Ministry of Food, Agriculture and Light Industry
Ministry of Economy and Development
Mongolia

THE PROJECT FOR FORMULATION OF MASTER PLAN ON THE AGRICULTURAL VALUE CHAIN IN MONGOLIA (MONMAP-AVC)

FINAL REPORT

January 2024

JAPAN INTERNATIONAL COOPERATION AGENCY

NTC INTERNATIONAL CO., LTD.

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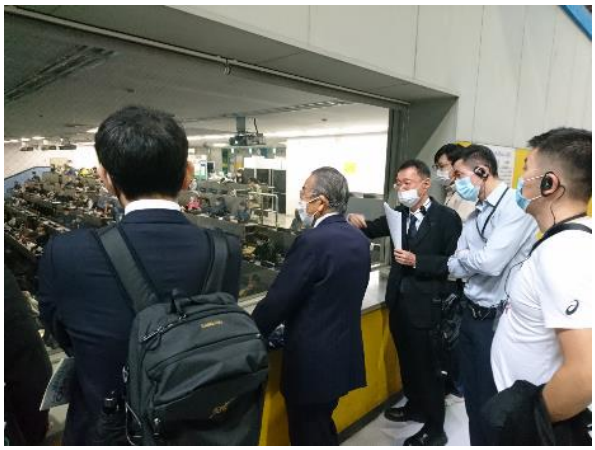
Photo 1

Joint Coordination Committee

Workshop on Action Plan

Training in Japan



Visiting the Auction During the Training in Japan

Third Country Training in Kyrgyzstan

Third Country Training in Kyrgyzstan

Photo 2

Vegetable Pilot Activity
(Tomato sowing)

Fruit Tree Pilot Activity
(Sea buckthorn seedlings)

Pet Food Pilot Activity
(Horse organ)

Wool Pilot Activity
(Wool shearing)

Honey Pilot Activity
(Veterinary training)

Honey Pilot Activity
(Exchange of opinions with beekeepers)

THE PROJECT FOR FORMULATION OF MASTER PLAN ON THE AGRICULTURAL VALUE CHAIN IN MONGOLIA

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Abbreviation

Abbreviation	English
ADB	Asian Development Bank
AMP	Agricultural Marketing Platform
A/P	Action Plan
APRSAF	Asia-Pacific Regional Space Agency Forum
ASEAN	Association of South-East Asian Nations
BSE	Bovine Spongiform Encephalopathy
COMECON	Council for Mutual Economic Assistance
C/P	Counterpart
EAEU	Eurasian Economic Union
EC	Electronic Commerce
ERI	Economic Research Institute
EU	European Union
FADPG	Food and Agriculture Development Partner Group
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FMD	Foot-and-mouth disease
F/S	Feasibility Study
GAP	Good Agricultural Practices
GAHP	Good Animal Husbandry Practices
GASI	General Agency for Specialized Investigation
GAVS	General Authority of Veterinary Services
GDP	Gross Domestic Product
GEF	Global Environment Facility
GVP	Good Veterinary Practice
HACCP	Hazard Analysis Critical Control Point
IFAD	International Fund for Agricultural Development
ISO	International Organization for Standardization
JCC	Joint Coordinating Committee
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JPY	Japanese Yen
LPI	Logistics Performance Index
MASM	Mongolian Agency for Standardization and Metrology
MED	Ministry of Economy Development
M/M	Minutes of Meeting
MNCCI	Mongolian National Chamber of Commerce and Industry
MNT	Mongolian Tugrug

Abbreviation	English
MNS	Mongolian National Standard
MOET	Ministry of Environment and Tourism
MOF	Ministry of Finance
MOFALI	Ministry of Food, Agriculture and Light Industry
M/P	Master Plan
NAEC	National Agricultural Extension Center
NAMAC	National Association of Mongolia Agricultural Cooperatives
NAMEM	National Agency Meteorology and the Environmental Monitoring
NDA	National Development Agency
NGO	Non-Governmental Organization
NRL	National Research Laboratory
ODA	Official Development Assistance
OEM	Original Equipment Manufacturer
OIE(WOAH)	Office International des Epizooties (World Organization for Animal Health)
OSSC	One Stop Service Center
PA	Pilot Activities
PIP	Public Investment Program
PGS	Participatory Guarantee System
PMU	Project Management Unit
PPR	Peste des Petits Ruminants
PSC	Project Steering Committee
R/D	Record of Discussions
SATREPS	Science and Technology Research Partnership for Sustainable Development
SCVL	State Central Veterinary Laboratory
SDC	Swiss Development Cooperation
TMREL	Theoretical minimum risk exposure level
TWG	Technical Working Group
UNDP	United Nations Development Program
USD	United States Dollar
VC	Value Chain
WB	World Bank
WTO	World Trade Organization

Currency Conversion Rate (as of November 1, 2023)

	MNT	USD	JPY
1MNT=		0.00038	0.05737
1USD=	2,620		150.708
1JPY=	17.3825	0.00663	

Source: OANDA

Chapter 1. Outline of the Project

1.1 Project Background

The agro-pastoral industry in Mongolia is the country's key industry, accounting for about 12.8% of GDP (in 2022), second only to the mining industry, with about 30% of the working population engaged in this industry. In the manufacturing industry, food products and textile processing account for about 22% of total manufacturing industry sales (in 2022). As the country's economic growth rate slows due to the recent decline in mineral prices, the agro-pastoral industry is attracting attention as a key sector for industrial diversification in the country. However, in the livestock sector, the concentration of livestock in peri-urban areas, overgrazing due to the increase in the number of animals, grassland degradation, damage from snow damage (Dzud), and inadequate measures against infectious diseases such as foot-and-mouth disease have been pointed out as challenges. In the agricultural sector, national policies have increased the area planted and harvested, and the domestic self-sufficiency rate is improving, but a stable production/supply system for the cold season has not yet been fully developed. In the area of processing and distribution, low levels of processing technology, inadequate logistics networks including cold chains, and lack of quality and sanitation management that meet international standards are obstacles that have yet to make the sector sufficiently competitive. Therefore, the Ministry of Food, Agriculture and Light Industry (MOFALI) and the Ministry of Economic Development (MED), in collaboration with the two ministries, have developed a strategic agro-pastoral value chain plan, taking into account factors of regional characteristics. Japan was requested to cooperate in the formulation of a Master Plan (M/P) for the strategic promotion of the agro-pastoral value chain (VC).

1.2 Project Objectives

The objective of this project is "to reflect the M/P and Action Plan (A/P) developed in this project in the regional development policy and national programs related to agro-pastoralism in the country of Mongolia". In order to achieve this objective, the project also aims to achieve the following three outcomes

1) To implement pilot activity to obtain necessary lessons learned for developing VC.
2) To improve the capacity of implementing agencies to support the promotion of agro-pastoral VC
3) To formulate M/P and A/P for agro-pastoral VC in Mongolia

1.3 Target Areas

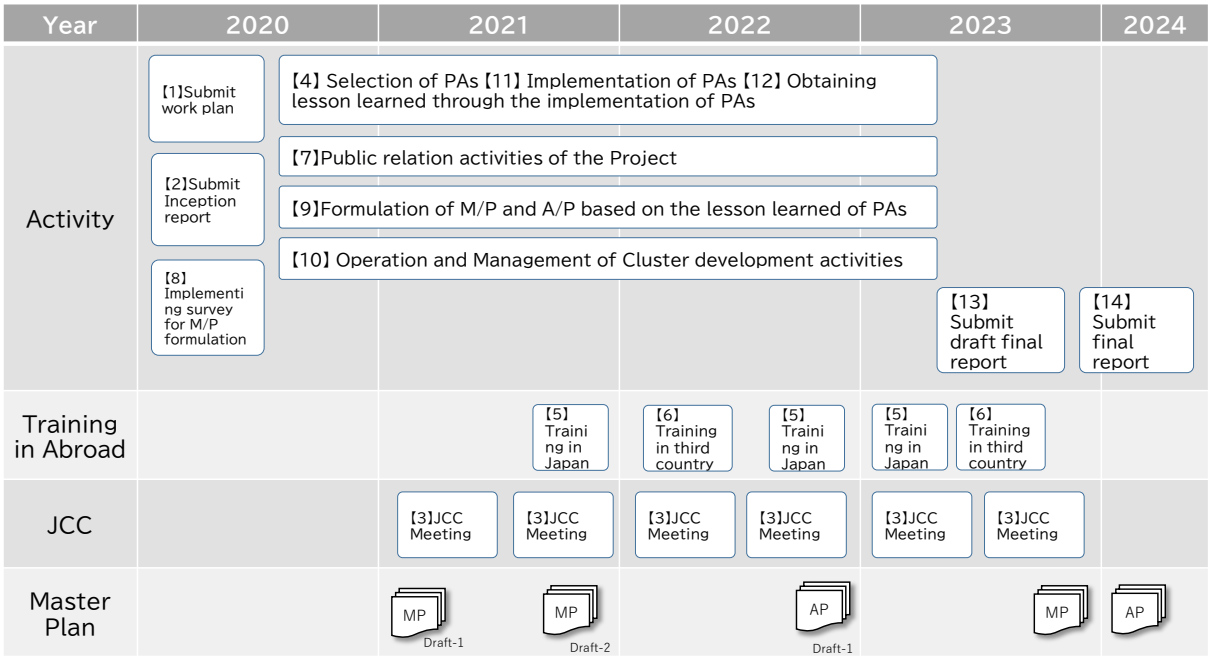
The target area of this project shall be "All of Mongolia".

1.4 Relevant ministries and agencies

MOFALI, MED, Ministry of Finance (MOF), Mongolian industry associations and Japanese and Mongolian private companies.

1.5 Project Activity Plan

A flowchart of project activities is shown in Figure 1.1. The duration of the work was extended by one year due to the difficulties in implementing the work in Mongolia as a result of COVID-19.



Source: JICA Project Team

Figure 1.1 Project Activity Flowchart

1.6 Composition of the Report

This report consists of 1) a main report and 2) sub-reports. The items covered in each report are as follows

1.6.1 Main Report (Final Report)

The main report consists of the results of the basic survey on the Mongolian agro-pastoral industry conducted under the project, pilot activities, and efforts to form an industrial cluster, as well as reports on workshops and review meetings held for implementing and cooperating agencies in the process of preparing the master plan. Table 1.1 shows the structure of the main report.

Table 1.1 Structure of the Main Report (Final Report)

Chapter	Title	Outline
Chapter 1	Outline of the Project	This chapter provides an overview of the project, including background and objectives of the project.
Chapter 2	Current situation of the study area	This chapter presents the results of the survey on the relevant policies in the economic, social, natural environment, and agro-pastoral sectors in Mongolia, the study area, as well as basic information on government agencies, private organizations, development partners, etc. related to the project.
Chapter 3	Current Situation and Issues on Agriculture in Mongolia	This chapter presents the results of a survey on the current status and challenges of the agro-pastoral industry in Mongolia. The report details the current status and challenges of existing supply chains for wheat, oilseeds, vegetables, and fruit trees in the agricultural sector, and for meat, dairy products, wool, cashmere, leather, and other items in the pastoral sector.
Chapter 4	Pilot Activities	This chapter presents results related to the 11 pilot activities conducted under the

Chapter	Title	Outline
		project, as well as findings and lessons learned through the pilot activities.
Chapter 5	Industrial Cluster Development	This chapter describes the contents and results of the initiatives and the findings and lessons learned through the honey clusters formed on a trial basis in this project. It also describes efforts toward institutionalization of the industrial cluster.
Chapter 6	Preparation of Master Plan for Agro-pastoral Value Chain Development	This chapter includes the methods and results of training, workshops, and review meetings conducted in the process of preparing the Agro-Pastoral VC Development Master Plan.

Source: JICA Project Team

1.6.2 Sub-report (Master Plan)

The sub-report is the "Agro-Pastoral VC Development Master Plan" itself, which was prepared in collaboration with the implementing agencies based on the findings and lessons learned from the basic research conducted in the main report and from the implementation of the pilot activity. The implementing agencies, MOFALI and MED, are required to budget and implement the plan described in this sub-report as their own policy. The structure of the sub-report is as follows.

Table 1.2 Structure of the sub-report (Master Plan)

Chapter	Title	Outline
Chapter 1	Agro-Pastoral Value Chain Development Master Plan	This chapter describes the background to the preparation of this Master Plan, along with the current status of the agro-pastoral industry in Mongolia. It also presents the positioning of this Master Plan in relation to the national development policies and plans currently being formulated and implemented by the Mongolian government.
Chapter 2	The Outlook for Agro-Pastoral Value Chain Development	This chapter summarizes the natural and social conditions surrounding Mongolia. The major agricultural and livestock products in Mongolia and those with potential for development are then discussed, and the current status and challenges of the supply chain and the direction of development are detailed for each product. Other perspectives required for agro-pastoral value chain development are also detailed by sector (trade, quality and sanitation, financial system, etc.).
Chapter 3	Development Strategy of the Mongolian Agro-pastoral Industry	This chapter reviews the development of the agro-pastoral industry in Mongolia to date, analyzes the current situation, and discusses the basic concept of agro-pastoral value chain development. It also presents four development directions that should be prioritized in order to realize this concept.
Chapter 4	Agro-pastoral value chain development program	This chapter presents a total of 11 programs and 43 action plans devised based on the development strategies established in Chapter 3. Each action plan includes the establishment of issues to be addressed, project goals, project period, organizations in charge of the project, and project budget.
Chapter 5	Implementation structure of each development program	This chapter describes the implementation framework for implementing this Master Plan. It presents the development indicators, implementation and monitoring systems, as well as the schedule and implementation costs for achieving the goals of each action plan. The implementation structure is based on the principle that MOFALI will play a central role in coordinating with relevant government agencies and developing partners, while the implementation costs will be shared between the government and the private sector.
Chapter 6	Summary and Recommendations	This chapter summarizes the main points of this Master Plan and provides recommendations for the realization of strategic Mongolian agro-pastoral value chain promotion.

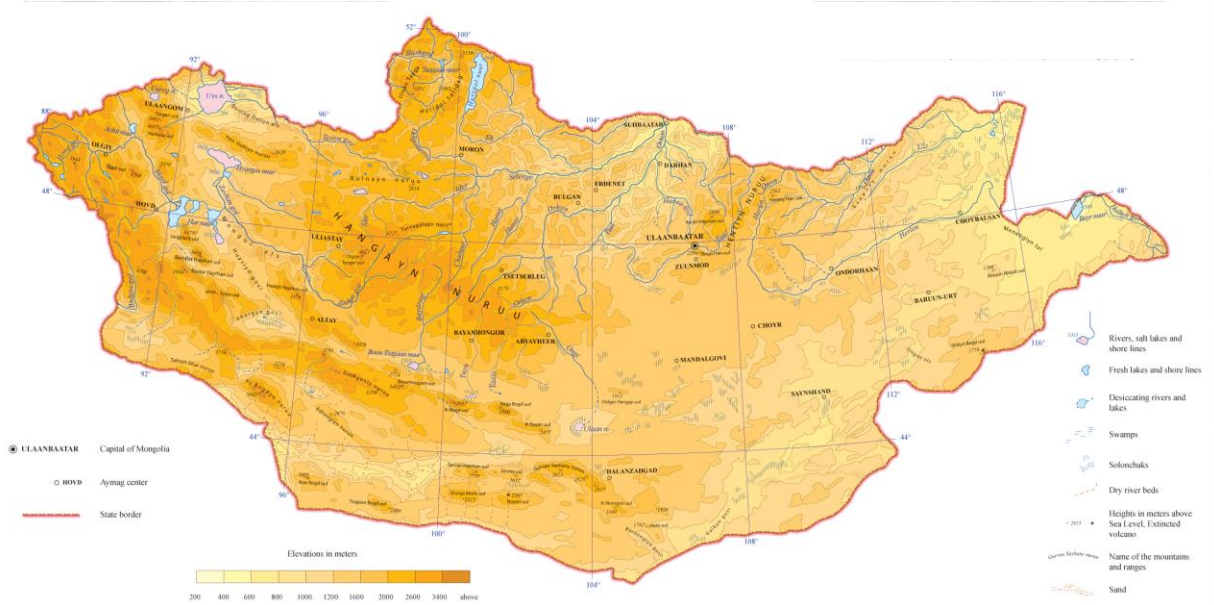
Source: JICA Project Team

Chapter 2. Current Situation of the Study Area

2.1 Natural Condition

2.1.1 Geography

Mongolia has a land area of 1,564,000 km^2 on the Eurasian continent, and borders Russia to the north and China to the south. In general, it is a landform of high altitude in the west and low altitude in the east. To the west is the Altai Mountains at an altitude of 4,300 m and the Khangai Mountains at an altitude of 3,500 m, while to the east is the plateau at an altitude of 900 to 1500 m. More than 80% of the land is located at an altitude of 1000 m or more.



Source: Ecosystems of Mongolia; A.N. Severtsov Institute of Ecology and Evolution; 2019

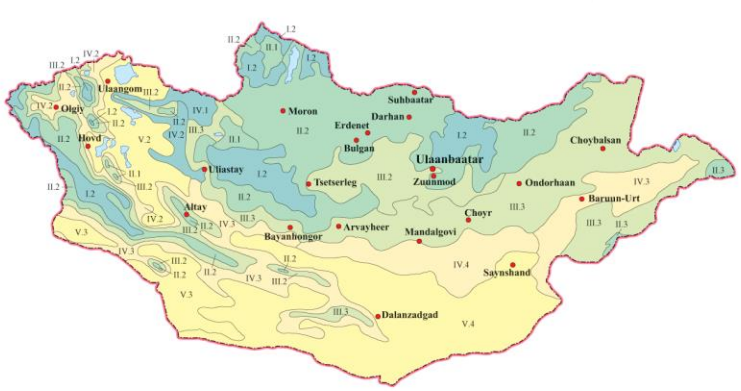
Figure 2.1 Topographic Map of Mongolia

2.1.2 Climate

Mongolia has a continental climate, generally characterized by very cold winters, cool or warm summers, and low precipitation. By region, the northern area around Lake Khövsgöl and the northern areas of Khentii and Tuv are subarctic, while the southern area is arid, including the Gobi Desert.

The daily and annual temperature differentials are large, with the difference between January and July being 44 °C and 30 °C. Average temperatures generally tend to be lower in the north than in the south. Temperatures in January and July in Ulaanbaatar are -22 °C and 17 °C, and in the southern Gobi region are -15 °C and 21 °C, respectively.

Annual precipitation increases at higher altitudes and latitudes: about 100 mm in the lower desert areas of the southwest and about 250 mm in the northern mountainous areas. Precipitation patterns vary widely from year to year.



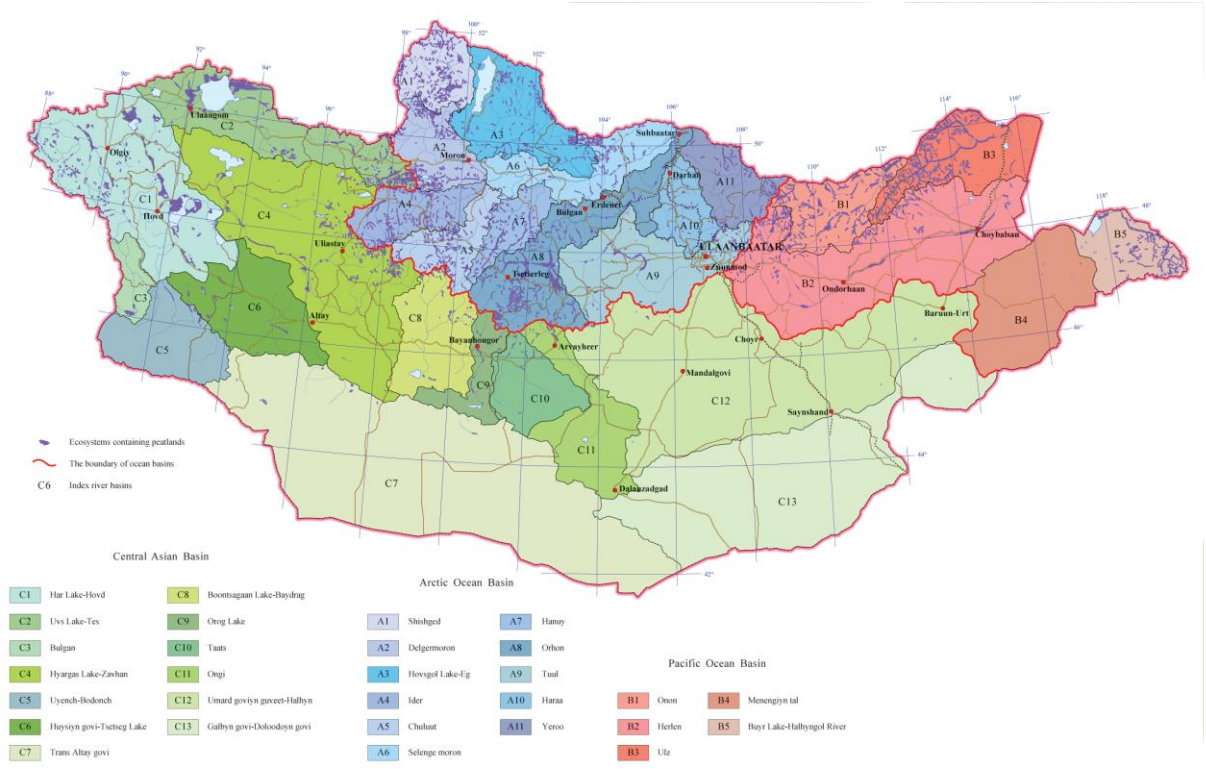
Summer	Winter	Water supply d/p	Radiant heat t >10°C
I. Wet, cold	I.2 Severe	Less than 1,0	Less than 1500
II. Moderate wet and moderate cold	II.1 Very severe II.2 Severe II.3 Moderate severe	1,1 - 2,5	1500 - 2000
III. Moderate dried and cool	III.1 Very severe III.2 Severe III.3 Moderate severe III.4 Cold	2,6 - 4,0	2000 - 2500
IV. Dried and moderate cool	IV.1 Very severe IV.2 Severe IV.3 Moderate severe IV.4 Cold	4,1 - 5,5	2500 - 3000
V. ZDry heat	V.1 Very severe V.2 Severe V.3 Moderate severe V.4 Cold	More than 5,6	More than 3000

Source: Ecosystems of Mongolia; A.N. Severtsov Institute of Ecology and Evolution; 2019

Figure 2.2 Climate Map of Mongolia

2.1.3 Hydrology

In northern Mongolia, water sources such as lakes and rivers abound. The Kherlen River, which flows into eastern Mongolia, flows into the Amur River, and the Selenge River, which flows into central and northern Mongolia, flows into Lake Baikal. In such international river basins, there is a cross-border watershed community relationship between Russia and China in terms of maintenance organizations, etc. In addition, rivers in Mongolia are managed in 29 river basins, and the southern basins, which have limited water resources, use groundwater as a water source.



Source: Ecosystems of Mongolia; A.N. Severtsov Institute of Ecology and Evolution; 2019

Figure 2.3 Watershed Division of Mongolia

2.1.4 Vegetation

The distribution of vegetation varies from region to region, and the landscape based on the distribution is divided into 6 categories. The vegetation of the southern part is mostly grassland with low grass and rocky areas. Coniferous forests cover the north-central aimags of Khovsgol, Arkhangai, Bulgan, Selenge, Tuv, and Khentii. On the other hand, in the southeast, there are trees such as Tamarisk and Poplar.

Source: Ecosystems of Mongolia; A.N. Severtsov Institute of Ecology and Evolution; 2019

Figure 2.4 Landscape of Mongolia

2.1.5 Soil

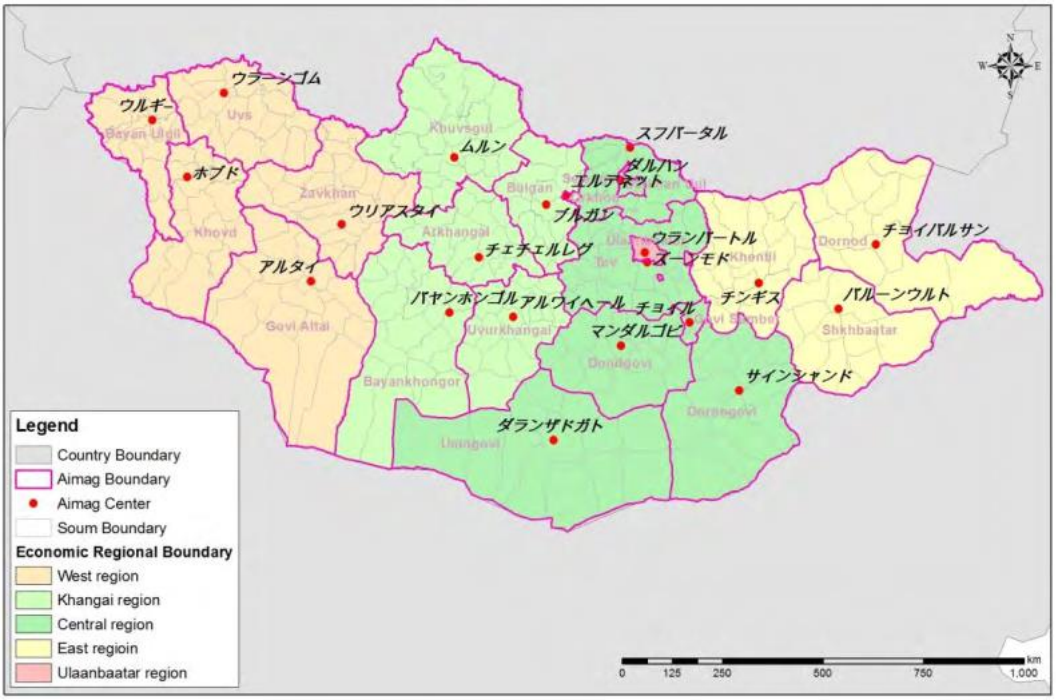
Soil with various properties is distributed in each region. High fertility alluvial soils are formed in the river basins, and chernozem soils suitable for wheat cultivation extend from east to west. Soil salinization occurs in desert or semi-desert areas. The Gobi region is a typical rocky desert covered with gravel and occasional dunes.

2.2 Socio-economic condition

2.2.1 Administrative Division

Mongolia is a landlocked country bordered by Russia to the north, China's Inner Mongolia Autonomous Region to the east and south, and China's Xinjiang Uyghur Autonomous Region to the west. Mongolia is divided into three administrative units: Aimag (province), Soum (district), and Bag (area). 347 Soums are located within 21 Aimags and 1,681 Bags are located within Soums. Each soum has a population of about 3,000 people, and a bag consists of 50~100 families.

In some cases, the entire country is divided vertically into five regions: Western Region, Hungay Region, Central Region, Eastern Region, and Ulaanbaatar.

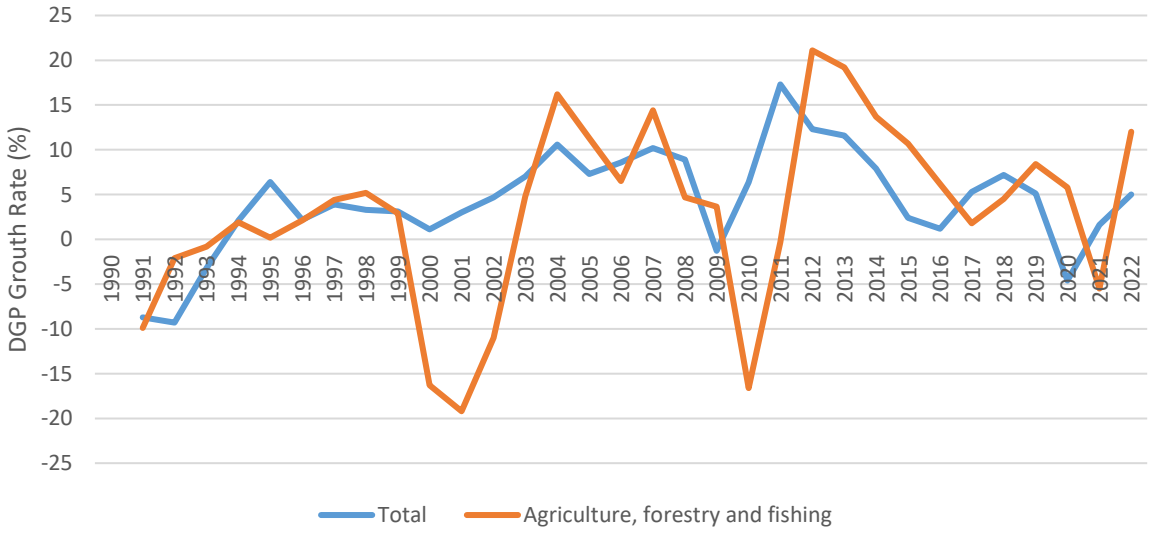


Source: JICA Study Report; 2016

Figure 2.5 Administrative Map of Mongolia

2.2.2 Economy

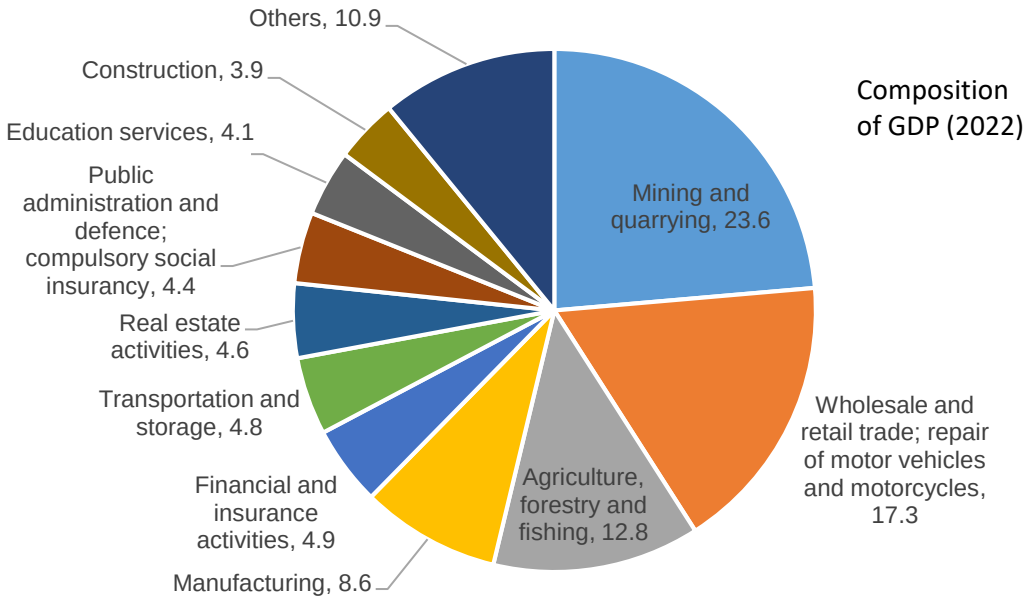
Mongolia has continued to grow since the early 1990s when the country shifted to a market economy. From 2011 to 2013, the growth rate exceeded 10%. In 2020, the growth was 7.2% negative due to the impact of COVID-19, but in 2022, it turned to growth with a high growth of 5%. The growth rate of the agro-pastoral sector has also moved in tandem with this, but there was a significant decline in the years of the Dzud in 2001/02, 2009/10, and 2015/16.



