MNS standard. They analyze average fineness, average fiber length, color fastness of fiber and dimension change rate. This testing center obtains certification of inspection on diameter of fiber and average fineness from International Wool Textile Organization[170].Additionally, large integrated cashmere manufacturers have own laboratories and conduct necessary analyses within companies. 6 companies (37.5%) of 16 companies surveyed have own laboratories. For export, however, they must order inspection abroad because there is no laboratory to conduct mixture ratio and average fiber length in Mongolia. It takes time and cost.

In the case of cashmere, the hair is so expensive products and mislabelling from mixture of other animal hair. Previously, in Japan as well, these accidents were very big problems and Japan Textile Federation published “Guideline on Quality of Imported Textile” in 2008. KE’KEN Textile Testing & Certification Center in Japan issues certification of 100% of cashmere products and some retail shops also requires manufacturers to submit a transcript of inspection result on mixture ratio issued by Japanese official inspection organization. Some manufacturers conduct an inspection at each process of five phases; 1) cotton, 2) dyeing, 3) yarn, 4) in-mid of processing and 5) final product[171].

Correct labeling on mixture ratio is essential for export. According to the Guideline of Japan Textile Federation, it requires to conduct an inspection and manage the process from planning stage to selling stage to avoid mislabelling. To trace from manufacturer to herder is necessary to meet such requirement.

Of the 16 companies surveyed, Gobi Cashmere and AVSG produce products by OEM. For OEM, manufacturers are required to have the technologies for fiber fineness and capacity for stable quality evaluations, as well as to meet the quality control standards of customers. Therefore, it is necessary for manufacturers to have specific quality targets to develop a system to conduct quality control from the stages of raw materials to final products. Also they are expected to build the capacity of quality managers who supervise the whole process. In China, raw cashmere and gilled cashmere are graded and managed by the code number of each grade[172]. Introduction of traceability and grading system and sharing information on quality among herders, middlemen and manufacturers will be needed in future.

[170] JICA(2017), “Data Collection Survey on the Development Policy and Public Investment in Mongolia” Final Report
[171] According to the interview KE’KEN Textile Testing & Certification Center (March 2017)
[172] In China, raw cashmere are graded by extraction ratio, six grades from highest level 58-68 to lowest level 30-40 and by color, three grades of white, gray and brown. Gilled cashmere are graded by mixture ratio, four grades from 0-0.1% and by color of three colors.

3.3.3.5 Leather

Defects of skin significantly affect transaction of leather. According to Mongolian Association of Leather Industry, defects are found in skins in spring much more than those in autumn and winter. Parasitic insects are blamed as a major cause of defects, so it is necessary to conduct deworming programs including periodic chemical bath. The slaughter company told that the price of skin is fluctuated seasonally, e. g. spring skins decline in price because of thinness, grow in price for June to August because of thickness and decline slightly because of the influence of mites. There is seasonal fluctuation but no grading at the individual level. Sheep skin is similar in price, even skin of 2-year- old sheep is good.

Leather manufacturer referred quality of raw skin was important. According to an integrated manufacturer (tanning of raw skin to final products of clothes, shoes and bags), they procure 250-500 cowskins every time and about 30% of them are rejected because of quality and the middlemen often make complains for rejection. In the case of sheep, they buy too big of amount of raw skin on a one-time deal, 2,000 to 3,000 skins, to check all, and check about 100 skins as sample. Quality of raw skin is very important for the quality of final products, on the other hand, if the manufacturer deal strictly, the middlemen may take out from the transaction. The manufacturer seems to be forced to compromise sometimes. As mentioned earlier, some upstream producers prefer buyers who buy all the products including good and bad, even the price is low, to severe transaction.

Quality management in the processing phase of the manufacturer is divided into six stages; 1) checking the quality of ram material, check every skin of cow and check 1/20-1/30 of volume of sheep skin, 2) checking chrome osmosis condition by technician in tanning process, 3) checking the quality of semi-products by quality manager in wet blue process, 4) checking for doneness after drying and judging dyeing or not by quality manager (checking every leathers one by one), 5) grading after dyeing by quality manager (checking every leathers one by one), 6) measuring area of leather by measurement instrument (checking every leathers one by one) . Addition to own management, they accept on-site inspection from GASI 1-2 times a year regulatory.

There are five grading categories internationally rated by yield ratios (usable area rate of leather), such as A (95% or more), B (85%), C (75%), D (50%) and E (45 % or less). The Leathers produced in Mongol Shevro JSC are usually accepted from customers according to the grade they rate. It means the quality standards of the Company are almost the same as the customers'. Grades to be shipped depend on the contract, but accepted leathers are mostly those of grade A to C. The contract conditions include the proportion to all shipping amount, such as X% of grade A, Y% or grade B and Z% or grade C. The thickness of leathers is also requested. Proportions of grade A to C are about 70% for cowskin, 80% for goatskin and for sheepskin, the proportion of A and B is about 20% and C is 20%. The ratio of production loss is 5-10% and the bad treatments of raw skins cause loss in many cases. Main bad treatments are 1) scratch, hole or crack caused at slaughtering by manual, 2) defect by parasitic insects especially for sheep skin and 3) skins of aging livestock, etc., according to manufacturer in Mongolia. In Japan, manager of a leather company pointed the bad exsanguinations.

On the other hand, as mentioned before, there is no differentiation in price by individual materials. Under the situation, it is no wonder that herders do not invest cost, time and labor to improve the quality of skins as by-products.

Of course, the quality of raw material is just one of a determinative factor of final products' quality and processing technology can cover the imperfection of raw materials. However, low quality of raw materials limits the range of final products. It is necessary to introduce any system that herders want to try to supply materials with good quality even they must invest cost or labor.

As described above, current situation and problems of quality management were analyzed through case studies of livestock products. These analyses lead to followings.

(1) To be hygienic and safe with the scientific basis

Hygiene and safety control should cover from raw material production to consumers totally. If any process of the whole is treated inadequately, safety is unsecured.

Livestock is traditional key industry and livestock are frequently moved. Control of infectious animal diseases is critical in Mongolia for enhancement value chain as well. If concerned parties can not adequately respond animal diseases including FMD, brucellosis and PPR and use veterinary drugs, such adequateness has risks to lead significant decline or disappearance of value of downstream products. Disease control, quick diagnosis and response are required when disease occurs, and introduction and proper operation of the system to minimize the affection of diseases on food and products. To tackle the animal diseases, however, it is important to conside the unique Mongolian environment such as the vast area of national land with a small population and traditional livestock. When we consider the value chain, ideal control but unrealistically ambitious methods possibly segmentalize the chain and allow irruption of hazards into the chain. It is necessary to study feasible system and operation for Mongolia with reviewing level of risk tolerance. On this occasion, "safety" to be protected by the Government should be concerned separately from "relief" demanded by consumers.

Regarding chemical/drug residue, at first, it is necessary to clarify the current condition because we can not find adequate control methods if we do not recognize incorporation route. Firstly, the epidemiologic investigation should be conducted. At any rate, appropriate usage of chemicals and drugs are critically needed at the whole process from pre-harvest to post-harvest.

Into processing and distribution as well, the introduction and establishment of GHP and GMP are desirable to prevent hazard. Small sized companies are also able to introduce such activities such as enforcement of washing hands, setting-in-order and hot water sterilization, etc. Daily activities of hygiene and quality control leads to awareness of whole society.

Additionally, it is also desirable to demonstrate safety on a scientific basis. Especially for export, scientific data is essential. Production inspection must be reliable.

(2) To reflect consumer needs to standard

How to set a standard of quality control, how to process, how to decide processing level――For standard setting and product development, it is important to focus on the perspectives of what consumer and customer needs are, how they decide to buy, what kind of type or size of products they prefer, etc. In other words, feedbacks from consumers or customers are important. For value addition, stable distribution of mass and general product meet to standard and establishment standard to distinguish one product from common product based on the feedback are essential. Information on quality standards processing manufacturers of downstream industries require should be shared with producers of upstream industries and these requirements should affect transaction price of upstream products. Constant information sharing among concerned parties from upstream to downstream are crucially important for quality control, but these systems are not built yet except several large companies. It is very big problem that all the materials including bad and good quality without sorting are bought by the middlemen and sent to neighbouring country. Under such circumstance, awareness of quality and incentive for improving quality are never created among agriculture and livestock producers. Although the broker already plays important role in Mongolian distribution channel, they are one of factor to block to share information on quality and price in the case of cashmere and leather, etc. It is necessary to study to accommodate them function of information communication.

If any defect are found in inspection conducted in downstream, the cause of the defect must be determined and information on the cause should be shared with upstream, the source of the defect, to respond it. Limited opportunities of inspection, miss of irregular products in inspection are one of constraints factors of feedback to upstream or information sharing with upstream.

(3) To develop relationship of mutual trust among market

In the case of honey, products are suspected of mislabelling like fake honey and deception on production area. Does consumer want to buy the product paying money without trust? To gain consumers' trust, it is important; 1) to stabilize quality, 2) to have clear production/distribution rule (therefore producer can show the quality of their product is good and stable) and 3) to assure the rule strictly at any time. Safety is a basic premise, and, in addition to that, if the products are food, they should be tasty and if the products are clothes, they should be beautiful. Producers must correctly and specifically know the target quality and show it to the customs.

On that basis, if the producer aims to produce top products in the market, it is necessary to add something good, such as the background or processing stories of the products, functionality, etc.

We can utilize standard and production rule as a tool to control the price decline and add value by avoiding t the expensive and labor waste system.

(4) To collect information and get a chance to expand market

Limitations of inspection coverage on chemical residue, etc. are weak points for new business opportunities. As mentioned in the case study of honey, lack of the enough inspection capability to meet the requirements of importing country leads to extra cost and barriers. To improve inspection ability, continuous training and development of human capacity are needed.

Collecting information is critical, especially for export, because the laws and institutions in importing country are different from those of Mongolia. For example in Japan, prioritized chemicals for residue inspection are listed every year. It is possible to gain maximum result by minimum input if concerned parties have this information beforehand For quarantine and customs as well, prior consultation and preliminary arrangement are important.

(5) To establish main gate and special route

From the production stage to the market, there are so many routes which are individually completed. Therefore it is difficult to develop a hierarchy of product in the market. Hygiene and quality control system is can be compared to the "gate" in distribution channels. When the product goes through the "gate", it is checked. The system is almost established and the actual operation of the system is needed now. In other words, how to let the product go through the "gate" and how to check the product passing through the "gate" are the key points. At first it is necessary to come up with other markets for products that are out of standards and to develop a system that even if there is a loss of profits due to nonstandard items, the market price can be increased by the products in the standard Afterward, each process in the whole chain from upstream to downstream build close relationship with each other to establish product hierarchy in the market. The "gate" should be a system create benefit for the producer, manufacturer, broker, retailer and consumer, etc.

Additionally, on the other hand, it is important to prepare special route as a necessary measure. For example in the case of meat export, it is required to prevent cross-contamination from livestock production, slaughtering and processing to distribution, but to deal all the meat including those for the domestic market now in the same way with meat for export are expensive and not realistic. Height and width of the "gate" are different depending on the market's requirements and niche routes distinguished from mainstream should be discussed on the other hand.

3.4 Analysis of Production Infrastructure

3.4.1 Overview of Production Infrastructure

The current state of land use and land conditions in Mongolia is summarized in Unified land Territory Foundation (hereinafter "ULTF"). The current ULTF was approved in 2003 and is the target period from 2004 to 2023. The revised version has been created in 2013.

The figure below shows the classification of the land use type. The legend shows "Special State Needs Land", "Water Fund Land", "Forest Land", "Land under Road and Network "," Land under Urban and Other settlement "," Agricultural Land ". In the legend, the white part has become "Aimag (Province) boundary", "Economic region boundary", "State boundary" from the bottom.

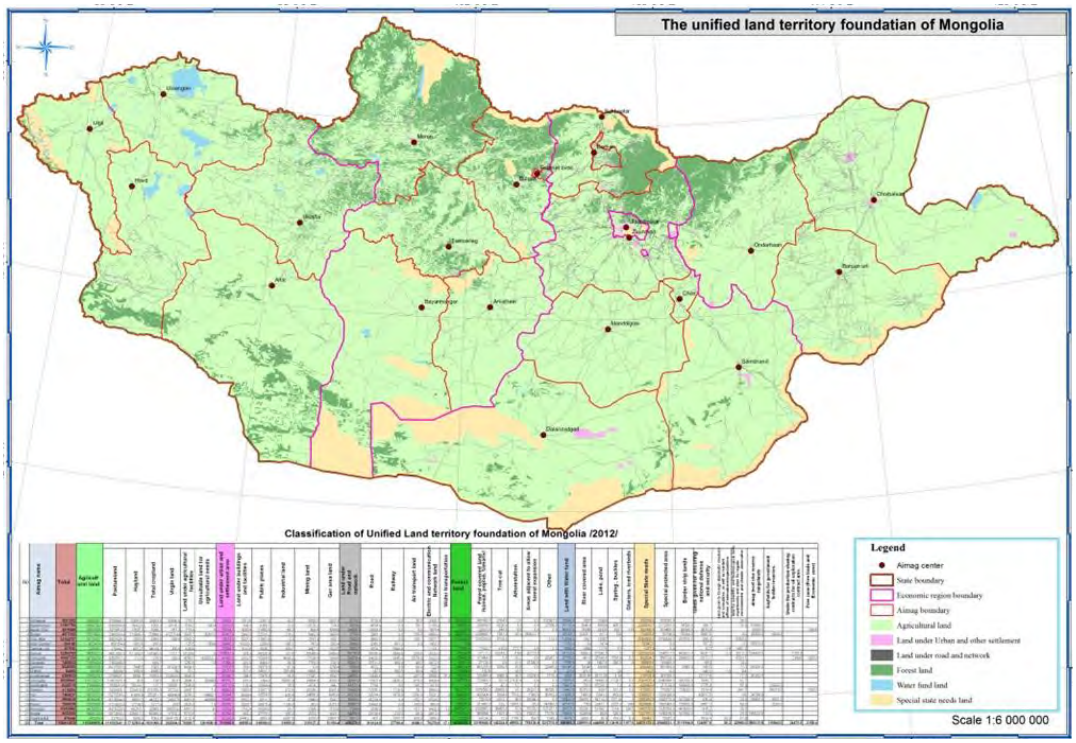


Figure 3.4.1 Map of the Unified Land Territory Foundation in Mongolia

Source: ULTF, ALAGaC

All agricultural land of approximately 100 million 1498.2 hectares, the pastures land occupies 96.2% by diversion to arable land, infrastructure construction of roads, etc., and expansion of urban area (2015). Although the pastures land tends to dwindle, the rate of decline compared with 2011 is about 4%. The arable land area was 1,028,000 ha (2015) and increased by 9.7% compared to 2011.

Table 3.4.1 Transition of Land Use for Agriculture and Livestock Farming

(Unit: thousands ha)

	2011	2012	2013	2014	2015
Agriculture Land	115,490.8	115,399.9	115,361.4	115,008.6	114,982.8
Pastures Land	111,181.4	111,032.5	111,026.2	110,646.7	110,613.6
Meadows Land	1,711.3	1,712.3	1,712.3	1,717.6	1,717.7
Arable Land	964.4	1,031.1	986.8	1,012.8	1,028.2
Land of Agriculture	67.8	70.3	71.4	76.8	74.4
Others	1,261.6	1,261.6	1,259.7	1,259.7	1,259.7

Source: Mongolian Statistical Yearbook

3.4.1.1 Production Infrastructure of Livestock

(1) Number of Livestock (Type of Livestock /District)

Pasture land in Mongolia is classified by 4 areas with its features. Table 3.4.2 shows the provinces which are included in each area, their features, land area, and percentage of livestock population (2009). The largest livestock population is forest area, and especially, Uvurkhangai, Arkhangai, and Huvsgul provinces have a large number of livestock. There were good pastures in the eastern region but little water resources and a small number of livestock, however, the number of large livestock such as cattle and horse increase recent years.

Table 3.4.2 Livestock Population by Regions[173]

Region	Province	Feature	Area	Percentage of Livestock Population
West	Bayan-Ulgii, Gobi-Altai, Zavkhan, Uvs, Khovd	Plain and dessert	26.6%	24.7%
Forest	Arkhangai, Bayanhongor, Bulgan, Orkhon, Uvurkhangai, Huvsgul	The largest volume of pastures in the nation	24.5%	38.0%
Central	Govisumber, Darkhan-Uul, Selegnge, Tuv	The highest volume of grasses	30.6%	23.9%
	Dornogovi, Dundgovi, Umnugovi	Dessert		
East	Dornod, Sukhbaatar, Hentii	Good condition of pastures, little water	18.3%	12.5%

Source：Prepared by JICA Study Team based on "The Feature of Mongolian's Livestock"

In the distribution of livestock by districts (Figure 3.4.2), sheep is found in Arkhangai, Uvrukhangai, Huvsgul, goat is found in Bayanhongor, Uvrukhangai, Gobi-Altai, cattle is found in Arkhangai, Huvsugl, Tuv, horse is found in Tuv, Arkhangai, Sukhbaatar, and camel is found in Umnugovi, Drnogovi, Dundgovi. There is regional gap among the distribution of livestock, and it is strongly affected by vegetation and water resources.

[173] JICA Study Team prepared by "The Feature of Mongolian's Livestock." Sumiya GERELSAIKHAN "Regional Policy Research" (Takasaki City University of Economics, The Society of Regional policy) No.14-4 (2012)

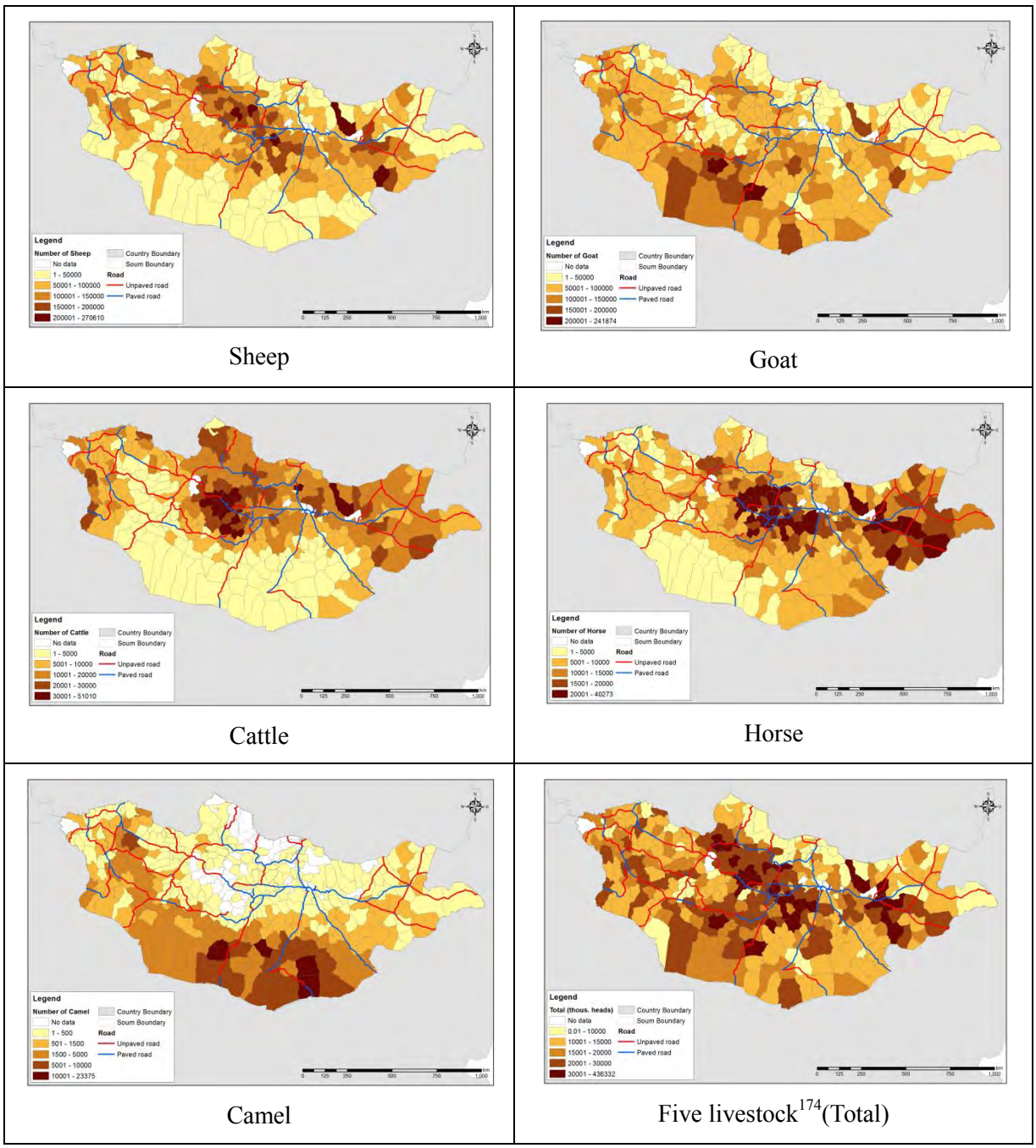
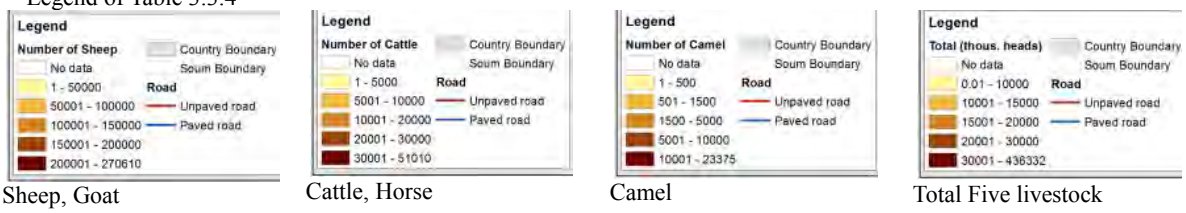


Figure 3.4.2 Distribution Map of Livestock Population by Type of Livestock/Districts (2015, with main road)[175]

Source: JICA Study Team

[174] Five livestock stands for sheep, goat, cattle, horse, camel, which are major livestock in Monoglia.
[175] Legend of Table 3.3.4



(2) Total Livestock Population

The figure shows trend in the number of livestock and in the legend of 1990 shows more than 3,800,001 head, 2,800,001-3.8 head, 1,800,001-2.8 head, 1,200,001-1,800,000 head, 800001-1,200,000 head, 800,000 head from the bottom. Compared with 1995 and 2010, the concentration of livestock has shifted from the western region to the east. In 1990 to1995, the number of livestock in the eastern region of Khentii and the Dornod provinces where the number of livestock was small were increased in 2015. The numbers of livestock in the provinces of Tuv, Uvurkhangai, Arkhangai, and Khuvsgul are remarkable. In particular, Khuvsgul was one of the most populous provinces in 2015, although it was the largest number of livestock in 2010.

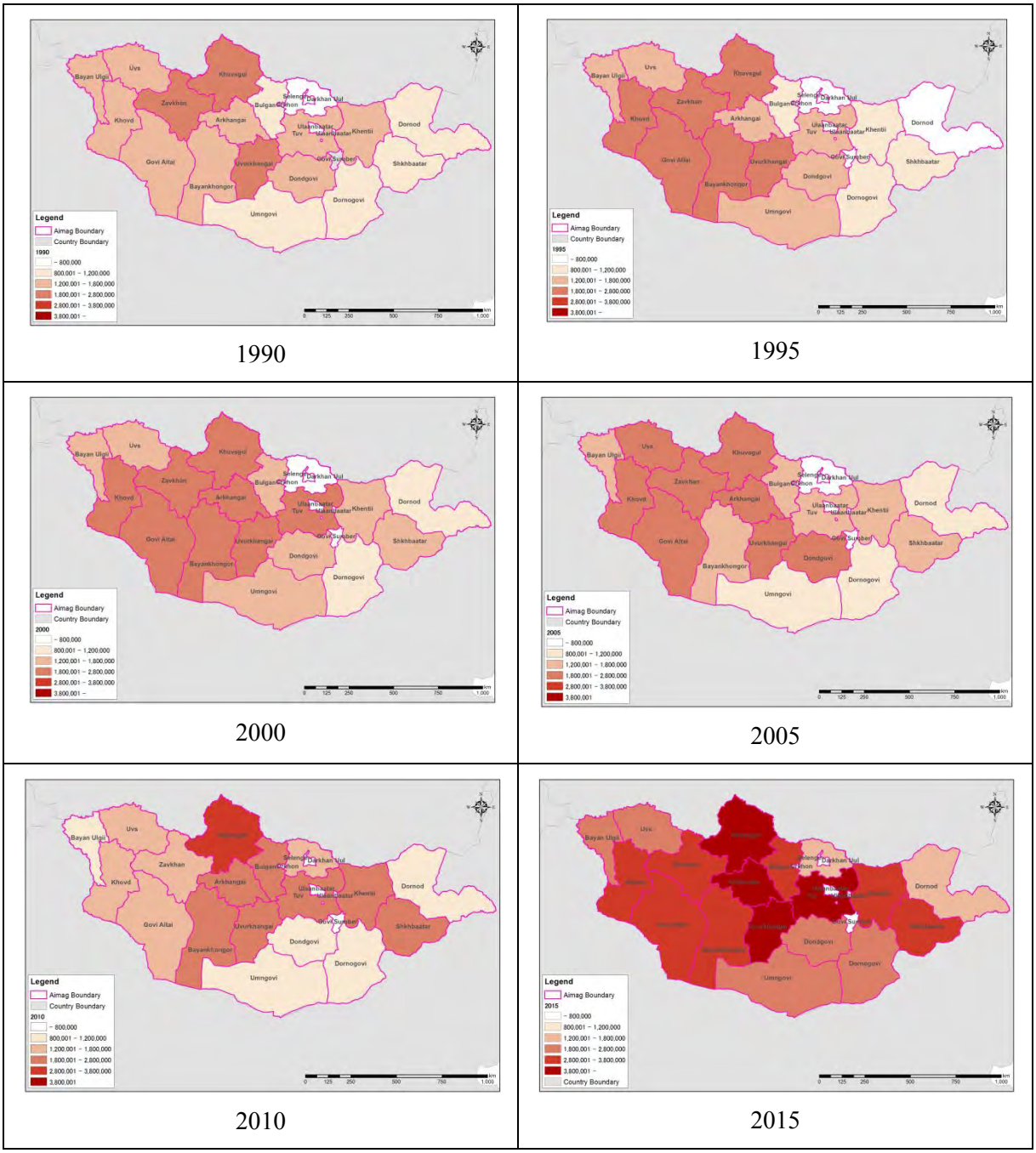


Figure 3.4.3 Trend of Total Livestock Population (by province, every 5years since 1990)

Source: JICA Study Team

3.4.1.2 Production Infrastructure of Agriculture

The most cultivated area of agriculture is in Selenge province, followed by Tuv, Bulgan, and the Dornod. The Dornod province has been growing sharply since 2013, although there has been few cultivated area. This is inferred to be due to the farmland development by large-scale investment. In recent years, since the eastern region has advanced farmland development, Sukhbaatar and Khentii provinces have been growing in recent years.

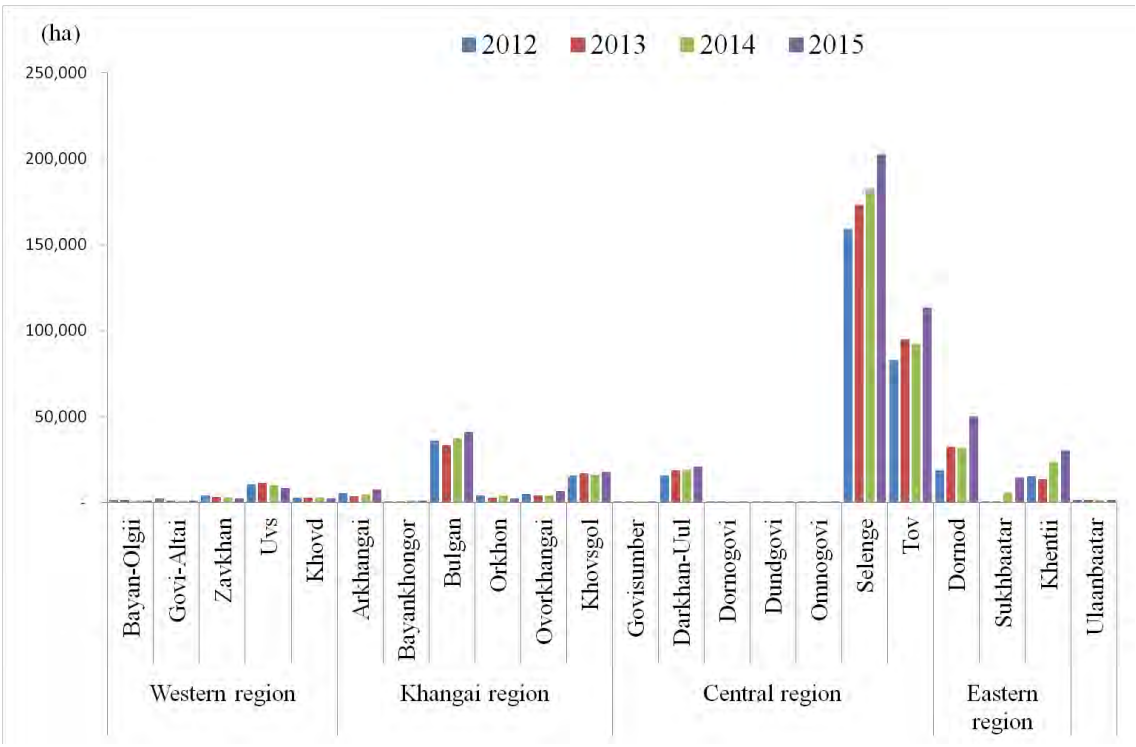


Figure 3.4.4 Trend of Cultivated Area by Crop (2012-2015)

Source: Mongolian Statistical Yearbook

3.4.2 Production Infrastructure by Regional Potential

3.4.2.1 Regional Potential of Agricultural and Livestock Supply

The potential areas in the supply of agricultural and livestock are categorized by regions from the point of view of Pasture land, Hay land, Crop land, Fallow land, Fodder supply, Water supply (Table 3.4.3). These categories are classified by the first intensified agricultural and Livestock area (level 1, High Residential Central zone) and the second intensified area (level 2, Aimag center).

The "first intensified agricultural and livestock area" is concentrated in Ulaanbaatar, Darkhan-Uul, Orkhon, Selenge and northern Tuv provinces. These are regions where the plenty of pasture and water sources exist. The second intensified area is mainly planned for the province Centre which is the development zone for the strengthening of the agricultural and livestock production. The development zone is classified by fodder and water resources.

Table 3.4.3 Regional Potential of Agricultural and Livestock Supply

Location		Pastureland	Hay land	Cropland	Fallow land	Fodder Supply	Water supply
Province (Aimag)	District						
Level 1. High residential central zone							
Tuv	North area	1,410,189.9	32,103.70	84,977.6	79,749.7	Enough	Good
Ulaanbaatar	Baganuur, Bagakhangai	227,633.0	5,588.00	7,003.4	3,220.5	Enough	Good
Selenge		1,630,485.1	123,410.0	313,705.5	28,724.5	Enough	Good
Darkhan-Uul		178,442.7	9,072.50	34,819.1	5,741.9	Enough	Good
Orkhon		39,589.5	1,400.00	4,938.6	427	Enough	Good
Level 2, Aimag Center							
Hovd	Hovd	572,035.6	7,233.20	3,570.3	1,182.3	Enough	Good
Khentii	Undurkhaan (Chingis)	591,203.1	20,530.00	365.3	15,203.8	Enough	Good
Arkhangai	Tsetserleg	423,470.8		3,077.1	5,975.8	Enough	Good
Dornod	Choibalsan	497,961.5	85,623.00	3,282.0	5,874.2	Enough	Mid
Khuvsgul	Murun	465,972.0	4,227.20	392.2	1,293.3	Enough	Mid
Sukhbaatar	Baruun-Urt	611,932.4		3.8	10,383.8	Enough	Bad
Bulgan	Bulgan	111,677.3	9,148.40	2,757.5	789.1	Available	Good
Savkhan	Uliastai	536,952.7		1,000.0	1,640.6	Available	Good
Uvurkhangai	Arvaiheer	613,339.9	1,517.00	512.3	2,794.0	Available	Mid
Uvs	Ulaango	575,871.3		2,917.1		Available	Mid
Bayan-Ulgii	Ulgii	613,859.4	1,609.50	338.7	0.5	to be improved	Bad
Dornogovi	Sainshand	644,571.2		45.5	0.5	to be improved	Bad
Govi-Altai	Altai	671,125.4				to be improved	Bad
Umnugovi	Dalanzadgad	503,054.7		29.7		to be improved	Bad
Umnugovi	Hanbogd (Gashuunshkhait)	445,302.3				to be improved	Bad
Umnugovi	Tsogttsetsii	402,067.7		2.4		to be improved	Bad
Dundgovi	Mandalgovi	783,193.1		27.8		to be improved	Bad
Govisumber	Choir	405,758.2		166.9		to be improved	Bad

Source: ULTF

3.4.2.2 Regional Potential Map of Agricultural and Livestock Products

Since the former Ministry of Industry, NDA has created a potential map to collect data[176] on the national, provincial, and district levels, such as climate, resources, soil, raw materials supply, market presence, infrastructure development status, population size, etc. Regarding the location of this potential map, using the technique of Weber theory (location theory), the data collected about 200 evaluation items to be gathered information is dropped into the GIS, and the location where there is a lot of overlap is selected, and the strongest part of the color is judged to be a high potential. Evaluation items are not disclosed.

In this case, regarding the potential map created by NDA related to livestock products (1) meat, (2) milk, (3) Wool and Cashmere, (4) leather, (5) wheat, (6) vegetables (including potatoes), the potential by areas were examined.

(1) Meat

Meat has potential in almost every district. In these areas, the potential of the market needs, transportation routes and exports are valued in conjunction with the number of livestock shown in Figure 3.4.3. In particular, the high-potential province is in the Khangai region of Uvurkhangai, Arkhangai, Bulgan, and the western provinces of Khovd, and the eastern region is the Dornod province.

The number of meat processing plants and the livestock population are in response (refer to 3.2 Agricultural and Livestock Processing). However, the plants are concentrated in the central part of the provinces, such as Ulaanbaatar, Tuv, Selenge, Bulgan, Darhan-Uul and Orhon provinces in approximately 80% and the number of meat processing plants are small in Uvurkhangai, Arkhangai, Khovd, and Dornod provinces where the meat potential is high.