Source: Mongolian Statistical Information Service

Figure 2.6 GDP Growth Rate of Mongolia

Looking at Mongolia's GDP by industry sector in 2022, the mining sector had the largest share of 23.6% and was heavily dependent on mineral resources. This is followed by the commercial sector (17.3%), and the agriculture and livestock sector (12.8%), which is the third industry. The manufacturing sector is in the 4th position with a share of 8.6%. In 2000, the share of GDP in the agro-pastoral sector was 27.3%, making it the largest industrial sector, but the shift to commerce and industry has been progressing as the liberalization of the economy progresses.

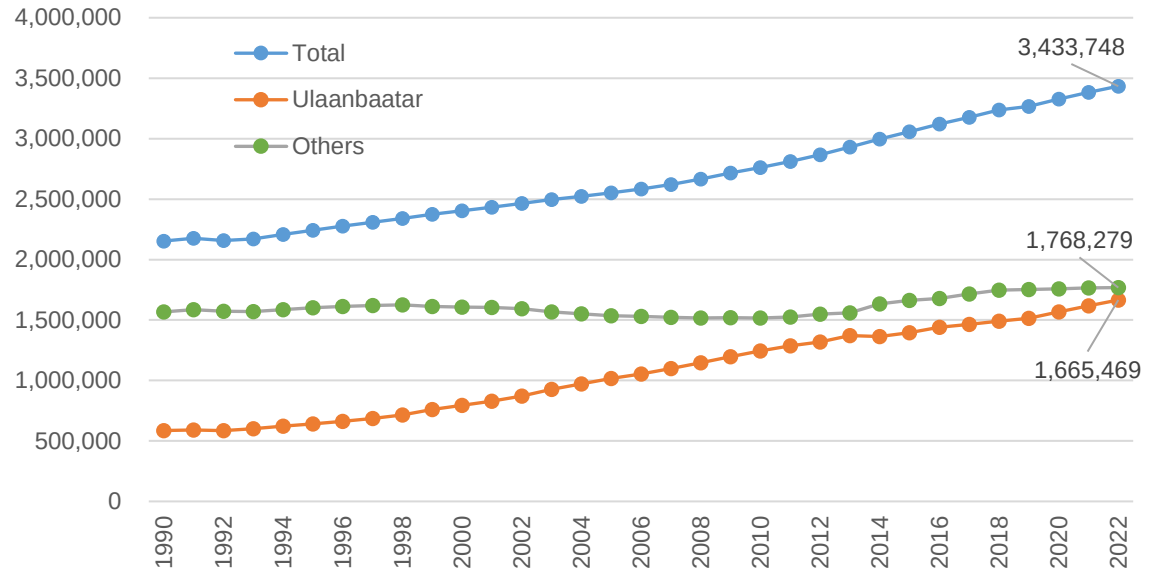


Source: Mongolian Statistical Information Service

Figure 2.7 Composition of GDP of Mongolia

2.2.3 Population

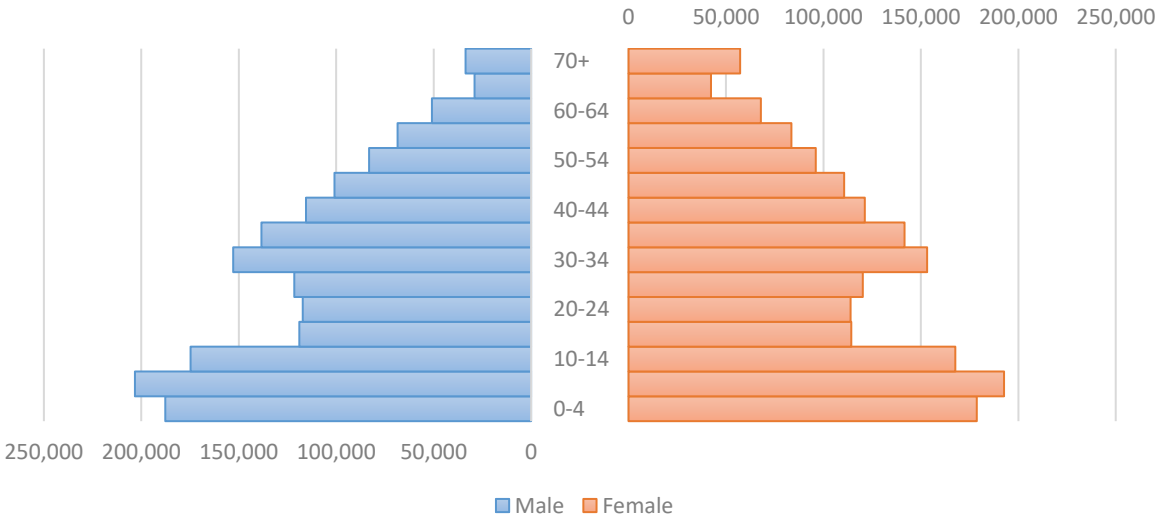
The population of Mongolia in 2022 was approximately 3.43 million, which is approximately 1.6 times larger than the 1990 population of approximately 2.15 million. The average annual growth rate during this period was approximately 2.3%. With the start of liberalization in the early 1990s, the population movement to the capital city of Ulaanbaatar has become remarkable, with the population ratio of Ulaanbaatar increasing from 27% in 1990 to 49% in 2022. The reasons include the search for higher incomes and higher education, as well as reduced barriers to moving to urban areas in line with the 2001 "Land Privatization Act" and the loss of livestock due to the occurrence of irregular Dhud (extremely severe winter).



Source: Mongolian Statistical Information Service

Figure 2.8 Population Trend of Mongolia

The breakdown of the population by age group in 2022 shows that the largest number of people were younger than 10, accounting for 22% of all age groups. It can also be seen that there is a peak in the age group between 30 and 34.

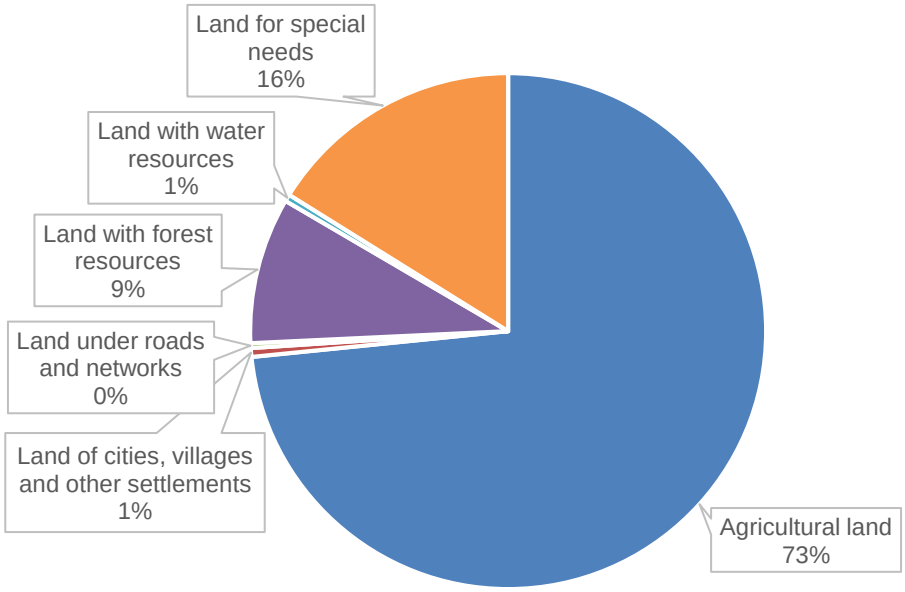


Source: Mongolian Statistical Information Service

Figure 2.9 Population Structure of Mongolia

2.2.4 Land Use

About 73% of Mongolia, or 114.81 million ha, is classified as agricultural land. Of this, 110.43 million ha is pastureland, 1.71 million ha is grassland and 1.09 million ha is cropland used to produce grains and horticultural crops (0.7% of the national land).



Source: Mongolian Statistical Information Service

Figure 2.10 Land Use of Mongolia

2.2.5 Social Infrastructure

In terms of transportation, the total length of the paved road network in Mongolia is 11,593.4 km, comprising 9,780.6 km of asphalt and concrete pavement, 1,207.9 km of gravel pavement, and 604.9 km of earth pavement. A railway runs through the country from north to south, with Sukhbaatar to Russia in the north and Zamyn-Uud to China in the south. Genghis Khan International Airport is located in the metropolitan area, and the new Ulaanbaatar International Airport has been constructed to operate all international flights. There are more than 20 local airports in the area.

There are 1,439 kindergartens, 78 elementary schools (five-year system), 113 junior high schools (nine-year system), and 629 high schools (10-year system). 81% of these are public schools. There are 175 institutions of higher education, with 50 public vocational schools, 7 colleges, and 14 universities.

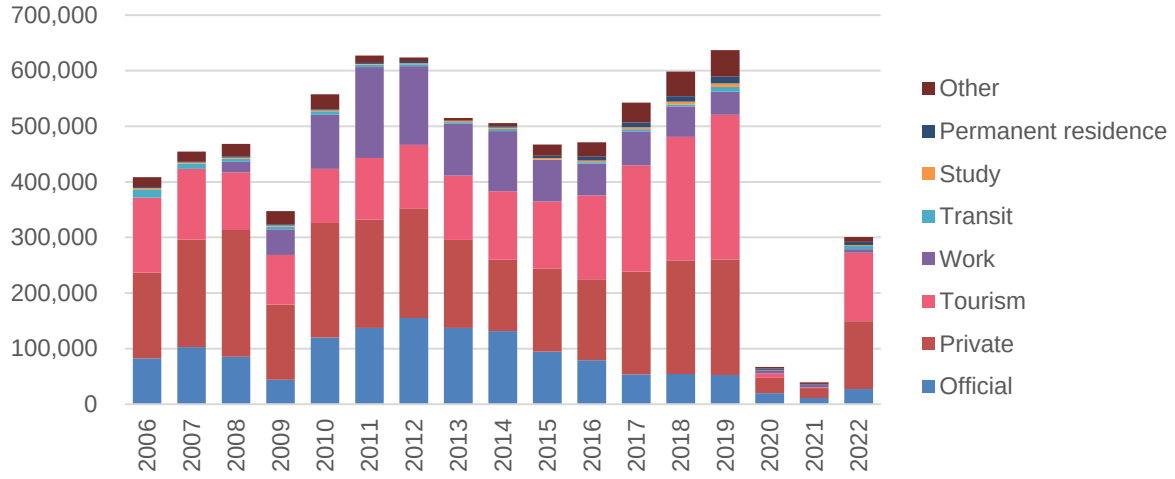
In terms of health and medical care, there are 24 central and specialized hospitals and 16 general hospitals at the Aimag level. Sum-level has 321 health centers. Privately, there are 237 hospitals, 1,444 clinics, and 1,541 pharmacies.

As for communications, the number of fixed-line telephone subscriptions is 312,663, the number of Internet connections is 2,656,300, and the number of cellular phone subscriptions is 3,371,600. Converted to a per capita basis, these numbers are 0.10, 0.82, and 1.04, respectively, indicating that mobile phones and the Internet are available to most people.

2.2.6 Tourism

In 2011 and 2012, the number of people visiting Mongolia from abroad exceeded 6 million, then dropped to less than 500,000 at one point, but in 2019 the number increased again to 640,000. By purpose of visit, the

number of tourists was 260,000, followed by 210,000 from the private sector, showing an increasing trend. On the other hand, the number of visitors for official and business purposes is decreasing. The number of visitors from Japan was the fourth largest after China, Russia, and South Korea, with about 24,000 in 2019. Then, due to the impact of COVID-19, the number of visitors declined sharply from 2020, but has been recovering since 2022.



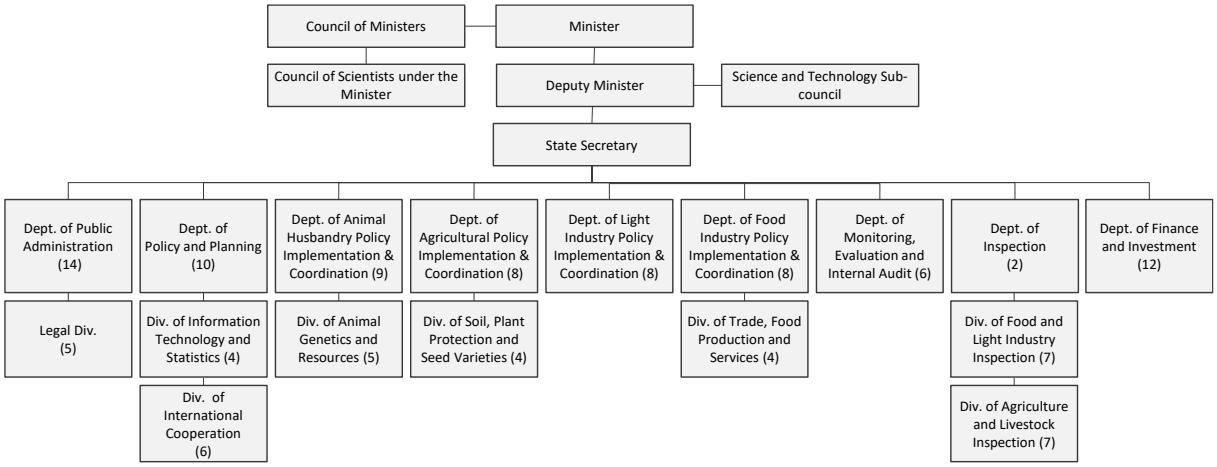
Source: Mongolian Statistical Information Service

Figure 2.11 Trend of Foreign Visitors to Mongolia

2.3 Relevant government bodies in the agricultural sector

2.3.1 Ministry of Food, Agriculture and Light Industry

As shown in the figure below, the Ministry of Food, Agriculture and Light Industry (MOFALI) consists of 9 departments and 8 divisions. In total, MOFALI has about 120 officers. With the dismantling of the General Agency for Specialized Inspection (GASI) at the end of 2022, the functions and inspectors related to food, agriculture, livestock and light industry returned to MOFALI, and the Department of Inspection and related Divisions were established in the ministry.



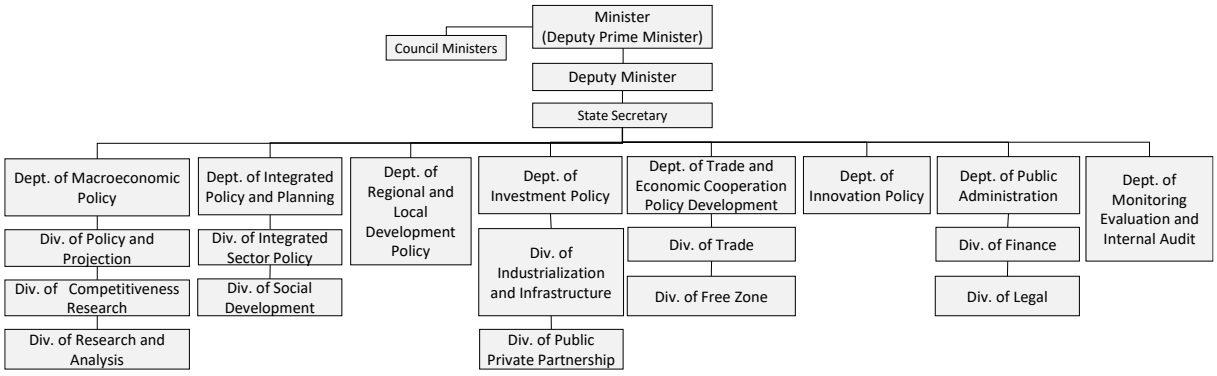
Remarks: Numbers in ( ) show the number of staffs Source: MOFALI

Figure 2.12 Organization Chart of MOFALI

The vision of MOFALI is to promote economic growth by bringing food, agro-pastoral, light industry, small and medium-sized enterprises, cooperatives, domestic trade, and services sectors to a new level of development that is competitive in international markets. The main role of MOFALI is to (1) make appropriate use of raw materials and resources, (2) manufacture products for import substitution and export, (3) develop the value chain, (4) improve productivity and profitability, improve competitiveness and achieve sustainable economic development of the industry, and (5) provide healthy, safe and nutritious food to the people, and ensure a stable supply of hygienic clothing and equipment. There are regional offices at the aimag level and also the soum level as local organizations under the control of MOFALI.

2.3.2 Ministry of Economy and Development

The Ministry of Economy and Development (MED) was established in January 2022, based on the former National Development Authority (NDA) and integrating some functions of the Ministry of Finance. The current organizational structure of the MED is shown in the figure below, consisting of 8 departments and 11 divisions.



Source: MED (http://en.med.gov.mn/structure)

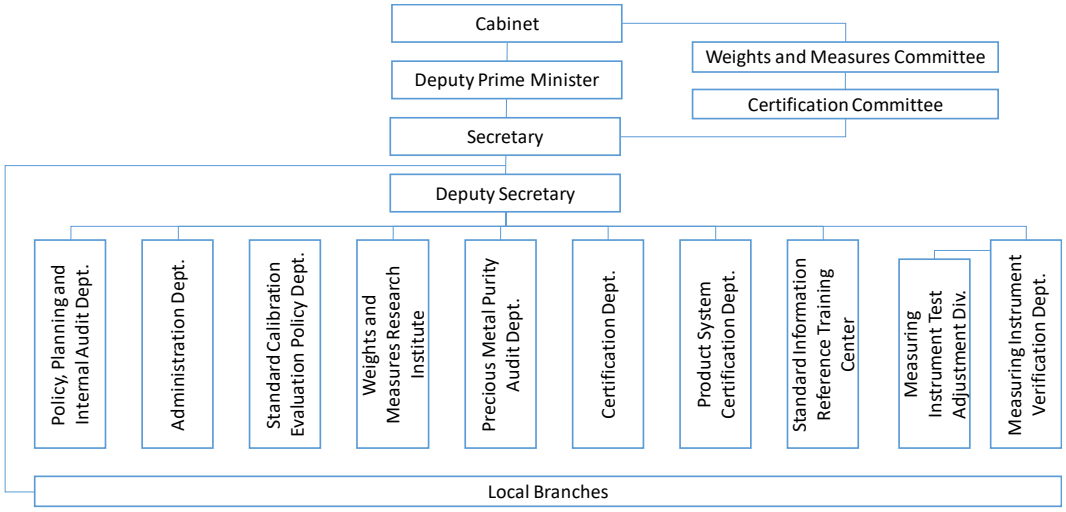
Figure 2.13 Organization Chart of MED

The vision of MED is to be a central administrative body that supports the Mongolian state's socio-economic capacity building and leads development policy making. Their mission is to improve the social and economic potential of Mongolia sustainably by (1) formulating Mongolia's short, medium, and long term development policies, and (2) providing integrated methodologies for planning and implementation, among others.

2.3.3 Mongolian Agency for Standardization and Metrology

Standardization activities in Mongolia started in 1953 and all relevant activities are handled by the Mongolian Agency for Standardization and Metrology (MASM). The decision-making body is the MASM Council, which consists of representatives from ministries, NGOs, research institutes, and industry. The MASM is an organization that manages the standards and regulations in Mongolia and supervises the various activities of society to harmonize them with the standards and regulations. Its services cover a wide range of government agencies, inspection agencies, domestic and foreign public agencies, and private companies. The responsibilities of MASMs can be broadly divided into (1) the establishment of national standards, (2) the accreditation of certification bodies and laboratories, including ISO, and (3) the certification body for the

Mongolian National Standards (MNS), which are management standards and product standards.



Source: MASM

Figure 2.14 Organization Chart of MASM

National standards are issued, modified, and deleted based on proposals from the National Committee for Standardization, which is composed of relevant administrative bodies, research and development institutes, and business entities. The accredited service covers testing organizations (test, calibration, measuring instruments, and test supply), certification organizations (Products, management systems, workers, and greenhouse gases), and inspection organizations. There are currently 24 certification bodies, of which 2 are responsible for management certification and 20 are responsible for product certification and inspection agency calibration. These 20 agencies are the provincial offices of the MASM and are responsible for developing standards in areas where access to the capital is difficult.

2.3.4 Dismantling GASI (General Agency for Specialized Inspection) and Integrating

The General Agency for Specialized Inspection (GASI) was responsible for monitoring compliance with standards. Compliance with standards was monitored through unannounced inspections at the market and on-site inspections at business sites. There were branches in 21 aimags and each district of Ulaanbaatar, and inspectors were stationed nationwide. However, at the end of 2022, the GASI was dismantled and its inspection functions were transferred to the relevant ministries. The following table summarizes the inspection areas and the transfer of inspection functions to the relevant ministries and agencies. In particular, the former Dept. of Food Safety and Agricultural Inspection, GASI was in charge of agricultural and livestock products and foods and conducted on-site inspections and monitoring not only of agricultural and livestock products and foods distributed in markets, but also of businesses, including markets, retailers, restaurants, and others. In addition, inspections were conducted on school meals every one to two years based on a checklist of sanitary standards, but these functions were mainly transferred to MOFALI.

Table 2.1 Areas of Inspection and Inspection Functions Transferred to the related Ministries and Agencies

No.	Areas to be inspected	Inspection functions transferred from GASI to
1	Natural Environment Inspection	Ministry of Environment and Tourism

No.	Areas to be inspected	Inspection functions transferred from GASI to
2	Geology and Mining Field Inspection	Ministry Mining and Heavy Industry
3	Land, Geodesy and Cartography Field Inspection	Agency for Land Administration and Management, Geodesy and Cartography
4	Petroleum Field Inspection	Ministry Mining and Heavy Industry
5	Road Sector Inspection	Ministry of Road and Transport Development
6	Transportation (Land and Water Transport)	Ministry of Road and Transport Development
7	Construction Technology Inspection	Ministry of Road and Transport Development
8	Communications Sector Inspection	Ministry of Digital Development and Communications
9	Energy Sector Inspection	Ministry of Energy
10	Standardization and Metrology Sector Inspection	MASM
11	Labor Inspection	Ministry of Labor and Social Protection
12	Occupational Health Inspection	Ministry of Labor and Social Protection
13	Social Security Sector Inspections	Ministry of Labor and Social Protection
14	Veterinary Inspection	MOFALI
15	Food Quality Standards Inspection	MOFALI
16	Plant Protection Inspection	MOFALI
17	Cultivated Plant Seed Inspection	MOFALI
18	Food Hygiene Inspection	MOFALI
19	Livestock Breeding Inspection	MOFALI
20	Treatment Quality Inspection	Ministry of Health
21	Public Health Inspection	Ministry of Health
22	Environmental Health Inspection (Environmental Health Supervision)	Ministry of Environment and Tourism, Ministry of Health, MOFALI, Ministry of Education and Science
23	Youth Hygiene Inspection (Supervision)	Ministry of Health, Ministry of Education and Science
24	Education Sector Inspection	Ministry of Education and Science
25	Nuclear and Radiation Inspection	Ministry of Education and Science
26	Cultural Sector Inspection	Ministry of Culture
27	National Food Safety Reference Lab	MASM

Source: JICA Project Team, interviewed with related parties

2.4 Relevant Private Organization

2.4.1 Mongolian National Chamber of Commerce and Industry

The Mongolian National Chamber of Commerce and Industry (MNCCI) was established in 1960. As of 2015, the number of members was 3,226, of which 70% were SMEs and 20% were agro-pastoral enterprises. About 1,200 are based in Ulaanbaatar and the remaining 2,000 are local companies. It has branches in 21 aimags in Mongolia and 42 overseas offices, of which 12 offices have office managers. At present, it mainly carries out the following business as NPO Corporation based on the NPO law.

1) Improvement of the business environment through public-private dialogue
2) Policy recommendations to protect the assets of companies and entrepreneurs
3) Marketing support for member companies and entrepreneurs
4) Business collaboration, sustainable networking, and partnerships
5) Provision of economic and market-related information to member companies and entrepreneurs
6) Improve governance and operations of the organization, strengthen internal coordination and resources

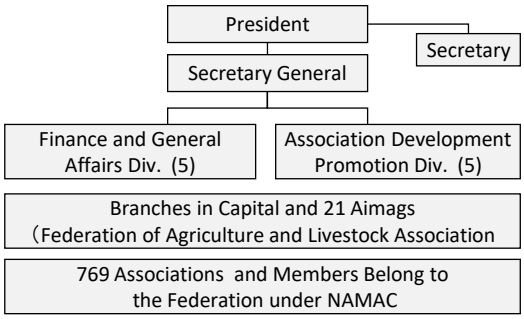
Specific tasks of MNCCI include the issuance of certificates of origin and eco-labels as third-party accreditation organizations, surveys of domestic economy and management, holding events such as inspections and business meetings, training programs for companies and entrepreneurs, and third-party accreditation organizations for organic foods.

The organizational structure of the MNCCI consists of Congress, the Supervisory Board of Directors, Presidency, Chairman and President of the Board, and Chairman. Under the Chairman there are Vice-chairman, Secretary General, and General Manager, with 8 Departments.

The MNCCI has a chamber of commerce at the aimag-level in each of the 21 aimags, and 2 to 3 permanent staff are stationed with the governor as the director. Besides, there is an organization called the Governor's Development Committee in each aimag, which discusses the development of each aimag, and the MNCCI is a member of this organization.

2.4.2 National Association of Mongolian Agricultural Cooperatives

The National Association of Mongolian Agricultural Cooperatives (NAMAC) of Mongolia was founded in 1967 as the Supreme Council of the Negdel Federation and was reorganized as a nongovernmental organization in accordance with the transition to a market economy in 1992. With the privatization of the assets of state enterprises and the division and dissolution of Negdel, NAMAC has been supporting the formation of associations. As the market economy system has permeated the nation, the number of member associations has increased.



Source: NAMAC

Figure 2.15 Structure of NAMAC

Association membership in NAMAC is voluntary, and there have been increasing cases of large agricultural and livestock federations joining NAMAC or joining NAMAC as a subsidiary of an influential association. The main activities of NAMAC are the promotion of the establishment of agricultural and livestock industries associations, training for members about 30 times a year, dissemination of member rights and claims to government agencies, support for reflecting these in policies and building cooperative relationships with international support organizations. As of 2019, Mongolia had about 1,399 agricultural cooperatives with 34,422 members. In Mongolia, farmers and pastoralists are strongly influenced by the seasons, and in the case of Mongolian farmers and pastoralists cooperatives, the lack of funds due to the seasons restricts their activities. One example of relatively successful union activity is the formation of companies with 15,000 to 100,000 ha of agricultural land (corporate farming). This is largely due to large-scale capital investment. On the other hand, there are concerns that small-scale farmers with 5 to 10 ha of farmland are being left behind.

2.4.3 Associations Related to Agro-pastoral Sector

In Mongolia, various industry organizations related to agriculture and livestock are established as non-

governmental organizations, and each of them promotes the development of the industry together with the government. The following is a summary of the major industry associations.

Table 2.2 Industry Associations in the Agriculture and Livestock Sector

Name of Associations	General Information
Mongolian Meat Association	The association was established in 1999 and has about 70 members, including processors, universities, slaughterhouses, and inspection facilities. The primary objective of the initiative was to promote exports, and to date, it has played a role in encouraging the country to promote meat exports. It is also an important mission for all meat distribution in Mongolia to promote a regular route, which is carried out through slaughterhouses where meat inspection is possible.
Mongolian Wool Association	The association was established in May 2011, it currently has 395 members, including private companies, individuals, and SMEs. As long as wool produced in Mongolia is processed by a company under the umbrella of the Mongolian Wool Association, no chemicals are used.
Mongolian Association of Leather Industry	The association was founded in 1997, but its predecessor dates back to 1911. In 1937, the company introduced the first mechanization in Mongolia, and since then it has built up an important industrial base in the country, but after the collapse of socialism, its management suddenly deteriorated. It was rebuilt in 2003, and 30 plants are currently operating in Mongolia. The federation now has 838 members. This includes 700 raw material suppliers, 108 end-product manufacturers, and 30 processing plants.
Mongolian Veterinary Medical Association	The federation was established in 1990. It has about 2,000 members. Important issues for veterinarians in Mongolia are (1) control of foot-and-mouth disease and important livestock diseases such as brucellosis, (2) establishment of indicator 29 and observance of the shipment suspension period, and (3) thorough meat hygiene at livestock farms.
National Federation of Pasture User Groups of herders	The federation was established in 2015. There are about 81,600 members, and about 80% of them are nomads. Under the vision of "Healthy Pasture-Healthy Livestock-Healthy food-Healthy Mongolian," the federation established a Pastureland management working group (PMMG) and strengthened its organization to improve pasture management in overgrazing Mongolia.
National Dairy Development Board of Mongolia	A new organization was established in April 2016. The board had cooperated in the livestock field of SECiM, but at present, there is almost no activity carried out by the organization itself, and processing and sales of 3 types of cheese using only yak milk are the main business (SUUN Bilegdell LLC), and it is distributed only to Shangli-La and City Tower which are famous hotels in Ulaanbaatar city.
Mongolian National Association of Fruit and Berry	The Mongolian Sea Buckthorn Federation was established in 2007 and renamed the Mongolian National Fruit Berry Federation in 2017. As of 2017, it has about 230 member organizations (approx. 12,000 members). Its main activities include the implementation of surveys and projects and cooperation with overseas sea buckthorn federations. Training and related information are shared with members.
Mongolian Association of Vegetable and Fruit Processing	It is a federation established to protect the rights of vegetable and fruit processors, and the following eight companies have joined the federation and are active by collecting membership fees.
Mongolian Greenhouse Federation	The Mongolian Greenhouse Federation is an organization consisting of 10 companies and 600 individuals engaged in greenhouse cultivation. The federation was established in 2012. The federation protects the rights of greenhouse farmers, introduces new technologies, provides safe and healthy vegetables year-round, conducts training and seminars to improve labor and land productivity, and provides advice for improving greenhouse cultivation techniques.
Mongolian Beekeepers Association	The parent organization of the association is the young beekeepers association established in 1977. There are currently 200 member beekeepers. In 2016, when it signed up Gatsuurt LLC, it formed a union group with about 40 members. If you pay a membership fee, you can use a discount system for various training expenses. The Supreme Council of the Mongolian Apiculture Association is independent of this association, and on the surface, it is a coexistence relationship.
Mongolian Aquaculture Association	The association was established in August 2018 to promote freshwater aquaculture of trout and other fishes in Mongolia, where there are few commercial fisheries. The activities are still limited.

Source: JICA Project Team

2.5 Development Plan

2.5.1 Law on Development Policy, Planning and Management

In Mongolia, development policies had been decided on and implemented based on the "Law on Development Policy Planning" since November 2015, but the law was abolished in May 2020 and the “Law on Development Policy, Planning and Management” was newly enforced. Under the revised law, development policies are categorized as follows.

Table 2.3 Types of Development Policy and Planning Documents

Term	Period	Policy
Long-term	Up to 30years	vision
Medium-term	10 years	Medium-term development policy 1. Human development targeted program 2. Social development targeted program 3. Economic and infrastructure development targeted program 4. Environmental targeted program 5. Governance targeted program 6. Regional development targeted program 7. National competitiveness development targeted program
	5 years	The five-year guidelines for the development of Mongolia (Including Public Investment Program) The five-year guidelines for aimags, capital city, and city development
	4 years	The Government Action Plan, The Governor's Action Plan
Short-term	1 year	The annual state development plan The annual state budget The annual development plans of the aimags, the capital city, and the cities as well as the local budget

Source: JICA Project Team based on the Law on Development Policy, Planning and Management

The purpose of the law is to strengthen the development policy, planning, and management by ensuring consistency and sustainability between sectors through the process that the MED compiles policy directions prepared by each ministry and local government.