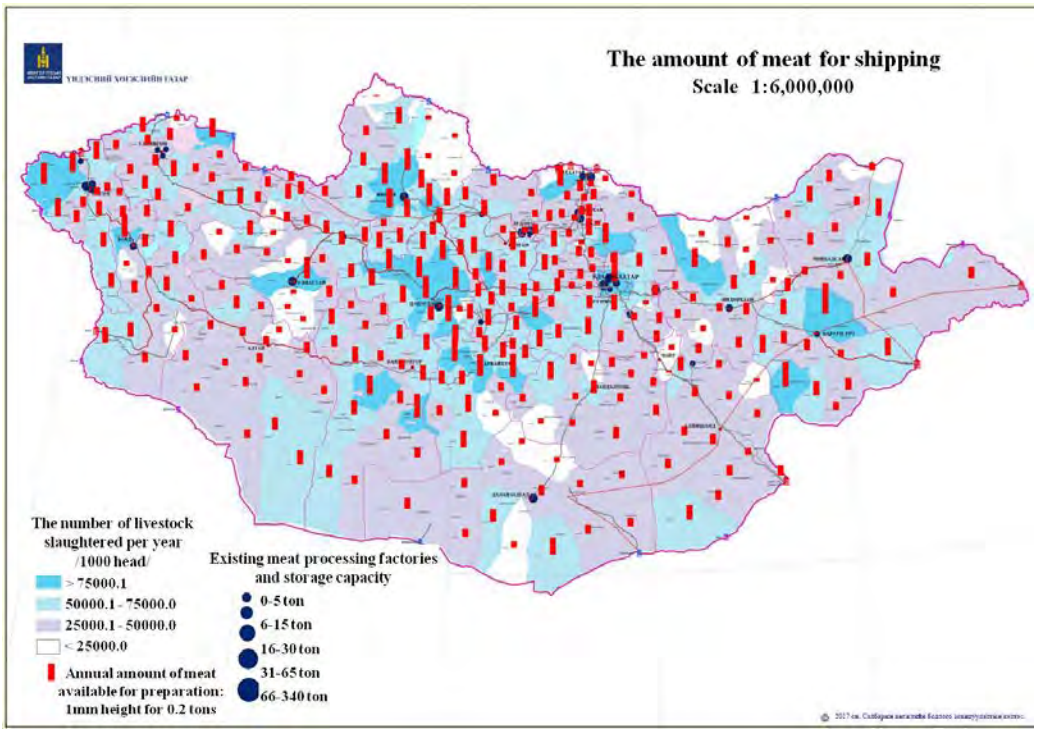


Figure 3.4.5 Meat Production Potential Map

Source: NDA

[176] The staff of the former Department of Industry, who goes to som of 333 points, also conducts additional hearings from each province and the industry development staff of som, and uses this information and data to create potential maps. Other institutions, such as the National Tax agency, customs clearance, meteorological agency, ALAGaC, Geographical Research Institute, and Academy of Sciences, have obtained data as needed.

(2) Milk

The potential of milk is linked to the number of cattle. The high potential areas are Arkhangai, Bulgan, Khuvsgul, Selenge, Tuv, Darkhan-Uul, Drnod, Khentii, Sukhbaatar provinces. The condition of the location where the road access is developed is given priority because the long-term storage at room temperature is not possible for milk.

The relationship between milk plants and the number of cattle are described in the section 3.3.1.2 livestock Products_ (2) Raw milk and dairy processing. The leading dairy company has a lorry (truck) route for dairy and a nationwide distribution network for sale. Suu JSC is a total of 2,500 households in Bulgan, Orkhon, Tuv, Selenge, Darkhan-Uul, and Khentii provinces, and APU Trade Company is buying directly from the 350 households contracted dairy farmers in Tuv province. In the provinces where there are a lot of contract dairy farmers, the production of milk is expected to increase in the future.

The potential of milk is not limited to the suburbs of Ulaanbaatar and other cities, but there are western regions bordering China and the eastern region bordering Russia and China. However, in the case of supplying milk to urban areas such as Ulaanbaatar, since the amount of raw milk that can be shipped and the amount of raw milk that could actually be shipped are different volumes, the potential evaluation should be considered on the actual condition of the value chain including distribution.

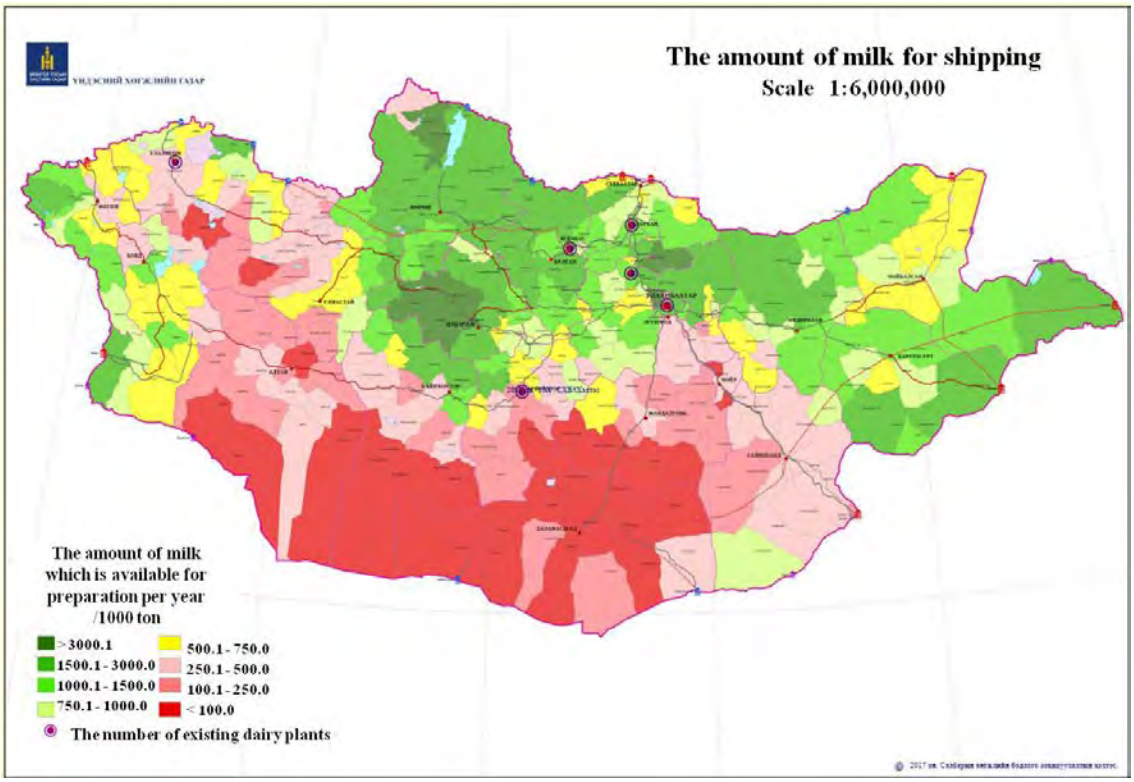


Figure 3.4.6 Milk Production Potential Map

Source: NDA

(3) Wool and Cashmere

Areas with high potential for wool and cashmere are linked to the number of sheep and goats. With regard to wool, a particularly high potential region is the Tuv province of Uvurkhangai, Arkhangai, Khuvsgul, and Tuv region in the Khangai region. Next, the region with high potential is the Bulgan in the Khangai region, the Zavkhan in the western region, and the Khentii and Sukhvaatar in the eastern region.

The relationship between the wool plant and the sheep population are described in 3.3.1.2 Livestock Products_(3) Wool, but currently, in Mongolia, there are 360 integrated and processing plants, which are large and small, 158 of which are located near Ulaanbaatar, and the remaining approximately 200 plants nationwide. The plants are arranged in response to this in Tuv province where the number of breeding of sheep is especially large.

Cashmere is a particularly high-potential region in the Bayankhongor province of the Khangai region, followed by Uvurkhangai in the Khangai region, Khuvsgul, Khovd and Govi-Altai in the western region, and Tuv in the central region.

The relationship between the cashmere plant and the livestock population of sheep are described in the section 3.3.1.2 Livestock Products_(4) Cashmere, and except for around Ulaanbaatar, especially in other provinces such as Bayankhongor, the number of goats and treatment plants is not relevant.

Cashmere is the most profitable livestock products, and the level and scale of processing technology are high in the Mongolian processing industry. The key point in the processing industry is how to collect raw materials efficiently and intensively. In the high potential, there are many areas where roads and other infrastructure are not developed, therefore, the use of this potential map should be considered in conjunction with the development of roads and pickup points.

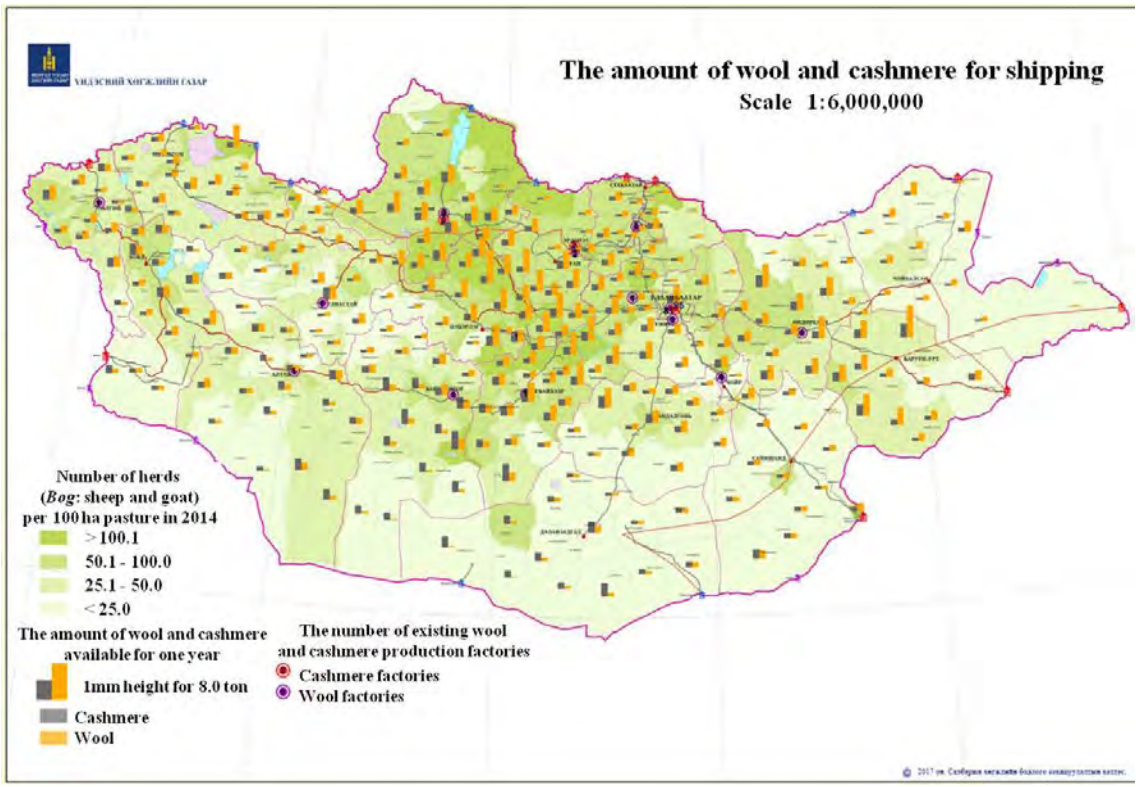


Figure 3.4.7 Wool and Cashmere Production Potential Map

Source: NDA

(4) Leather

The high potential region in leather is in Uvrukhangai, Arkhangai Khuvsgul in the Khangai region, and the Tuv in the central region. Next, it is Bulgan, Byankhongor in Khangai region, Khovd, Zavkhan, Govi-Altai in the western region, and Khentii and Sukhbaatar in the eastern region.

The relationship between the leather plant and the number of sheep is described in the section 3.3.1.2 livestock products_(5) Leather. Currently, 15, 000t or more hides are produced annually. The placement of the leather tanning plant and the placement of the meat plant are not necessarily consistent. Meat and leather are also required to slaughter livestock, and it is considered reasonable to have meat processing facilities and a leather plant. However, the problem of the present leather processing plant is drainage treatment, and the infrastructure to handle a large amount of factory waste water is required to the location of the leather processing plant.

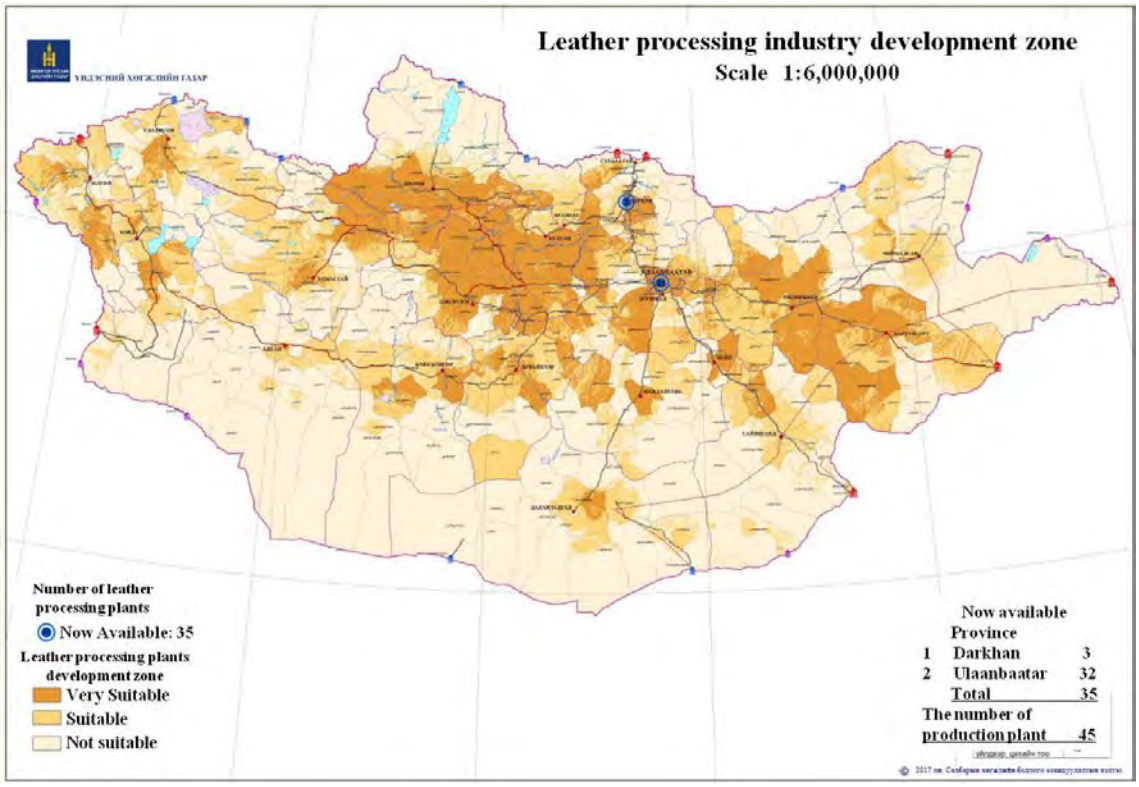


Figure 3.4.8 Leather Production Potential Map

Source: NDA

(5) Wheat

Wheat production is mainly carried out by the corporate entity, and approximately 1,100 companies are producing. The scale of the companies accounts for a total of 10% of large-scale management (more than 6,000ha), 50% of medium-scale management (more than 1,000ha to less than 6,000ha), and 40% of small-scale management (less than 1,000ha). 80% of corporate bodies are located in Selenge, Tuv, Bulgan, Khentii provinces. Wheat processing plants are concentrated in Selenge and Tuv provinces.

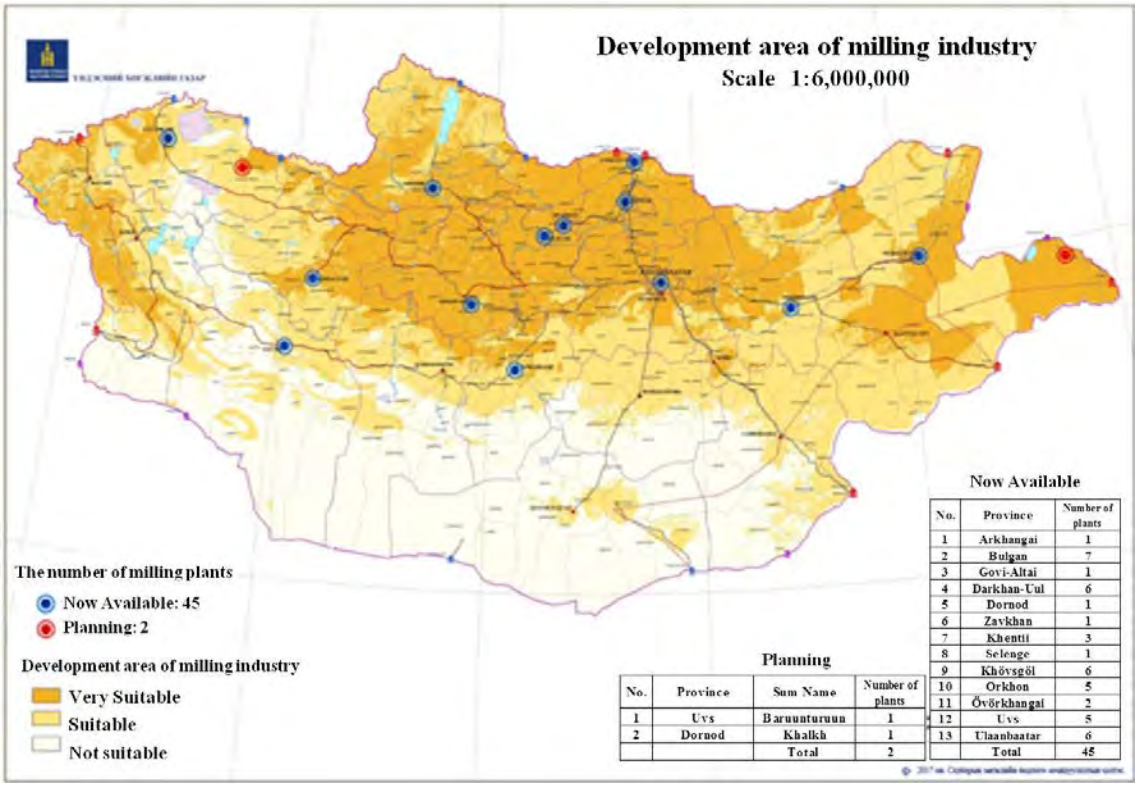


Figure 3.4.9 Wheat Production Potential Map

Source: NDA

(6) Potatoes and Vegetables

The region with high potential in the potato production is Tuv province in the central region, and next, Selenge in the central region, the Khovd province in the western region, Bulgan in the Khangai region. Potato production increased in the target area of the potato program, which was conducted under the support of SDC since 2004.

The region with high potential for vegetable production is Selenge province in the central region, then Tuv province in the central region, Khovd province in the western region, the Darkhan-Uul province in the central region, Bulgan, Uvrkhangai, Bayankhongor in Khangai region, Uvs in the western region, and Khentii in the eastern region. Selenge and Khovd provinces are the regions where vegetable cultivation has been done since the socialist period, and has high technology.

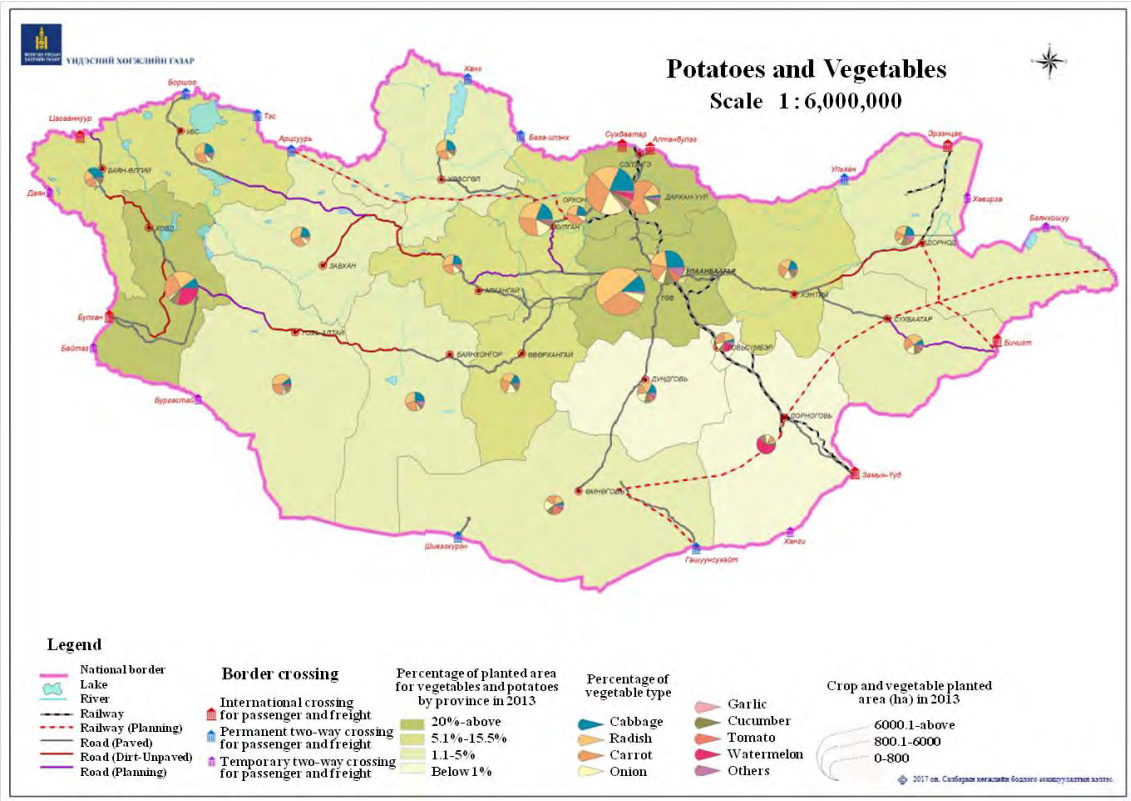


Figure 3.4.10 Potato and Vegetable Production Potential Map

Source: NDA

3.4.3 Roles of Production Infrastructure in the Agro-value Chain and its Issues

The most upstream of the agro-value chain is the "Production infrastructure (stage of production and production area)" which is an important role in forming the future value chain. It is difficult to say that the added value in the production infrastructure is high. However, it is often possible to solve it by the self-help effort of the producer such as the efficiency of cultivation (field management and production management) and stable supply of the products. It is important to build a value chain in a way that is more profitable to the producer than it is now.

Currently, each agricultural and livestock products area forms an independent production infrastructure. Each production area not only the difference in the characteristics of the locality and the product, but also the natural environment of the land, agricultural and livestock processing plant, the distance to the nearest market, and the maintenance of the transportation infrastructure (roads, railways, etc.) are distributed variously by various elements. The role of the production infrastructure is to ensure the production infrastructure and supply of agricultural and livestock products tailored to the market needs, by cultivating and rearing livestock products stably and continuously. Moreover, it is necessary to develop the infrastructure such as transportation to connect each integrated infrastructure while forming the integrated infrastructure by securing the production system which makes the best use of the regional resource.

The following measures are necessary to address the issues pertaining to production Infrastructure.

- The region which shows the expansion tendency of production concentrates on outskirts of the city. In order to make effective use of regional potentials, the expansion of production in rural areas is required. Whether it is possible to solve it by the improvement of the distribution or the technical improvement such as soil improvement, it should be examined from various viewpoints.
- The concentration of herders from the convenience of transportation distribution is observed around the city and the main road. It is important to reduce the load on the grassland by intensive livestock. In addition, it is necessary to tackle the problem such as reducing the load by dispersing while taking advantage of traditional grazing technology by concentrating on herders.
- Local distribution improvement, slaughter house and primary processing, collecting point, the arrangement of the water supply base, etc., not only the development of the distribution network connecting the local and urban areas, but also positioned in the value chain, to consider the base for production and pickup based on market information, it is necessary to prepare to lead to the economy of scale.

3.5 Development of Cluster Hub Site based on Production Infrastructure

3.5.1 Significance and Perspective of Cluster Hub Site (Hub) Development

As outlined previously in the chapter on distribution and marketing, currently, most value chains in the Mongolian agriculture and livestock sector coexist separately and conduct their operations exclusively for each of their entities[177]. For that reason, not only are the challenges inherent in each value chain present, but also such exclusive coexistences themselves are causing inefficient operations. Specifically, this exclusive business environment causes difficulty in achieving cost reduction and impediment of thorough and standardized business management, because improvement cannot be made on areas where improvement can normally be expected within the value chain through implementation of cooperative management/handling, such as storage/transportation, commercialization, packaging, quality control, quarantine, etc. Such exclusive business environment also causes difficulty in carrying out trades at reasonable prices, loss of opportunities, and other issues, especially among small and medium-sized enterprises and individual producers who do lack sufficient capital or access to information, because the main value chain operators have so much domination over marketing and market access.

Efficiency improvement or advancement of the value chain should be meant to produce an effective connection between productions and market in the agricultural and livestock sector, and not only results in market expansion but also increases the profit motives in the production areas so as to contribute to the promotion of the agriculture and livestock sector itself. To that end, there are various approaches, such as introduction of institutional structures and technologies, making regional or organizational efforts, but in light of the actual situation of Mongolia today, it would be important to prioritize development of product collecting/processing points/sites (hubs) in the production infrastructure based on the regional characteristics. These hubs must carefully be developed rather than focusing only on their facilities or physical locations as "points"; it will be necessary to clarify the roles of these hubs within the wide picture of the overall national value chain structure and consider what kind of functions are needed in order to advance the value chain.

The following outlines the future direction based on the current status and challenges in establishing the hubs.

3.5.2 Current Status of Hub Development

3.5.2.1 Significance of Establishing Hubs in the Value Chains of the Agriculture and Livestock Sector

After the dissolution of the *negdel* system including the cooperative organizations, agriculture and livestock farming value chains in Mongolia have transitioned to diversified and individually/exclusively coexisting structures under the name of market-based economy and free competition. Although there are many benefits in the current individual value chains, there seems to be room for improvement in terms of agriculture and livestock farming promotion by accomplishing efficiency improvement of the entire value chains. Especially, if the value chain can adopt a function that allows mutual sharing of benefit even in one part of the various value chains, the economy can be developed within the subject area, and this can be a starting point of efficiency improvement of the entire value chains. It can be said that creations of "hubs" at key points of regional production infrastructures and the development of a scale economy environment will help improve the efficiency of agro-value chains.

[177] Originally, a value chain owned by business operator is of an exclusive nature, but as mentioned in this report, from a bird's-eye view on the sectors' value chain, its exclusivity is a particularly noticable and distinctive feature in Mongolia.

The "hub" development in the production infrastructure requires examinations from a variety of aspects. The preceding paragraph addressed an overview of potential/actual areas (production infrastructures) that can become a core of agricultural and livestock farming promotion, which were identified based mainly on the regional characteristics of agricultural and livestock farming resources focusing on the overlapping of production amounts or the like. In one sense, such a regional core can be a strong candidate for the "hub" location; however, when expansion of the economic scale is taken into account in the development of an agro-value chain, it is also necessary to consider other aspects, such as the level of agglomeration/availability of organizational structures in the region including primary products and their processing structure, agricultural and livestock sector industries and associations, distribution of processed products, quality control and quarantine systems at the distribution stage, physical infrastructure environment such as transportation, water supply and sewerage, power etc. It is also necessary to pay attention to the relationship with local economies, such as employment and improvement of income of producers when sustainable value chain development is concerned.

MONDEP survey, which was conducted prior to this study, shows the East-West Economic Corridor linking the production infrastructures (hereinafter referred to as "East-West Green Development Corridor" in Figure 3.5.1). Rather than paying attention only to regional characteristics, it is important to embody this conceptual overview more concretely[178], and understand the overall picture of the value chain and roles of the "hub" in each region.

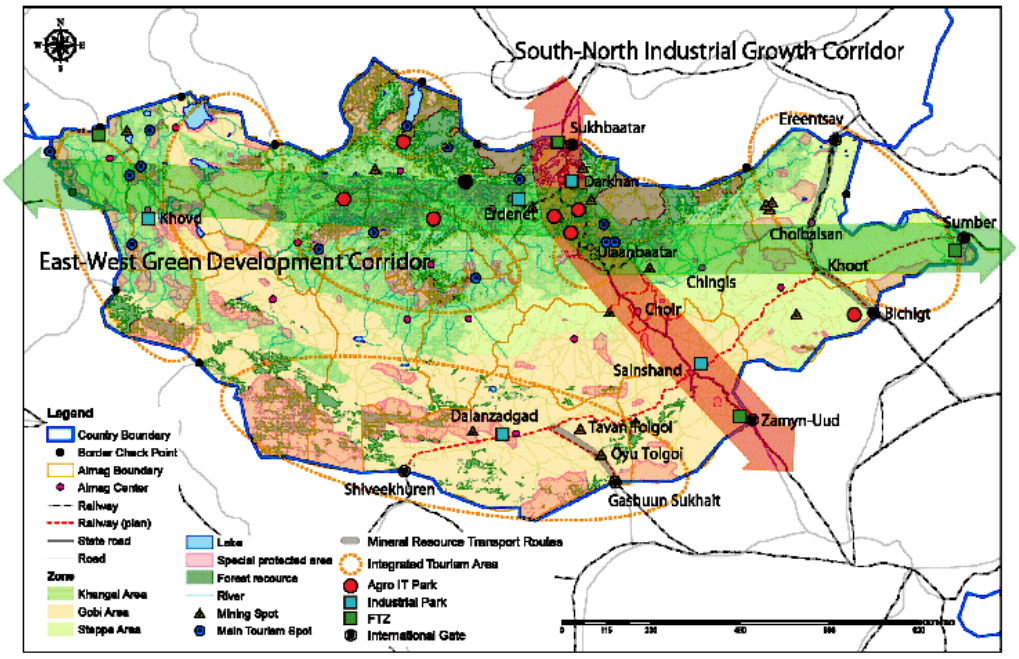


Figure 3.5.1 Conceptual Drawing of Economic Corridor in MONDEP

Source: MONDEP Final Report

[178] For example, pertaining to the figure contained herein, it includes the relationship between the production sites in the East-West Corridor and the domestic and foreign markets, the rationality of the connection with the North-South "Growth Corridor," and the way they are supposed to be, etc.

In addition to the aspects of regional importance or the roles under the value chain, examinations must also be conducted from multiple aspects in terms of functionality. Depending on the characteristics of the production infrastructure and other factors, the hub may be a simple product collecting and pick-up point, it may be a primary processing site, or it may be more advanced complex processing site. What is important is not to equalize and average the functions (levels) of all "hubs," but to conduct careful examination focusing on the regional characteristics, production infrastructure characteristics, actual industry agglomeration presence or other related aspect, or its roles within the value chain, etc., to determine the most appropriate function for each "hub."

In summary, the "hub" in agriculture and livestock farming value chain development must be consistent with the regional characteristics, roles within the entire value chain, and function of the "hub" itself and its level, and is expected to be a core component for achieving efficiency improvement (such as economy of scale) according to each characteristic or need. To achieve this, it is important to examine and determine the specific direction for the development of "hub."

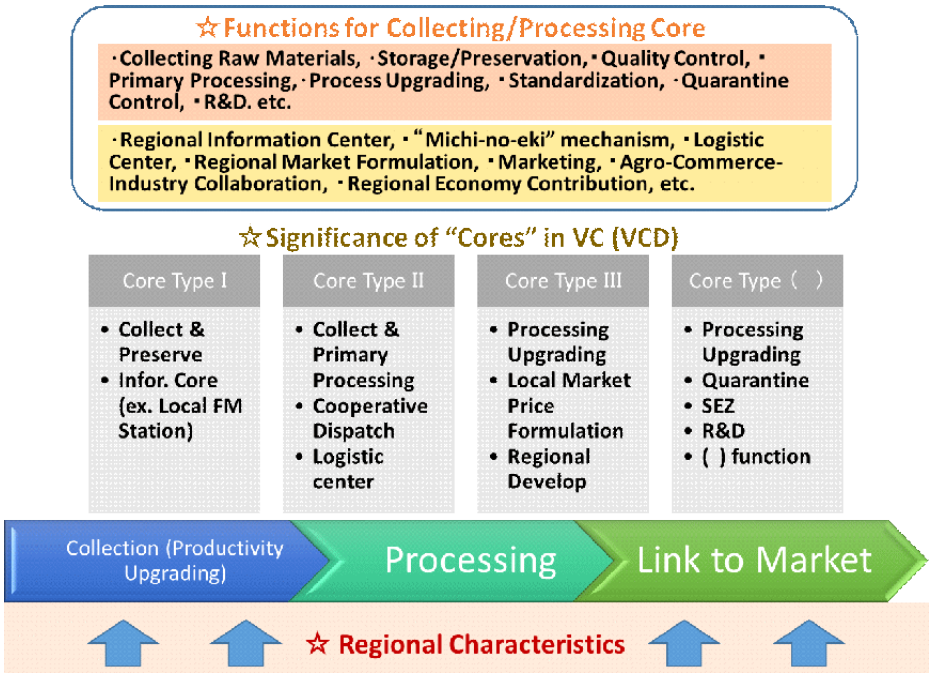


Figure 3.5.2 Concept of Hub Development

Source: JICA Study Team

3.5.2.2 Current Status and Challenges in Development of Hub in relation to Government Policy

Currently, hub development, which aims to achieve efficiency improvement of the agro-value chain, is promoted based mainly on government policy such as the NDA's study on collecting/processing hub development project, MOFALI's "Industrialization 21:100" program, etc. Regarding the Agro IT Park Project (driven by the former Ministry of Industry) and the Halha River Basin Development Project (driven by the former Ministry of Agriculture), which were promoted with the lead of the government under the former administration as further detailed below, the government's initiative was slowed down with the change in administration; however, under the new administration, these projects are being reexamined to evolve from the original time of design. Below outlines the current status and challenges of hub development initiative promoted by the former Ministry of Industry/NDA and the former Ministry of Agriculture/MOFALI and the status of reexamination under the current administration, and clarifies the viewpoints to examine the future direction.

(1) Agro Industrial Technology Park (Agro IT Park)

(a) Concepts of Agro IT Park and Current Status of the Project

Agro IT Park Project was originally promoted under the initiative of the former Ministry of Industry and its basic concept is to consolidate the four processing sectors, which consist of agricultural products (vegetables etc.), leather/wool/cashmere, dairy products, and meat, and integrate them into one location aiming at improving productivity, efficiency of logistics, etc. It also plans to provide R&D/training facilities in the Park depending on the level of mutuality of these processing sectors to pursue better quality and value-added product development. Due to the reorganization of the former Ministry of Industry, the initial concept was reviewed and reevaluated. Currently, NDA is working on reestablishing the concept to make it a new hub development project.