2.5.2 Long-term Development Vision 2050

(1) Mongolia’s long-term Development Policy “Vision 2050”

Long-term development policy “Vision 2050”, approved by the date on 13 May 2020, is a long-term development policy document formulated on the occasion of the passage of about 30 years since the transition from a socialist to a democratic system, to present a long-term vision for the next 30 years, based on a review of the historical steps taken and the failures and lessons learned so far. This long-term development policy raises a vision: “By 2050, Mongolia will be a developed country in terms of social and economic development, with sustainable protection of nature, language, borders and culture.” And a development policy keyword “Energetic Mongolia”. The following 9 major goals were set to achieve this vision.

① **Common National Values**: To aim for a nation with sophisticated national values and immunity.

② **Human Development**: To reach the human development index of 0.9 and become one of the top 10

countries with the highest Gross Happiness Index.

③ **Quality of Life and Middle Class**: The share of the middle-class population that owns a comfortable living environment in Mongolia will reach 80 percent of the total population by 2050.

④ **Economy**: GDP grows 6.1 times and GDP per capita grows 3.6 times, reaching 15,000 US dollars, which is a standard for developed countries.

⑤ **Good Governance**: To establish smart and sustainable governance, fully ensure human rights, and strengthen the justice system eliminating corruption.

⑥ **Green Development**: To promote environmentally friendly green development and ensure environmental sustainability.

⑦ **Peace and Security of the Society**: To develop a good internal and external environment to protect the fundamental profits of the nation.

⑧ **Regional Development**: To develop competitive regions within the country that are integrated into the regional economy and have a stable population and settlement system.

⑨ **Ulaanbaatar and Satellite Towns**: To develop Ulaanbaatar city into a comfortable, environmentally friendly and human-centered city

Five major goals (No.2, 3, 4, 6) out of 9 goals above are related to the field of agriculture and livestock in terms of "Nomadic culture rooted as a national value", "Grasslands covering the vast land of Mongolia", and "Importance of agriculture and livestock in the economic structure". Particularly relevant goals are the following.

Table 2.4 Goals related to Agriculture and Livestock in "Vision 2050"

2. HUMAN DEVELOPMENT	
Target 2.5. Create a wealthy, healthy, safe, and comfortable living environment for the people ensuring food security.	
Strengthen the food control systems at all stages of the food chain, such as registration, quality management, inspection, and certification processes	2.5.15. Prohibit all the import, production, trade, storage, and transportation of genetically modified products. 2.5.16. Set up the food safety control system by establishing tracking systems for potato and vegetable production processes, including reserved seed potatoes and vegetable seeds, soil conservation, soil processing, cultivation, irrigation, harvesting, storage, transportation, sales, and retail trade. 2.5.17. Establish monitoring and information tracking systems for meat and meat products processed using industrial methods by ensuring the safety and suitability of pasture land, animal feed, and water are of adequate quality and vaccination status. 2.5.18. Establish and strengthen the capacity of the monitoring laboratories that test and inspect the import foodstuffs and empower their registration control. 2.5.19. Introduce hazard analysis and critical point control principles, food safety management system, food chain (from primary production through to the consumer) control system, and the standards in the food processing industry.
Improve the availability of safe and nutritious food for all people	2.5.20. Implement national food policies aimed at stabilizing food supply and availability, ensuring food safety at all stages of the food chain, and improving the national food standards in line with international and regional standards. 2.5.21. Promote innovative manufacturing of organic and nutrient-enriched products, regulatory services, and product variety. 2.5.22. Establish the laboratories for prevention and control of transboundary infectious diseases, and disease surveillance and response systems. 2.5.23. Strengthen social protection measures to protect the poor and vulnerable groups live in food-insecure households. 2.5.24. Protect animals' health and implement the program "Healthy Food - Health Mongolian"
3. QUALITY OF LIFE AND MIDDLE CLASS	

Target 3.3. Promote employment, develop entrepreneurial skills, and improve the competitiveness of small and medium-sized businesses (MSMEs).	
Create a sustainable supply chain of local raw materials to large national exporters and support their activities through economic and financial mechanisms, discounts, and incentive programs.	3.3.5. Organize and run the "One Soum - One Product" campaign in each Soum, aimed at encouraging community independence and creativity. 3.3.6. Create an information system that contains the required data for achieving sustainable development goals in the sector. 3.3.7. Support the implementation of pilot activities based on local potentials aimed at producing and supplying raw materials and goods for the food industry. (For example, milk and dairy products, livestock slaughter, meat, and meat products, offal processing, fishing, beekeeping, potatoes, and vegetable farming, storing and processing, greenhouse, fruits and berry processing, crop farming, bakery, drinking water, herbal tea production, etc.); 3.3.8. Support the implementation of pilot activities based on local potentials aimed at producing and supplying raw materials and goods for the agriculture and light industry. (For example, leather workshop, small leather items workshop, wool, and cashmere supply workshop, bone processing entity, knitting workshop, felt and felt items workshop, sewing workshop, wood, and wood items workshop, forest waste processing workshop, wood breeding and planting farm, techniques, and equipment maintaining workshop, livestock fodder, etc.); 3.3.9. Issue the land licenses with discounted terms for herders and farmers. 3.3.10. Implement the projects aimed at the production of primary, secondary, and final stage processing products in the food, agriculture, light industry, and construction sectors.
4. ECONOMY	
Target 4.2. Build an export-oriented economy, by developing priority sectors of the economy.	
Develop the manufacturing of agricultural products and increase the exports of meat, wool, and cashmere products.	4.2.6. Protect animal health to ensure the food security of the population and increase food export. 4.2.7. Support the cashmere industry and increase the export of combed cashmere and final products. 4.2.8. Fully process animal products, such as skin, hide, furs, and wool, and increase the export of stitched and knitted products. 4.2.9. Create and implement a regulatory mechanism to support foreign and domestic joint investment. 4.2.10. Ensure the implementation of state policy aimed at creating favorable conditions for the production and export of environmentally friendly products that are least affected by international market prices. 4.2.11. Supply the water needs of the agricultural sector by introducing efficient technologies of the rainwater harvesting system.
Build the manufacturing (processing) industry prevailing economic structure and ensure food security	4.2.39. Make the technical modernization as per advanced agricultural technologies, develop smart and intensive crop production, and produce organic foods. 4.2.40. Develop a transport and logistics system to increase the volume of food products produced by industrial methods, and improve storage, transportation, production, and sales of raw materials. 4.2.41. Increase the heavy and light industries' production based on deep processing technologies for domestic and international markets.
Strengthen the position of leading industries of the economy in global markets	4.2.50 Develop production of the manufacturing industry at the level of world brands.
6. GREEN DEVELOPMENT	
Target 6.1. Assess and protect the environmental value and maintain the balance of primary ecosystems.	
Assess and define the value and carrying capacity of ecosystem services	6.1.1. Refine the regulation on ecosystem service evaluation, update the economic value of ecosystems, and publicly advocate the importance and value of ecosystem services. 6.1.2. Conduct studies on plant and animal distribution and resources at a national level to redetermine changes in resources and create conditions for proper management.
Protect soil fertility and moisture, prevent land degradation and desertification, restore damaged and degraded	6.2.8. Implement a national program on soil protection, land degradation, and desertification. 6.2.9. Restore degraded lands due to mining, agriculture, infrastructure facilities, urban development, and pasture use by implementing the Green Jacket Project, and increase user liability by making it recyclable for business use.

lands, and circulate it into the economy	6.2.11. Abolish traditional tillage technology, introduce advanced agriculture and irrigation technologies, refrain from plowing new land, and only circulate affected areas into use by cultivating. 6.2.12. Establish a land payment system based on regional differences and hierarchy, limit the number of livestock according to the land carrying capacity, and balance the grazing load. 6.2.13. Implement a policy on rational land use and rehabilitation through land and environmental management plans.
Introduce environmentally friendly, efficient, and advanced technology, increase consumption and production productivity, save natural resources, and develop circular economy:	6.4.1. Support eco-friendly and efficient green technology by leveraging economic incentives. 6.4.2. Establish and implement legal regulation on eco payments aimed at reducing waste and circulating it into the economy. 6.4.3. Encourage environmentally friendly and sustainable green ideas, attitudes, and practices such as sustainable green cities, green buildings, green lifestyles, and resource savings. 6.4.4. Introduce advanced and environmentally friendly technology, reduce pollution save resources, and promote clean production and efficient consumption through economic incentives.
Strengthen climate resilience capacity and reduce potential risks:	6.4.11. Approve and implement the National Climate Change Adaptation Program. 6.4.12. Research and develop a climate risk insurance system. 6.4.13. Strengthen the capacity to pre-report natural and weather hazards and establish a radar station in at least 5 locations.
8. REGIONAL DEVELOPMENT	
Target 8.1. Become a region that preserves the ecosystems of Eastern Mongolia and develops green technology-based agriculture, manufacturing, and tourism in synergy with an active role in the economic integration of Northeast Asia.	
Target 8.2. Maintain the balance of the Gobi ecosystem, actively participate in East Asian economic cooperation, and become a region with responsible mining, high-technology-based production and services.	
Target 8.3. Maintain the ecosystem balance of the Gobi mountains and steppe and become an agriculture and tourism recreation zone that actively participates in regional integration.	
Target 8.4. Maintain the ecosystem balance of the Altai Mountains of Mongolia and become a tourist destination region with livestock management connecting the east and west with international transport and logistics.	
Target 8.5. Become a region with a proper combination of tourism, intensive agriculture, and processing industries that maintains the ecosystems of Khangai-Khuvsgul, protects the freshwater resources of humanity, and actively participates in neighboring and international cooperation.	

Source: Mongolia's long-term development policy "Vision 2050"

2.5.3 Medium-term Development Policy

(1) National Policies Related to Agriculture and Livestock

Among the medium-term development policies, the national policies related to the agro-pastoral sector are "National policy on food and agriculture", "National policy on herders", and "National policy on industry". The following is the outline of each national policy. "National Policy on Food and Agriculture (2016-2025)", approved by the national assembly in November 2015, aims to improve productivity to strengthen competitiveness in food and agriculture development. The basic policy is as follows.

Table 2.5 Outline of National Policy on Food and Agriculture

Basic Policy	Outline of the corresponding plan (excerpts)
① Supply nutritious and safe food evenly to the population.	Stable supply of domestic products. Promotion of nutritious organic food production. Improving the quality of school lunches, etc.
② Build capacity of the personnel sustainably.	Human resource development. Implementation of training programs utilizing the media.
③ Base production on research and	Product development for export through research and development. Strengthening research capacity.

Basic Policy	Outline of the corresponding plan (excerpts)
development.	Genetic resource protection.
④ Endorse and protect the investment.	Increase in investment and loans in the agriculture and livestock sector by national and local governments. Investment promotion in priority areas. Improvement of the tariff system.
⑤ Develop production through a value chain and increase competitiveness.	Productivity improvement. Livestock infectious disease control. Raw material processing improvement. Storage and transportation network development.
⑥ Climate Resilience Improvement	Capacity building for climate change adaptation. Introduction of the insurance system.

Source: MOFALI

The "National Policy on Herders (2009-2020)" approved by the National Assembly in 2009, has set the following as its basic policy due to the necessity to improve the living environment and livelihood of herders.

Table 2.6 Outline of National Policy on Herders

Basic policy	**Outline of the Corresponding Plan (excerpts)**
① Job creation for herders and improvement of social welfare.	Legal environment improvement, the establishment of local SMEs, improvement of education, etc.
② Improvement of production technology of herders.	Livestock improvement, infectious disease prevention, feed access improvement, etc.
③ Strengthening the organization of herders.	Strengthening of unions, implementation of business management training, etc.
④ Improvement of traditional pastoralism for intensive one.	Building a database of herders, livestock industry, markets, etc.
⑤ Improvement of the living environment of herders.	Enhancement of medical services and promotion of health / social insurance participation, etc.
⑥ Risk dispersion of livestock farming.	Distribution of weather forecasts and market information on mobile phones, etc.

Source: MOFALI

"National Policy on the Industry (2015-2030)", approved by the national assembly in August 2016, aims to strengthen competitive and sustainable economic growth by introducing advanced technology and improving productivity. The basic policy is as follows.

Table 2.7 Outline of National Policy on Industry

Basic Policy	**Outline of the Corresponding Plan (excerpts)**
① Promotion of environment-friendly industry that considers the health and safety of residents.	Zoning of Industrial development based on the ecosystem, population distribution, raw material resources, etc. Product development that makes use of history and culture.
② Support for the production of competitive final products that are export-oriented and can be imported and substituted.	Establishment of priority areas. Construction of industrial clusters, industrial IT parks, and logistics networks. Building a domestic product priority system for public procurement. Sales promotion.
③ Promotion of economically effective industrial development based on advanced technology and innovation.	Improvement of the investment system in the industrial sector. Support through special funds and application of reduced tax rate system.
④ Utilization of effective cooperation between governments, chemical institutions, and private companies.	Promotion of industry-government-academia collaboration. Promotion of new technology introduction.
⑤ Promotion of fair trade among industry stakeholders	Improvement of the legal environment. Human resource development in the industrial sector.

⑥ Formulation of strategies for diversification of manufactured products by investigating productivity and competitiveness in the industrial field.	Formulation of development strategies and programs for the industrial sector. Promotion of related research and surveys

Source: MOFALI

2.5.4 Short-term Development Policy

(1) Five-Year Basic Development Policy

The Five-Year Basic Development Policy is the short-term basic development policy to be prepared based on the Long-Term Development Vision 2050. The policy contains the development direction based on the Long-Term Development Vision 2050.

(2) Government Action Plan

"Government Action Plan" is a Planning document based on the long-term development policy "Vision 2050" and other national policies mentioned above. "Government Action Plan (2016-2020)" formulated by the previous administration, and "Government Action Plan (2021-2025)" approved by the national assembly in July 2020 by the current administration, respectively state their fundamental policy directions as shown in the table below.

Table 2.8 Outline of Government Action Plan

Plan	Policy Directions
Government Action Plan (2016-2020)	1. Special policy to overcome economic difficulties. 2. Policy to ensure sustainable economic growth. 3. Social policy. 4. Policy on the environment and green growth. 5. Policy on governance.
Government Action Plan (2021-2025)	1. Policies to overcome social and economic difficulties caused by the COVID-19 pandemic 2. Human Development Policy 3. Economic Policy 4. Governance 5. Green Development Policy

Source: MOFALI

(3) Concrete Policies for Implementation of the Government Action Plan

1) Third and fourth Agriculture Reconstruction Plans

The third Agriculture Reconstruction Plan (2008-201) was implemented to promote intensive agriculture, providing the people with safe and secure food by improving production technology, promoting import substitution, and increasing the domestic self-sufficiency rate. Loans (allowing the repayment after harvest) for purchasing agricultural materials and machinery etc. through an "Agricultural support fund" were made in this plan. The national programs (National program on vegetables, National program on fruit trees and berries) mentioned later are included as a concrete activity based on the plan. The goals of the Fourth Agriculture Reconstruction Plan (2020-) are to prevent soil degradation, develop agriculture that is adapted to climate change, and improve a capacity to manage risk.

2) First Meat and Milk Campaign

The first Meat and Milk Campaign (2017-2020) has the aim of realizing stable provision of healthy and safe food by reducing seasonal fluctuations in meat and dairy products, which are essential foodstuffs. For this aim, the promotion of intensive livestock farming, establishment of the product supply system, improvement of processing field, promotion of domestic consumption, and export overseas have been expedited. As part of improving the legal and economic environment, the “Law on Livestock Gene-Pool” and “Law on Livestock and Animal Health” were enacted in 2017. Moreover, it was decided that machines and equipment for processing meat and dairy products become exempt from import tax after the government had enacted the "List of Manufacturing Machines and Equipment for Micro, Small, and Medium-sized Enterprises Exempt from Import Tax". Other specific activities based on this campaign include the following National programs (Program on livestock hygiene, Program on Intensive livestock production support, etc.).

3) National Program

The following national programs are being implemented as concrete measures in the field of agriculture and livestock.

Table 2.9 Purpose of each National Program

Program Name	Purpose
Safe and healthy food and healthy Mongolian (2019-2022)	1. Ensuring stability and equality of food supply. 2. Improving the nutritional value of food and encouraging proper use. 3. Ensuring the safety of raw materials and products in the pre-stage of the food chain. 4. Improving the competitiveness of the food processing sector, and sustainable development of manufacturing for export. 5. Building a system to ensure food security and improving sector human resources capacity.
National Program on Livestock of Mongolia (Phase 1: 2010-2015, Phase 2: 2016-2021)	1. Sustainable development in the livestock industry. Institutional construction and legal environment to accelerate economic effects. 2. Improvement of the traditional livestock industry. Amelioration of breeding technology and veterinary services to improve productivity. 3. Improvement of livestock hygiene. Creating an environment for the supply of safe livestock products. 4. Proper use and management of pastures in light of climate change and socio-economic development. Reducing risk in the livestock industry through a stable supply of feed. Improvement of procurement and distribution system of raw materials (livestock).
Program on livestock hygiene (2018-2021)	1. Improving the legal environment of veterinary clinics. 2. Controlling infectious diseases by early detection and guaranteeing the safety status of infectious diseases-free in each region through the analysis results. 3. Formulation of vaccination plan based on scientific confirmation and research. 4. Strengthening of livestock and animal movement management. 5. Improving the quality of veterinary hospital services and increasing its cover ratio. Human resource development of workers. 6. Providing agricultural and livestock workers, manufacturers, and consumers with knowledge and information on livestock hygiene and related social health.
Program on intensive livestock production support (2019-2023)	1. Development of regions and clusters of the intensive livestock industry. Development of distribution network. 2. Reduction of imports of some livestock products. Export expansion, Protection of domestic industry. 3. Increase in high-productivity livestock. Increase in supply of food (milk, meat, eggs, honey, etc.) to the urban population. 4. Improve productivity and benefits by making step-by-step Improvements of equipment and technology for the intensive livestock industry. 5. Reduce seasonal changes in meat and milk supplied to processing plants. Security

Program Name	Purpose
	assurance through registration. 6. Support ideas and investments from intensive livestock farmers through long-term low-interest rate loans and tax exemptions, etc. 7. Improve technique, economic knowledge, and capacity of intensive livestock farmers.
National program on vegetable (2018-2021)	1. Realizing the supply of fresh vegetables from winter to spring and increasing the variety of vegetables and unit crop yields. Reducing import dependency. 2. Activating vegetable production by introducing the latest technology. Encouraging private investment to expand the capacity of irrigation facilities and warehouses. Promotion of support for the supply chain and vegetable market. 3. Promotion of vegetable seed production. Improving seed quality through testing of promising and foreign varieties 4. Improvement of the capacity of vegetable growers through training and information provision. Human resource development.
National program on fruit trees and berries (2018-2022)	1. Development of farms of fruit and berry. Increase in cultivation and products. Building a legal environment to improve competitiveness. 2. Selection and cultivation of excellent species of fruit and berry. Development of sapling growing regions. 3. Introduction of the latest technology into the cultivation, processing, and commercialization of fruit and berry. 4. Formulation of the marketing strategy for the fruit and berry sector. Consumer research. Penetrating the new market.
Program "Industrialization 21：100" (2018-2021)	1. Support for industry through financial and investment policies. Improvement of the legal environment. Introduction of quality standards for raw materials and products. 2. Improvement of system related to raw material procurement. Increase in the use of raw materials. 3. Increase in output in the processing industry. Introduction of environment-friendly technologies and machines. Factory construction in rural areas. Increase in production of highly market-competitive products through cluster development. 4. Human resource development and employment increase in the processing industry. 5. Increase in export volume through logistics improvement and marketing strengthening.
Program on cashmere (2018-2021)	1. Building a comfortable and stable environment of investment and tax and a legal environment required for the export of final product production. 2. Breeding of goats. Procurement of raw materials. Improvement in cashmere quality. 3. Expansion of production and export volume of final products through a step-by-step increase in the level of cashmere complete processing 4. Introduction of new environmentally friendly technology. Development of highly competitive products for special markets. 5. Increase in production capacity by human resource development according to demand and need.
Program on micro, small, and medium-sized business support (2019-2022)	1. Improving the legal environment for running micro, small and medium-sized businesses 2. Improvement of investment policy by offering lower interest rates and extension of loans to micro, small, and medium-sized enterprises 3. Development of consultant services sector. 4. Positive introduction of environmentally friendly technical innovation. Increase in production of products that meet standards. Enhancement of competitiveness. 5. Sales promotion and market expansion of micro, small, and medium-sized businesses. 6. Implementation of "One Village, One Product" campaign. Local branding. Support for independence and efficiency of micro, small, and medium-sized businesses.

Source: JICA Project Team

4) Public Investment Program

Public Investment Program (PIP) is defined as a document detailing the programs and investment plans needed to implement the five-year guidelines for the development of Mongolia. Article 28 of the Budget Law, which regulates PIP, stipulates in paragraph 1 of the same article that "projects with an implementation period longer than one year and a project amount exceeding 30 billion MNT are included in PIP." The projects of PIP summarized by MED are identified through this regulation and will be implemented in cooperation with various Ministries in Mongolia. In Article 28, paragraphs 4 and 6 of the same law, MED's authority which implements "pre-feasibility study (F/S)" and F/S including project design and budget measures, is stipulated as to projects eligible for PIP. Besides, it also stipulated in paragraph 28.9 of the law that the MED must update the PIP annually and submit it to the Cabinet by 15th May.

There are, in total, 149 projects eligible for PIP (2018-2021; 2019 revised edition). The following five projects are related to the agro-pastoral sector (under the jurisdiction of MOFALI).

Table 2.10 PIP related to Agriculture and Livestock

Project	Period	Performance of 2018	Progress Rate		
			2019	2020	2021
A project to support the production of agricultural and livestock products	2018-2019	10% 130 sprinklers of 50-125ha, 116 Small sprinklers, 90 drip irrigation systems, and 115,000 Irrigation hoses have been introduced.	65% Reached Evaluation index level.	100% completed	-
A project to construct a comprehensive facility with a quarantine area and a slaughterhouse, and to update the technology.	2019-2021	-	5%. Reached Evaluation index level.	10%. Reached Evaluation index level.	45% Reached Evaluation index level.
A project of infrastructure construction of Emeelt light industrial IT park.	2018-2021	10%. EIA implemented. Infrastructure design implemented.	60%. Infrastructure construction fee (phase 1 implemented)	80%. Infrastructure construction fee (phase 2 implemented)	100% Industrial IT park is built.
Seasonal greenhouse	2018-2020	21%. Production in greenhouses in summer has increased by 5,120 m^2. Lending low-interest loans to 12 individuals and companies who use greenhouses of 3ha in winter.	75%. Construction work started.	100%. Cultivation started.	-
A project to produce dairy products in a cluster format in remote areas, to substitute imports and increase exports.	2018-2020	4% Dairy samples have been passed through the experiment.	60% Buildings suitable for production are repaired, extended, and used.	100%. Start signing milk supply contracts with herders. Production, transportation, and export of dairy products started.	-

Source: Legal Site of Mongolian Government

2.6 ODA from Japan

Japan's assistance policy for Mongolia has set the "realization of sustainable economic growth and stable development of society" as a major goal. Three priority areas have their medium goal: 1) strengthening governance toward the realization of a healthy macro-economy, 2) achieving balanced economic growth in harmony with the environment, and 3) achieving an inclusive society. The table below provides an overview of Technical Cooperation Projects (TEC) and Science and Technology Research Partnership for Sustainable Development (SATREPS) related to this project.

Table 2.11 Overview of related JICA Projects

Project	Period	Goal and results
The Project for Epidemiological Studies on Animal Protozoan Diseases in Mongolia and Development of Effective Diagnostics Measures	2014-2019 SAT	Research and development capacities of the Institute of Veterinary Medicine (IVM) for early detection, prevention, and control measures against animal protozoan diseases (trypanosomosis and piroplasmosis) are improved through conducting epidemiological studies and developing on-site diagnostics in collaboration with the National Research Center for Protozoan Diseases (NRCPD). Output 1：On-site diagnostics against animal protozoan diseases are developed. Output 2：. The prevalence, distribution, and damage of major animal protozoan diseases and vector ticks in Mongolia are clarified. Output 3：Effective measures for the prevention and control of animal protozoan diseases in Mongolia are proposed based on detailed analyses of the results of epidemiological studies and the trial runs of the measures.
Project for Strengthening the Capacity for Human Resource Development in the Field of Veterinary and Animal Husbandry	2014-2020 TCP	Strengthening educational and in-service training capacity of the School of Veterinary Medicine (SVM) of MULS and Ministry of Food, Agriculture and Light Industry (MOFALI). Output 1: improved teaching curriculum of SVM Output 2: more prepared educational system in implementing new teaching curriculum. Output 3: Strengthened teaching capacity of staff at SVM. Output 4: improved in-service training by the Department of Veterinary and Animal Breeding (DVAB) in collaboration with SVM, State Central Veterinary Laboratory (SCVL), Institute of Veterinary Medicine (IVM), and Ulaanbataar Veterinary Office (UVO).
Project for Formulation of National Comprehensive Development Plan	2018-2021 TCP	Output 1：National Comprehensive Development Plan is formulated. Output 2：capability of the implementing agency to formulate and revise the National Comprehensive Development Plan is strengthened.
Project for Strengthening the Government Capacity of Public Investment Plan	Feb.2019-Feb.2023 TCP	The framework for formulating and managing the Public Investment Program (PIP) aligned with the national development policy and financial resources is established. Output 1: Roles and responsibilities of MOF and MED in PIP formulation and management are clarified with shared criteria for determining projects in PIP. Output 2: A mechanism to formulate projects for PIP listing by sector ministries/ municipalities is developed. Output 3: A mechanism to appraise projects and secure financial resources by MOF and MED is developed. Output 4: Mechanisms to monitor PIP projects are developed.
The Project for Restoration of Pastureland by Effective Usage of Wild Forage Plants based on Traditional	2020-2025 SAT	Grassland restoration by fast-growing plants and functional plants is carried out near the model test site. Activity 1: Search for high biomass-producing plants in oligotrophic conditions and analysis of physiological action/causative genes. Activity 2: Identification of new functional compounds derived from Mongolian grassland plants and utilization as useful grasses in Mongolia. Activity 3: Development of cultivation techniques for fast-growing plants and

Project	Period	Goal and results
Knowledge of Nomadic Mongolians		functional plants based on herders' tradition
Control of tuberculosis and glanders in Mongolia	2020-2025 SAT	This project focuses on tuberculosis and glanders, which are zoonotic diseases that are prevalent in Mongolia. Veterinary medicine and medical researchers in Japan and Mongolia will collaborate to conduct epidemiological surveys and develop rapid diagnostic methods. They then Investigate the prevalence of tuberculosis and glanders in animals and humans. After that, Clarify the presence or absence of pathogen transmission between animals and humans and between animals and animals. Besides, they will develop a simple and highly sensitive genetic diagnostic method for bovine tuberculosis and glanders (dry LAMP method) and a serum diagnostic method for glanders (immunochromatography), and verify their effectiveness. The method will be widely used in Mongolia along with the dry LAMP method for existing Human Mycobacterium tuberculosis.
Project for Strengthening the Practical Capacity of Public and Private Veterinarians	2020-2025 TCP	Improvement in the practical skills of civil servant veterinarians and private veterinarians. Output 1: The foundation for research and training activities of veterinary institutions （SCVL, IVM, SVM, UVO） in Mongolia is laid. Output 2: The ability of research and training groups to conduct research based on the needs of veterinarians is Strengthened. Output 3: The training developed in the project is proposed as a practical training course.

Source: JICA Project Team

2.7 ODA from Developing Partners

2.7.1 Status of Support from Developing Partners

In Mongolia, developing partners such as the Asian Development Bank (ADB), the Food and Agriculture Organization of the United Nations (FAO), and the World Bank (WB) have been providing support to the agro-pastoral sector. The projects operated by developing partners related to this project are shown in Table 2.12. Besides, Table 2.13 shows the target products supported by developing partners.

Table 2.12 Developing Partners' Projects in the Agro-pastoral Sector

DPs	Project title	Period	Outline
ADB	Community Vegetable Farming for Livelihood Improvement	2017.12-2022.6	Agricultural VC pilot activity targeting Tuv, Darkhan-Uul, Uvs, and Selenge, including small-scale seed production, processing, and off-farm livelihood improvement activities.
ADB	Agriculture and Rural Development Project	2016-2021	Provides loans and branding support to companies wishing to start or develop new businesses, especially in the livestock sector. Initially started as a grant scheme, but due to its success, is now being continued as a loan scheme.
ADB	Vegetable Production and Irrigated Agriculture (VPIA)	2018-2019 2020-2026	Irrigation rehabilitation, strengthening farmer organization, promotion of appropriate agricultural input use, and development of storage and wholesale markets for agricultural products in Ulaanbaatar.
ADB	Unleashing the Private Sector to Drive Inclusive Growth in Eastern Mongolia	2019-2021	Formulation of private sector development strategies for three aimags in eastern Mongolia (Dornod, Khentii, and Sukhbaatar). Creation of a model for agribusiness clusters.
ADB	Cooperative-Based Sustainable Agriculture Production	2019-2021	Strengthen the system of herder's cooperative, strengthen the capacity of herders and MOFALI officers on sustainable livestock production, and

DPs	Project title	Period	Outline
			develop policies and action plans to promote meat exports.
ADB	Sustainable Fodder Management	2019-2021	Establishment of a sustainable feed production system (production, processing, storage, transportation), and the development of related policies and action plans.
ADB	Preparing the Climate-Resilient and Sustainable Livestock Development Project	2019-2021	1) Support for policy formulation and strengthening of systems for livestock sector development, 2) Organization and strengthening of herder's cooperatives, 3) Strengthening of VC for meat and dairy products (promotion of cooperation between herder's cooperative and meat processors, ICT-based extension services, improvement of veterinary and breeding services)
ADB	Aimag and Soum Centers Regional Development Investment Program	2017-2020	Formation of regional urban clusters for administrative services and local economic revitalization. In the agro-pastoral sector, preparation of pasture management plans, strengthening of veterinary services, and development of small-scale infrastructure to promote agribusiness.
ADB	Managing the Risks of Food Insecurity in Mongolia during the COVID-19 Crisis	2020-2021	To assess the vulnerability of the food supply chain in Mongolia and to develop strategies and action plans for developing a resilient supply chain.
EU	Support to employment creation in Mongolia (SECiM): Piloting quality private sector work in selected livestock and vegetable value chains	2016-2020	Implemented by UNIDO and FAO. VC development of agro-pastoral products (meat, dairy products, textiles, leather, vegetables) for employment generation. Capacity building for the private sector and local government officials to improve agricultural productivity and quality, and reduce harvest losses.
EU	Trade Related Assistance for Mongolia (TRAM Project)	2017.3-2021.3	The project targets the export of cosmetics and underutilized agricultural and livestock products, strengthening the capacity of the private sector through institutional building and compliance with quality standards necessary to export to the EU market.
FAO	Improving Local Dairy Processing by promoting women	2017-2019	Production and marketing support for high-value-added dairy products for six aimags (Khovd, Khuvsgul, Dornond, Tuv, Selenge and Darkhan-Uul).
FAO	Emergency assistance for the control of Foot and Mouth Disease in central and western regions of Mongolia	2018-2019	Emergency support for FMD outbreaks in the eastern region. Improving livestock health by strengthening management systems and measures to prevent the spread of disease.
FAO	Piloting the Climate-Smart approach in the livestock production systems	2018-2020	Strengthening resilience to climate change in the livestock sector.
SDC	Inclusive and sustainable vegetable and marketing project (VEGI)	2016-2019	1) Increased production of domestically produced vegetables through the dissemination of agricultural technology and knowledge to small-scale farmers, 2) Increased income of small-scale vegetable farmers and female-headed households through improved market access, and 3) Increased vegetable production and consumption by poor households through the promotion of vegetable

DPs	Project title	Period	Outline
			garden activities.
SDC	Green Gold Project	2017.1-2020.12	This project has been ongoing since 2004 and aims to build a pasture management system and strengthen the organization of pasture management groups to improve the livelihoods of pastoralists.
WB	Livestock and Agricultural Marketing Project (LAMP)	2013-2017	Strengthen linkages between agricultural and livestock products produced by herders and markets, and improve productivity and quality of livestock products
WB	Export Development Project	2020-2023	The project aims to strengthen the export capacity of Mongolia's non-mining sector and expand access to export markets by 1) developing export finance products; 2) strengthening the capacity of the Agricultural Reinsurance Joint Stock Company; and 3) providing training and matching grants for SMEs.
WB/ SDC	Third Sustainability Development Project	2017.9-2020.8	Strengthening the capacity of local administration, funding from the Rural Fund based on requests from the local administrative organization.
WB/ FAO	Livestock Commercialization Project	2020-2025	Strengthening of laboratories to control livestock infectious diseases and developing VC for meat and dairy products.
GEF	Strengthening Capacity in the Agriculture and Land-use Sectors in Mongolia	2019-2022	Strengthen country-level capacity to measure, report, and verify greenhouse gas emissions from the land-based agro-pastoral sector, to contribute to the Enhanced Transparency Framework (ETF) under the Paris Agreement.
IFAD	Project for Market and Pasture Management Development	2018.8-2021.9	Formation and strengthening of pasture management groups, construction of feed storage and reservoirs, VC improvement for vegetables, fruit trees, and meat/dairy products.