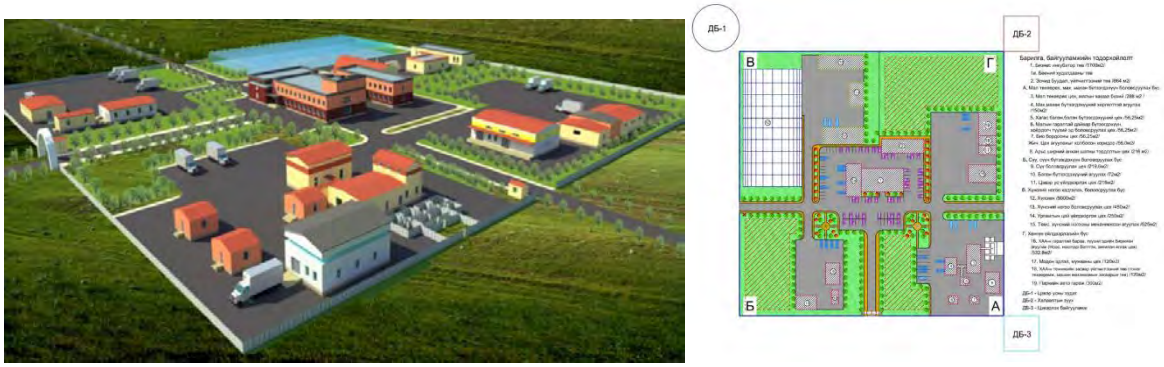


Figure 3.5.3 Conceptual Image of Agro IT Park

Source: Based on information from the former Ministry of Industry

Initially, the national government was supposed to provide support on the basic infrastructure development for the areas designated as Agro IT Park; however, the originally planned financial support became difficult due to constraints on the budget. Accordingly, the government took action by establishing a system to separately secure a total of 200 billion MNT of funds required for each sector, regional development, district development, and support for small and medium enterprises, and made it available for Agro IT Park project execution at each district. It also allows Agro IT Park tenant companies to be able to grant exemption of the land ownership/usage fees and an average of 500 million MNT (about 30 million yen) of financial support for basic infrastructure development, equipment and machine renewal, technical support, start-up support, etc., at the district Level.

Initially, the former Ministry of Industry and the former Investment Agency designated eight priority locations under the Agro IT Park development, and implemented measures to attract investors through a concession system. Regarding the selection of priority locations, approximately 40 types of map data were developed using GIS based on the data collected at the time of industrial policy development, including population size, livestock head count, diversification of meat processing plants, agricultural production rate, and other data for each area (district level). The locations where multiple data overlapped were considered priority locations, and 40 locations were selected through deliberation/conducting surveys (the department in charge of the former Ministry of Industry has actually conducted field survey) with each regional center (provinces, districts). (The eight priority locations mentioned above were selected with reference to these 40 locations.)

Subsequently, the government has adopted a policy to prioritize local initiatives, has accepted applications from local governments or development organizations in local regions (public corporations composed of government and private investors, etc.), and as a result of examination has

selected a total of nine locations[179] as secondary designated locations. At that time, there were some areas among those where such initiative was taken in response to the selection of candidate locations where tenants had already moved in before the concession agreement. In the case of Hutag-Undur, the local small-sized meat processing businesses have initiated preparations for relocation. Along with this movement, a trial operation was started for the livestock agglomeration project in collaboration with the park development wherein a few groups of pastorals participated.

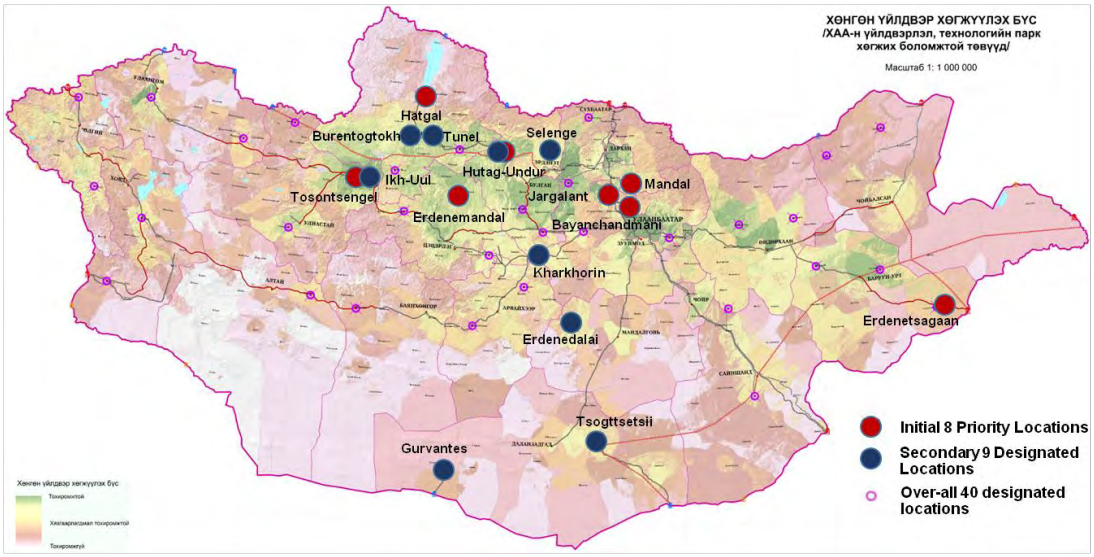


Figure 3.5.4 Designation and Selection of Agro IT Park Locations

Source: Based on information from the former Ministry of Industry

The priority location designation was cancelled and withdrawn from the concession list after reconsideration of the former concept; however, these 40 selected locations are still used today as the basis for reexamination by NDA. Note that the locations where applications were submitted based on local initiative (secondary designated locations) are continually pursuing the efforts even after the cancellation of the designation, aiming at establishing the hubs with the lead of entities indicated in the "Initiative" column in Table 3.5.1. At Bayanchandmani, actual park development is still underway through the establishment of a development public corporation composed of public and private sector entities, and a plan is being proposed for the park as a unique investment project. At Selenge district, FS was formulated, and at Hutag-Undur, efforts are continued by taking measures to attract investors.

[179] Hutag-Undur was designated as one of the original eight priority locations. Although the application from Burentogtokh was separately submitted, which appears to have two applications from Murun, the designated location was determined to be counted as one location because Murun has hegemony over Burentogtokh in terms of administrative jurisdiction.

Table 3.5.1 Agro IT Park Initial 8 Priority Locations

No.	Province	District	Initiative	Industrial Scope	Regional Characteristics	Scale of Park
1	Arkhangai	Erdenemandal	The former MOI[1], The former MIA[2]	Food meat, Milk, Vegetable Processing, Leather Primary Processing, Storage	Arkhangai province hods the largest number of livestocks, especially sheeps, among provinces. Good quality in food meat and wool. A major production region of raw materials for the large scale carpet factory. Rich in water resources. Delayed infrastructure foundation development.	Small Scale (approx. 5ha)
2	Bulgan	Hutag-Undur	The former MOI , The former MIA	Food meat, Milk, Vegetable Processing, Leather Primary Processing, Storage	Major agricultural region. Flour milling, vegetable growing. Along side of UB-Huvsgul main corridor. Rich in water resources. Partly developed infrastructure.	Small Scale (approx. 5ha)
3	Zavkhan	Tosontsengel	The former MOI , The former MIA	Light Industry, Food meat, Milk, Vegetable Processing, Leather Primary Processing, Storage	Traditional region for timber industry under Scialist regime. Partly developed infrastructure.	Small Scale (approx. 5ha)
4	Huvsgul	Hatgal	The former MOI , The former MIA	Dairy Products, Tea, Fruits, Fish, Tourism related indusry	District of tourism aside of the Lake Huvsgul. Fruits, mushroom, harbe tea, medical harbe. Regional branded products: Smoked fish, canned food, reindeer leather bags/shoes. Rich in water resources. Partly developed infrastructure.	Small Scale (approx. 5ha)
5	Tuv	Bayanchandmani	The former MOI , The former MIA	Fodder, Fertilizer, Food Meat, Milk, Vegetable, Intensive Farming	Closed to UB. Vegitables and eggs supplying region utilizing Zamiin-Uud-Altanbulag corridor. Partly developed infrastructure.	Large Scale (over 500ha)
6	Tuv	Jargalant	The former MOI , The former MIA	Vegetable, Dairy Husbandry	Potato, vegitable production region supplying to UB, Darkhan, Selenge. Milk production factory location. Developed infrastructure.	Middle Scale (approx. 1-200ha)
7	Selenge	Mandal	The former MOI , The former MIA	Agriculture, Flour Milling, Vegetable, Dairy Husbandry	Largest agricultural district in Selenge province. Many green house facilities. Dairy husbandry. Rich in water resources. Partly developed infrastructure.	Large Scale (over 500ha)
8	Sukhbaatar	Erdenetsagaan	The former MOI , The former MIA	Food Meat, Leather Primary Processeing, Storage	Major region for brand sheep, Uzemchin. Rich in. Rich in grass and suitable for pasturing. Possible export through Bichigt gateway. Negative impact by the foot-and-mouth deseases. Poor quality of water resources. Delayed infrastructure foundation development.	Small Scale (approx. 5ha)

Source: Prepared by JICA Survey Team based on information from the former Ministry of Industry

Table 3.5.2 Agro IT Park Secondary 9 Designated Locations

No.	Province	District	Initiative	Industrial Scope	Regional Characteristics	Scale of Park
9	Bulgan	Hutag-Undur	"Bulgan Park" LLC	Food Meat, Vegetable Processing, Leather Primary Processing, Storage	Major agricultural region. Flour milling, vegetable growing. Along side of UB-Huvsgul main corridor. Rich in water resources. Partly developed infrastructure.	Small Scale
10	Bulgan	Selenge	Requested from regional Cooperative supported by the District mayor.	Grain, Flour Milling, Food Meat, Milk, Vegetable Processing, Fish, Bee Keeping, Seabackthorn, Fruits Processing, Leather Primary Processing, Storage	The former large-scaled farming area. Mongolian originated beef meat production region, Selenge beef. Good quality milk. Breeding center, pork, chiken. Factory for lumber products. Flour, vegetable supplying region to Erdenet market. Water power plant building project initiated at Egiin river. Designated nature preservation area located in the north of district, suitable for potential tourism development. Bee keeping, regional branding. Rich in water resources. Developed infrastructure.	Middle Scale
11	Dundgovi	Erdenedalai	Province mayor, District mayor	Food Meat, Milk, Leather Primary Processing, Storage	One of the largest livestock growing districts supplying products to mining companies in Gobi region. Delayed infrastructure foundation development.	Small Scale
12	Zavkhan	Ikh-Uul	District mayor	Food Meat, Milk, Vegetable Processing, Leather Primary Processing, Storage	Close location to the corridor. Good quality food meat, and sheep wool. Delayed infrastructure foundation development.	Small Scale
13	Huvsgul	Burentogtokh	"Murun Agro" LLC Food, Agri/Live-stock Dept. of Province Center	Intensive Dairy Husbandry, Dairy Products, Leather Primary Processing, Storage	Agro-IT park location by "Murun Agro" LLC in Burentogtokh district is actually under Murun district administratively. Facilities fro traditional beef meat, pork. Rich in water resources. Developed infrastructure foundation.	Middle Scale
14	Huvsgul	Murun				
15	Huvsgul	Tunel	Food, Agri/Live-stock Dept. of Province Center	Food Meat, Milk, Vegetable Processing, Leather Primary Processing, Storage	Along side of UB-Huvsgul corridor. Best quality goat, Erchim. Rich in water resources. Partly developed infrastructure foundation.	Small Scale
16	Uvurkhangai	Kharkhorin	District mayor	Food Meat, Milk, Vegetable Processing, Leather Primary Processing, Storage	The former agricultural farming area. Small breed livestock. Large population. World heritage, Orkhon Valley Cultural Landscape. Rich in water resources. Developed infrastructure foundation.	Small Scale
17	Umnugovi	Gurvantes	Parliament	Food Meat, Milk, Vegetable Processing, Leather Primary Processing, Storage	Products suppying region for large scale mining companies in Gobi region. Possible export through Shiveehuren gateway. Poor in water resources. Delayed infrastructure development.	Small Scale
18	Umnugovi	Tsogttsetsii	Parliament	Food Meat, Milk, Vegetable Processing, Leather Primary Processing, Storage	Products suppying region for large scale mining companies in Gobi region. Possible export through Gashuunsuhait gateway. Poor in water resources. Delayed infrastructure development.	Middle Scale

Source: Prepared by JICA Survey Team based on information from the former Ministry of Industry

Regarding the status of examination by NDA, efforts are made on digging into the basic concept of the previous concept and focusing ever more on the establishment of products collecting/processing hubs that meet the characteristics and needs of each region. The examination has been carried out to re-establish it as a new project through evaluations on how the entire value chain should be and clarifying the roles of the value chain at each hub. Additionally, with the cooperation with MOFALI's "Industrialization 21:100" program in mind, efforts are also being made in deciding a direction of national project development. Currently, a joint working group with MOFALI was established and detailed project scoping has started. The establishment of this joint working group is also a result of the training in Japan in this study.

(b) FS of Agro IT Park (Future Hubs) Project, etc.

Regarding Agro IT Park, FS for Erdenemandal was formulated by the former Ministry of Industry when initial eight priority locations were designated. Regarding the second designated locations, the FS was formulated by the lead agencies of each region. After the transition to the new structure, NDA developed FS for the establishment of a hub in Selenge district as a part of the new hub planning initiative[180].

In the latest Selenge district FS, the FS methodology and regional characteristics of Selenge district, Bulgan province (economic environment, actual conditions of companies, infrastructure environment) were reviewed and the agriculture and livestock farming resources/production conditions, human resources, and other factors were analyzed in detail. Thereafter, as FS on technology and economy, evaluation was conducted for the physical locations of hub developments and analysis was further conducted for production, human resources, financial resources, investment effects, new construction demands, etc. Based on the FS, a development plan, infrastructure plan, transport/logistic plan, and construction plan were proposed. Regarding the targeted agricultural products, 16 types of market research were conducted for each agricultural product and agricultural processed product, and a production plan, marketing plan, human resource development plan, etc., were proposed based on the results of the research. The following is the table of contents of said FS and action plan by stage of development. (The report consists of approximately 300 pages for all the hubs, and it exceeds 500 pages in total when agricultural products and other elements are included.)

[180] Detailed analysis was conducted by obtaining support from Mongolian Logistics Association

Feasibility Studies on the Industrial and Technological Park (UTP) in Selenge district, Bulgan province.

1. Research methodology on UTP technical feasibility studies
1.1. UTP technical-economic feasibility study to develop methods
1.2. UTP's core principles, nature, and value
1.3. UTP development good practices in the experiences of foreign countries
1.4. UTP legal environment studies

2. Current situation and economic assessment in Selenge district and Bulgan province
2.1. "Bulgan" provincial socio-economic situation
2.2. "Selenge" district current social and economic situation
2.3. Districts current situation surrounding social and economic
2.4. The current situation of small and medium enterprises in Selenge
2.5. The current infrastructure situation in Selenge

3. UTP related plants, raw materials and labor resources, and related feasibility study
3.1 Livestock commodity research
3.2 Crop Resources Research
3.3 Natural resource exploration
3.4 Workforce Resource Survey
3.5 "A poll conducted among Selenge district Citizens"

4. Technical and economic feasibility of factories located in UTP
4.1 UTP location, area, and located industries
4.2 "Basic industries located in Selenge," UTP related data
- Production and required material
- Average required human resources and payroll
- Financial indicators
- Investment and efficiency indicators
- Demand for construction

5. Selenge district UTP: Overall planning and infrastructure planning
5.1 Current infrastructure
5.2 "Selenge" UTP's general plan
5.3 "Selenge" UTP infrastructure planning
5.4 "Selenge" UTP transport and logistics system planning
5.5 The construction investment

6. Management and socioeconomic impact
6.1 UTP management and development projections
6.2 Administrative technical and economic feasibility
6.3 Required investment and financial efficiency rating
6.4 Socio-economic impact and risk management

Conclusions and Recommendations

ATTACHMENTS. Industrial feasibility studies,
Appendix 1 - Meat and meat products processing complex
- Leather primary maintenance of plant
Appendix 2. The milk processing plant
Appendix 3. Food Production
Appendix 4. Aluminium Production
Appendix 5. - Wholesale trade and logistics center
- Plant Maintenance
Appendix 6. Livestock cooperatives）

Figure3.5.5 Table of Contents of FS Report for Hub Establishment in Selenge District

Note: UTP is an abbreviation for “Industrial and Technological Park” in the original Cyrillic characters “ҮЙЛДВЭРЛЭЛ ТЕХНОЛОГИЙН ПАРК” in Roman characters.