Source: JICA Project Team

Table 2.13 Target Products Supported by Each Developing Partner's Projects

DPs	Title	Period	Cross-product support	Meat	Dairy, milk	Wool	Cachmere	Other textiles	Leather	Honey	Vegetable	Sea buckthorn	Other crops & horticulture	Fodder
ADB	Agriculture and Rural Development Project (ARDP)	-2021.6		○	○	○	○		○	○		○		
ADB	Aimag and Soum Centers Regional Development Investment Program	2017-2020	○											
ADB	Community Vegetable Farming for Livelihood Improvement (Japan Fund)	2017.12-2022.6									○			
ADB	Cooperative-Based Sustainable Agriculture Production	2019-2021		○										
ADB	Preparing the Climate-Resilient and Sustainable Livestock Development Project	2019-2021		○	○									
ADB	Sustainable Fodder Management	2019-2021												○
ADB	Unleashing the Private Sector to Drive Inclusive Growth in Eastern Mongolia	2019-2021	○											
ADB	Vegetable Production and Irrigated Agriculture (VPIA)	2020-2026									○	○	○	○
ADB	Managing the Risks of Food Insecurity in Mongolia during the COVID-19 Crisis	2020-2021	○											
EU	Trade Related Assistance for Mongolia (TRAM Project)	2017.3-2021.3				○	○		○			○		
FAO	Dairy Asia (multi-stakeholder partnership)	-			○									
FAO	Emergency assistance for the control of Foot and Mouth Disease in central and western regions of Mongolia	2018-2019		○										
FAO	Improving Local Dairy Processing through promoting women	2017-2019			○									
FAO	Piloting the Climate-Smart approach in the livestock production systems	2018-2020		○	○	○	○	○	○					○
FAO	Asian Regional Component- Global Strategy to Improve Agricultural and Rural Statistics	2012-2019	○											
FAO	Building disaster and climate resilience of agriculture sector to achieve the SDGs in Asia	2019-2020	○											
FAO	Enhancing Efficiency and Traceability of Agricultural Value Chains in Mongolia through innovations and ICTs	2019-2021		○	○	○	○	○	○					
FAO	Global coordination project for the SFM Drylands Impact Program (PPG)	2019-2021	○											
FAO	Prevention and mitigation of sand and dust storms originated in dry land areas of Mongolia	2019-2022	○											
FAO	Promoting strategic intervention to achieve long term implementation of the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT)	2017-2019	○											
FAO	Support in developing efficient food control management systems	2019-2020	○											
FAO	Support the assessment of animal genetic resources	2019-2021		○	○	○	○	○	○					
FAO	TCPF: Support to development of Mongolian National E-Agriculture strategy	2019-2020	○											
FAO (GEF)	Strengthening Capacity in the Agriculture and Land-use Sectors in Mongolia	2019-2022	○											
FAO (GEF)	Mainstreaming biodiversity conservation, SFM and carbon sink enhancement into Mongolia`s productive forest landscapes	2014-2019	○											
FAO (IFAD)	Pastoralists driven data management system (P4D)	2017-2019	○											
FAO (WB)	Strengthening animal health and food safety systems	2020-2023	○	○										
FAO (WTO)	Piloting an improved animal identification and registration system (AIRS) in Mongolia	2019-2021		○										
IFAD	(Soft loan) Project for Market and Pasture Management Development	2011-2022		○	○	○	○		○	○	○	○	○	○
ILO/ UNFPA /UNICEF /FAO	Extending Social Protection to Herders with Enhanced Shock Responsiveness	2020-2022	○											
SDC	Green Gold Project	2017.1-2020.12		○	○	○	○	○						○
SDC	Inclusive and sustainable vegetable and marketing project (VEGI)	2016-2019									○			
UNDP	Mongolian Sustainable Cashmere Platform	2018-2026					○							
UNIDO/ FAO (EU)	Support to employment creation in Mongolia (SECiM): Piloting quality private sector work in selected livestock and vegetable value chains	2016-2020		○	○	○	○	○	○		○			
WB	Export Development Project	2020-2023	○											
WB / FAO	Livestock and Agricultural Marketing Project (LAMP)	2013-2017		○	○	○	○				○	○		○
WB / FAO	Livestock Commercialization Project	2020-2025		○	○									
WB / SDC	Third Sustainability Development Project	2017.9-2020.8	○											

Source: JICA Project Team

2.7.2 Coordination among Development Partners

In Mongolia, a number of development partners have been providing support in the agro-pastoral sector from various perspectives and approaches. In recent years, there has been a lack of coordination among development partners to create synergies and duplication of assistance without sufficient prior coordination. For this reason, the FOOD AND AGRICULTURE DEVELOPMENT PARTNER GROUP (FADPG) was established under the joint management of MOFALI and the Ministry of Environment and Tourism (MOET) with the support of FAO and ADB. The objective of FADPG is to support effective development dialogue, increase the level and frequency of communication, promote a common understanding of key policy priorities, agree on how to monitor, review, and evaluate various projects, promote replications while avoiding duplications, promote knowledge exchange, and facilitate further transparency and coordination/harmonization between development partners and the Government on investment and assistance related to food and agriculture sector. The group also serves as a platform for the government to present its plans to the development community and identify development partners as appropriate.

At this stage, there are no clear restrictions on the conditions for participation in the FADPG, and any bilateral (or multilateral) organization interested in supporting the agro-pastoral sector can join. The FADPG will also form a Technical Working Group (TWG) with members from interested organizations, which will guide the Secretariat in setting meeting agendas, and any specific surveys or analyses to be conducted and shared with FADPG members for more informed discussions and decisions.

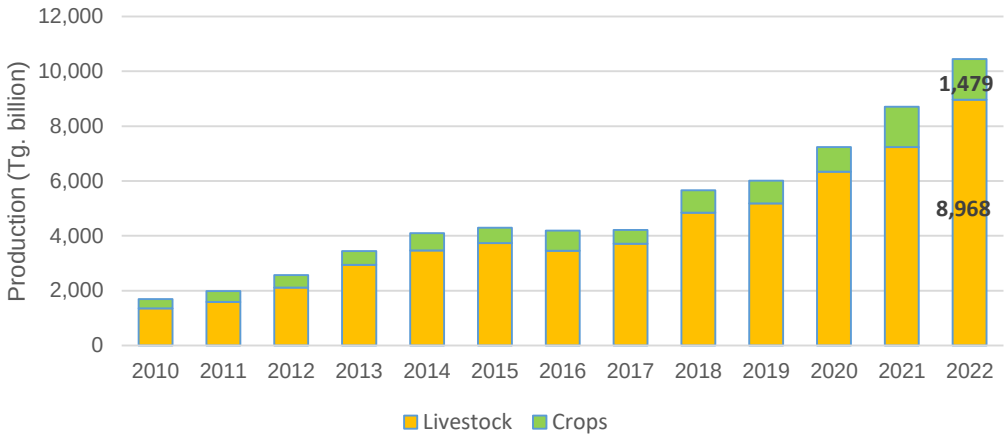
Chapter 3 Current Situation and Issues on Agriculture in Mongolia

3.1 General Overview of the Mongolian Agro-pastoral Industry

3.1.1 Major Agricultural Products

The agriculture and livestock sector accounts for 12.8% of GDP (2022), the second-largest share after the mining industry, and is the country's key industry with about 30% of the working population. Until 2004, the agriculture and livestock sector had been ranked No. 1 in terms of GDP, and since 2005, the rank has declined as mining development has progressed. However, the agriculture and livestock sector remains an important industry that supports the Mongolian economy. In the past 5 years (2018 to 2022), the annual average growth rate of the entire GDP was 3.0%, but the agriculture and livestock sector was 4.8%[1] despite the impact of COVID-19, indicating that it is one of the sectors driving the nation's economic growth.

The output of the livestock and agricultural sector is 8,968 billion MNT and 1,479 billion MNT, respectively, with the livestock and agricultural sectors accounting for 86% and 14%, respectively. The output in 2022 increased significantly by 6.6 times in the livestock industry and by 4.4 times in agriculture, compared to 2010.



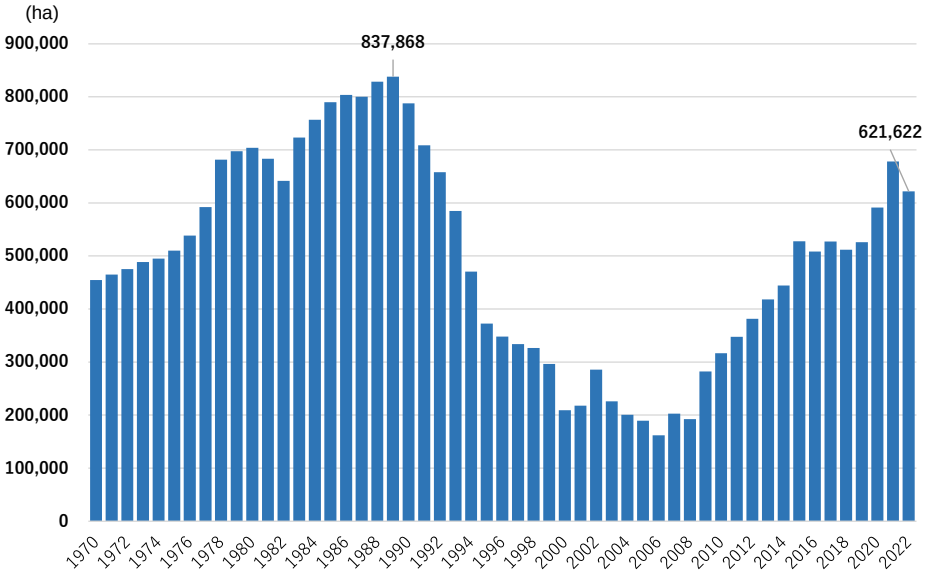
Source: JICA Project Team based on Mongolian Statistical Information Service

Figure 3.1 Output Trend of Livestock and Agriculture Sectors (2010-2022)

In the socialist era, agriculture was developed on a large scale, and in the 1980s, there was an amount of production that could be exported overseas[2]. The cultivation area of agricultural products drastically decreased from 837,868 ha in 1989, which was the peak, to 316,388 ha in 2010, but it has been increasing recently, and in 2022 it reached 621,622 ha. In this way, although the level of agrarian agriculture declined significantly after the transition to a market economy, it has recovered thanks to the Third Crop Rehabilitation Campaign in recent years and is approaching the level of the period of the planned economy[3]. At the end of

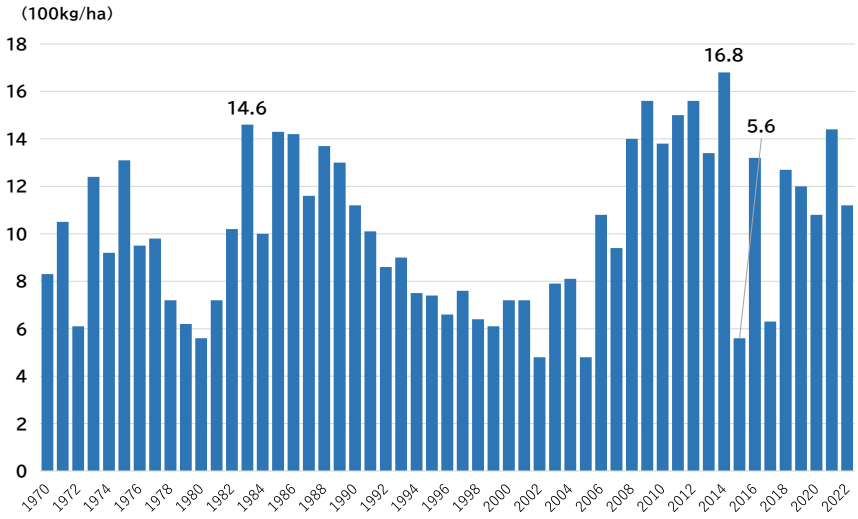
[1] NSO Mongolian Statistical Yearbook 2022, p388
[2] Yuki KONAGAYA, "History of agricultural development in Mongolia", National Museum of Ethnology Research Report, 35 (1): 9-138, 2010
[3] Hiroshi KOMIYAMA, Agro-pastoralism in the arid lands of north-east Asia,-Focus on Mongolia-, New developments in international regional development, Tsukuba Shobo,55-69, 2016

the socialist era, the yield of wheat was as high as 1,460 kg/ha because of relatively high precipitation and well-maintained irrigation facilities. After the transition to a market economy, irrigation facilities did not function, the weather was relatively bad, and yields became low. In recent years, due to abundant rainfall and an increase in the area of irrigated land, the annual yield reached 1,680 kg/ha in 2014, the highest level in recent years. However, extremely low yields in 2015 (560 kg/ha) and 2017 (610 kg/ha) drought-prone years need to be considered.



Source: JICA Project Team based on Mongolian Statistical Information Service

Figure 3.2 Long-term Trend of Cropped Area in Mongolia



Source: JICA Project Team based on Mongolian Statistical Information Service

Figure 3.3 Long-term Trend of Wheat Yield in Mongolia

(1) Production of Major Crops

Agriculture in Mongolia is an industry that produces 14% of its agricultural GDP from less than 0.5% of

the country's planted farmland[4]. In terms of numerical values, it shows very high productivity compared with the livestock sector. They include wheat, potatoes, and other vegetables and fruits that are important to the modern Mongolian diet. Recent production volumes are shown in the figure below. Wheat and potato production respectively reached levels that met domestic self-sufficiency rates between 2010 and 2022. However, it is necessary to take into account the extremely low yields during drought years in 2015 and 2017. On the other hand, the production volume of vegetables and fruits is still small and the dependence on imports is high.

The main crops are wheat, potatoes, and vegetables. In 2022, the production was approximately 401,900 tons, 214,000 tons, and 148,900 tons, respectively, but many agricultural products were affected by drought in 2015 and 2017. In 2017, compared with the previous year, wheat production was 0.49, potato production was 0.73, and total vegetable production was 0.86, indicating once again that production is strongly affected by climate conditions. In particular, wheat production is significantly affected by the climate as the production volume decreases to less than half.

Table 3.1 Production of Major Crops in Mongolia (2013-2022)

Commodities	*thousand ton*									
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Cereals	387.0	518.8	216.3	483.5	238.1	453.8	433.3	430.3	614.5	428.6
wheat	368.4	488.3	203.9	467.1	231.4	436.1	411.4	406.1	566.3	401.9
Potato	191.6	161.5	163.8	165.3	121.8	168.9	192.2	244.3	182.6	214.0
Vegetables	101.8	104.8	72.3	94.4	82.1	100.7	99.5	121.2	121.7	148.9
cabbage	20.6	18.7	15.4	16.7	15.2	18.8	21.9	24.4	26.8	37.0
carrot	34.5	34.7	18.5	31.0	21.7	26.3	28.9	33.8	26.6	40.0
turnip	22.4	23.9	17.6	21.2	16.6	24.1	21.5	21.6	19.7	24.4
onion	9.3	9.4	6.7	10.0	12.1	14.1	9.5	11.4	20.4	17.3
garlic	1.0	1.0	0.7	0.7	0.4	0.5	0.8	1.4	1.5	1.6
cucumber	4.3	4.7	3.8	3.7	3.9	3.8	4.7	3.1	3.5	1.6
tomato	2.5	2.4	1.9	2.2	2.0	1.9	1.9	2.3	2.0	2.2
watermelon	5.4	6.3	6.5	7.2	8.8	9.6	9.1	10.2	10.5	8.6
greenhouse	-	3.0	2.8	3.4	3.1	3.1	4.5	-	-	8.1
Fruits &berries	1.6	1.2	1.4	1.6	1.5	1.7	1.8	1.6	2.4	2.6

Source: JICA Project Team based on NSO Mongolian Statistical Yearbook 2022 and MOFALI 2022.4

(2) Consumption of Major Crops

Mongolia is based on a nomadic society and its traditional staple foods were meat, raw milk, and dairy products. Under socialism, wheat spread and became a major food product through the development of arable agriculture. Therefore, meat, dairy products, and wheat tend to be consumed at high levels. Since then, the consumption of vegetables and potatoes has been increasing in recent years due to changes in dietary habits caused by the transition to a market economy. In particular, the consumption of vegetables and potatoes in urban areas is about 30% and 12% higher than in rural areas, respectively. On the other hand, the consumption of meat and dairy products in urban areas is about 30% lower than in rural areas, respectively[5].

[4] NSO Mongolian Statistical Yearbook 2022
[5] NSO Mongolian Statistical Yearbook 2022, p150

Table 3.2 Consumption Rate of Food in Mongolia (2013-2022)

Commodities	Consumption Rate (kg/person/year)									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Meat	97.2	105.6	102.0	104.4	103.2	106.8	102.0	108.0	108.0	109.2
Milk	160.8	163.2	165.6	133.2	130.8	120.0	132.0	132.0	127.2	112.8
Butter	3.6	3.6	3.6	3.6	3.6	2.4	2.4	2.4	2.4	2.4
Flour& bakery	121.2	127.2	126.0	122.4	122.4	121.2	121.2	123.6	115.2	110.4
Rice	21.6	22.8	21.6	21.6	21.6	21.6	22.8	22.8	21.6	22.8
Sugar	16.8	15.6	9.6	8.4	9.6	13.2	13.2	14.4	12.0	10.8
Egg (piece)	43.2	43.2	49.2	46.8	52.8	54.0	62.4	73.2	75.6	85.2
Potato	38.4	36.0	33.6	33.6	32.4	31.2	31.2	32.4	28.8	31.2
Vegetables	24.0	25.2	24.0	22.8	22.8	22.8	25.2	26.4	25.2	25.2
Fruits	8.4	9.6	8.4	7.2	7.2	7.2	7.2	7.2	6.0	7.2
Vegetable oil	6.0	6.0	6.0	6.0	6.0	4.8	6.0	6.0	4.8	4.8

Source: JICA Project Team based on NSO Mongolian Statistical Yearbook 2022

The following table shows the production, import and export volumes, and import dependency rates of major agricultural products in 2021. The production volume of agricultural products decreased sharply after the transition to a market economy. However, the Third Agricultural Reconstruction Plan started in 2008, and the production volume of agricultural products increased significantly. The production volume of wheat and potato has almost met domestic demand in recent years except for drought years. Except for wheat and potatoes, the country is highly dependent on imports, with about 30-40% of vegetables and more than 90% of fruits.

Table 3.3 Production, Import and Dependency on Import of Main Crops in 2021

	Wheat	Potato	Vegetables	Fruits
Production	566,273 ton	182,638 ton	126,629 ton	2.689 ton
Import	227,054 ton	103 ton	66,553 ton	55,367 ton
Dependency on Import※1	28.62%	0.06%	34.5%	95.2%

※1: As the export of those crops is negligible, dependency on import is estimated in the following simplified formula.
(Dependency on Import) ＝ (Import) ÷ (Production + Import)

Source: JICA Project Team based on NSO Mongolian Statistical Yearbook 2021 and FAOSTAT

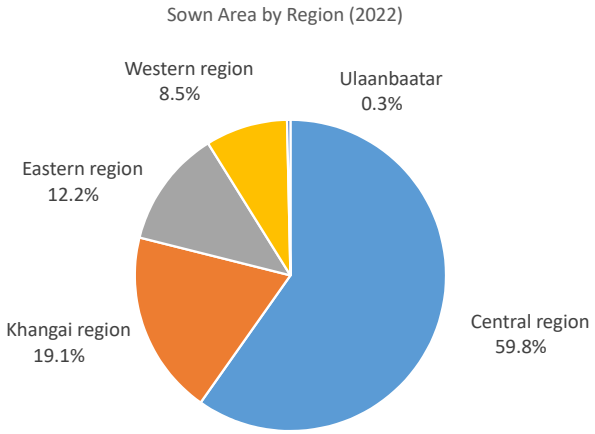
(3) Size and Type of Producers

In 2022 there were about 1,600 agricultural companies and about 17,000 households of individual farmers. Most agricultural companies are grain enterprises that grow wheat on large farmland, and many individual farmers grow potatoes and vegetables on farmland of several hectares or less. The regional distribution of agricultural companies and individual farmers is shown below. The majority (75% or more) consists of the central region and the Khangai region.

Table 3.4 Number and Cropped Area by Companies and Individual Farmers (2022)

	Number of Entities	Cropped Area (ha)				Rate (%)			
		Wheat	Potato	Vegetable	Fodder	Wheat	Potato	Vegetable	Fodder
Company	1,590	325,125	3,715	2,745	43,354	90.8	17.7	19.3	59.0
Individual	17,693	32,825	17,300	11,461	30,159	9.2	82.3	80.7	41.0
Total	19,283	357,950	21,025	14,026	73,513	100	100	100	100

Source: JICA Project Team based on NSO Mongolian Statistical Yearbook 2022

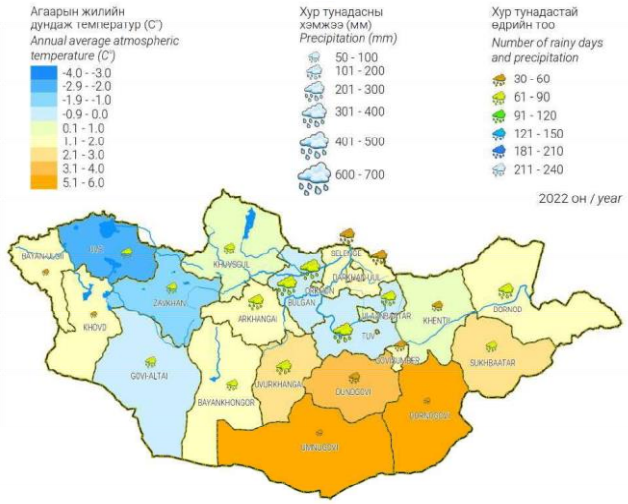


Source: JICA Project Team based on NSO Mongolian Statistical Yearbook 2022

Figure 3.4 Cropped Area by Region

(4) Climate and Seasonality

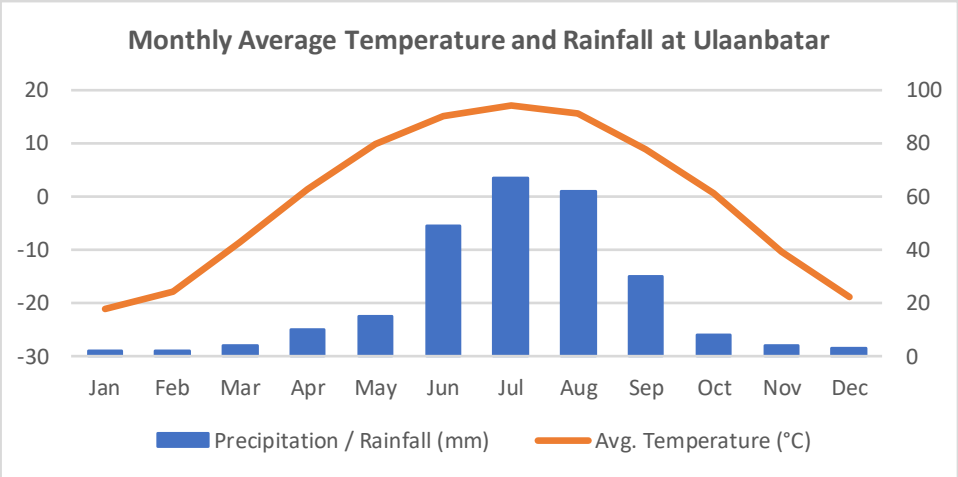
The regional distribution of crops is highly dependent on weather conditions. The northern central part of Mongolia has relatively large amounts of rainfall and a large number of rainy days. Annual average temperatures are also moderate. For example, the average annual precipitation in Selenge aimag is 284 mm, and the temperature is -22.6 ℃ in January and 20.1 ℃ in July. On the other hand, although the temperature is relatively high in the central and southern regions, precipitation is very low, and rain-fed agriculture is difficult. For example, the annual average precipitation in Dornogovi aimag is 112 mm, and the temperature is -17.8 ℃ in January and 23.8 ℃ in July.



Source: Mongolian Statistical Yearbook 2022, p.330; National Statistics Office of Mongolia

Figure 3.5 Climate Map of Mongolia

In Mongolia, monthly average temperatures above 10 °C are generally from May to September, and the planting season is limited to May to September. According to the hearing, the sowing time of buckwheat is generally after the middle of May, and the sowing/planting time of vegetables is after the middle of June. There is relatively rainfall during this summer growing season. A fundamental challenge in the value chain is the concentration of harvest time due to the very limited period of cropping.



Source: https://en.climate-data.org/asia/mongolia/ulaanbaatar/ulaanbaatar-490/#climate-graph

Figure 3.6 Monthly Average Temperature and Rainfall in Ulaanbaatar

3.1.2 Major Livestock Products

Of Mongolia's total land area, slightly more than four times that of Japan, 80 percent is under pasture, thereby enabling its people to make their semi-nomadic pastoral livelihoods for millennia. Its constitution, unlike any of the others, proclaims proudly 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. As one might expect, livestock's contribution to agricultural GDP is above 80% (2021, census). The mainstay of the livestock sector is the mobile livestock-keeping based on the representative five gregarious animals, namely, horses, cattle, sheep, goats, and camels[6], and, naturally, the main livestock products, such as meat, milk, fibers (wool and cashmere) and hides are all derived from these five beasts. Of those, especially meat and milk are of higher importance not only forming the backbone of the national economy but also feeding the relentless maw of Mongolian people. As shown in Table 3.5, the average daily meat and milk consumption per capita in Mongolia is markedly high in Asia, taking in meat more than twice and milk almost three times those of its counterparts in the region. In most developing countries, there is a tendency for meat and milk consumption to increase according to wages, meaning that people on high incomes consume these animal products more than low-paid workers. In Mongolia, however, this does not seem to be the case, and this has much to do with their tradition[7]. Linked to this, it should be mentioned that in Mongolia city-dwellers who

[6] The sheep-equivalent head coefficients for horses, cattle, goats and camels are 7.0, 6.0, 0.9, and 5.0, respectively.
[7] Nishino, I. and Kusano, E. 2013. Livestock industry in market economy (Chap. 5) *In* Fujita, N., Kato, S., Kusano, E., and Kouda, R. (eds.). Mongolia. Kyoto University Printing House (in Japanese).

earn more incomes than their counterparts in rural areas consume meat and milk rather less[8].

Table 3.5 Average Daily Meat and Milk Consumption in Asia (g/day per capita)

Items	Mongolia	Asia	Japan	China	Korea
Meat	190	80	130	150	150
Milk*	400	140	210	80	70

Source: Nishino and Kusano (2013)[9] *dairy products included.

As mentioned earlier, mobile livestock keeping has long been the mainstay of the national economy as well as its tradition. Thus, keeping them, namely, the five livestock species healthy could be likened to "*gokoku hojo*" which is traditionally used in Japan to pray for a huge harvest of the five important staple grains such as rice and wheat. And, more importantly, what makes the five animals tick is the vast natural grassland this unique state possesses. Mongolia has the world's largest grassland in terms of the ratio to the total land area, followed by other pastoral countries such as Australia, New Zealand, Botswana, Namibia, and Uruguay[10]. Nevertheless, none of these countries utilize the grassland as Mongolian herders do such that they graze their animals continuously by moving from one campsite to another while in the aforementioned countries, livestock producers, say, ranchers raise their animals on a sedentary and intensive basis with the help of commercial grain feeds. Things that make this unique aspect viable are Mongolia's natural vegetation and a set of values most Mongolians may have towards traditional nomadism.

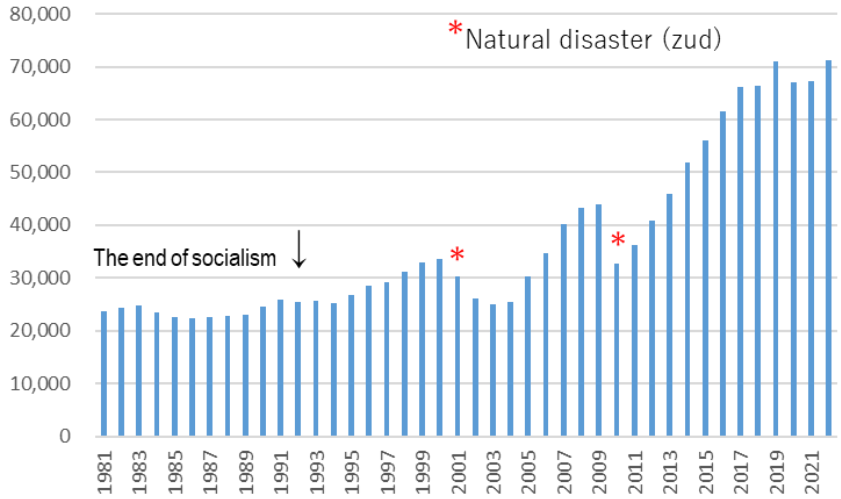
Concerning the former, it is widely known that there are a lot of kinds of native forage grasses in Mongolia reaching as many as 2,000 species, and approximately 300 of those, which are notably the favorite ones of most animals, are very rich in nutrition comparable to improved forage grasses such as Orchard grass[11]. On top of that, although, in general, the contents of nutrition of most grasses in the tropics decreases after the growing season, a number of natural grasses in Mongolia keep their nutritional values almost in the same range even in winter[12].

As to the latter, it would be worth mentioning that unlike other ex-socialist countries such as Romania and Bulgaria that promptly transitioned to sedentary farming after the collapse of the Soviet Union[13], a considerable number of Mongolians rather chose to move back to the countryside[14]. Thus, it is interesting to point out that even urbanites in Ulaanbaatar, one of the most modernized cities in Asia, are still highly dependent on this traditional animal keeping.

On the other hand, this traditional production method is under threat from an unprecedented situation. It is a livestock explosion. As clearly shown in Figure 3.7, just thirty years into a capital market economy after

[8] Nishino, I. and Kusano, E. 2013. *Op.cit*.
[9] Nishino, I. and Kusano, E. 2013. *Op.cit*.
[10] Miaki, T. 1995a. Mongolia: Nomadic world No.3: diversified vegetation supporting mobile livestock-keeping. *Sustainable Livestock Production and Human Welfare* 49: 834-838 (in Japanese).
[11] Imaoka, R. 1988. Characteristics of natural conditions on Negdel. *Journal of Mongolian Studies* 11: 2-30. (in Japanese)
[12] Miaki, T. 1995. Mongolia: Nomadic world No.9: diversified vegetation supporting mobile livestock-keeping. *Sustainable Livestock Production and Human Welfare* 50: 88-96 (in Japanese).
[13] Urushibara, K. 2009. Changes in sheep transhumance in Romania and Bulgaria since the change of the socialistic regime. *Rikkyo University Bulletin of Studies in Tourism* 11: 39-52. (in Japanese)
[14] Fratkin, E. and Mearns, R. 2003. Sustainability and pastoral livelihood: Lessons from East African Massai and Mongolia. *Human Organization* 62: 112-122.

the end of socialism, though there were natural disasters (Zud) twice, killing 20 to 30% of the national herds, the total number of animals has tripled. In Mongolia, during the period of feudalism as well as socialism, the total number stayed in the range of 20 to 25 million[15]because of the state control, especially through herders' cooperatives called negdel as well as the state farms in the socialist era. Annually, a fixed number of animals as an obligatory quota had to be slaughtered before winter, and livestock were the assets of the state, meaning that individual herders could not keep more than an officially determined number[16]. During the 1970s in its heyday, the numbers of negdel and state farms reached as many as 354 and 25, respectively. In terms of their function, the latter dealt with veterinary services, and animal off-takes while the latter was in charge of selective breeding and fodder production[17]. As depicted in Figure 3.8, negdels were located strategically nationwide covering all the villages so that, unlike the current situation, all the herders had access to locations where they could trade in their animals, or more likely, a well-functioning market infrastructure[18]. Looking back upon the negdel system, Mongolia used to enjoy, though the animal production method itself can be said as pre-modern because of its huge dependence on the natural grassland, the whole system including all the rural negdel branches connected by its network with the central controlled state market system as well as planned to slaughter with well-equipped logistics seems to be a highly sophisticated structure.



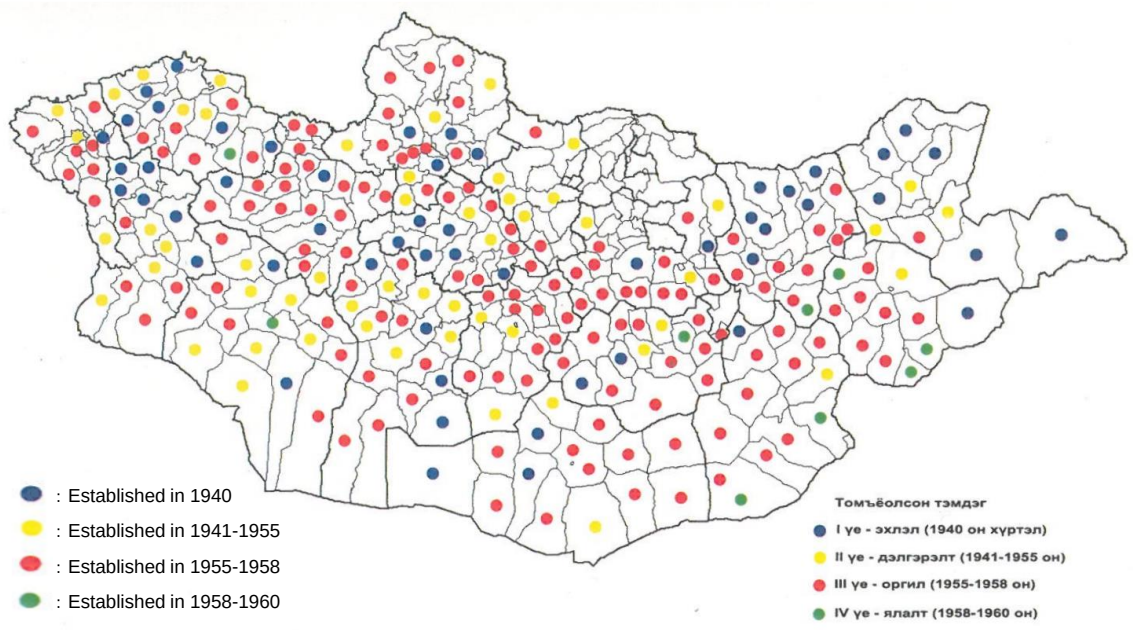
Source: FAOSTAT, Mongolian Statistical Yearbook (2022)

Figure 3.7 Trend of the Number of Five Animals from 1981 to 2022

The end of socialism had been the end of all those functions provided by the state-planned system, after which all the livestock were privately owned. Thus, as one might expect, the number of livestock started increasing. Besides, during the period just after the end of socialism, some other factors seemed to enhance the tendency. First of all, the most serious one was severe inflation in the early 1990s almost paralyzing the capital city, and, consequently, the livestock market prices hit the ground thereby causing herders to stop

[15] Humphrey, C. 1978. Pastoral nomadism in Mongolia: the role of herdsmen's cooperatives in the national economy. *Development and Change* 9: 133-160.
[16] Approximately 75 animals (*See* Humphrey, C. 1978. *Op.cit.*).
[17] Gerelsaikhan, S. 2012. The feature of Mongolian's livestock. *Studies of regional policy* 14: 63-75.
[18] On top of those services, a negdel functioned as a mini super-market (Brunn, O. 1996. The herding household: economy and organization *In* Mongolia in transition. Bruun and Odgaard (eds.), Nordic Institute of Asian Studies, UK.).

selling their animals. Another factor linked to this is that the obligatory quota before winter was not the norm since the negdel system had disappeared totally. Thus herders started attaching greater importance to their animals as their assets[19]. Besides, as mentioned earlier, a considerable number of Mongolians moved back to the rural areas, and by 2000 the number of people who left the city tripled[20]. Those people, naturally, were new entrants. Thus, they tried to establish their herds not by selling but by breeding animals.



Source: National Association of Mongolian Agricultural Cooperatives

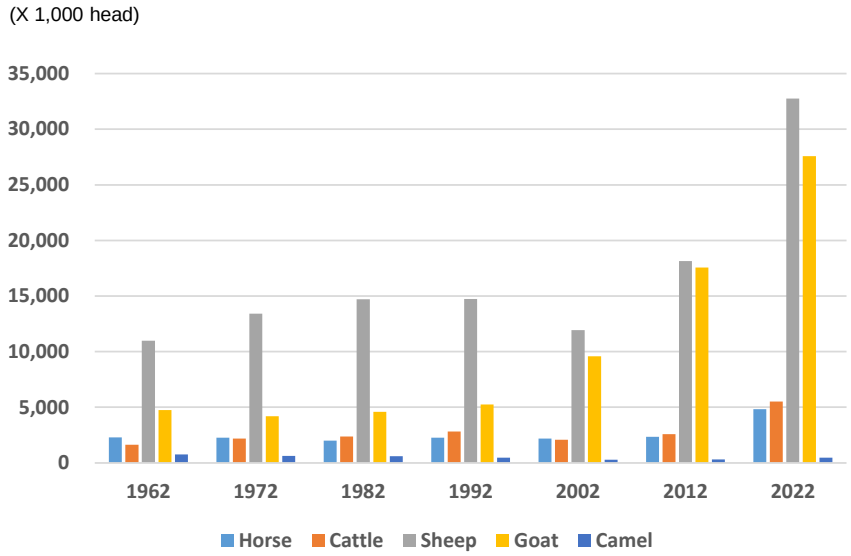
Figure 3.8 Locations of Negdel During the Socialist Era

As pointed out earlier, in Mongolia the number of animals increased exponentially during the period of transition from a planned economy to a market economy, exceeding 70 million in 2019, a record high, and growing by 4.2% during the period of the last 30 years in terms of the growth rate. Considering the fact that the growth rates from the world and during the socialist era in Mongolia are 0.7% and 0.5%, respectively, the difference is noticeable[21]. On the other hand, not all animal species increased at the same rate. As clearly shown in Figure 3.9, the rates of sheep and goats are most prominent. Traditionally in Mongolia including the socialist era, the ratio of the five major animals, namely, horses, cattle, sheep, goats, and camels were 1:1:7:3:0.5, respectively, considered the most appropriate from a point of view of animal keeping[22]. Nevertheless, due to the cashmere industry, the ratio changed dramatically. Cashmere is a fiber obtained from cashmere goats raised in cold regions and very renowned for its soft texture as well as thermal efficiency. Also important is its scarcity because cashmere-producing countries are very limited, Mongolia with China being two of the leading producers. Thus, as expected, cashmere is not only one of the most liquid and profitable commodities in livestock products being a principal source of livelihood for herders, but also one

[19] JICA. 2016. Data collection survey on the regional comprehensive development in Mongolia. Japan International Cooperation Agency.
[20] National Statistical Office of Mongolia (2004, 2006)
[21] Calculations based on FATOSTAT and Mongolian Statistical Yearbook.
[22] Especially the ratio of sheep to goats is most important because the longer hair of sheep keeps the goats worm (Humphrey, C. 1978. *Op.cit.*).

of the most important exports in Mongolia. Consequently, unlike any other animal commodities, its price, including the average farm-gate price, is subject to the international market. In 1993, around the collapse of socialism, the international cashmere price plummeted from about 130 USD/kg to 37 USD/kg, an all-time low, remaining until 2000[23]. Under these circumstances, most herders not only started retaining their goats but also increased the number of goats to make up for the losses caused by the collapse of the international market.

By contrast, the only species in decline is the camel, showing eloquently that waves of modernization are around even in the remotest areas of Mongolia. Although camels are used for multiple purposes such as milking, fiber, and meat, they have been working animals as a vital means of transport for cargo including tents (=ger), and other pieces of furniture. Recently, however, a majority of herders possess some kind of vehicle including motorbikes thereby making camels obsolete[24][25].



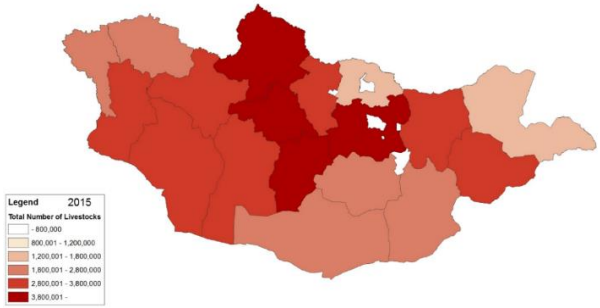
Source: FAOSTAT, Mongolian Statistical Yearbook 2022

Figure 3.9 Trend of the Number of Five Animals from 1962 to 2022

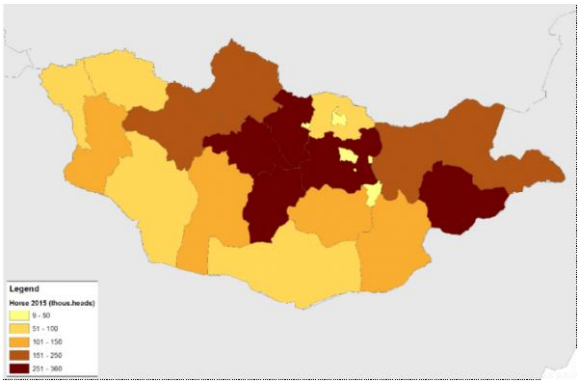
Concerning the livestock explosion, one of the important questions here would be how it would be possible for herders to keep multiplying their animals at will. In the case of most intensive and commercial farming, it would not be feasible to do so because of higher costs for feeding as well as the expansion of spaces for confinement. Thus, as one might expect, the most decisive factor that makes Mongolian herders possible to keep a lot of animals is that they virtually do not need any payment for feed or land. As mentioned repeatedly, Mongolia's mobile livestock-keeping is based on the vast natural grassland. The use of the land is highly limited for crop farming due to the harsh climate, but for gregarious animals, it would be almost ideal. Besides, the grassland itself benefits from animals moving on it, thereby making the relationship between them complementary[26]. Nevertheless, even this vast grassland has its limit for carrying animals. Thus, once the

[23] Chimedtseren Baldan. 2006. Cashmere industry in Mongolia. ERINA. The Economic Research Institute for Northeast Asia. (in Japanese)
[24] In recent years, this trend has become even stronger, with car ownership rising from around 27.8% in 2010 to 51.2% in 2019; Mongolian Statistical Yearbook, 2019.
[25] Janzen, J. 2005. Mobile livestock-keeping in Mongolia: Present problems, spatial organization, interactions between mobile and sedentary population groups and perspectives for pastoral development. *Senri Ethnological Studies* 69: 69-97.
[26] Humphrey, C. and Sneath, D. 1999. The end of nomadism? : Society, state and the environment in Inner Asia. Duke University Press,

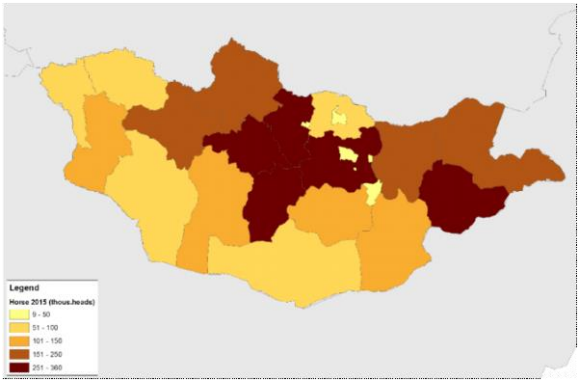
number of animals has outstripped the carrying capacity of the grassland, it may cause degradation of the land to a varying degree, and this is the critical issue that Mongolia is facing today[27].



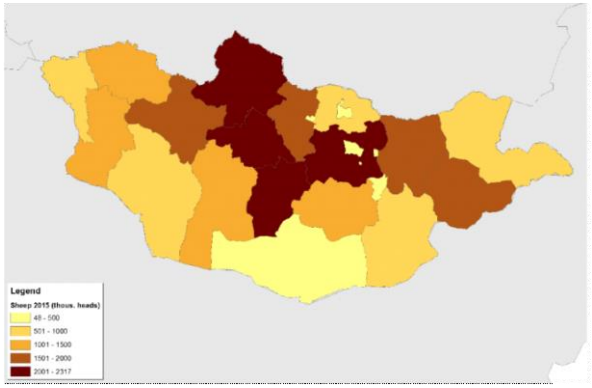
a Five animals



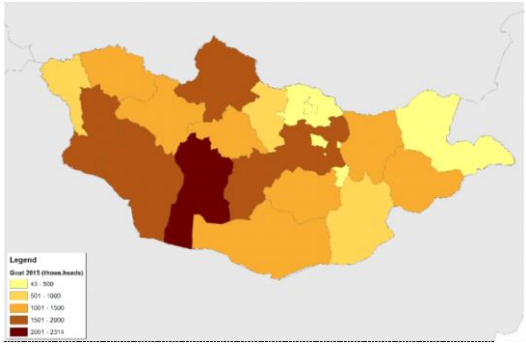
b Horse



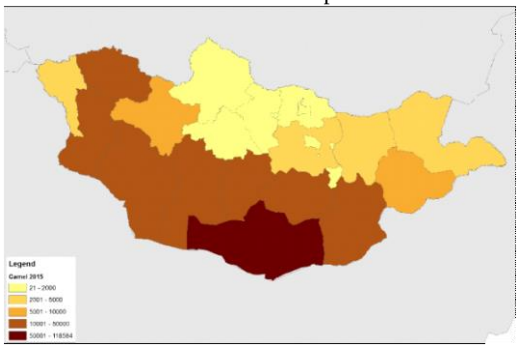
c Cow



d Sheep



e Goat



f Camel

Source: JICA Project Tam based on Mongolian Statistical Yearbook

Figure 3.10 Distribution of Every Animal of the Five Species in Recent Years (a-f)

Concerning further information on grassland degradation, not that all the areas deteriorate evenly. The situation is more serious in the regions where greater concentrations of animals are found than in those with fewer animals. Figure 3.10 depicts the distributions of the five animals as well as each animal of them. As shown in (a), higher concentrations of animals are found in the central region, especially in the north, and the number tapers off gradually along east to west axes. The reason for this would be the quality pastures a great

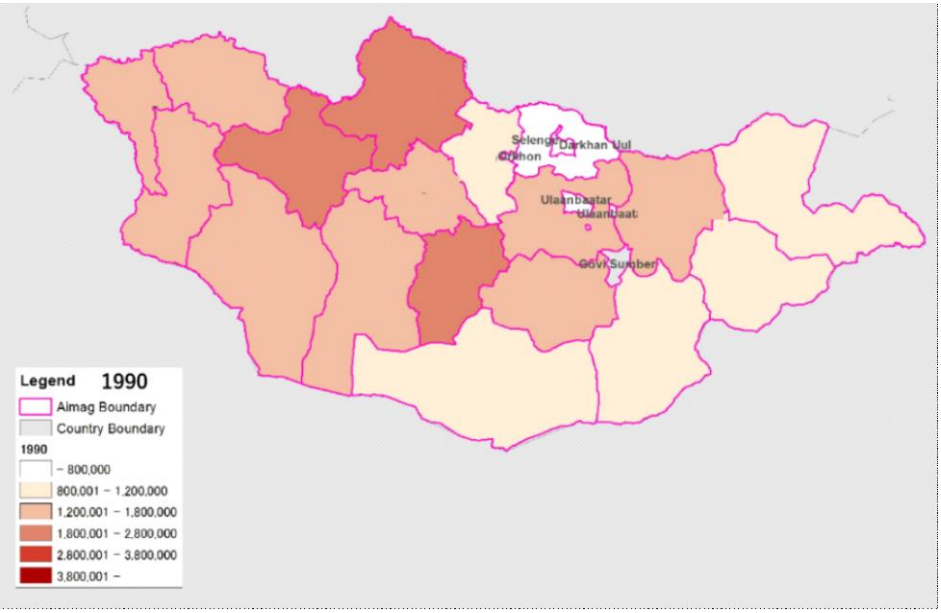
Durham, NC; Loreau, M. 1995. Consumers as maximizers of matter and energy flow in ecosystems. *American Naturalist* 145: 22-42.

[27] Apart from the livestock population explosion, other causes pointed out are climate change, desertification, rodent problems, urbanization, crop-farming, compactization due to heavy vehicles, mining industry, etc. (*See* JICA. 2016. *Op.cit.*).

majority of northern regions have[28], and the proximity to a market or the larger cities including Ulaanbaatar[29]. As to individual cases, while the distribution manners of horses, cattle, and sheep (b-d) are similar to that of the five animals (a), goats and camels (e and f) are different. This contrast could be explained by the characteristics of the vegetation in Mongolia as well as of these two animal species. While the vegetation types of the northern regions are mainly mountain taiga, forest-steppe, or steppe, the southern parts are desert steppe or desert where water supply is limited and camels and goats are raised more. The reason for this is that camels and goats are more resistant than other species to the harsh climate[30].

In Mongolia, Hardin's renowned concept called "the tragedy of commons[31]", is a situation in a shared-resource system such as communal grasslands, where individual animal keepers, acting independently according to their self-interest, behave contrary to the common good of others by depleting the shared resource through their collective action, is highly recognized in Mongolia as well. Nevertheless, it would be highly important to point out that Hardin's most crucial decisive factor is the limited amount of resources, or more likely in the case of Mongolia, grass for which cattle keepers compete against each other. In Mongolia, however, precisely speaking, the most important deciding factor is not the amount of grass, which could be abundant depending on a given place, but the availability of the market to which herders can sell their animals. As mentioned above, after the collapse of the state cooperatives herders lost access to the market. Thus, they had to move to the larger cities, or to the areas near the main roads where they could trade[32]. In the socialist era, however, the market system as negdel was available in every district throughout the country, thus herders could trade in every area and consequently, the difference in livestock concentrations between regions was not so conspicuous as depicted in Figure 3.11.

[28] Miaki, T. 1995b. Mongolia: Nomadic world No.4: diversified vegetation supporting mobile livestock-keeping. *Sustainable Livestock Production and Human Welfare* 49: 934-940 (in Japanese).
[29] JICA. 2016. *Op.cit*.
[30] Mattiello, S. 2016. Husbandry practices and animal health *In* Non-bovine milk and milk production. Tsakalidu, E. and Papadimitriou, K. (eds.). Elsevier, UK.
[31] Hardin, G. 1968. The tragedy of commons. *Science* 162: 1243-1248.
[32] Oniki, T., Yamanura, N., Tsutsumida, N., Ito, M, Tayasu, I. and Nagata, T. 2013. Immigration and urbanization of herders (Chap. 7) *In* Fujita, N., Kato, S., Kusano, E., and Kouda, R. (eds.). *Op.cit.* (in Japanese).



Source: Mongolian Statistical Yearbook

Figure 3.11 Distribution of Every Animal of the Five Species in 1990 (still in the Socialist era)

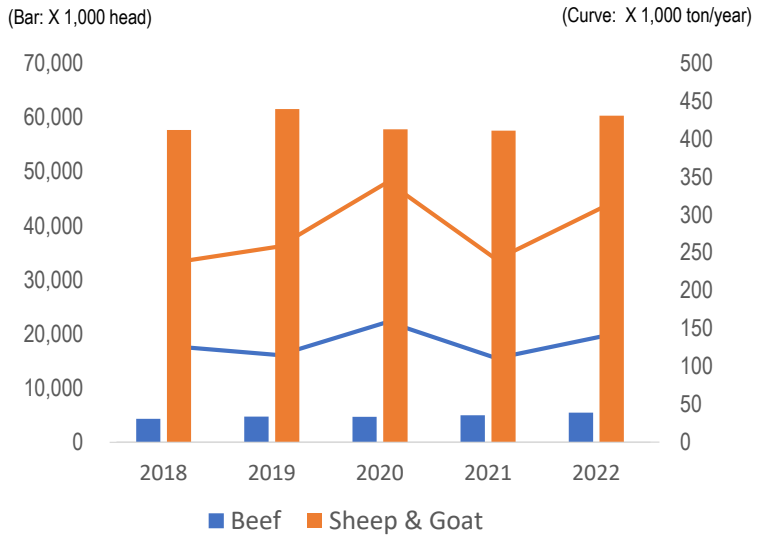
Regarding each livestock product, general information on Meat, Milk and Dairy, Wool, Cashmere, Hides, Leather, and Sedentary Livestock Enterprises will be given here. Then, in Chapter 3.2.2, considering establishing a novel livestock value chain, some specific information on the products that are high on the list of priorities, namely, Meat, Milk and Dairy, Wool, and Cashmere will be mentioned.

Also, the advantage of Mongol's mobile animal-keeping should be mentioned. During the period of transition to capitalism, especially, in former socialist countries as well as in Inner Mongolia, sedentarization policy providing herders with private rights to land was the norm, especially in the agenda of international donors. Mongolia was in the same boat as well[33]. Eventually, as mentioned earlier, Bulgaria and Romania transitioned to sedentary societies, and, in fact, even in Mongolia settled farming practices are becoming more common recently[34]. Nevertheless, it is unreasonable to replace traditional mobile animal-keeping with modern settled animal husbandry at all since it is now scientifically accepted that pastoralism is a highly sophisticated system of production as well as land management in some marginal regions of the world[35]. This aspect should be considered carefully in discussing the livestock industry as well as livestock supply chains in Mongolia[36].

[33] Hatfield, R. and Davies, J. 2006. Global review of the economics of pastoralism. The World Initiative for Sustainable Pastoralism.
[34] World Bank. 2019. Mongolia central economic corridor assessment: a value chain analysis of the cashmere-wool, meat and leather industries. Report No. AUS0000216. Clarke, J. L. and Piatkowski, M. (eds.). World Bank Group.
[35] Ellis, J.E. and Swift, D.M. 1988. Stability of African pastoral ecosystems: Alternative paradigms and implications for development. *Journal of Range Management* 41: 450-459; Christensen, L., Coughenour, M.B., Ellis, J.E., and Chen, Z. 2003. Sustainability of Inner Mongolian Grasslands: Application of the Savanna Model. *Journal of Range Manage* 56: 319-327.; Ying, L. 2011. Grazing resource management and grassland degradation in Northern China. *Journal of Resource Ecology* 2: 286-288.
[36] JICA. 2019. Report for formulation of master plan on the agricultural value chain in Mongolia. Japan International Cooperation Agency. (in Japanese)

(1) Meat

As mentioned earlier, meat is by definition one of the most important staples in Mongolia, but not all kinds of meat are consumed equally. Sheep meat (not lamb but mutton) would be the most popular meat for a great majority of Mongolian while the other ones vary considerably depending on so many factors. Figure 3.12 shows the trend of the number of animals and their production featuring two groups; cattle and sheep & goat. Although meat production seems directly proportional to the increasing number of animals of the two groups (except for the year 2021, showing a sudden drop in meat production which was obviously caused by COVID-19), according to the voices from almost all the people in the industry, the great majority of the meat production of the group Sheep & Goat accounts for mutton, meaning that goat consumption is low. They also mentioned that in Mongolia goat meat is not popular, or more likely they do not recognize goat meat as a fine diet[37]. Besides, since herders try to keep goats for cashmere, the number of goats for consumption might be lower. Therefore, how to utilize more goat meat should be given priority in meat supply chain improvement thereby contributing to the mitigation of grassland degradation.



Source: Mongolian Statistical Yearbook 2022

Figure 3.12 Trend of the Number of Animals and their Production: Beef and Sheep & Goat

(2) Milk and Dairies

In Mongolia, not only meat but also milk comes from all five species. Naturally, in terms of production volume, cow's milk is dominant, but milk from other animals, for instance, mare's milk (horse milk) is traditionally very important for making the famous airag, fermented horse milk, an alcoholic spirit. Roughly, the proportion of each milk is shown in Table 3.6. Besides, in the case of Mongolia, milk from yak is included in cow's milk. Yak is, belonging to the bovine family, long-haired domesticated cattle found in mountain ranges. Although its production is extremely low (<1 to 2 liter per animal per day), milk fat and solids-not-

[37] According to the interview with CEO of Maha Market, one of the largest meat packers in Mongolia, goat meat is in general recognized as a poor man's diet, and it has an effect of giving a chill when one consumes. Furthermore, goat fat becomes solid sooner than other animals' fat. In meat factories, however, goat meat are being used for some traditional diets, to a different degree, not as goat meat but "bog meat" meaning in Mongolian "sheep and goat, or small ruminants"

fat are much higher than those of cow's milk thereby making its market value higher as well[38].

Linked to milk issues, horse milk, the only product derived from non-ruminants, is similar to human milk in terms of biochemical composition, with milk fat and protein being lower than the others while lactose is prominently higher[39]. Therefore, although it is not suited to cheese making, airag, a fermented horse milk product is ideal because of its higher content of sugar (lactose). Besides, for airag making, unlike other dairy products, there is no need to be scalded, thus maintaining its nutritional properties such as vitamins which are rich in horse milk. And that's why airag is commonly said as a substitute for vegetables, especially for herders who are oftentimes prone to lack vegetables[40]. Furthermore, airag has a good number of killed microorganisms and, according to some studies, they may function as an antidote to some harmful substances in the gut and as dietary fibers as well[41].

Table 3.6 Proportion of Milk Type by Animal Species (%)

Horse	Cow	Sheep	Goat	Camel	Total	Sources
4.5	60.1	4.5	31.3	0.3	100.0	SECiM. 201642.
9.7	58.6	10.9	19.7	1.0	100.0	2017. www.mofa.gov.mn

Source: SECiM, MOFALI

(3) Wool

In terms of prices per unit, wool is probably one of the cheapest livestock products in Mongolia, especially in comparison to cashmere or camel fiber. Besides, in the case of Mongolian indigenous sheep, the yield is noticeably lower (ca 1 kg/head) than those of improved breeds such as Corriedale due to, mainly, the smaller size (> 5 kg/head) [43]. Also, the average diameter of wool fibers of those local breeds is considerably thicker than that of wool-type breeds such as Merino, thereby lowering the marketability[44].

In Mongolia, however, wool production is indispensable for herders. Keeping them warm in winter as well as setting up a tent (ger) including its walls and roofs, requires the traditional felt made from sheep wool. As described below, nowadays, even in rural areas herders can afford to buy some commercial type felt, but in any case, felt is still indispensable for mobile animal-keeping. Also important are industrial uses of wool such as carpets, shoes, etc.

Linked to wool production, one other thing that should be added is that wool is rather a by-product in sheep raising in Mongolia, showing a strong contrast with cashmere from the goat in which the fiber is the main purpose for a living.

[38] Alichanidis, E., Moatsou, G. and Polychroniadou, A. 2016. Composition and properties of non-cow milk and products *In* Non-bovine milk and milk production. Tsakalidu, E. and Papadimitriou, K. (eds.). Elsevier, UK.
[39] Alichanidis, E., Moatsou, G. and Polychroniadou, A. 2016. *Op.cit*.
[40] Ishi, S. 2015. Characteristic and property of Mongolian nomads' dairy products and kumiss production. *Milk Science* 64: 53-62. (in Japanese)
[41] Ishi, S. 2003. Probiotics: a spirit from milk. *Journal of Bioscience and Bioengineering* 81: 78. (in Japanese)
[42] SECiM. 2016. Situation analysis in dairy value chain in Mongolia; Support to Employment Creation in Mongolia (SECiM), UNIDO.
[43] Yamamoto, M. 2016. Fleece in Japan. *Sheep Japan* 18. (in Japanese)
[44] *Montsame*. 2019. 726: P.5. (in Japanese)

(4) Cashmere

In terms of the trade balance, cashmere is the only significantly contributing livestock commodity. In Mongolia, the mining industry started growing rapidly from 2000 onwards, and consequently, the ratios of livestock products and livestock GDP to both exports and agricultural GDP plummeted notably from 50% to 10% and from 40% to 15%, respectively, and despite the fact, still, the most contributing commodity has been cashmere[45], being ranked in top 10 export commodities (Table 3.7).

On the other hand, it should be remembered that there is one double-edged aspect of cashmere. During the period of transition from a planned market to a capital market, the fact that cashmere is the most profitable, recognized as one of the highest quality raw materials, and mostly coming from small-scale poor herders, made this commodity one of the most powerful remedies for poverty mitigation[46]. Foreign investment including Italy was highly encouraged by the government[47]. Also important is that the government started to impose a new taxation system and a ban on cashmere raw fiber export[48]. As a result, the income of the cashmere industry increased significantly, which was the positive side of the change. Nevertheless, it triggered off heavy reliance of herders on exporting semi-processed material as well (a minimal or nominal operation such as rough scouring). On top of that, it also caused a lot of herders to smuggle raw materials to avoid paying the additional tax[49].

Lastly, as repeatedly mentioned, the rapid growth of the cashmere industry is inextricably linked with the livestock population explosion. Thus, this aspect should be considered carefully in improving livestock supply chains in Mongolia.