Source: Prepared by JICA Study Team based on information from NDA

Table 3.5.3 Action Plan for Each Selenge District Development Phase

Phase	Major Action	Implementation	Outcome
Phase I 2017-2018	・ Establishment of preparatory office ・ Securing the budget ・ Infrastructure improvement, Construction of facilities ・ Selection of companies, Contract ・ Funding, Preparation ・ Establishment of Agro IT Park office ・ Paperwork, Human resource development	・ PPP ・ Three party contract among Agro IT Park-Bank/Financial Institution-Company ・ Technical support, Consulting services ・ Training	・ Establishment of the office and its operations started ・ Agro IT Park infrastructure and facility construction ・ Workshop operations started ・ Establishment of the related policy ・ Human resource development
Phase II 2018-2022	・ The workshops inside the Park enter into the market ・ The workshops recover the initial investments ・ Implementation of workshop support measures by Agro IT Park ・ Expansion and improvement of services at Agro IT Park ・ Creation of Agro IT Park model	・ Free land use, Tax reduction ・ Agro IT Park transportation, logistics, and other comprehensive services ・ Free or discount training and consultation services ・ Cooperation between the workshops and nomadic association	・ Stable plant operations, Recovering the initial investments ・ Stable Agro IT Park operations, Types of services increased and improved ・ Increase in number of workshops/plants in Agro IT Park ・ Becomes an Agro IT Park model
Phase III 2022-2025	・ Stop various supports from Agro IT Park office and transfer to the market principle ・ Creation of new workshops ・ Expansion of Agro IT Park products and market ・ Establishment of the nation-wide Agro IT Park network ・ Human resource development, Reeducation ・ Draft future development plan	・ Agreements between Agro IT Park and workshops ・ Creation of a comprehensive network organizational structure for the nationwide Agro IT Park operations, Business partnership ・ Technical support, Consulting services ・ Training, Reeducation	・ Increase in discount or free services ・ Increase in number of plants/workshops in Agro IT Park ・ Improvement of manufacturing products ・ Establishment of development plan ・ Establishment of the nationwide Agro IT Park transportation network/logistics system

Source: Prepared by JICA Study Team based on information from NDA

In this FS, facility planning was established for plants under 16 sectors including meat/meat products processing complex, leather primary maintenance shops, etc., and for the service center under four sectors such as incubator center, etc. The FS analyzes and estimates the required land spaces for each sector as well as projecting availabilities of raw materials, processing capacities/operation rate, number of employees, etc., for each of the regions identified by market research; and these elements are compiled together in a draft five-year project plan.

According to the project plan, total sales are estimated at MNT 121.4 billion (about US $51 million) (expenditure MNT 106.9 billion, revenue MNT 13.1 billion). Moreover, government revenue is estimated at MNT 1.4 billion through income tax. (Annual sales total is MNT 24.2 billion on average, expenditure is MNT 21.4 billion, revenue is MNT 2.6 billion.)

Although this FS assumes that development is carried out as a form of PPP, the burden of local government (district) side (own capital) and financial resource calculations such as loans were evaluated for each sector. The evaluations were also conducted for the IRR, although there are some variations in each field (2.6% ~ 63%).

Table 3.5.4 Facilities/Plants within Selenge District Agro IT Park

No.	Plant/Facility	Location
Plant		
1	Meat/meat products processing complex	
	Slaughterhouse (with livestock cage)	Slaughterhouse
	Meat sorting shop	
	Internal organ sorting shop	
	Meat freezing storage	Warehouse
	Semi-processed, processed food shop	Plant facility
	Livestock by-product and other material processing	Plant facility
	Bio fertilizer shop	Plant facility
2	Leather primary maintenance plant	Plant facility
3	Milk processing plant	Plant facility
4	Mineral water production plant	Plant facility
5	Herb tea production plant	Plant facility
6	Confectionary, bread making plant	Incubator center
7	Greenhouse	Plant facility
8	Vegetable processing plant	Plant facility
9	Potato and vegetable storage	Plant facility
10	Agriculture and livestock farming products, materials storage (wool, cashmere shipment, sorting shops)	Plant facility
11	Felt processing shop	Incubator center
12	Leather craft shop	Incubator center
13	Knit processing shop	Incubator center
14	Sewing shop	Incubator center
15	Woodworking shop	Maintenance center
16	Traditional leather primary maintenance, processing shop	
Service Center		
1	Incubator center	Central facility
2	Wholesale center	Incubator center
3	Hotel, Commercial facility	Central facility
4	Agricultural equipment maintenance center (repair of machines and equipment)	Central facility

Source: Prepared by JICA Study Team based on information from NDA

Table 3.5.5 Investment/Value of Selenge District Agro IT Park

No.	Plant	Investment amount (Million MNT)			Investment value evaluation item[181]				
		Total	Own capital	Loan	PV	NPV	PI	IRR	PBP
1	Meat/meat products processing complex	1,091	391	700	2,901	1,809	2.66	34.0 %	2.86 years
2	Leather primary maintenance plant	179	79	100	217	48	1.22	8.6%	3.6 years
3	Milk processing plant	581	174	406	935	354	1.61	16.0 %	3.24 years
4	Mineral water production plant	248	37	211	409	161	1.65	18.0 %	3.14 years
5	Herb tea production plant	177	50	127	206	29	1.16	5.0%	4.2 years
6	Confectionary, breadmaking plant	6	2	4	7	2	1.18	15.0 %	3.55 years
7	Greenhouse	1,100	165	935	1,283	183	1.17	4.83 %	4.23 years
8	Vegetable processing plant	376	56	320	455	78	1.21	6.1%	4.13 years
9	Potatoes, vegetables storage	388	58	330	420	31	1.08	2.6%	4.31 years
10	Agriculture and livestock farming products, materials storage	312	12	300	579	276	1.85	24.6 %	2.64 years
11	Felt processing shop	27	2	25	34	17	1.26	23.3 %	3.11 years
12	Leather craft shop	27	7	20	29	11	1.07	16.6 %	3.4 years
13	Knit processing shop	30	5	25	71	53	2.39	46.2 %	2.42 years
14	Sewing shop	14	2	12	42	38	2.92	62.7 %	2.43 years
15	Woodworking shop	4	1	3	15	12	3.08	63.0 %	2.07 years
Total		**4,566**	**1,046**	**3,520**					

Source: Prepared by JICA Study Team based on information from NDA

(c) Challenges in Agro IT Park Project

A major issue of the Agro IT Park concept by the former Ministry of Industry can be said to be that the government's support budget is limited, including the currently ongoing hub establishment plan carried out by NDA. It was expected that the infrastructure development would be funded by the national government and the rest of the hub development projects would be funded by local governments and private investors, and the basic policy of the initial Agro IT Park concept was prepared in line with this plan. However, for the Government of Mongolia, which is under the support

[181] PV: Present Value, NPV: Net Present Value, PI: Profitability Index, IRR: Internal Rate of Return, PBP: Pay Back Period

of the IMF, it is difficult to expect that sufficient budget measures will be established until fiscal stability is obtained. It seems ironic that while the Government of Mongolia must strengthen the economic foundation through promotion of agriculture and livestock farming and diversification of industries by implementing the development policy in order to secure financial resources, the Government of Mongolia is, in reality, having a hard time in ensuring sufficient budget measures due to the request for fiscal equilibrium.

As there is no silver bullet in this regard, it is important to continually take proactive actions, such as an allocating part of the local development budget, and evaluate a reasonable mechanism to allocate a part of the regional development support from sponsors, in the same manner with the actions taken at the former concept. Moreover, it may be more realistic to narrow down the scope focusing on fewer effective locations such as several locations (1 to 3 locations), where successful outcomes are more credible, although the size is small, by prioritizing the hub candidate locations rather than developing 10 to 20 places at the same time. In addition, it is also important to take an approach to designate locations with high local initiatives as implemented during the former initiative. At these locations, there is also a high possibility of attracting private investments, and therefore there is room for reducing the burden of financial support by the government. For these locations, it may be important to consider complementary support methods other than the government budget (for example, technical support, indirect tax incentives for training expenses, priority mediation of sponsor support, etc.)

Another thing can be said is that although it is highly remarkable that, under the former concept, 40 locations were selected through extensive coordination with local governments based on considerations of local agriculture and livestock farming/product characteristics, economic/industrial characteristics, local community foundation characteristics, etc., there is still room for improvement in the point that the development policy did not clearly address the agro-value chain as a whole and the roles of the hubs within its operations. In other words, even in the FS, although the target area was analyzed, evaluations were not sufficiently carried out for the relationship between the hub and the market or in which stage of the value chain (economy of scale) the efficiency improvement should be made through the establishment of the hub. As also mentioned at the beginning of this section, the way the hub should be must be made clear based on the regional characteristics and its roles under the value chain, its practical functions must be determined by profitability, and its scale and facilities must be designed to meet these factors. Additionally, if each region initiates its own development in a condition where the whole picture of the value chain is not clear, it may cause duplication of functions and products and defects in a part of the value chain, which in turn may result in insufficient efficiency improvement as a whole.

One hopes that, through careful considerations of these elements, the currently progressed hub establishment will be promoted to ensure clarification of the overall picture of the value chain and roles of the hub within the value chain, and each hub will have its own characteristic/functions suitable for the regional demands. The currently ongoing NDA-MOFALI cooperation is believed to work well in this regard. On the MOFALI side, there are plans to develop specific measures such as the "Industrialization 21:100" program under the new agriculture and livestock farming promotion policy by focusing on the advancement of the value chain of the whole country as its core initiative. Through this effort, it is believed that hub establishment evaluations will further progress in a mutually complementary manner with NDA.

In addition to the above, there are many challenges, including but not limited to the challenges associated with capacity such as human resources on the government side who can take leadership roles in the establishment of hubs, challenges associated with advancement of technologies such as product processing technologies for agriculture and livestock farming products, challenges associated with the relationship with quarantine and traceability, and challenges associated with industrial agglomeration; however, one hopes that by overcoming the above-mentioned challenges, evaluations will be continued for the measures that correspond to the implementation processes of the practical hub establishment plan, which will clarify the roles under the over all picture of national agro/livestock value chain structure.

(2) Special Economic Zone for Agriculture and Livestock Farming (Halh River Basin Development Project)

(a) Current Status of Development Project

The Halh River Basin Development Project was originally initiated in conjunction with the agriculture and livestock farming development project where a total of 40,000 ha of agricultural lands was secured utilizing 4 million USD of grant assistance provided by KOICA in 2009, and promoted by the previous administration. In 2015, an application was submitted to expand the entire development site to 50,000 ha and request designation of the area as a Special Economic Zone, but approval of the Diet could not be obtained. This was because the scope of the application was too wide. Accordingly, the former Ministry of Industry requested revision of the scope, and the MOFALI side was re-evaluating the scope in a way that only a part of the processing zone under the functional concept of Agro IT Park will be designated as a Special Economic Zone; however, the work was discontinued upon the administration change. With the subsequent change of administration, the concept was deemed as completed.

Under the initial plan, within about 500,000 ha of the land, it was planned to create a special zone that consists of a 26,000 ha product processing zone as a core area (production/service zone: purple part), 65% of the entire property (265,000 ha) of semi-agglomeration livestock zone (green part), 14% (72,000 ha) of Agrozone (ocher color part: thin colored part is the property already cultivated where production has already started, and dark color is the planned development site), and a total of 16% (49,000 ha + 31,000 ha) of a tourism zone which is a sum of two places in north and south (light blue part). In addition, it was planned to have a quarantine zone of about 10,000 ha with a quarantine wall adjacent to the processing zone. According to the OIE guidelines, the quarantine zone was designed for 60 days of intensive quarantine management isolating the animals from contact with other areas. It was planned to transfer only those animals that passed the 48 to 72 hours quarantine inspection to be carried out after the 60 days to the processing zone for meat/processed products, leather processing, etc., and introduced to meat traders, etc., in the eastern region.

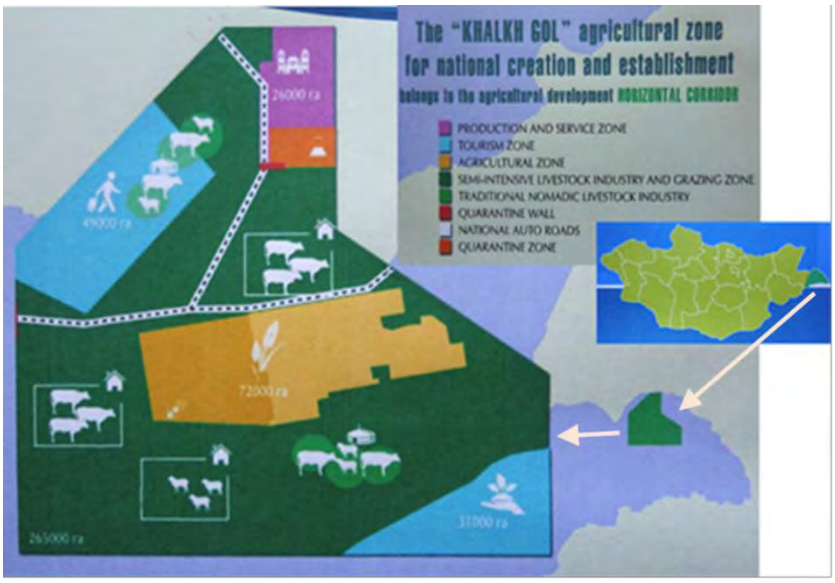


Figure 3.5.6 Basic Plan of Development Project for Special Economic Zone for Agriculture and Livestock Farming, Halh River Basin (Former Concept)

Source: Prepared by JICA Study Team based on information from MOFALI

In June 2016, it was decided that 317,000 ha of the area would be incorporated into the Halh River Area Development project, which aims to establish an export hub for agriculture and livestock farming products. Although the scope of the target area has been reduced from the beginning, the basic structure is in line with the above plan. At present, the permissions for exclusive use of the subject area for agriculture and livestock farming purposes, which were obtained from 24 businesses under the former special economic zone initiative, were revoked (Resolution # 87). The area was reorganized to use the land for eco-friendly and local community partnering-based agriculture and livestock development, and evaluation of a new development plan (master plan) is proceeding. Under this plan, it is supposed that the government will provide the infrastructure support, and incentives for investors are the core of the policy; however, to date, the 2017 budget has not been obtained. For the foreseeable future, it is expected to establish a plan in the direction to start from the processing/quarantine zone (about 40,000 ha). Integration or application of the "Industrialization 21:100" program is also taken into consideration.

Currently, in Agrozone, eight companies out of the 14 companies (wheat production, buckwheat production, etc.) that have been operating in the area continue production operations. It will be up to the progress of the development plan, but the MOFALI authorities want to restart reauthorization of the occupation right of the business area from August to September 2017 (as of March 2017, many companies are interested in submitting applications). Since it is located about 1,000 km away from Ulaanbaatar, financial and business capabilities will be emphasized in selecting companies, and for foreign investments, promotion of JV creations with local operators is planned. In 2017, not only the development plan but also the land use plan, etc., are planned for development. Regarding meat products, exports to neighboring countries are also taken into consideration through operation of the quarantine zone. The authorities have received information from Russia and China that intention to consider meat imports has been raised if freedom from infectious disease can be proved even in only one specific area.

(b) FS for Development Project, etc.

It is expected that the FS of the subject project will be detailed in the currently ongoing master plan, but, with regard to the projection of income and profit at the time of the previous concept, some information such as estimated amount, etc., has already been publicized. In both income and profit estimates, the basis for the estimation or other factors are not clear; the data are shown below for reference only.

(3) Agglomeration Livestock Sector

For the livestock producers related to the special economic zone, it was assumed that there will be 11 cattle raising businesses and three sheep raising businesses. The investment amount is estimated at MNT 202.9 billion (about US $85.2 million) for cattle raising and MNT 3.7 billion (about US $1.6 million) for sheep raising, while expected annual income of meat, leather/raw leather, and by-products was estimated at MNT 56.4 billion (about US $23.7 million) for cattle raising and MNT 4.4 billion (about US $1.9 million) for sheep raising. The forecast for the collection period is set to 3 years and 5 years, respectively.

Table 3.5.6 Estimate of Return on Investment for Semi-agglomeration Livestock Farming Sector

	Cow Farming	Sheep Farming
Number of Farm	11	3
Primary Investment (mil. USD)	85.2	1.6
Profitability Turnaround (in years)	3	5
Expected Annual Income (mil. USD)	23.7	1.9

Source: Prepared by JICA Study Team based on information from MOFALI

(4) Meat Processing Plant

As for the investment in the meat processing plant in the processing zone, there is estimated information which was developed based on an assumption that loans from China and Mongolian side investments are available. The initial investment amount is estimated at USD 6.49 million, with 85% (USD 5.53 million) being provided by the Chinese side and 15% (US $ 980,000) by the Mongolian side. The breakdown is as follows: transportation cost is 73%, construction cost is 24.4%, detailed planning cost is 4%, etc. The IRR is very high, at 68%, and the recovery period is 3.2 years, which is quite optimistic, but the basis of this estimation is unknown.

(5) Agrozone (Grains)

For vegetables and grains, specific calculations are not presented for each crop; however, estimation was made by utilizing cultivation methods of other products and dividing the cultivated land into three categories, i) fallow land, ii) wheat/corn, iii) potato/oilseed rape/barley/wheat/buckwheat, and based on an assumption that rotation occurs every year. Based on a scenario where 60,000 ha of Agrozone are offered to 12 producers, for grain cultivation by non-tillage cultivation, on which emphasis has been placed in Mongolia in recent years, the initial investment amount is estimated at MNT 64.6 billion (about US $27.1 million), while annual income is estimated at MNT 117.6 billion (about US $49.4 million) and an investment recovery period is 3.9 years. The breakdown is 69% livestock feed, 24% food processing industry, 3% seeds, and 3% exports.