Table 3.7 Top 10 exports in 2022 (ratio to the total export=12,047,212,000 USD)

order	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Item	Coal	Copper concentrate	Gold	Iron ores	Cashmere	Zinc	Petroleum oil	Fluorite	Goat hair	Molybdenum ores
%	54.0%	22.7%	9.4%	3.3%	2.6%	2.4%	2.0%	0.9%	0.8%	0.7%

Source: National Statistical Office of Mongolia (2022)

(5) Hides and Leather

All the leather goods are made from hides, and naturally, they come from slaughtered animals. Thus, the hide could be said as a by-product of the meat supply chain, especially from the meat packers. In Mongolia, however, unlike a majority of the other countries, hides come from not only slaughterhouses but also from individual herder households where home slaughter is a normal practice. While they sell larger animals such as horses or cattle, they trade in smaller ruminants as carcasses. Also important is the distance between the campsite and the main road. In general, herders living far from the main road tend to sell their animals. The further from the main road they live, the more necessary to hire middlemen for herders it is, in which herders should sell animals. By contrast, herders camping in the proximity to the main road, slaughter animals and

[45] Suzuki, Y. 2013. Mining, land and water (Chap. 8). *In* Fujita, N., Kato, S, Sono, E, and Koda R. *Op.cit*. (in Japanese)
[46] World Bank. 2003. from goats to coats: Institutional reform in Mongolia's cashmere sector. Report No. 26240-MOG. Songwe, V. (ed.). World Bank Group.
[47] Genté, R. 2013. Yourtes de banlieue à Oulan-Bator. *Le Monde diplomatique* (http://www.diplo.jp/articles13/1303mongolie.html)
[48] World Bank. 2003. *Op.cit*.
[49] World Bank. 2003. *Op.cit*.

transport carcasses on their own to cut the costs. According to a study conducted in Arkhangai aimag, even larger animals were killed by about 70% of herder households who lived along the main road[50].

Besides, not all the animals traded live are killed and processed at a formal slaughterhouse. In fact, as described below, "out-of-slaughterhouse killing" is the norm in Mongolia. Thus, as expected, the state of preservation of hides is far from being excellent.

All in all, regarding the leather industry in Mongolia, one of the most peculiar aspects is that there are various sources from which raw materials come: mainly, slaughterhouses, "out of slaughterhouse killing" sites, and individual households. Thus, the quality varies considerably, and, especially in the cases of slaughterhouse killing and individual households, the utilization becomes lower.

(6) Sedentary Livestock Enterprises

Of the five livestock species in Mongolia, animals that are used for intensive farming are mainly cattle and sheep. Concerning other livestock species, pigs and chickens would be most common. In terms of the type of products, cattle are for meat and dairy purposes while sheep are mainly raised for meat with wool as a by-product. During the period of socialism, naturally, there was no animal husbandry of this kind. According to the statistics of the MOFALI in 2018, the number of intensive farming increased to 3,592 by 2017, of which roughly half are dairy (by milking cows), 40 % sheep fattening[51], and the remaining cattle fattening. Nevertheless, a good portion of them still utilize natural grassland as well thus, they are not necessarily "pure intensive". By contrast, pig raising and poultry farming (both layers and broilers) are operated under a totally intensive and vertically integrated system. Concerning the poultry industry, only a small group of entrepreneurs hold almost all the market, in which there are two-layer farms with approximately 300,000 hens, and one broiler farm with about 1,500,000 chickens.

Concerning some emerging issues these intensive enterprises are facing are, as expected, animal waste problems and a lack of a secure feedstuff supply system, especially grains which are highly dependent on imports.

3.2 Current Analysis and Issues in Supply Chain of Major Agricultural and Pastoral Products

3.2.1 Supply Chain of Major Agro-pastoral Products

The various actors who have entered Mongolia's agro-pastoral sector can be categorized according to which process (Production, manufacturing, processing, distribution, and sales) they are involved in the supply chain. This can be categorized in relation to each process in the agro-value chain as shown in the table below.

Table 3.8 Types of Value Chain of Agro-pastoral Products in Mongolia

Type	Process				
	Production	Collecting	Processing	Distribution	Selling

[50] GFA consulting group. 2015. Final report on the study of value chain for live animals/meat and hides/skins in Mongolia. SDC, Pasture-Greengold, GEFAK.

[51] Recently, in Mongolia fattening of young male stock of sheep for producing lamb type tender meat as a new business is becoming popular. They feed high energy rations and castrates by using some special device for castration to shorten the fattening period.

					Domestic	**Export**
Production to Selling	●	●	●	●	●	●
Intensive Collecting		●		●	●	
Special Commodity		●	●		●	
Direct Selling	●		●		●	
Intermediate Buying		●		●		

Source: JICA Project Team

The characteristics of each type are as follows.

1) Production to Selling

It is consistent from the primary collection, processing, and transportation to sales. This is mainly due to large companies and corporate groups. These are operated and managed by the company, and all processes from production to sales are completed by the company. The background is the diversification of business by the corporate group to enter the agricultural and livestock industries and the construction of a value chain unique to a business entity with capital.

2) Intensive Collection of Raw or Processed Commodities

For example, primary collection at the sum level, product transportation, and sales. Most of them are formed by unions or industrial associations. In these cases, there are no cases where advanced processing is performed. Raw materials such as raw hair and raw leather are sometimes supplied to companies. The items handled are mainly perishable foods.

3) Special Products

It involves the collection, processing, and marketing of agricultural and livestock products. This is often carried out mainly by small and medium-sized enterprises (SMEs) and is a small-scale operation. It is limited to specific stages and specific products.

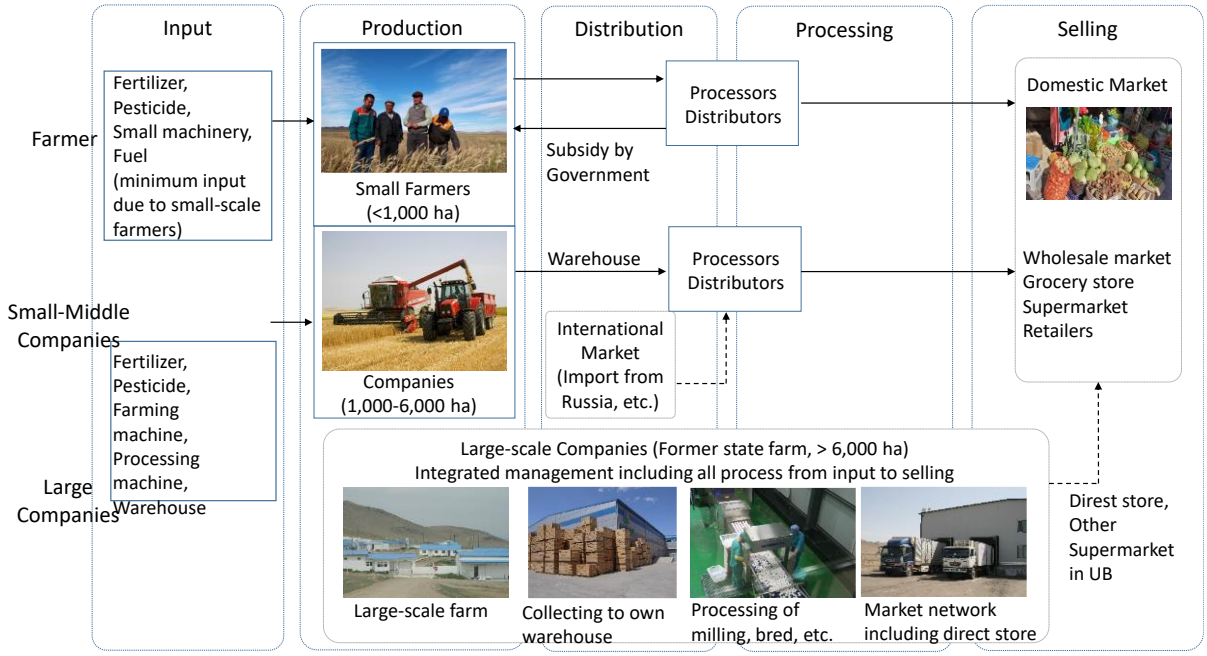
4) Direct Selling by Producers

It is direct sales by producers and small businesses. This is the conventional type, and although the economic scale is small, it accounts for the majority in number.

5) Intermediate Buying

It purchases raw materials and processed products from producers and processors and sells them to markets and companies. Middlemen who are called "changes" play an important role in the supply chain in Mongolia.

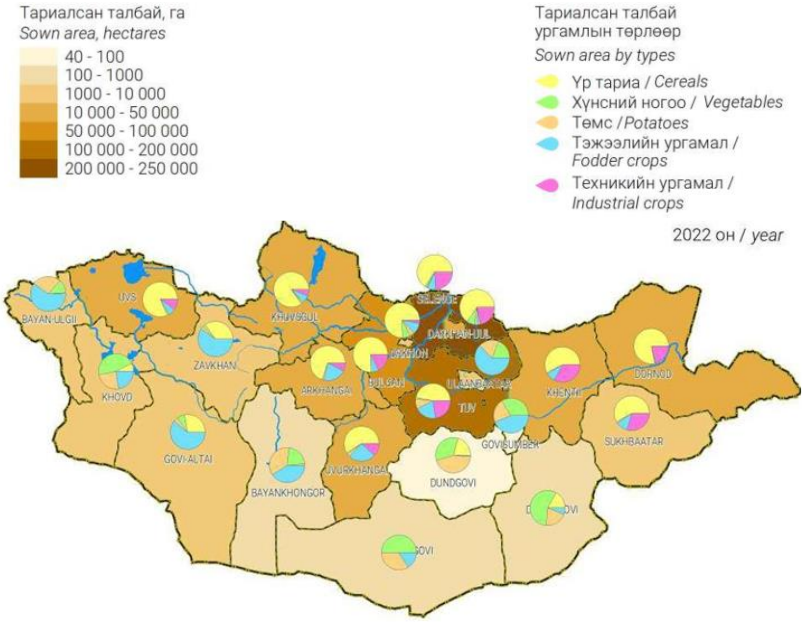
3.2.2 Cereals



Source: JICA Project Team

Figure 3.13 Conceptual Diagram of Supply Chain of Cereals

The most dominant crop in Mongolia is wheat, which accounted for 401,900 tons of grain production in 2022 out of 428,600 tons of cereals. Other than cereals, potatoes, and vegetables are 214,000 tons and 148,900 tons, respectively. The seeding distribution by region is shown in the figure below. Selenge aimag has the largest area of crops with 212,476 ha, followed by Tuv and Bulgan aimags. Crop production is low in the southern regions where precipitation is low and dry.



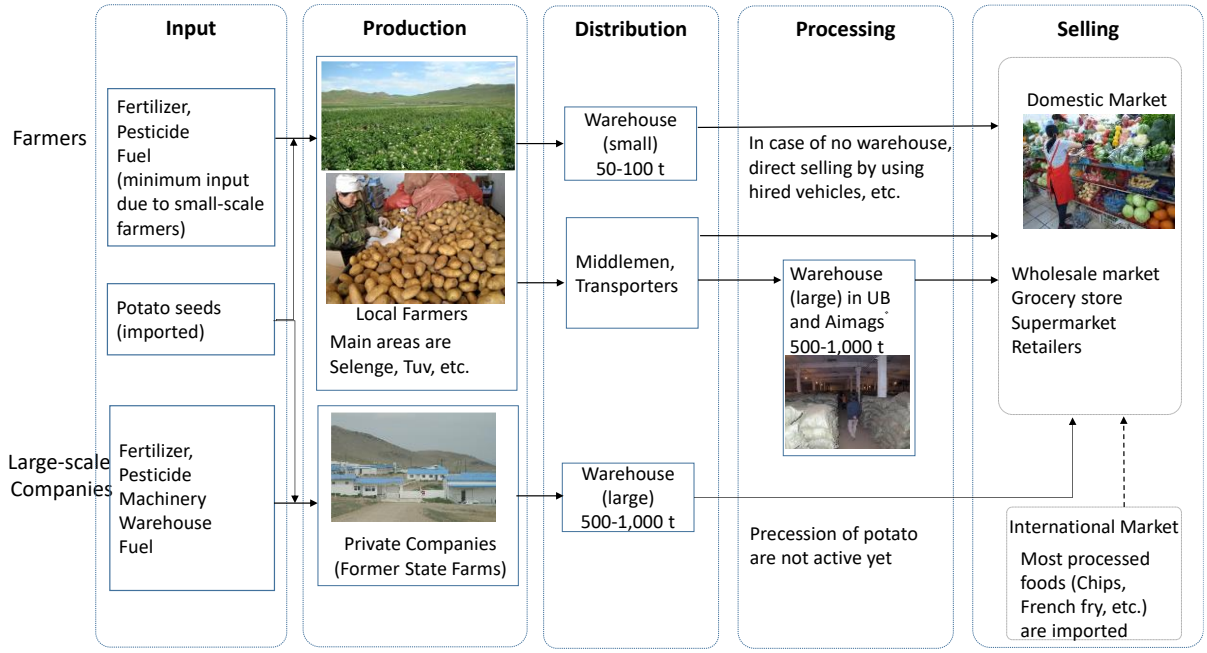
Source: Mongolian Statistical Yearbook 2022; National Statistics Office of Mongolia

Figure 3.14 Cropped Area by Aimag and Crop Type in 2022

For wheat, farmers are paid a certain government subsidy on the amount shipped after harvesting and shipping to private processors. Some major agricultural corporations have their flour mills and sell their products under their brand names. Formerly, it was sold mainly as wheat flour, but now processed foods such as bread, dried noodles, and confectionery are also available.

In Mongolia, there is a certain amount of demand for buckwheat as grain, and although buckwheat imported from Russia is sold in the domestic general market, domestic production is limited. On the other hand, a Japanese buckwheat flour milling company started production in 2014 and has been expanding the production aiming at export to Japan. A local subsidiary was established in 2018 for full-scale production. The growing areas in 2018 were Dornod, Khentii, Selenge, and Tuv aimags. They carry out contract cultivation with 8 producers including individual farmers and enterprises. As of 2019, the cropped area is estimated at 6,000 ha and the yield has not reached 1 ton/ha. In the future, it aims to produce 50,000 ha of 50,000 tons. To import them to Japan, it is important to improve the sorting process at the site and to transport them efficiently after peeling the shells at the site. Therefore, there is a need to develop machinery facilities for on-site sorting work.

3.2.3 Potato

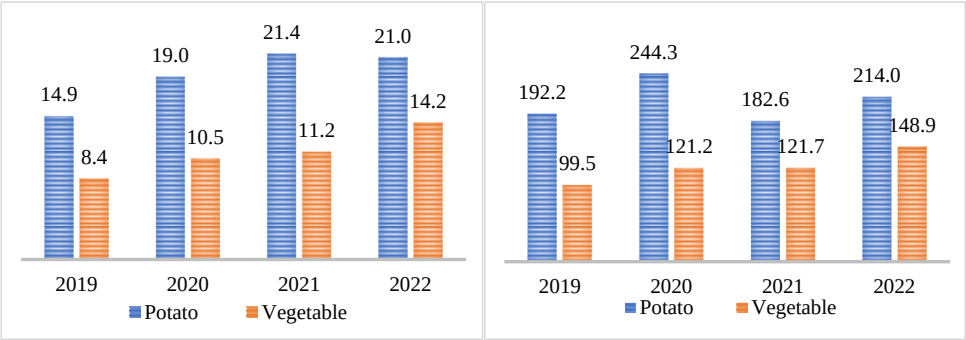


Source: JICA Project Team

Figure 3.15 Conceptual Diagram of Supply Chain of Potato

The production trend of potatoes and 9 kinds of vegetables (carrot, cabbage, red turnip, beet, onion, cucumber, tomato, watermelon, and garlic) is shown in the figure below. In 2022, 21,014 ha of potatoes produced 214,000 tons, with annual fluctuations. In recent years, the demand for vegetables has been increasing, and the Ministry of Health has issued a guideline to increase the per capita consumption of vegetables from 200 g to 260 g. However, domestic production of vegetables other than potatoes has not kept pace, and about 50% of vegetables are imported from China and other countries. The vegetable production of the general farmers is still limited in the region and is unevenly distributed in and around in Darkhan-Uul

aimag and Selenge aimag, where natural conditions are suitable for growing vegetables. Besides, major agricultural production corporations in Japan produce major vegetables such as potatoes, carrots, and onions on a large scale, store them in their refrigerated warehouses, and ship them to various places in Mongolia.

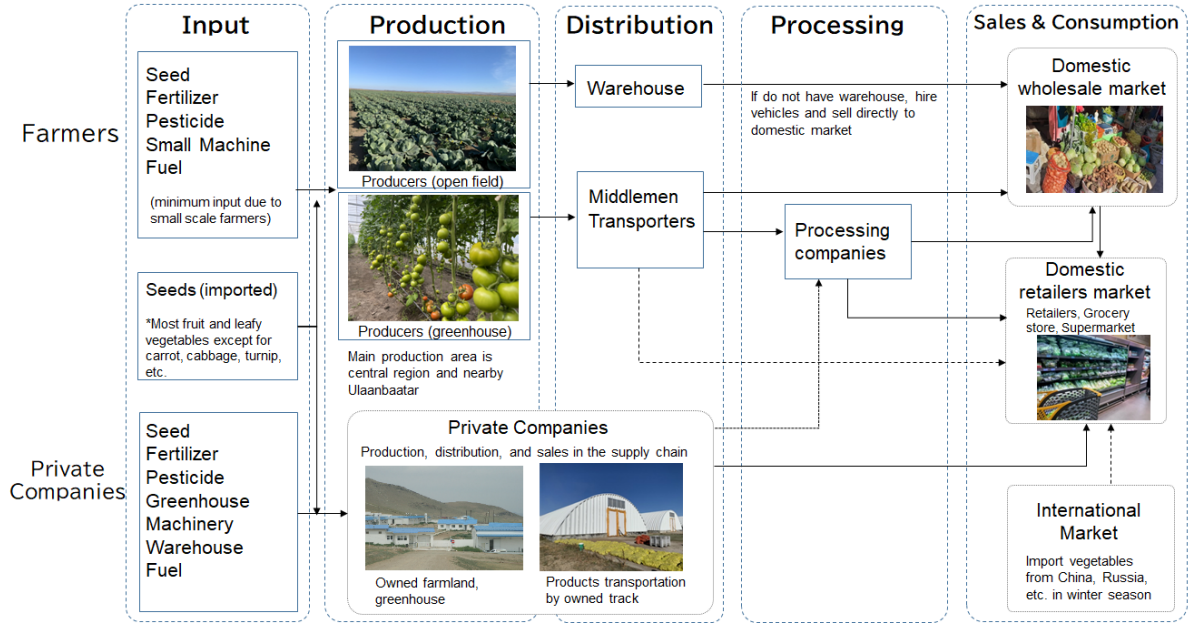


Source: JICA Project Team based on National Statistics Office of Mongolia
Note: Left = Cropped Area in '000 ha; Right = Production in '000 ton

Figure 3.16 Cropped Area and Production of Potato and Vegetables in Mongolia

3.2.4 Vegetable

During the socialist era, vegetable production was mainly potatoes, carrots, cabbages, and turnips. Since the transition to the market economy, the variety of vegetables such as leafy greens, tomatoes, peppers, garlic, and onions has increased, and also consumption has been increasing. In recent years, the production of broccoli, radishes, zucchini, bell peppers, etc. has been increasing.



Source: JICA Project Team

Figure 3.17 Conceptual Diagram of Supply Chain of Vegetables

(1) Agricultural Inputs

1) Seed and Seedling

Not many vegetable seeds are produced domestically and basically depend on imports (almost 100% of fruit and leaf vegetable seeds are imported, except for potatoes, carrots, cabbage, and turnips, which can be grown in the open field culture). Individual farmers and private companies import seeds of tomatoes, cucumbers, carrots, turnips, onions, etc. from the Netherlands, Russia, China, Korea, etc., or agricultural retailers import and sell seeds to the producers. In terms of domestic production seeds, cabbage seeds are produced in the country. Besides, there are no producers who specialize in vegetable seedlings. Therefore, each producer makes seedlings from seeds and directly sows them, which is not very efficient in production. On the other hand, when few large-scale producers have a surplus of seedlings, they may sell them to smallholder farmers.

2) Fertilizer and Pesticide

Chemical fertilizers and pesticides are bought and sold at general agricultural supply stores, but the application of organic fertilizers is also preferred.

3) Facility

In terms of protected horticulture, some vegetables are grown in summer greenhouses (without heating) and winter greenhouses (with heating). The major type of summer greenhouses is 120 m^2 (6m*20m) and costs 3,850,000 MNT including construction cost, while the major type of winter greenhouses is 660 m^2 and costs 160,000,000 MNT including construction cost. Rental rates for summer greenhouses are 500,000 to 600,000 MNT per month and for winter greenhouses 1,200,000~1,500,000 MNT per month. Also, irrigation systems (sprinkler type, drip irrigation type, etc.) for greenhouses are prevalent.

(2) Production

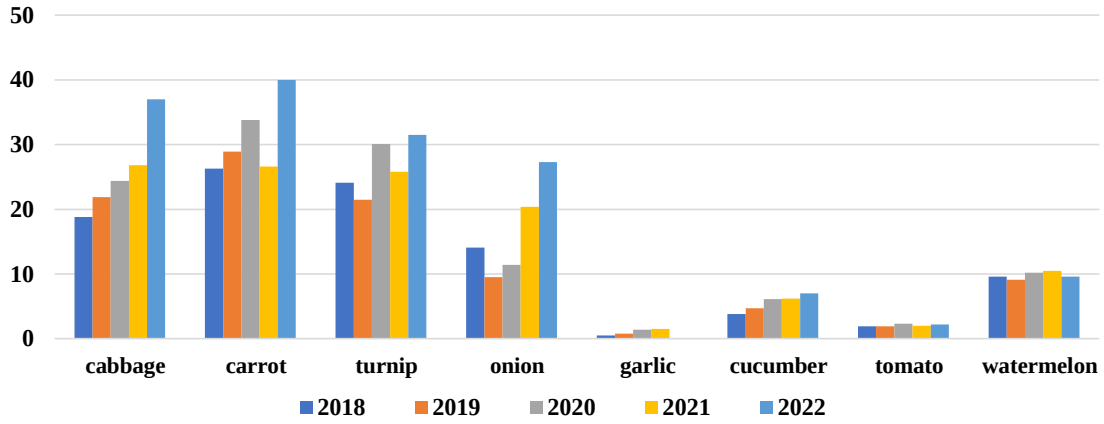
The main vegetables produced in Mongolia are cabbage, carrots, turnips/beets, onions, garlic, cucumbers, tomatoes, and watermelons. The production volume of each vegetable is shown in Table 3.9. Although yearly fluctuations are seen in the overall production of vegetables, it is approximately 148,900 tons in 2022 with an increasing trend. In recent years, the demand for vegetables has increased rapidly, and the Ministry of Health has issued guidelines to increase per capita vegetable consumption from 200g to 260g, but domestic production of vegetables is not meeting the demand except for potatoes. Therefore, approximately 50% of vegetable consumption is dependent on imports from China, and other countries. Vegetable production by ordinary farmers is still limited to some areas and is unevenly distributed in and around Darkhan-Uul aimag and Selenge aimag, where the natural conditions are suitable for vegetable cultivation. Besides, some major domestic agricultural production corporation produces major vegetables such as potatoes, carrots, and onions on a large scale. They are also in the business of storing the products in their refrigerated warehouses and shipping them to various areas of the country.

Table 3.9 Vegetable Production Volume (1,000 ton)

Commodities	*Thousand ton*									
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Vegetables	101.8	104.8	72.3	94.4	82.1	100.7	99.5	121.2	121.7	148.9
cabbage	20.6	18.7	15.4	16.7	15.2	18.8	21.9	24.4	26.8	37.0
carrot	34.5	34.7	18.5	31.0	21.7	26.3	28.9	33.8	26.6	40.0
turnip	22.4	23.9	17.6	21.2	16.6	24.1	21.5	30.1	25.8	31.5
onion	9.3	9.4	6.7	10.0	12.1	14.1	9.5	11.4	20.4	27.3
garlic	1.0	1.0	0.7	0.7	0.4	0.5	0.8	1.4	1.5	-
cucumber	4.3	4.7	3.8	3.7	3.9	3.8	4.7	6.1	6.2	7.0
tomato	2.5	2.4	1.9	2.2	2.0	1.9	1.9	2.3	2.0	2.2
watermelon	5.4	6.3	6.5	7.2	8.8	9.6	9.1	10.2	10.5	9.6
greenhouse	-	3.0	2.8	3.4	3.1	3.1	4.5	13.2	10.7	-

Source: JICA Project Team based on NSO Mongolian Statistical Yearbook 2022

In 2022, the percentage of imported vegetables was 37.1%; by commodities, cabbage accounted for 54.6%, garlic 48.8%, carrots, turnips, and root vegetables 7.3%, and greenhouse vegetables (tomato, cucumber, etc.) 70.7%[52]. Regarding cabbage, varieties with high shelf life have been introduced, and domestically grown cabbage can be sold for a few months after harvest.



Source: JICA Project Team based on National Statistics Office of Mongolia

Figure 3.18 Production of Vegetables by Commodity (2018 to 2022, 1,000 tons)

In terms of protected horticulture, a total of 88.2 ha of summer greenhouses and 32.3 ha of winter greenhouses have been constructed by 2022[53]. Most greenhouses are located within 30-70 km around Ulaanbaatar city, the main consumption area for vegetables, but there is a tendency for protected horticulture to increase in rural areas as well. In 2012, the Mongolian Greenhouse Federation was established, and currently, approximately 10 companies and 600 individuals who participated in greenhouse cultivation are the members. Vegetables grown in greenhouses include fruit vegetables such as cucumbers, tomatoes, and bell peppers in the summer, and leafy vegetables in the winter. Also, strawberries have been produced in recent years.

In Mongolia, there is a movement toward mutual certification of organic agricultural commodities including vegetables. MonVegi, the Swiss Development Agency (SDA), recommends the proper use of pesticides, and ADRA Mongolia, a German NGO, supports organic vegetable production. Particularly

[52] MOFALI, 2022.4
[53] MOFALI, 2022.4

important techniques include the application of manure and biological control (such as the use of natural enemy insects), which are being promoted in the vegetable-producing aimags of Darkhan-Uul and Selenge. In 2016, the Organic Food Law and its regulations were enacted, and the Participatory Guarantee System (PGS) is being promoted within the law.

(3) Distribution

Fresh vegetables are sold in supermarkets and retail stores in urban areas. In Ulaanbaatar, about 10 public markets also sell to the general consumers. The markets have small warehouses that can store several days' worth of vegetables. As of 2021, about 7,300 warehouses are registered for the storage of potatoes and vegetables. Their capacity is approximately 254,000 tons, with 66,000 tons being refrigerated storage[54]. The wholesalers in these public markets procure vegetables from the Bars market, which is a private wholesale market in Ulaanbaatar, and from large agricultural production companies.

The supply of vegetables to the Barus market is strongly related to middlemen called “Change”. In the east and west suburbs of Ulaanbaatar, there are large 1,000-ton class warehouses of major middlemen, where major domestic vegetables and imported vegetables are stored. In recent years, there has also been an increase in warehouses equipped with freezing or refrigeration functions. As for greenhouse vegetables, there are many cases where producers deal directly with supermarkets and retailers. Greenhouse vegetables are often traded directly by the producer to retailers, while open-field vegetables are mainly traded between the producers and middlemen.

Supermarkets have warehouses, but their capacity is only enough to store a few days' worth of fresh vegetables. Therefore, suppliers such as agricultural production corporations are required to have a system that allows them to ship to the warehouse regularly. In recent years, there has been a trend for small-scale vegetable growers to organize themselves into cooperatives and start annual contracts with major supermarkets. As a processed vegetable product, there is a large demand for pickles. Most of them used to be imported from Europe, but in recent years, domestic products have been increasing as import substitution. Frozen vegetables and dried vegetables are still not well accepted by consumers who value freshness.

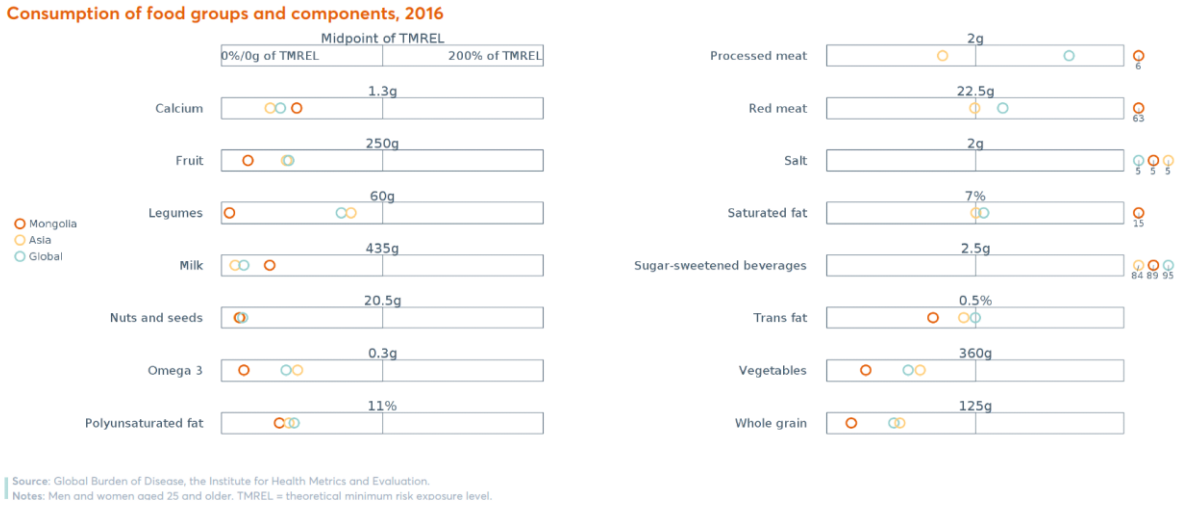
According to the Mongolian Association of Vegetable and Fruit Processing and vegetable processors, the following issues have been identified: the short harvest season of cucumbers for pickles has not allowed for sufficient raw materials to be secured, which has resulted in a low operation rate (about 30%) for processing; and have to rely on imports for raw materials such as bell peppers.

(4) Sales and Consumption

Per capita consumption of vegetables (2.1 kg/month/person) and fruits (0.6 kg/month/person) in Mongolia [55] is much lower than the Asian average and well below the Theoretical Minimum Risk Exposure Level (TMREL) [56]. On the other hand, meat consumption is higher than the Asian average and above the TMREL.

[54] MOFALI, 2022.4
[55] NSO Mongolian Statistical Yearbook 2022
[56] The theoretical minimum risk exposure level (TMREL) is the intake level that minimizes the risk of disease.

This is attributed to the Mongolian food culture, which is the number one cause of death and severe disability (2019) in Mongolia: hypertension, number two: dietary risks, and number three: alcohol consumption, suggesting that the Mongolian diet has a negative impact on health risks[57]. These results suggest that Mongolians' dietary habits harm their health risks. In addition, it is estimated that the government's per capita cost of health care will increase from US$107.64 in 2019 to US$122.13 in 2050[58], indicating the need for national efforts to improve dietary habits. Of Mongolia's population of about 3.43 million, about 1.66 million live in the capital Ulaanbaatar. This and the rest of the urban population of about 2.1 million are expected to shift from a traditional diet heavy on livestock products to a more balanced diet in the future.



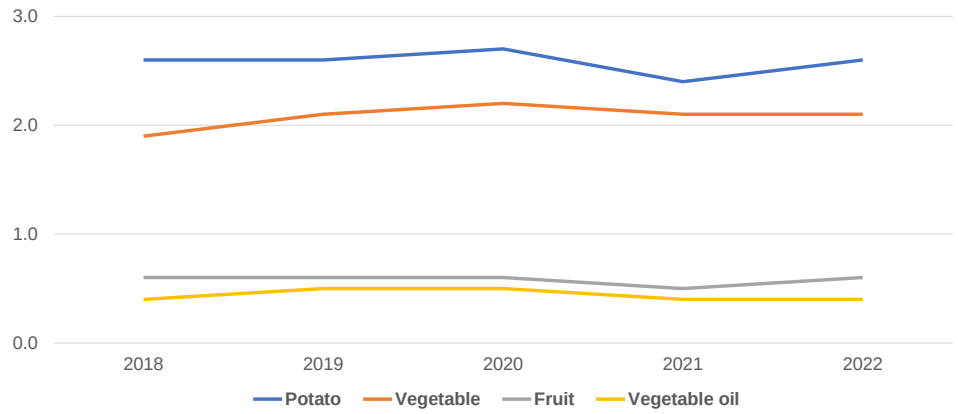
Source: Global Nutrition Report –Mongolia, 2018

Figure 3.19 Per Capita Consumption of Each Commodity in Mongolia

The monthly consumption of vegetables per household in Mongolia is about 6 kg for potatoes, about 1.5 kg for onions, cabbage, and carrots, and only 0.1-0.5 kg for other vegetables. In particular, the consumption of tomatoes, cucumbers, cabbage, etc. tends to increase during the third quarter, which is the domestic harvest season.

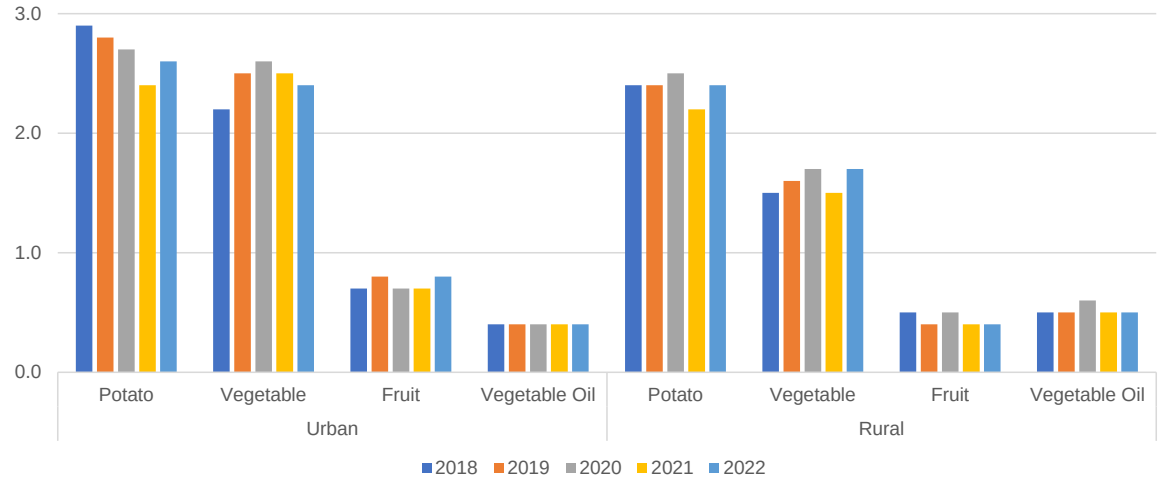
According to a survey in 2019 by the Economic Research Institute (ERI) [59], 88% of consumers said they would buy domestic produce even if it was more expensive than imported produce, and 12% said they would buy domestic produce if the price was acceptable. The average amount of vegetables purchased per household is about 15,000 MNT per month. Even in restaurants, there is a strong tendency to use domestically produced vegetables, and in terms of vegetable purchasing criteria, freshness is the first factor, and place of production is the second factor.

[57] Institute for Health Metrics and Evaluation（http://www.healthdata.org/）
[58] Institute for Health Metrics and Evaluation（http://www.healthdata.org/）
[59]「Data Collection Survey for Master Plan Project for the Development of Agricultural Value Added Chain」Feb 2019 by JICA Mongolia Office



Source: National Statistics Office of Mongolia

Figure 3.20 Monthly Consumption per Capita of Potato, Vegetable, Fruit and Vegetable oil (kg/month/person)



Source: National Statistics Office of Mongolia

Figure 3.21 Monthly Consumption per Capita by Urban and Rural Areas (kg/month/person)

The variety of vegetables used in the traditional Mongolian dishes is very limited such as potatoes, carrots, onions, cabbage, and turnips. On the other hand, there is an increasing demand for a variety of vegetables, including tomatoes and cucumbers for urban residents. Since the vegetables are imported from China and partly from Russia, it is important to diversify vegetable commodities produced domestically in Mongolia and to consider import substitution. Furthermore, the consumption of legumes is very low, and it is considered useful to confirm the demand and investigate the production possibilities for it.

(5) Import and Export

In 2021, about 70,165 tons of vegetables were imported[60]. On the other hand, because vegetable production and supply are not sufficient to meet domestic demand, there are few vegetable exports.

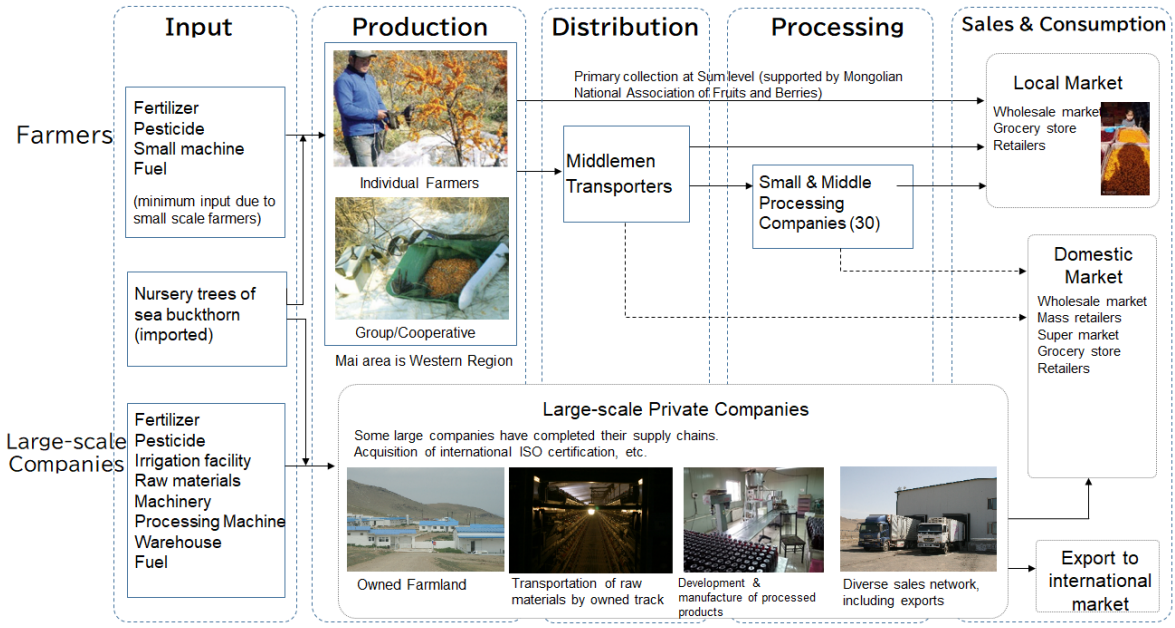
[60] MOFALI, 2022.4

(6) Issues and Challenges

- Due to the low rainfall and cold continental climate, the cropping season is limited to May to September. Greenhouses and other facilities are required for cultivation in other seasons.
- The production system for domestic seeds and seedlings has not been established, and the quality of the seeds sometimes is low.
- The supply chain is not well developed and farmers have to transport and sell open-field vegetables to Ulaanbaatar by themselves, which is costly and causes a decline in profitability.
- There is a shortage of warehouses and refrigeration facilities for storing vegetables. As a result, there is a tendency for market prices to decline, especially for open-field vegetables produced in Mongolia, due to overlapping production and shipping periods. It is one of the reasons why the profitability of farmers has not increased very well.
- Farmers need to use organic fertilizers, but there are not enough organic fertilizers in the market.

3.2.5 Fruits (Sea Buckthorn and Other Fruits)

Fruit production is very limited due to the climatic conditions in Mongolia. The production of fruit and berries be about 2,600 tons in 2022, of which 1,469 tons will be produced in Uvs aimag in the western region of Mongolia. Since sea buckthorn is one of the few fruit trees adapted to the continental climate and accounts for about 90% of fruit production, the value chain of sea buckthorn is summarized as follows. Sea buckthorn is also used for juices, jams, oils, cosmetics, etc., and a variety of products are manufactured in Mongolia.



Source: JICA Project Team

Figure 3.22 Conceptual Diagram of Supply Chain of Sea Buckthorn

(1) Agricultural Inputs

1) Seed and Seedling

The domestic seed production system is not well organized in Mongolia, and seedlings of sea buckthorn

are imported from Russia. About 20 varieties are imported from Russia's Altai region and other regions that are suitable for Mongolia's climate. However, importing seedlings has some risks, such as the risk of pests and diseases, and the economic burden of purchasing them in foreign currency. On the other hand, from the viewpoint of the domestic market, there is a mixture of varieties on farms and in the wild, and also in harvested and processed products, so there is no differentiation of varieties.

2) Fertilizer and Pesticide

The application of chemical fertilizers and pesticides is limited, and the application of organic fertilizers is preferred.

3) Facility

Sea buckthorn is grown in open fields and does not require a greenhouse. Some of the growers have irrigation systems to stabilize production.

(2) Production

The cultivation area is currently estimated to be over 3,000 ha, but the government has formulated a plan to expand it to 20,000 ha by 2030[61]. Apart from cultivars, there are about 14,000 hectares of wild species growing wild[62]. The optimal yield is 5 tons per ha, but the average yield in Mongolia is only 2 to 3 tons per ha. However, in Uvs aimag, the main production area, some companies harvest 10 to 13 tons per ha. In addition to cultivation techniques irrigation equipment and technology, bird damage before and after harvesting is also said to be a cause of low yields. In particular, bird damage can cause a loss of 30-40% in some cases, which affects the yield. Regarding cultivation methods, productivity is low when cultivated by seed. On the other hand, the method of producing seedlings by vegetative propagation has been tried, but a stable production system has not been established yet. Therefore, sea buckthorn seedlings are mainly imported from Russia. On farmland, there is a method of cultivating 1,250 plants per hectare, of which 125 are male plants and the rest are female plants. In order to increase productivity, some companies prune branches, but many producers do not prune. In addition to bird damage loss during harvesting, various harvesting tools and machines (vibrating, vacuum, pruning, etc.) have been introduced in recent years because harvesting is traditionally done manually and requires a lot of labor cost. However, the appropriate harvesting method has yet to be found.

(3) Distribution

There are multiple distribution channels for sea buckthorn: 1) growers - primary collection at the sum level (supported by Mongolian National Association of Fruits and Berries) - local markets; 2) growers – Change (middlemen) - local and domestic markets (sometimes with small and medium-sized processors in between); 3) integrated management by large scale companies - export to international markets and domestic markets.

Some companies and farmers own freezers, and some producers store their products in freezers and supply them to the market throughout the year. In 2019-2020, market prices declined in the summer (3,500 MNT

[61] One Billion Trees National Canpaign, the Government of Mongolia
[62] Mongolian National Association of Fruits and Berries

per kg) due to high distribution volumes, while market prices increased in the winter to spring (6,000 MNT per kg). Thus, market price fluctuations are significant[63].

(4) Sales and Consumption

The annual consumption of fruit is over 30,000 tons, and the production of domestically produced fruits is only 5-10%, mostly dependent on imports. Thus, there is a shortage of production to meet the increasing demand every year. Sea buckthorn, in particular, is the most consumed fruit in Mongolia, and its production is expected to expand in the future. Sea buckthorn juice contains more than 200 nutrients, including vitamin A, vitamin C, vitamin E, palmitoleic acid (Omega-7 fatty acid), and aspartic acid. Because of its antioxidative effect, domestic demand is rapidly increasing as a healthy beverage. It is also being shipped under contract to mining companies that have a large number of workers. It is exported to other countries as described below. Besides, the EU TRAM project (the next phase planned for 2024) is supporting the development of the sea buckthorn cluster. The project implements a diverse range of stakeholders, including government, R&D institutions, and private companies, and mainly provides marketing support.

(5) Import and Export

Although the overall demand for fruits does not meet the domestic demand, sea buckthorn is one of the few fruits that are exported. Small and large companies export to Japan, South Korea, Taiwan, and other countries as juice, jam, and raw materials for cosmetics and pharmaceuticals. Annual exports to Japan range from $10,000 to $100,000, with small importers contracting with Mongolian manufacturers for imports. In terms of sales in Japan, they work on developing products such as a type of juice with yuzu added, as well as developing and selling oils and skincare products. The quality of the products is inspected by an organization in Japan. Some of the companies that are considering exporting to Europe and other countries in the future have installed equipment that meets European standards. However, the competitiveness of Mongolian sea buckthorn products is not high on a global market, and competitors are Germany, Romania, Turkey, Russia, China, etc.

(6) Issue and Challenge

- Since most of the seedlings are imported, a domestic seedling production system is desirable. Besides, there is no differentiation of varieties due to the mixture of varieties in the production areas.
- In terms of production, there are unstable yields due to inadequate irrigation facilities, losses during harvest due to bird damage, and high costs in the harvesting process.
- There is insufficient evidence of the nutritional and functional components of Mongolian sea buckthorn, and the way of usage is not standardized. This has become a bottleneck for export. Besides, large companies lack the advanced processing capacity that should meet some of the needs of the international market (e.g. extraction of omega fatty acids from seeds, freeze-drying of fruits, etc.).

[63] Interview with MOFALI Officer in charge of fruit (August 13th 2020)

(7) Other Fruits

According to the Mongolian National Association of Fruits and Berries, other promising fruits include blackcurrants, blueberries (including wild species), and lingonberries. Juices and jams made from these fruits are also being manufactured and sold. Although there is a tendency to prefer wild berries for processing, there is a need to expand cultivation to ensure stable procurement of raw materials in the future. There are also companies in Ulaanbaatar that produce and sell seedlings of these berries, and they can produce them to order. There are also plans to revive the apple and pear crops that were once grown in the western region of Mongolia. Currently, apples and other fruits are still being produced, albeit on a small scale. Domestic production of these fruits is very low, and consumption remains low due to dependence on imports from China and other countries. With the expected change in the propensity to consume, it is desirable to promote domestic production as an import substitution

3.2.6 Flowers and Ornaments

In Mongolia, many people send fresh flowers at seasonal events recently and the flower market has been growing rapidly, especially since the mid-2010s. It is said that around 100 flower shops are selling fresh flowers in Ulaanbaatar.

(1) Inputs

1) Seeds, seedlings, and bulbs

In Mongolia, seeds, seedlings, and bubs are not produced and rely on imports. In the case of flower seedlings for flower beds, individuals and producers import their seeds. If the purchase amount is large, it will be cheaper, so even individuals import more seeds than they grow and sell the surplus. Producers who need seedlings are more likely to purchase from these individuals than from agricultural material shops[64].

In cut flowers, bulbs account for most of their production. Bulbs imported from Russia and China are overwintered and used in the next season. It is said that each bulb is about 2000 MNT, which puts pressure on production costs. Due to its high price, it is rarely updated. Some farmers said that they would fail about 10% over winter.

2) Fertilizers and pesticides

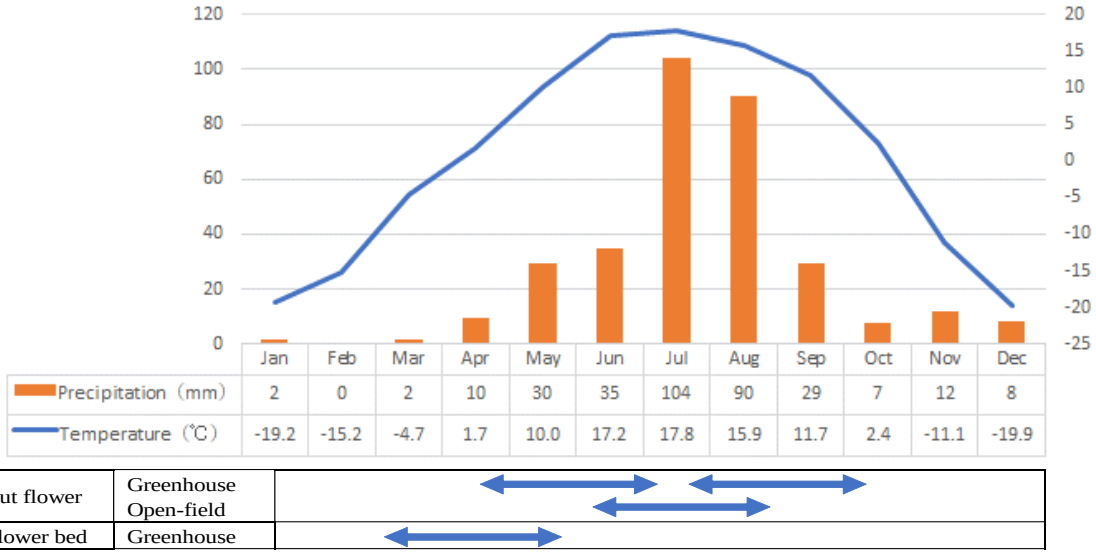
The use of agricultural chemicals is limited. Farmers make and use compost themselves.

3) Greenhouse

Greenhouses are indispensable for extending the shipping period. In the case of cut flowers, summer greenhouses are used for flower production, which is shipped around June and September-October. In the case of flower seedling production for flower beds, the cultivation period is from February to May, and all shipments are usually completed by the end of June.

[64] Interview with the flower farmer, September 2020

Figure 3.23 Greenhouse for Flower



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Precipitation (mm)	2	0	2	10	30	35	104	90	29	7	12	8
Temperature (℃)	-19.2	-15.2	-4.7	1.7	10.0	17.2	17.8	15.9	11.7	2.4	-11.1	-19.9

Cut flower	Greenhouse Open-field	
Flower bed	Greenhouse	

Source: Mongolian Statistical Information Service and JICA Project Team

Figure 3.24 Ulaanbaatar Monthly Average Temperature and Precipitation (2022-2023) and Cut Flower Production

(2) Production

Flower production has been in operation since the middle of the 1970s, however, the number of producers is very small. The scale is polarized between individual farmers and companies.

While some companies grow many types of flowers such as flowerbed flower seedlings and cut flowers, some individual producers grow and sell them in the garden of the villa[65]. It is said that there are only a few family-owned flower farmers in the suburbs of Ulaanbaatar that grow flowers as their main business.

There are more than 10 types of flower seedlings for flower beds, but cut flowers are limited to a few types such as asters, gladiolus, and lilies[66].

Precipitation and temperature fluctuate widely from year to year and are not stable. Due to the small scale of production, weather conditions have a significant impact on supply. The supply of cut flowers is small and unstable, and it is not possible to ship them stably.

Seedlings for flower beds are cultivated only in greenhouses, and cut flowers are cultivated in greenhouses

[65] Interview with the flower retailer, June 2020
[66] Interview with the gladiolus farmer, September 2020

and open fields. The cultivation period is from February to May for flowerbed seedlings, and all shipments are completed in June. Cut flowers are shipped from April to October. Production in winter could not be confirmed.

According to cut flower farmers, winter production requires a greenhouse for winter, which costs about 8-10 million MNT. In the case of gladiolus producers, the introduction of a winter greenhouse is expected to ship about 2,500 flowers, but cost recovery is not easy[67]. In winter, there is little rainfall and it is difficult to secure water, so there is no prospect of year-round cultivation at this time.

The development and dissemination of flower cultivation technology have not been implemented.

(3) Distribution

The distribution of domestic flowers is extremely weak due to the small amount of production. Therefore, in the case of cut flowers, the simple distribution of producer-retail store, and in the case of flower seedlings for flower beds, producer-consumer is common.

Especially in the case of cut flowers, since it is a very small production, the flower dealer has a basic stance of "when there is a flower, buy the flower at that time". Some vendors go to the producer's field and bring in scissors, cut them out, and take them to the shop. Even if the vendors order flowers regularly, the number of orders may not be secured immediately due to unstable production[68]. Domestic cut flowers are expensive and the price is not worth the wholesale price, so the flowers are distributed directly from the producer to retail and do not go through wholesalers[69].

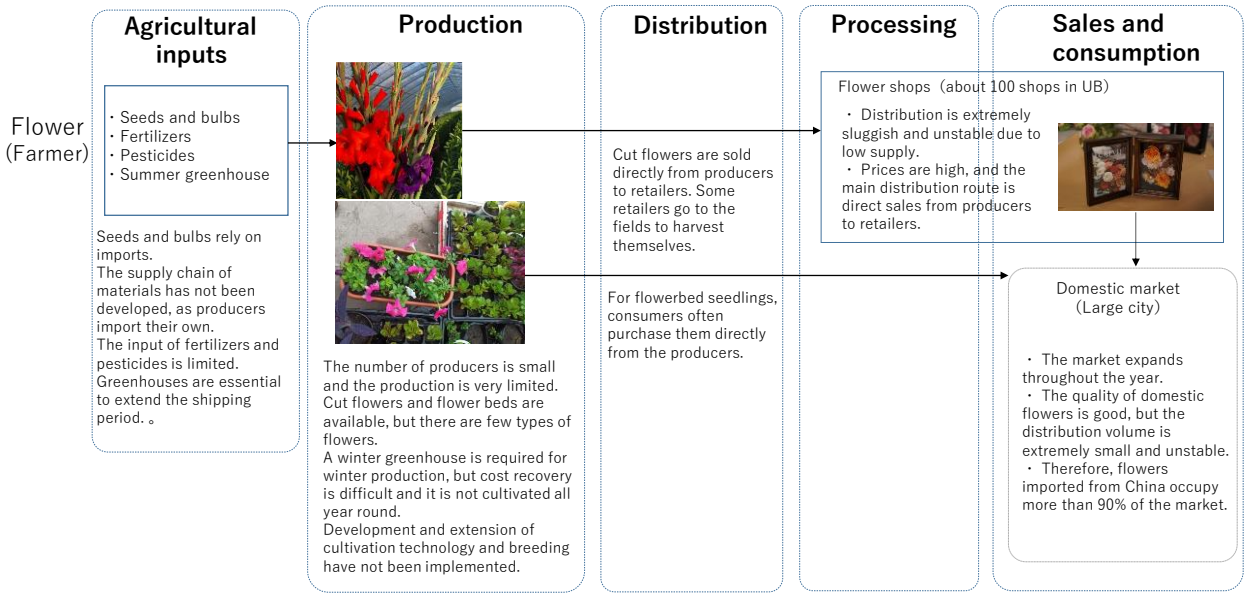
(4) Sale and consumption

The flower market is expanding. Demand is growing rapidly with the habit of giving flowers throughout the year, such as Valentine's Day in February, Women's Day in March, and then graduation and wedding seasons, enrollment ceremonies, and Christmas. Flower beds have also been installed in hotels, government offices, and private homes. Although fresh flowers are rarely seen in rural hotels, they are now being displayed in hotels in Ulaanbaatar, and there are need for foliage plants in the offices. Flower shops are becoming more common in shopping malls in Ulaanbaatar.

(5) Import and Export

On the other hand, as mentioned above, the distribution of flowers is unstable. That is not enough for weddings and hotel decorations. Flower distributors, therefore, have no choice but to rely on imported products for their main products. Almost all cut flowers in circulation are imported from China. The qualities of imported flowers are not good because they are packed in boxes and transported by rail. In that respect, domestic flowers are outstandingly fresh, but the variety and quantity are very small, and the price is high.

[67] Interview with the gladiolus farmer, September 2020
[68] Interview with the flower retailer, June 2020
[69] Interview with the flower retailer and the wholesaler, July 2020



Source: JICA Project Team

Figure 3.25 Conceptual Diagram of Supply Chain of Flower

(6) Domestic and Overseas Market Forecasts and Outlook

It is expected that the flower market will continue to expand for some time, especially in Ulaanbaatar, due to the establishment of the custom of giving flowers and the penetration of urban lifestyles. It is unlikely that markets will be created in nomadic or agricultural areas, but consumption in cities, including local cities, will increase. In Mongolia, the winter season is long and severe, so in order to entertain the eyes, people often put artificial flowers in the rooms and decorate the trees in the city with vinyl. Nowadays, imports have gradually made it possible to obtain fresh flowers regardless of the season, and economic growth has made it possible to afford to purchase them.

Currently, there are no sectoral associations, but it is conceivable that flower production association and flower shop association will be established to promote life with flowers and flower culture in various scenes. In fact, some flower distributors hope to establish a flower association, and some flower producers hope to encourage the government to support flower production. Some of these moves will come true and will be a tailwind for market expansion.

There is a great need for domestic flowers, and it is unlikely that this will shrink from the perspective of consumer sentiment to prefer domestic flowers, freshness, and quality. On the other hand, since domestic flowers cannot meet the expanding market needs, it is highly possible that import sources will diversify and import volumes will increase in the future. The situation in which Chinese flowers, which are price-competitive and have a stable supply, are the main distribution will continue for a while.

(7) Issues and Challenges

First of all, the issues are to increase production and to provide a stable supply of flowers. It is required to obtain inexpensive seedlings and bulbs, expand the production period, and stabilize the production volume

by developing and disseminating cultivation techniques. Besides, especially for flower beds, the use and breeding of wild species suitable for the climate of Mongolia should be considered. Now that market needs are expanding year by year, it is desirable to aim to foster the flower industry in the long run from both aspects of experimental research and marketing.

3.2.7 Other Crops

(1) Oil Crops

Mongolia's demand for edible oil ranges from 23,000 to 25,000 tons and is almost 100% dependent on imports. In response, the Mongolian government has been encouraging the cultivation of oil crops such as rapeseed since around 2007/08. Initially, China brought seeds into Mongolia, sowed them in spring, harvested them in autumn, and purchased them. The main purpose of the Mongolian side was to protect the soil during the fallow period of grain fields, and it was a yellow variety that was not necessarily suitable as an oil. In 2015/16, A Mongolian company constructed an oil mill in Bajangor sum in Selenge aimag. In response, Mongolia has adopted a policy of encouraging black rapeseed, suitable for oil, as a low-tension crop with wheat.

Since 2012, rapeseed production has ranged from 60,000 to 80,000 hectares, with a maximum of 90,000 hectares. The production volume is 20,000 to 30,000 tons. In 2019, it was planted on 60,000 ha and produced 22,000 tons. Productivity remains as low as 400 kg/ha (Potential is estimated to be 1,200 to 1,500 kg/ha). Production areas are Tuv, Selenge, Darkhan, Khentii, and Bulgan aimags in north-central Mongolia. The size of the producers is about 400 to 500 ha for large scale, 200 to 300 ha for medium scale, and 50 to 100 ha for small scale.

The reasons why the production is low are as follows: 1) farmers do not carefully manage it, 2) they do not use fertilizers nor pesticides, 3) there is a harvest loss because they do not use a special rapeseed harvester, and 4) they do not harvest well at the harvest time because the priority is lower than wheat. On the other hand, the government's policy for improving rapeseed oil production includes 1) selecting varieties suitable for the climate and soil of Mongolia and establishing a stable supply system, 2) improving cultivation techniques, such as improving fertilization and plant control techniques for rapeseed and introducing harvesting machines exclusively for rapeseed, and 3) restricting exports of raw materials to properly supply raw materials to domestic oil extraction companies.

(2) Mushroom

Mushrooms such as Shiitake Mushrooms and Common Mushrooms are sold in Ulaanbaatar. At present, most of these are imported from China. Since urban residents seem to have a certain amount of demand for mushrooms (There is a survey result that the demand for mushrooms in Ulaanbaatar is 600 kg/day.), there is room for studying the possibility of domestic production as import substitution.

Recently, the production of oyster mushrooms has started in Mongolia using the mushroom bed cultivation method. Because they are fresher and of better quality than imported products, they are increasingly used in

restaurants. Mushroom production is being promoted under a system in which small companies involve ordinary farmers in the production of mushrooms. Such companies have formed a mushroom production association to expand production and consumption.

The current challenges in mushroom production include expanding domestic consumption, building production and sales networks, improving and disseminating production technologies, and increasing the kinds of products.

(3) Medical Crops

There are many medicinal plants such as Glycyrrhiza in Mongolia, and 89 kinds are described in "Medial Plants in Mongolia" issued by WHO. These have been used as traditional medicinal herbs since ancient times. Domestic companies are also developing products that utilize them for medicine health and beauty. The largest company in Mongolia grows a variety of useful plants, including sea buckthorns, on its farms, and develops medicines, cosmetics, and health foods using the ingredients for the domestic and international market. Some of them are also being tested in the Japanese market. In the procurement of medicinal plants as raw materials, artificial cultivation is desirable to reduce the cost and quality fluctuation of the collection of native plants, but there are technical problems in artificial cultivation for some plants.

Cosmetics using Sea buckthorn oil appear to have a high potential for development. Even in Japan, such products have been imported in a small amount. Trade Related Assistance for Mongolia (EU-TRAM), a project initiated by the EU in March 2018, also includes this product as one of the target items, and the export review subcommittee of the relevant business associations has already been held regularly.

3.2.8 Livestock Products Supply Chains

In Mongolia, as one might expect, almost all the supply chains linked to livestock products are subject to mobile animal-keeping, putting this pastoral country in a unique position. Here we will pass from the general to the special on the issues. A supply chain, which is obviously a self-explanatory term, means a network system between a company and its suppliers such as farmers in the case of agricultural supply chains, to produce and distribute a specific product to the final buyer. In the case of Mongolia, the following aspects are important ones in terms of the supply chain network:

- **Different kinds of animal species are raised in the same household:**

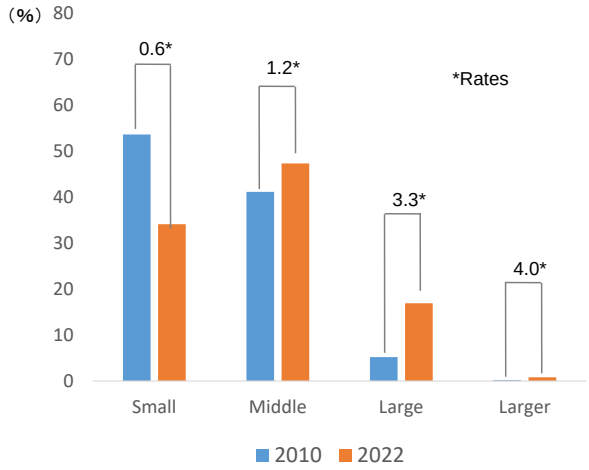
  In the case of intensive farming, in general, a farmer dedicates him/herself to a given specific operation by raising a single livestock species in a field at a time, for instance, dairy farming (cows), cattle fattening (cattle), or pig-raising (pigs). In Mongolia, however, this is not the case. Although not necessarily all the representative five animal species are being raised in the same herder family, it is a common practice that a herder holds more than one species. Therefore, all those different kinds of livestock products such as meat, milk, fibers, and hides, come from the same producer called “herder”.