(a) Challenges in Development Project

Regarding this regional development, although it is at the stage of reviewing the master plan, it would require some time before starting full-scale development because there are dispute-related issues over the occupied land of producers at the time of the previous concept, and there was a time when opposition campaigns for foreign companies' land occupancy became active among local residents. It is expected that full-fledged business development will be made after resolution of these problems. In addition to the unavailability of budgetary measures at the moment, there is currently no discussion with the NDA to implement this as a PIP project, and there are still issues concerning securing financial resources.
Regarding the natural environment, the Halh River Basin has been conventionally regarded as a fertile

zone blessed with water sources and seasonal weather conditions, but, in recent years, the damage caused by drought has expanded and concerns about desertification also exist. Proper measures are required for future improvement. Regarding the soil conditions, although it was evaluated that 270 thousand hectares were suitable as agricultural land at the time of investigation conducted by Russia in 1979, agricultural land devastation is progressing, as the study conducted by KOICA in 2009 revealed that 190 thousand hectares were suitable as agricultural land and the MOFALI's recent study revealed that only 170 thousand hectares are available. For soil management, it was pointed out that considerations are needed to take appropriate measures such as leaving the fallow lands in the future.
Regarding the establishment of an infectious disease free zone in livestock, gazelles inhabit the area, and due to their large movement range, countermeasures to prevent infection by colonizing gazelles are reportedly extremely difficult.
In order to achieve practical development investment, in addition to securing financial resources and attracting investors, it is also necessary to ensure that economic efficiency is supported based on appropriate value chain development suitable for the region, and understand that there are conditions where measures to protect the natural environment are indispensable.

3.5.3 Direction of Establishment of Hub for Advancement of Agriculture and Livestock Farming Value Chain

As mentioned in the beginning, it is important to consider the hub development as one of the effective approaches to efficiently collaborate between the existing agriculture and livestock farming value chains that coexist individually and exclusively. An approach to achieve advancement focusing on specific products, specific areas, or specific technologies is also important; however, advancement of value chain requires that all factors involved in the value chain are efficiently operated, and therefore, it is basically difficult to cut out only a specific part of it and make an advancement only on that portion.

On the other hand, it is also not realistic to take measures that produce the maximum outcomes of all factors. Therefore, in value chain development, it is important to take an approach in which the entire picture of the structure is conceptualized in a way it should be (i.e. the value chain is connected to the market to promote intermediate industries such as processing companies and assure the profits of consumers, while providing a better income environment for producers) and then actions are taken by focusing on the part (stage) that deviates from the actual value chain operations.

The hub development is an approach wherein this "focusing area" is identified after understanding the entire picture of the structure and actions are taken for such identified area, and therefore, the type of the hub differs depending on the roles in the value chain. For example, in the value chain of raw milk sales, if a seller directly picks up milk from a large number of producers scattered across remote locations one by one, it not only faces high costs but also has difficulty securing product quality. In this case, if the pickup work can be agglomerated to create the hub location, efficiency can be improved and the value chain itself can be advanced. In the case of the value chain where raw milk is processed into cheese and to be sold, the efficiency can be improved if milk pickup and milk processing are done at the same hub. Furthermore, in the case of selling both raw milk and cheese, it is conceivable to establish a hub that integrally agglomerates pickup, refrigeration storage, processing, and similar operations. The same concept applies not only to products but also for processes such as the cooperative use of processing facilities and cooperative transportation. In this respect, there are variations in consideration of regional characteristics, distances from the market, required functions such as quality control, regional promotion, industrial development, and so on.

In this way, in order to promote the hub establishment, as mentioned in the "Challenges" section of the Agro IT Park above, step-by-step advancement of value chain can be expected by focusing on the priority areas and promoting hub establishment, and creating success cases (note that successful cases also contribute to securing financial resources). Additionally, it is also important to consider the future

relationship between hubs. It may depend on how to conceptualize the entire picture of value chain, but, for example, if there are two locations in the same value chain where one has advantages as it is located adjacent to a major road for product transportation, but this location has no hub for collecting and processing operations, while the other has a hub for collecting and processing operations, but a feeder to the major road is not secured[182]; it is important to consider how these can be efficiently improved.

Also, it is also necessary to pay attention to seeds that have a potential to become a new hub even if it has nothing to do with agriculture and livestock farming value chain. For example, some of the service stations that have recently been constructed along major roads have a restaurant and supermarket in the same building[183] and are becoming attracting points not only for passengers and tourists but also for agricultural producers in the vicinity and pastoralists who visit neighboring areas. It is important to consider how such locations are positioned as a new piece of the value chain (for example, these locations can serve as a future "road station" or a new hub of a value chain, etc.)

Promotion for efficiency improvement of the value chain and triggering towards hub establishment by government policy plays an important role. Therefore, one hopes that the national government will conceptualize the entire picture of value chains, while strengthening the ability to lead local governments and private sector entities for their advancement, provide consistent policy to the relevant authorities in a transparent and clear manner, and make efforts on establishing structures and organizations that allow step-by-step but sure implementations.

[182] The case of Hutag-Undur district can be exemplified in the former case, and Selenge district in the latter case; Erdenemandal district, etc., can also be listed as example, although it is in the stage of hub planning.
[183] For example, a service station of Burihan in Jargalant district.

3.6 Study Tour in Japan, Market Research in China and Japan, Japan-Mongolia Joint Consultation with Government and Private Sector

This section summarizes the study tour in Japan, market research in China and Japan, and the issues specified at the "8th Japan-Mongolia Joint Consultation with the Government and Private Sector."

3.6.1 Study Tour in Japan

The study tour in Japan[184] in which MOFALI, NDA, GASI, MASM, MNCCI participated, identified the comparative advantage technologies and systems in Japan based on strengthens and weaknesses of agriculture and livestock sector in Mongolia.

Production in the agriculture and livestock sector in Mongolia is based on using natural resources. Therefore, in the current market which has a demand for natural-oriented and high scarcity products, it is considered possible to add value to products made in Mongolia by taking advantage of those features. However, the agriculture and livestock sector in Mongolia has been missing the opportunities to add values to its products due to the shortage of logistics, quality deterioration of raw materials, and lack of information analysis. The Table below summarizes the comparative advantage technologies and systems in Japan which could benefit to strengthen the agricultural and livestock sector in Mongolia and to overcome its weaknesses.

Table 3.6.1 Comparative Advantage Technology and System in Japan

Comparative Advantage Technology and System	Specified Advantages
Protection of producers by Japan Agricultural Cooperative (JA)	Cooperatives secure sales channel for producers through collecting, shipping, processing and sales. Strengthen the financial body of cooperatives and prepare credit business.
Policy for cooperation of producers, processors, and sales	Establish the system from production to processing and sales. Support government programs such as the "Sixth-Sector Industrialization" and the "Agriculture-Commerce-Industry Cooperation", and related legal establishments.
Wholesale market	Secure producer's profit by proper dealing of agricultural and livestock products. Introduce a system that functions for price stabilization and price optimization such as wholesale market.
Regional branding	Implement regional branding/regional promotion such as Food Valley Tokachi. Create regional development policy/system by industry-academia-government cooperation.
Quality control, inspection system	Establish quality control system/ inspection system by the government and the private sector. Provide safe and secure agricultural and livestock products, processed food to consumers

[184] April 12th to 21st, 2017

3.6.2 Market Research in China and Japan

The market research in China and Japan was conducted in order to examine barriers to market entry for Mongolian agricultural and livestock products in overseas market[185]. Issues pointed out by Mongolian and Japanese participants in the market survey were the strict Japanese import standards for agricultural and livestock products, small market scale in Japan for products made in Mongolia, and the few variation of Mongolian products. To address such issues, it was suggested that Mongolia should take advantage of the opportunities of international exhibitions, develop the agro-value chain through the improvement of processing technologies, and manufacture final products domestically to create value-added besides supplying raw materials.

3.6.3 Japan-Mongolia Joint Consultation with the Government and Private Sector

At the "8th Japan-Mongolia Joint Consultation with the Government and Private Sector" held in Ulaanbaatar, JICA Study Team made a presentation on "Issues of the Value Chain of Agricultural and Livestock Products in Mongolia and the Potentials for Japanese Markets." The main issues pointed out were (1)the logistic functions (collection, storage, and transportation) are vulnerable; (2)the processing quality is not evaluated based on international standards; (3)the operation of standards are not sufficiently established; and (4)raw materials for processing are not stably supplied. It was concluded that Mongolia should address the issues of logistics, hygiene and quality control, and cooperatives' activities[186].

3.7 Issues in the Agro-value Chain System

3.7.1 Issues at Each Stage of the Agro-value Chain

Considering the current status and issues in the agro-value chain system based on the Mongolian policies, environmental conditions, and case-studies that have been organized and analyzed, the issues regarding the development of the agro-value chain system in Mongolia should be addressed at each stage as organized in the Table below.

[185] China: 17th to 19th in May/ Japan: 25th to 27th in May
[186] Mongoru Tsuushin issued on July 27th 2017

Table 3.7.1 Issues at Each Stage of the Agro-value Chain

Stage	Issues	Countermeasures	Production	Processing	Distribution / Marketing	Export
Distribution and Marketing	" Market-in " approach has not permeated in Mongolian companies.	・ Employ a flexible combination of " product-out " and " market-in " approaches in the light of market conditions. ・ Work to permeate " market-in " approach for the time being. Disseminating and sharing good practices among the producers is an effective way.	✔	✔	✔✔	✔
	Distribution/logistics are not effectively functioned due to insufficient cooperation among stakeholders of the sector.	・ Improve conditions of physical infrastructure such as paving feeder roads and establishing facilities for storage, collecting points, and direct sales. ・ Improve the quality and diversify distribution service. Diversify distribution /logistics service, to enhance the quality, and to enlarge the target area of the service. ・ Enhance the functions of local chambers of commerce and of industry-specific associations such as supporting collection and marketing activities.	✔	✔✔	✔✔	✔
	Reputation/recognition of Mongolian brands is low.	・ Enable companies to obtain information on market trends and related technologies through outsourced manufacturing technique or OEM. Improve product quality and intensify marketing capability. ・ Implement governmental assistance to enhance the " brand recognition " of Mongolian products (e.g. supporting new product development and publicity) ・ Enhance processing and packaging technologies and stabilize product quality at the firm-level. The government should support such efforts of the private sector as well as providing governmental assistance to establish standards for hygiene and quality control.		✔✔	✔	✔✔
	Awareness of hygiene and product quality is low	・ Provide incentives to companies to undertake sophisticated hygiene and quality control and raise consumers ' awareness of quality and hygiene.	✔	✔	✔	✔

Stage	Issues	Countermeasures	Production	Processing	Distribution / Marketing	Export
Agricultural and Livestock Processing	There are difficulties to secure a stable supply of raw materials.	・Create a stable market as a trading mechanism that guarantees constant participation of both producers and processors under mutually agreed conditions and requirements. It is important to make an effective linkage between the processors and the market. ・Integration of traditional herders (processors) into the modernized and sustainable production system is a premise.	✔✔	✔		
	Quality improvement of raw materials is urgent.	・Classify products by quality and sell them based on the grading system. (Producers will be able to develop abilities to distinguish quality differences which lead to bringing incentive by producing better quality products.)	✔✔	✔		
	Processing firms are not aware of market needs.	・Take a “market-in” approach; in other words, give positive feedbacks to quality improvement and product development learned from consumers’ demands and claims.		✔✔	✔	✔
	Poor infrastructure and low processing technologies are not acknowledged.	・Establish a stable market as an incentive.		✔✔	✔	✔
	First-rate/grade products are not appreciated by processors.	・Provide processors the opportunities to appreciate the hidden potentials of processing/converting raw materials into better products.		✔	✔	✔

Stage	Issues	Countermeasures	Production	Processing	Distribution / Marketing	Export
Hygiene and Quality Control	Scientific-based hygiene and safety control is necessary.	・Ensure constant hygiene and safety control from raw material production to consumer markets. If any part of the whole process is treated inadequately, safety is unsecured and compromised. ・Carry out disease control, quick diagnosis and response when disease occurs, and introduce and ensure proper operation of the system to minimize the affection of diseases on food and products. ・Ensure appropriate use of chemicals and drugs. ・Introduce and establish GHP and GMP into processing and distribution stages. ・Present scientific evidence to prove safety (production inspection must be reliable).	✔✔	✔✔	✔✔	✔✔
	Reflecting consumer needs to the standards is necessary.	・Share and disseminate information on quality standards requested by processing manufacturers to producers of upstream industries. Such requirements should affect transaction price of upstream products and constant information sharing is important. ・Carefully consider effective roles of information sharing by middlemen.	✔	✔	✔✔	✔✔
	Mutual trust relationships need to be developed among markets and consumers.	・Stabilize the quality and, reduce consumers ' anxiety by establishing and adhering production/distribution rules ・In the aim/written material of first-rate products, add some features such as backgrounds, stories, and functionalities of the products.			✔✔	✔✔
	Due to numerous type of individual distribution routes, it is difficult to	・Operate a hygiene and quality control system through "gates". ・Prepare special route distinguished from mainstream as necessary.	✔	✔	✔	✔

Stage	Issues	Countermeasures	Production	Processing	Distribution/ Marketing	Export
Analysis on Production Infrastructure	Regions showing production expansion tendency are concentrated in outskirts of the city.	・Expand production in rural areas to utilize regional potentials.	✔	✔		
	The concentration of herders is observed around the city and in the vicinity of the main road due to the convenience of transportation and distribution.	・Reduce the load on grassland by intensive livestock farming. It is necessary to reduce the loads by means of decentralization as well as taking advantage of traditional grazing technologies.	✔✔		✔	
	Value-addition in production infrastructure is small.	・In addition to establishing distribution network connecting rural and urban areas, take the development of agro-value chain into consideration for distribution improvement and arrangements of slaughter houses, primary processing facilities, and collecting points.	✔	✔		
	Securing budget for hub development is necessary.	・Consider possibilities of allocating part of the local development budget, and formulate/evaluate a reasonable mechanism to allocate a part of the regional development support from donors. ・Prioritize hub development candidates to locations where successful outcomes are more credible, even though the scale may be small. ・Consider complementary support methods other than government budget. (e.g. technical support, indirect tax incentives for training expenses, priority mediation of sponsor support, etc.)	✔	✔		
	The development policy for the whole agro-value chain and the roles of the hubs within it are not clearly addressed.	・Examine the relationship between hubs and markets and consider at which stage of the value chain (economy of scale) should the efficiency improvement be made. ・Determine practical functions of hubs by profitability based on the clarification of regional characteristics and their roles in the value chain system. Scale and facilities of hubs must be designed to meet such factors.	✔	✔	✔	✔
	Without a clear picture of the whole value chain structure, individual developments in each region may cause duplication of functions/products and defects in a part of the value chain.	・First conceptualize the entire picture of the of the value chain structure, in a way that production/processing stages are connected to the market. It should promote intermediate industries such as processing companies and assure the profits for the consumers, while also providing a better income environment for producers. ・Promote efficiency improvement of the value chain and trigger for the hub establishment through government policies. (The national government should conceptualize the entire picture of the value chain structure/system. Moreover, it is also necessary to strengthen its own ability to lead local governments and the private sector for their advancement and to provide coherent and transparent policy.)	✔	✔	✔	✔

3.7.2 Summary of Issues

Issues at each stage of the agro-value chain system are summarized as below.

Table 3.7.2 Summary of Issues at Each Stage of the Agro-value Chain

Stage	Countermeasures
Distribution and Marketing	**Strengthen competitiveness of agricultural and livestock products.** ・ Permeate the idea of "market-in" approach. ・ Diversify distribution services and encourage cooperations among stakeholder. ・ Accumulate technologies and knowledge.
Agricultural and Livestock Processing	**Establish a system to link producers and processors.** ・ Integrate traditional herders for a stable supply of raw materials. ・ Classify products by quality grading system. ・ Receive external evaluations on levels of processing technologies.
Hygiene and Quality Control	**Develop a total quality control system.** ・ Ensure constantly following quality standards from raw material production to reaching consumer markets. ・ Inform requirements for quality standards to the upstream industries, ・ Establish "gates" that manage diverse distribution routes.
Production Infrastructure	**Determine functions of hubs based on the roles under the value chain.** ・ Decentralize production infrastructure by expanding production in rural areas. ・ Enhance value-added system at production sites. ・ Create a picture of the value chain structure/system that connects production/processing and the market.

Chapter4 Conclusion and Recommendation

As referred in Chapter 2 and 3, the policy goals in Mongolia's agriculture and livestock farming, issues related to natural resources, and issues at each stage of the agro-value chain has been organized through the study. In this chapter, a comprehensive agro-value chain development strategy (master plan, hereinafter "M/P") is proposed in order to achieve these goals and to solve the issues. In addition, pilot projects (hereinafter "P/P") shall be implemented in the process of M/P formulation.

4.1 Necessity of the Comprehensive Agro-value Chain Development Strategy (M/P)

4.1.1 Focus on M/P Formulation

This strategy shall be organized from the three perspectives of "platform to cooperate related policies", "solution of issues based on the whole picture of the value chain", and "efficient use of regional resources".

4.1.2 Platform to Coordinate Related Policies

As mentioned in "2.3.1 Policy of Agriculture and Livestock" in Chapter 2, the agriculture and livestock sector has a role to contribute to sustainable economic development by economic diversification which is one of the development goals of SDV 2030, through the "Healthy Food - Healthy Mongolian Citizen" conducted by MOFALI based on the Action Program 2016-2020 and "Regional Development Policy" positioned as a mid-term plan of the Law on Regional Development Policy and Planning.

MOFALI implements various plans and programs based on the Action Program 2016-2020. In particular, the integration of the light industry department with the food, agriculture and livestock department enabled consistent administration for production to processing and sales. However, from the viewpoint of agro-value chain development, it is necessary to examine the way of agriculture policy in several aspects.

First of all, regarding the plans/programs focusing on raw material supply that are currently implemented, it shall be noted that improvement of raw material supply system requires efforts in cooperation with the provision of downstream market information and coordination of policies and plans/programs. Next, efforts in each sector of livestock, agriculture, food industry and light industry need to construct a mechanism of value-added chain from a combination of product-specific approaches and cross-product issues. In addition, it is necessary to organize consistency of intersectoral policies and plans/programs. Furthermore, to promote agro-value chain development, it is necessary to consider priority regions to proceed plans and programs. This arrangement and consideration need not only to solve issues of each product but also to introduce strategic plans/programs based on regional characteristics. For the purpose of this, it is expected to link both MOFALI's policy on the agro-value chain and NDA's regional development policy.

In order to upgrade the agro-value chain based on these considerations, comprehensive tools are required to manage the relevant ministries and agencies and related policies in order to ensure functional coordination and consistency among policies. The M/P is recommended to be used as the tool.

4.1.3 Issues to be Solved Based on the Overall Picture of the Value Chain

The value chain is a series of related processes from production to sales. There are common processes on certain products, but to improve some processes does not necessarily lead to improvement of the total value chain. In addition, the way of solution of issues on each process in the value chain differs depending on the target market. For example, operations of livestock disease control in the food sector are to work on compliance with laws and inspection for food safety. As for the light industry sector, it

shall address on the loss of leather value caused by perforation of parasites for productivity improvement and value-addition activities. Furthermore, as clarified in "3.7 Issues in the Agro-value Chain System", each issue in each agro-value chain process exist across several stages of the agro-value chain.

Each issue shall not be addressed by temporary palliative measures but based on the overall picture of the value chain. It is recommended that M/P would be used as a tool to arrange the position of each issue in the value chain and the pathway for the solution.

4.1.4 Efficient Use of Regional Resources

The Mongolian agriculture and livestock sector is based on diverse natural resources, and the way of using these resources varies greatly depending on regional conditions. Because it is based on natural resources, the production easily fluctuates by the season and the production infrastructure is dispersed nationwide, as typified by livestock farming throughout the country. This condition is considered as a bottleneck in the supply of raw materials and a major issue of regional development by agriculture and livestock products. In order to efficiently utilize natural resources with large seasonal variations, intensive farming is proposed to be one of the solutions. However, considering the distribution of grassland and water resources, regions that can be resolved by intensive farming are limited. For this reason, it is important to secure a certain production scale by proper arrangement and coordination of collecting points and processing points. In order for the agriculture and livestock sector to contribute to the regional development, efficient use of regional resources which include human resources as well as natural resources is necessary.

For efficient utilization of regional resources from the viewpoint of the value chain, it is necessary not only to improve the logistics infrastructure but also to carry out production and collection activities based on market information that links producers and the markets. In order to further advance these attempts, it is essential to make groups and networks of producers. The M/P is recommended to be used as a tool for building an industrial foundation that takes advantage of the regional characteristics and advantages.

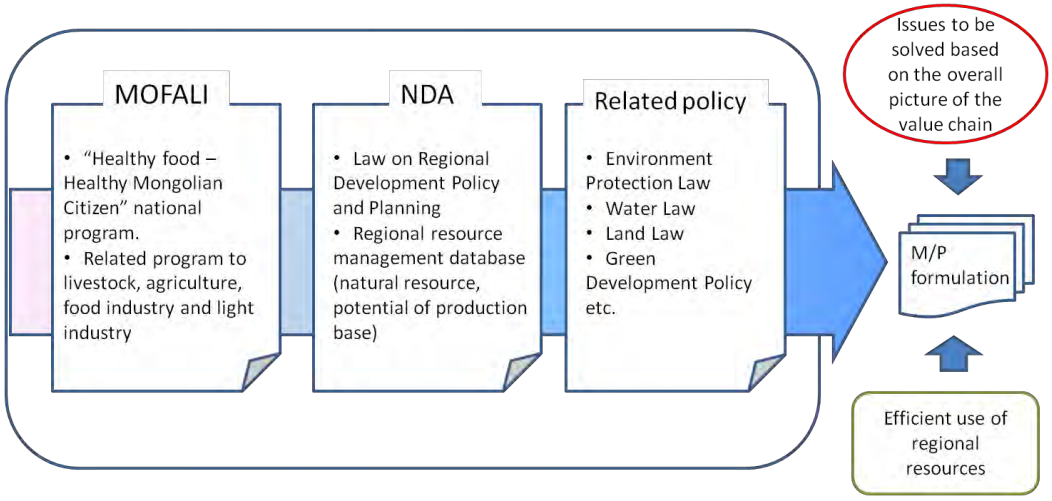


Figure 4.1.1 Perspective on M/P Formulation

4.2 Process of M/P formulation

4.2.1 Research and Analysis for M/P Formulation

A baseline survey, research and analysis on the value-chain and P/P shall be implemented to formulate M/P.

The baseline survey shall be based on the issues and countermeasures for each stage in the agro-value chain that has been organized in this report. Specific case study and detail analysis shall be made on subjects such as the policies and institutions related to the agro-value chain, the implementation status of similar projects, the market trends, the institution, organization and standard of quality and inspection related to import and export, potential of regional resources, import/export status of agriculture and livestock products (domestic, regional, export) etc. Based on the results, it shall be narrowed down to cross-sectional issues on target agriculture and livestock products and quality inspection systems.

After the selection of target agriculture and livestock products, through conducting value chain survey and analysis, issues on each value-chain stage as from production to reaching consumers (including export) and the conditions of the involvement of related stake holders and cooperatives shall be comprehended. Based on the survey, it is expected to conduct analysis on the target production area and target market of agriculture and livestock products, implement the pilot project, monitor progress and results, and formulate M/P based on the results.

In Mongolia, information and data has been accumulated through research and analysis, and policy development and on-site initiatives has already been proceeded in various fields of agriculture and livestock, light industry, and regional development, mainly by MOFALI and NDA. Therefore, in investigating and analyzing M/P formulation, it is recommended to maximize the utilization of knowledge and experience from past lessons and to rearrange them from the viewpoint of agro-value chain development. It is also important to note that the formulation of M/P is not proposed to start from rudimentary data collection.

4.2.2 Purpose of P/P

P/P shall be carried out during the investigation period of the M/P formulation. The purpose of P/P is to carry out and verify some of the activities suggested in the draft M/P so as to give feedbacks from the lessons learned and improve the M/P to a more feasible plan.

4.2.3 Position of P/P in the Survey on M/P Formulation

P/P shall be implemented as one of the M/P formulation processes as shown in Figure 4.2.1.

In Figure 4.2.1, “pre P/P” refers to possible cases where the P/P for some agricultural and livestock products may be able to be started in advance after the completion of the baseline survey and analysis.

4.2.4 P/P Theme Setting Process

The theme of P/P shall be selected by comparing with issues at each stage of the agro-value chain. For example, P/P theme may be selected from a long-list of P/P contents and verification theme, referring to issues at each stage of the agro-value chain pointed out in "3.7 Issues in the Agro-value Chain System".

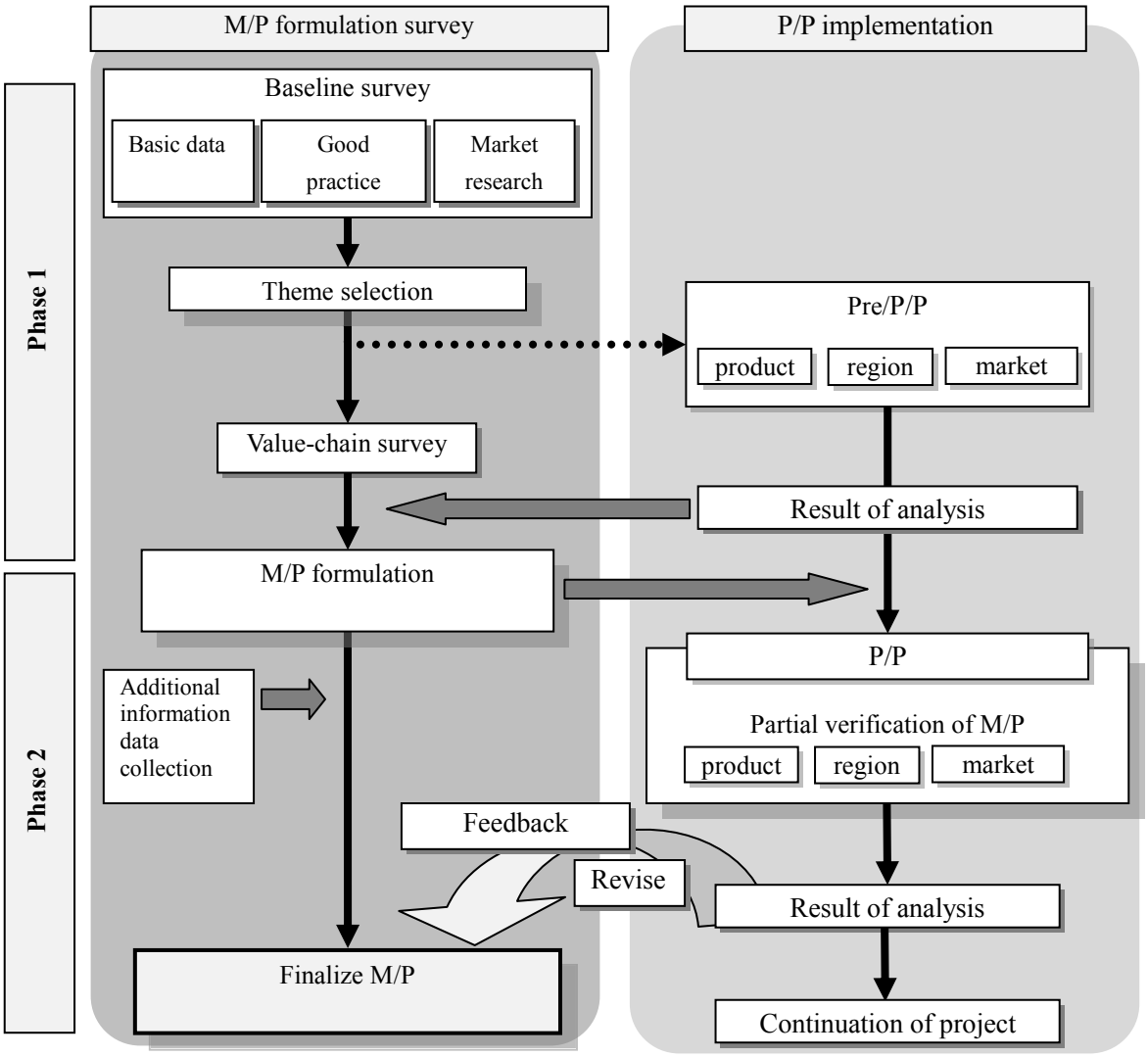


Figure 4.2.1 Relationship between M/P Formulation Survey and P/P Implementation

4.2.5 Relationship between P/P and M/P

In consideration of the following points, a long-list shall be created as a proposed P/P from the draft M/P, and from the same list, details of the P/P activities shall be decided through the discussion with the Mongolian government, JICA and the Study Team. Since details on P/P may change depending on the situations of M/P formulation, it is important to carefully consider the implementation methods and conditions, etc. among related stakeholders to make sure it appropriate.

(1) Draft of P/P Selection Criteria

- There are prospects of obtaining results and lessons within the investigation period of M/P formulation
- Utilize existing organization as much as possible
- P/P target area shall not be concentrated in a particular region
- No negative influence shall be caused by P/P

(2) Examples of P/P

As a reference for having an idea of the implementation scale of P/P, examples on agro-value chain development are described below.

Example1: Export Expansion

"Burkina Faso, The project for the formulation of master plan for the market oriented agriculture in Burkina Faso[1]"

In order to expand the export of fresh mango and dried mango to the international market, the purpose of the project is to expand sales routes for private companies, improve selection packaging capacity, improve hygiene at processing facilities, improve quality, and to reduce manufacturing costs.

Sector	Issues	Pilot Project
Improve hygiene	Improve hygiene and quality control	Enlightenment of awareness about hygiene and quality control by visiting advanced processing factories.
	Improve processing technology and hygiene/quality control method	Improve product processing technology according to Japanese market demand.
	Improve drying machine	Improve the variation of quality by changing the material of trays of drying machine.
Improve profitability	Waste utilization	Visit advanced processing factories.
	Improve drying machine	Improve mechanical functions such as the fan and temperature controller of drying machines to improve productivity.
Develop sales channel	Develop export channel	Subsidize expenses for exhibitions of overseas exhibitions.
	Product improvement according to the requirements of new export destinations	Teach processing techniques that meet general hygiene control standards. Improve the smell of products by temperature management.

Example2: Import Substitution

Mongolia imports chicken meat and eggs, and it is required to promote domestic poultry farming for import substitution. In particular, the import dependency ratio of eggs is as high as 87.3% in 2014 and 66.4% in 2015. This pilot project aims to improve breeding technology for farmers' group (farmers' cooperatives), improve hygiene at poultry farms, improve quality, reduce processing costs, and improve sales ability.

Sector	Issues	Pilot Project
Production	Improve feeding technology	Visit advanced chicken farms, implement technical training.
	Health management of poultry houses	Sanitary control standard
Processing technology	Consumer needs	Interview to retailers
	Hygiene management	Certification acquisition support for HACCP、GAP, etc.
Develop sales channel	Domestic consumer needs	Market research
	Support for ensuring sales channels of retailers, middlemen, markets, and supermarkets.	Participation in the exhibition
	Competition of price and quality to imported chicken meat and eggs.	Nutrition analysis, support for certification acquisition.
	Sales of poultry manure	Needs survey

[1] JICA(2015), Burkina Faso, The project for the formulation of Master Plan for the marcket oriented agriculture, final report

4.2.6 Monitoring of P/P

Before implementing P/P, it is recommended to clarify items to be verified and confirmed in the project, and during the implementation of P/P, verification activities shall be carried out according to the monitoring plan.

4.3 Contents of M/P and Implementation Structure

4.3.1 Positioning of M/P

Because M/P is expected to have a function as a platform to ensure collaboration between existing national policies and programs, it is expected that the M/P will have a legal position that conforms to existing policy (for example, it is important to secure the approval of the Cabinet as a prescribed national program defined by Article 10 of the Law on Regional Development Policy and Planning). It shall be associated with the "Healthy Food - Healthy Mongolian Citizen" national program which MOFALI currently conducts, and propose a plan that materializes each policy from the viewpoint of the value chain.

4.3.2 Contents of M/P

The draft contents of M/P are as follows.

Contents of M/P (Draft)

1) Purpose of M/P
2) Process of M/P formulation
   2-1 Affiliated ministries and agencies
   2-2 Positioning to policy
3) Perspectives of M/P
   3-1 Policies related to each process (production - collection - processing - distribution - sales) of the value chain.
   3-2 Bottleneck of the value chain by product and methods for solution.
   3-3 Identification of added value at each stage of value chain process.
   3-4 Evaluation of regions that established a value chain based on regional characteristics (cross-sectional products).
4) P/P implementation
   4-1 Purpose and plan of P/P
   4-2 P/P implementation status
   4-3 Evaluation
   4-4 Feedback
5) Action plan for realization of M/P
   4-1 Achievement Goal / Indicator / Activity / Development Approach
   4-2 Implementing entity and target area
   4-3 Time and schedule for implementation
   4-4 Input, cost and financial resources

4.3.3 Implementation Structure

MOFALI and NDA are proposed to be the main executing agencies for M/P formulation. Organizations involved in policies related to regional development (MET, Ministry of Construction, Urban Planning, etc.) shall be the cooperating agencies and shall participate in M/P formulation through information sharing.

Regarding the selection of P/P activities, MASM and GASI, which are responsible for quality control, inspection and certification, are recommended to be involved. Moreover, when implementing P/P, private enterprises shall be involved through MNCCI. In addition, regarding human resource development for further effectiveness, P/P shall be implemented in cooperation with local administrations and production associations.

4.3.4 Points to be Noted in M/P Formulation Survey

Followings are the current matters to be noted in the M/P formulation survey.

- Consistency with policy:
  Various policies are placed in Mongolia, and it is vital to be conscious of the position and relevance of M/P towards building an agro-value chain system and ensure its consistency.
- Target market:
  The primary target market is domestic import substitution market as mentioned in SDV 2030. The import substitution market is a large market that is relevant to "Industrialization 21:100" program conducted by MOFALI and the "Inclusive and Sustainable Vegetable Production and Marketing Project" project by SDC.
  Entering into overseas markets is essential to strengthen Mongolian agriculture and livestock sector through sales of agriculture and livestock products. Furthermore, it enables to develop market-competitive agriculture and livestock products through the supply of products that satisfy the conditions of the partner country.
- Overseas market research:
  The domestic market of Mongolia is weak both in market size and quality, and some products are reasonable to be developed aimed for export. For such product developments, it is considered useful to visit major overseas market such as China, Russia, Japan, etc. to accurately grasp the situation.
- Cooperation with the private sector:
  In the formulation of M/P and especially P/P implementation, it is necessary to incorporate the private sector related to the agro-value chain and to establish a cooperation system with them. Moreover, it is important to consider risk compensation or other measures for private enterprises and others that would participate in P/P.
- Collaboration with other donors:
  Other donor activities in Mongolian agro-value chain development are preceded by FAO and SDC projects. In collaboration with other donors, special attention shall be paid to (1) market information sharing, (2) quality control standard setting, and (3) capacity building. In other words, important implementations for the Mongolian agro-value chain are nationwide regional development through collaboration among P/P, sharing information that import substitution and export are the target markets, and in particular, sharing terms and conditions concerning entry into the Japanese market. In quality control, differences in criteria required in the targeted countries by each donor shall be considered. In addition, in terms of capacity development for farmers, herders and farmers' organizations, it is important that donors share their goals and create programs for capacity development.