- **Seasonal variations in production are noticeable:**

  In comparison with crop farming, seasonality in production is not so tangible in livestock keeping. In Mongolia, however, since herders are subject to natural grasslands, and Mongolia’s warmth index is

the lowest in the world[70], production cycles vary considerably with the seasons.

Concerning the former, the size of herder households has been rapidly changing. Until recently, the average number of animals a herder may have was between 100 and 300 head by which number a herder family could feed them decently[71]. Nowadays, however, as clearly shown in Figure 3.26, the number has increased noticeably. Obviously, this is a result of the aforementioned livestock population explosion, and, since the increasing number of animals per household provokes a higher concentration of animals per unit of land, it may accelerate grassland degradation.



Household sizes	No. of Animals
Small	1Less than 100 head
Middle	101 to 500 head
Large	501 to 1,499 head
Larger	More than 1,500 head

Source: Mongolian Statistical Yearbook

Figure 3.26 Composition of Herder Families According to the Number of Animals: in 2010 and 2022

Then, concerning the latter, Table 3.10 depicts a strong seasonal pattern. The contrast between summer, during which grasslands are greener, and winter is obvious. Furthermore, all the preparatory and complementary activities such as breeding, castration, calving, or slaughter are done according to the seasons.

Table 3.10 Seasonality in Production of Mobile Animal-keeping

Items	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Seasons	Winter ~ early spring				Spring	Summer			Fall	Winter		
Meat, hides									●	●	●●	●
Milk					●	●●	●●	●●	●			
Cashmere			●	●●	●							
Wool						●●	●	●				

Source: from officers at related institutes as well as herders

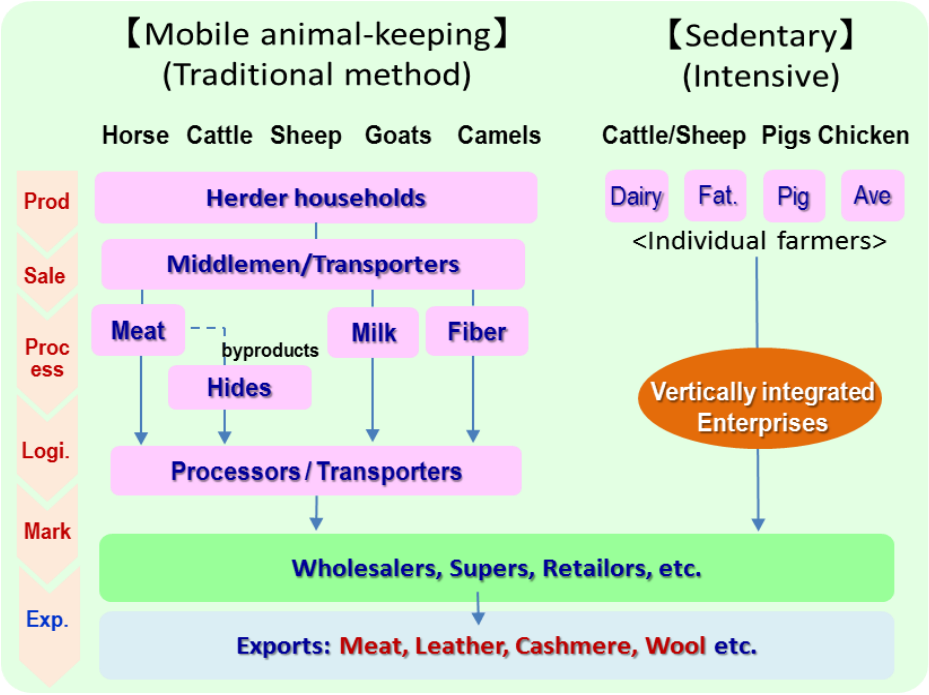
[70] Imaoka, Y. 1988. *Op.cit*.
[71] Humphrey, C. 1978. *Op.cit*.; Uemura, A., Nachinshonkhor, G. U., Jargalsaikhan, L., Kodama, K. and Konagaya, Y. 2013. Animal husbandry/Crop-farming and land use (Chap. 6). *In* Fujita, N., Kato, S., Kusano, E. and Kouda, R. (eds.). *Op.cit.*

Source: JICA Project Team

Figure 3.27 illustrates, broadly, the difference between mobile animal-keeping and non-mobile animal-keeping, namely, sedentary and intensive farming. In Mongolia, nowadays, the function of the middlemen, as shown in the same figure, is extremely important. Although there are some occasions in which herders, processors, or wholesalers transport their products by their means, in a great majority of cases, middlemen do this job connecting one player of the supply chain to another. Middlemen, commonly called "change" in Mongolia, are indispensable, especially for the smallholders in rural areas because of the lack of an organized transport system. Unfortunately, however, there are cases in which herders are exploited, being one of the most serious problems in livestock supply chains[72]. In Mongolia, such a situation can be commonly observed not only in livestock supply chains but also in the supply chains of crop farming, coupled with the geographical remoteness between cities, or between campsites and the main roads, as well as fragile road conditions between production sites and the markets.

Concerning these downsides, in the case of almost all the entrepreneurs of sedentary farming, shown in the same figure, it can be said that they are already able to deal with these difficulties by integrating production and logistic processes vertically. Besides, some owners practice an intermediate type of production, namely, half traditional and half intensive. For instance, they buy some cattle from traditional herders and then fatten animals for a period of time (3 to 6 months) by providing them with commercial grain-based feeds to make the meat tender and tasty. Also, in the case of some large dairy plants, they work with several herders contracted to sell their milk to the company. Thus, those herders do not move so often anymore. Instead, they now can sell their milk to the company by residing near a fixed route where a milk lorry of the plant passes every day during the summer season. In Mongolia, as suggested by these examples, when it comes to the establishment of livestock supply chains, an issue such as collection and distribution, namely, the system of transporting and delivering goods should be given priority.

[72] JICA. 2017. Final report for data collection survey for agriculture and livestock sector in Mongolia. Japan International Cooperation Agency. (in Japanese)



Source: JICA Project Team

Figure 3.27 General Chart of Livestock Products in Mongolia

Moving on to the next subject, the types of consumption of every livestock product will be described. The detailed information was given in Table 3.11, but since a considerable amount of information was gathered verbally from officers and related persons, due attention should be given to the figures. Furthermore, it is virtually impossible to get accurate data on some categories such as unutilized hides, or the amount of unofficial consumption of meat and milk. Thus, we believe these pieces of information should be for reference purposes only.

Firstly, as to meat and milk, one of the most striking points is that a great majority of both commodities are distributed from herders' households to consumers through unofficial channels.

Regarding fibers such as wool and cashmere, although these commodities, especially cashmere may offer excellent potential for adding more value domestically, a good amount of them are being sold abroad as raw material or semi-processed. According to the interview conducted at the Mongolian Wool and Cashmere Association, the low ratio of "official channels" (20%, *See* Table 3.11) is the most serious problem in the cashmere industry. The vice president of the association emphasized that the number be at least 60%. To do so, obviously, all those not processed fibers, 70% of which are being sold abroad currently should be cut off considerably. Besides, according to information from some other sources[73], even among those supposedly processed or semi-processed fibers, there are, in reality, not processed ones but being sent out to foreign countries as processed[74] .

Concerning leather products, according to the president of the Mongolian Leather Industry Association,

[73] Khyargas, T. 2019. Trade and green economy in Mongolia. PAGE, UN environment, Environment and Trade Hub. Ulaanbaatar.
[74] Anonymous middlemen.

the most challenging issue is how to tap a huge amount of unutilized hides. As mentioned earlier, in Mongolia since home slaughter is a common practice, it would be difficult to say whether or not the figure of unutilized hides shown in Table 3.11 is true, but based on the Mongolian Yearbook in 2021, there were some 17 million animals slaughtered and the amount of hides processed was 18,000 ton. Thus, compared to the slaughtered number of animals, the amount of hides is, by definition, too small[75].

On the other hand, it would be important to see the capacity of the leather industry in case all the unutilized hides are now available for tanning. In Mongolia, there are some 34 tanneries where approximately 800,000 hides are processed, accounting for only 5% of the slaughtered number of animals in 2019[76]. Therefore, in Mongolia also important for the leather industry to scale up as well as improve the tanneries.

Linked to the tanneries, also important is environmental pollution. According to a study conducted in Mongolia, a small but hazardous amount of some heavy metals (chromium) was detected in soils sampled in the tannery-concentrated areas in Ulaanbaatar[77].

Table 3.11 Types of Consumption of Main Livestock Products (Estimations)

Items		Estimated production (ton/year)	No. of platns (Estim.)	Approximate ratios (%)						
				Domestic			Exports			Total
				Un-utilized	House consum-ption/ unofficial	Official channels	Not processed	Semi-processed	Final products	
Meat		554,200	±70		90	9		1		100
Milk		1,074,200	±470		90	10				100
fiber	Wool	33,700	±360			48	26	26		100
fiber	Cashmere	10,900	±41			20	70	10		100
Hides		19,600	±140	58		18		24		100

Source: as per production in number by Mongolian Statistical Yearbook 2019, and others from officers interviewed[78].

[75] The number of slaughtered animals of horses, cattle, sheep, goats and camels are 570,000, 899,000, 8,296,000, 7,206,000 and 62,000 head, respectively. Thus, considering the weight of hides from each animals as 10kg, 10kg, 4kg, 4kg, 12kg, respectively, the total would be 77,000 ton.

[76] Mongolia News Letter P.5 Vol.658, 2018

[77] Naidansuren, E., Dondog, A., Erdenesaikhan, B. and Byambanyam, E. 2017. Heavy metal pollution near a tannery in Ulaanbaatar, Mongolia. *Journal of Health Pollution* **16**: 2–11.

[78] SECiM. 2016. Situation analysis in dairy value chain in Mongolia; *Op.cit*. 2016. Situation analysis in meat value chain in Mongolia; JICA. 2017. *Op.cit*, and based on the interviews conducted at National Dairy Development Board of Mongolia (NDDBM), Mongolian Meat Association, Mongolian Leather Industry Association, Mongolian Wool and Textile Association, Mongolian Wool and Cashmere Association, Maha Market, and CYY milk Company, etc.

Figure 3.28 Live Sheep Traded around a Town (in Bayankhongor aimag)

Figure 3.29 Raw Milk Sold by Weight Near a Market (in Selenge aimag)

Continuously, to see roughly how much value is added to the main livestock commodities at each segment of the supply chain, based on the estimations gathered from different sources, summarized information on prices will be given in Table 3.12. Compared to meat and milk, the price build-up for the activities in the fibers and leather products augments in leaps. For instance, the value-added in the meat and milk supply chains based on the farm-gate price and the wholesalers' prices (1.9~2.8 times, and 3.9~5.0 times, respectively) are more or less similar to other supply chains in developing countries[79] such as a yam supply chain in Ghana, an apple supply chain in Pakistan, or a cocoa supply chain in Ivory Coast, with the values added: 2.0 times, 3.2 times, and 2.5 times, respectively. Besides, concerning the commissions added by middlemen, in the case of Pakistan and Ivory Coast, according to the same report, are 11% and 15%, respectively, which are again comparable to those heard in Mongolian meat wholesale markets such as the Emmert market. Coincidentally, in the case of Japan, agricultural supply chains such as onions, potatoes, and taros, their values range from 3 to 4 times, and the commissions charged by dealers are 10 to 11%[80].

By contrast, other livestock products such as fibers and leathers show much higher values added even in domestic markets. Because, unlike meat and milk, these commodities require special techniques, some precision instruments, and trained workers for processing, the higher values added can be understandable. In Mongolia, however, despite this fact, as frequently pointed out in developing countries[81], a huge proportion of the value of the end product, especially in the cashmere and wool industry, is being captured by other players in the supply chain except for herders. Regarding wool, as mentioned earlier, it is not so profitable for herders. In terms of value-added, however, the ratio of the farm-gate price to prices at domestic markets is strikingly high, and even in comparison to those of cashmere still much higher, meaning that only less than 10% of the value of the end product belongs to herders. Furthermore, the degree of the ratio is even more prominent in the case of exports, consolidating the comments made by the vice president of the Mongolian Wool and Cashmere Association that the most important challenge is how to increase domestic utilization of raw materials for final products. For this purpose, naturally, comprehensive improvements including

[79] Boston Consulting Group. 2009. The next billions: business strategies to enhance food value chains and empower the poor. World Economic Forum. Switzerland.
[80] MAFF. 2017. Establishment of trading for ideal processing, and distribution for agricultural farmers. Ministry of Agriculture, Forestry, and Fisheries. (In Japanese).
[81] Webber, C. M. and Labaste, P. 2010. Building competitiveness in Africa's agriculture: a guide to value chain concepts and applications. World Bank Group.

processing techniques, quality control, overall efficiencies, as well as the design and development of new products. According to an interview made with the president of Tanilag, a private cashmere company in Japan, she stressed that quality assurance is a top priority.

Table 3.12 Price Build-up for Each Activity of Livestock Supply Chain (MNT)

Items		Farm-gate price/unit	Prices for trading or consumers		
			Domestic		Abroad (value added)
			Wholesaler (value added)	Supermarkets (value added)	
Sheep meat		±4,000 MNT/kg	7,559 (1.9 times)	11,000 (2.8 times)	—
Cow's milk		±500 MNT/L	1,959 (3.9 times)	2,500 (5.0 times)	—
Fibers	Wool	±1,200 MNT/kg	30,000 (25 times)	65,000 (54.2 times)	120,000~250,000 (100~208 times)
	Cashmere	±82,619 MNT/kg	-----	1,400,000 (16.9 times)	1,830,000~3,600,000 (22~43 times)
Cattle hides		±25,000 MNT*/hide		320,000 (12.8 times)	1,000,000~2,500,000 (40~100 times)

*This price refers to not farm-gate price but the one a tannery may pay for middlemen or slaughterhouses. Besides, according to a factory where we conducted an interview, the price for semi-processed hides called "wet blue" when they are to be sold out to a foreign country, was approximately 80,000 MNT/hide in the case of cattle hides, the ratio of added value being 3.2 times.

Source: Mongolian Statistical Yearbook, etc.[82].

Linked to the price built-up for livestock products, there are some interesting studies. One of the reports clearly shows that, depending on a given livestock commodity, the interaction (R^2) between the distance from production sites to sites of consumption (Ulaanbaatar), and the farm-gate prices at different aimags changes significantly[83]. A second study demonstrates how stable the arbitrage of a given commodity is for a fixed period between two markets by investigating the fluctuations of the transaction costs (done in the 22 major cities). Here, if the fluctuations between the two markets are significantly interrelated, the arbitrage, or could be said as the degree of market integration is high[84].

A combination of the results of these two studies was shown in Table 3.13, depicting clearly distinguishing features of four representative commodities: cashmere, beef, sheep meat, and cow's milk. The result of cashmere, due to its scarcity and irreplaceability, is most peculiar with the higher market integration, especially in the areas closer to China, suggesting that this commodity is a fixed export to the neighbor. Regarding beef as well as sheep meat, the tendency shown in these results is attributed mainly to a huge demand Ulaanbaatar, where half of the well-known meat-eater population resides, possesses. On the other hand, despite its indispensability, meat is hardly scarce, especially in rural areas where home slaughter and

[82] Concerning the farm-gate prices of meat and milk, from herders, as to wool, from Mongolian Wool and Textile Association, cashmere from Mongolian Statistical Yearbook, hides and leather from the Mon-ireduui company. As to the prices at domestic markets, from Nomin supermarket, Khuchit Shonhor, Gobi factory, etc. Pieces of information on wool, cashmere, and leather products, from the sources available on the websites.

[83] Nishino, I, and Kusano, E. 2013. *Op.cit*.

[84] Kusano, E. and Saizen, I. 2013. Spatial market integration of livestock products and road conditions in Mongolia. *Japan Agriculture Research Quarterly* 47: 423-433.

consumption are the norm. Therefore, the farm gate prices for meat are higher in regions closer to the large cities than those near the rural areas. As to the market integration, the figures are higher in Uvs, Selenge, and Dornogovi aimags where trade with Russia or China is frequent. Milk, likewise, is indispensable yet not scarce in general, but the results of each R^2 are contrasting. One of the reasons might be that in the case of milk, unlike meat, more or less cheap imports are available in the larger cities. Furthermore, the market integration of milk is at the bottom, according to the same report, because of its perishability and the absence of cold chains, especially between the capital and areas far from it.

Also important is the road conditions. According to the study, the more paved the roads are, the higher the market integration is. In Mongolia, however, this reasonability is not necessarily an appropriate suggestion for stable livestock supply chains because there could be a trade-off between a higher percentage of paved roads and natural grassland availability. Thus, it would be ideal to maintain a reasonable ratio of the paved roads[85], otherwise, the grassland degeneration will be exacerbated by the increasing number of herds converging on the limited paved main roads.

Table 3.13 Interaction Between Farm-gate Prices and Rural-to-city Distances*

	Cashmere	**Beef**	**Sheep meat**	**Milk**
R2 (Regression)	0.14 (Slightly)	-0.52 (Markedly)	-0.59 (Markedly)	0.49 (Slightly)
Market integration**	Many	Middle	Middle	Few
Discussions	Apart from its scarcity and profitability, cashmere fiber is considerably a lightweight and unperishable commodity, thus, transport is highly easy, and the costs are relatively inexpensive, thereby making the farm-gate price of this material comparatively stable and similar in all parts of the country.	The nearer to the sites of consumption, the higher the farm-gate prices because of the huge demand for meat in the capital city of Mongolia where half of this meat lovers' country's population live. In the case of meat production and supply, Mongolia is totally self-sufficient except for some special kinds of meat for Mongolians such as chicken, pork, or fish. Thus, in terms of supply, herders residing near cities may benefit more while others coming from remote areas gain less because they have to pay more commissions on transport costs which increase according to the distance. Besides, in the rural areas, where meat demand is by nature low at markets because of depopulation, the farm-gate prices are below the usual price.		The nearer to the sites of consumption, the lower the farm-gate prices because, unlike meat supply, in the cities, different kinds of milk imports such as powdered milk as well as reconstituted milk are available at a relatively cheap price.

*The distance between Ulaanbaatar and each aimag's capital.
**Numbers of combinations in which a higher market integration was observed between two given aimags' capitals randomly chosen.

As a supplementary explanation for the gate price of milk, the following point should be added. In the above paragraph, the milk farm-gate price was mentioned as if it were fixed. In reality, however, it may vary

[85] In Mongolia, as of 2014, 41.6% of the roads are paved (JICA. 2016. *Op.cit.*)

a lot depending on the seasons, lower in summer in which grasses are lush and higher in winter[86]. Thus, in winter major milk companies as a common practice import powdered milk for compensation[87].

Lastly, one other issue on the livestock supply chains that should be mentioned here is some regionality (or could be regionalism in some cases) in livestock products in Mongolia. As shown in Table 3.14, many aimags or villages have their own animal breeds, specialty products, or cuisines. Almost all of this piece of information came from the interviews with some Mongolian officers. Thus, the sources are not necessarily reliable, thereby requiring due attention to understanding the contents. In practice, however, there appear to be some suggestions for the improvement of livestock supply chains.

By the way, among the pieces of information, there are some pieces of information dealing with breeds. Concerning this issue, some scientific studies are available as well. During the survey, we oftentimes heard some locals saying that the diameter of fiber varies significantly with some breeds such as the Zalaa jinstiin tsagaan breed or Ulgiin ulaan breed. In reality, however, according to the studies mentioned earlier, almost all those "breeds" are not breeds in the usual sense. Based on the investigations of DNA diversities by checking more than 50 makers of genes of every "breed" group, it is suggested that in Mongolia for centuries the genes of a given species have been interchanged constantly and rather haphazardly, and thus, no organized and planned breeding program was practiced[88]. In general, this result seems to illustrate eloquently the profile of the traditional mobile livestock-keeping in Mongolia. By contrast, although it suggests the necessity of a modern breeding program for Mongolian livestock herds, the result should be understood that we must be so careful when planning a breeding program, especially of a negative aspect caused by a rather short-sighted policy. First of all, we should never forget that a number of livestock projects for genetic improvement were foundered witnessing, for instance, many European dairy cows supposedly for breeding dying or moribund soon after the project inception[89]. In this meaning, here, we should not take the result of the aforementioned study as a drawback but rather an advantage because the interchanged genes appear to have been a solid base for all the adaption processes of animal species to the harsh Mongolian environment as well as all the genetic diversities Mongolia possesses. Nowadays, it is widely accepted that the preservation of animal genetic resources is the norm worldwide[90]. These points should be kept in mind for planning.

[86] Interviews at CYY milk company, Mon Fresh milk company and some herders.
[87] JICA. 2017. *Op.cit*.
[88] Domestic animal society. 2009. Native domestic animals in Asia. Nagoya University Printing House; Nomura, K. 2009. In search for genes of goats in Asia. *Shin-jitsugaku Journal* **9**: 3-5. (in Japanese)
[89] An interview with CEO of Mon Fresh Milk Company.
[90] Commission on genetic resources for food and agriculture. 2007. The state of the world's animal resources for food and agriculture. FAO, Rome.

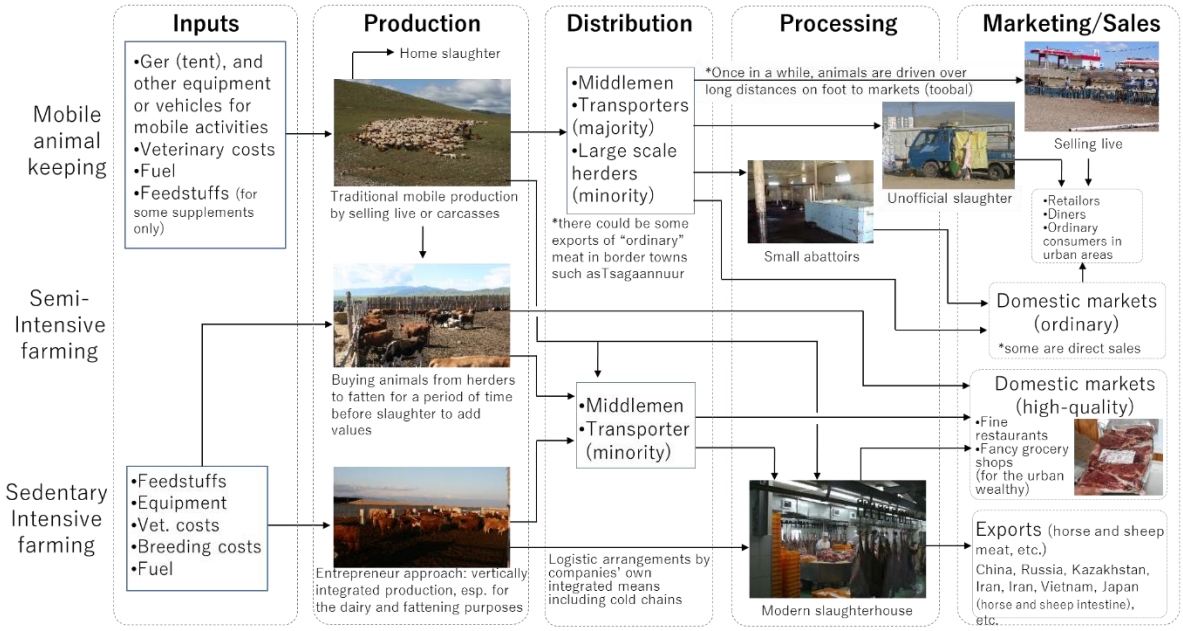
Table 3.14 Regionality of the Five Animal Species

species	Livestock breeds, local specialties or animal anecdotes related to a region, province, or district
Horses	• Airags (femented horse milk) of Khotont district (Arkhangai province) and Saikhan district and Gurvanbulag district (Bulgan province) are tasty. • Airag of Donndgovi province has plenty of body because horses are grazing on the govi grasslands. • Horses from Khentii province and Sukhbaatar province run faster
Cattle	• Aaruuls (traditional dry cheese) from Ondor-Ulaan district and Tsakhir district (Arkhangai province) are tasty. • Cattle from Selenge province, Arkhangai province, and Bulgan province all have large frames. • Sukhbaatar province has its own breed for fattening called Tairin-ulaan
Sheep	• Sheep meat from the Govi regions are tasty because the regions' sheep graze on local spring onions • Sheep from Bayandelger district (Sukhbaatar province) have some more vertebras, and their carcass yielding is higher. • Sheep raised by Kazakh in Bayan-Olgii province have very characteristic hindquarters
Goats	• Cashmere fiber of red goats raised in Zavkhan province is very fine • Cashmere fiber of black goats raised in the govi regions is no good. • Zalaa jinstiin tsagaan breed (Bayankhongor province), Ulgiin ulaan breed (Uvs province), Sumber breed (Govisumber province), Erchmiin khar breed (Khuvsgul province), and Gobi gurvan saikhan (Omnogovi province) are all local specialties.
Camel	• Dairy products made of camel milk harvested in Bayanlig district (Bayankhongor province) is tasty. • In Omnogovi province, there is a special local breed with a higher yield of wool

Sources: JICA Project Team based on the interviews with local officers

Moving on to the next subject, the specific information on each commodity will be described by focusing on Inputs, Production, Processing, Marketing, Consumption, and Trade. In the case of traditional mobile livestock keeping, however, as mentioned earlier, all the different kinds of commodities come from the same production group, namely, herders. Therefore, the information on Inputs and Production, which is described in the following Meat section will be referred to in the other sections as well.

3.2.9 Meat



Source: JICA Project Team

Figure 3.30 Conceptual Diagram of Supply Chain of Meat

(1) Inputs

As mentioned repeatedly, in the case of traditional mobile livestock-keeping, inputs, namely, the production costs are minimal. Thus, one of the most peculiar and advantageous aspects of this production

method is its higher profit margins[91]. According to an estimation, the average margin ranges between 60 and 80%[92], which is strikingly higher than that of intensive farming, for instance, dairy farming in Japan (10 to 30%)[93]. In the case of intensive farming, the feed costs take up a large proportion of the inputs, which account for 50 to 80%.

Despite the fact, that naturally, there are some necessities without which herders cannot raise animals. As specified in Figure 3.30, the most crucial one is the ger (tent) as shown in Figure 3.31. Since the ger is a mere structure for people to live in, it might not be recognized as an input for production. In the case of mobile livestock-keeping, however, this is one of the most important tools for herding a flock of animals from one place to another. Also, this tool provides herders with living space for cooking meals as well as lounging around where all the necessary pieces of equipment or furniture are compactly arranged[94]. One of the important elements of the ger is a piece called khana, a wooden latticework, and the size of a ger would be determined by the number of khanas. The average size of the ger, say, for a household with 5 to 6 family members commonly has a diameter of 5.5 to 6.0 m. Gers are covered by double-layer heat insulators made of felt except for the roof part. The unit prices range from 2.5 to 3.5 million. The lifetime of a ger used to be about 30 to 40 years unless herders were not careless or negligent with their gers. Recently, however, a mass-produced type of ger could be worn out faster because wooden materials in use are of poor quality. Also important in keeping the gers in good condition is maintenance, especially for some parts such as hinges of the door and felt for insulators, which should be replaced with a higher frequency. As to domestic appliances, especially electrical ones, a TV set is nowadays so common that as high as 70% of herder households have one, exceeding vehicles[95]. Since those gers with the TV set using a set of solar panels and a parabolic dish, one can recognize it from a distance (Figure 3.31)

Among other items, also important and relatively costly would be a vehicle. As mentioned earlier, camels were a vital means of transport. Recently, however, the picture has changed dramatically. Including a motorbike, a great majority of herder households possess vehicles of one kind or another.

As to still other inputs, commonly observed are fuel, veterinary costs, and feedstuffs. An example of record-keeping for expenditure from a herder household with approximately 1,000 animals is given in Table 3.15. Here, some additional explanations would be necessary. First of all, the feed is given only to animals for breeding purposes. Veterinary costs, 400MNT per head are almost negligible for a herd of 1,000 animals. Fuel is the largest share of the spending, reaching as high as 50%, followed by other materials such as fences for winter preparedness. Last but not least, in the case of this household, the gross annual income is 26.2 million MNT, and, since the total expenditure is, as shown in the table, as low as 5.7 million MNT, the profit margin is as high as 78.1%.

[91] The ratio of the net profit to the gross income.
[92] JICA. 2019. *Op.cti*.
[93] Yokoyama, Y. 1999. The Management of Farm Evaluation in Order to Expand with the Corporation: Case Studies of Independent & Organization Style in S-tyo in Hokkaido. *Hokkaido Journal of Farm Management* 25: 77-98. (in Japanese)
[94] Menya, S. 1997. Living space and living materials for modern Mongolia. *Human Culture* 3: 84-97.
[95] Mongolian Statistical Yearbook, 2019.

Table 3.15 Breakdown of Expenditure from Herder Household with 1,000 Animals in Tuv Aimag (MNT/year)

Feedstuffs (14.7%)		Veterinary costs (7.0%)		Transport	Others (26.1%)		Total
Hay	Concentrates*	Drugs	Vaccines	(fuel)	Fences	Stones	
600,000 (10.5)	240,000 (4.2%)	400,000 (7.0%)	Free of charge	3,000,000 (52.3%)	1,500,000 (26.1%)	free	5,740,000

Source: JICA. 2019. *Op.cit.* *For milking animals only.

Concerning the fuel, in the case of herders, one other thing should be described. In herders' households, animal feces are still an important fuel source for their cooking as well as heating. The kitchen of a ger, as mentioned earlier, is not an independent room but an area in the ger, habitually in the central part where a stove-cum-cooker is found as shown in Figure 3.32. The stove goes necessarily with a chimney that sticks out from the roof through a ring called toono and is again one of the most indispensable tools, for which animal-dried dungs are used (Figure 3.33 and Figure 3.34).

Animal dung as a fuel source is most important in the steppes where the availability of firewood is markedly lower than in wooded land areas where firewood gathering is one of the duties. Thus, in the forest regions, by contrast, the ratio of animal dung users is lower. According to a study conducted in Zavkhan aimag, in some villages, only 20% of local herders say that they use animal dung as fuel[96]. In any case, in Mongolia, a country based on the vast grassland, where firewood is scarce, the fact that animal-dried manure is flammable by definition is one of the greatest blessings[97].

[96] Lkhagvadorj, D., Hauck, M., Dulamsuren, C. and Tsogtbaatar, J. 2013. Twenty years after decollectivization: Mobile livestock husbandry and its ecological impact in the Mongolian forest-steppe. *Human Ecology* 41: 725-735.

[97] As to livestock dried manure, it has long been in use in Mongolia not only for fuel but also for the other purposes such as medical uses. Also, peculiar is that depending of the species or the state of excrement such as hard, soft, or frozen, the name changes (Ho, K. 2014. The meaning of livestock dried dung in Mongolia. Mishima Kaiun Kinen Zaidan report 51: 146-149)

Figure 3.31 A Typical Ger with a Set of Equipment

Figure 3.32 A Common Stove Installed in the Middle of a Ger

Figure 3.33 Piled Dung Cakes on a Wooden Fence

Figure 3.34 Dung Cakes in a Box Next to the Stove

(2) Production

As already mentioned in Table 3.10, prominent is the seasonality in production from mobile animal-keeping, which is heavily dependent on natural resources and not capital but labor. Likewise, all the production activities are highly linked to the seasons as shown in Table 3.16. In reality, however, although there are some aspects all the herders share in common, the meaning of the seasonality may vary considerably depending on a given situation, such as region, age, gender, the number of animals, and even the financial situation of each herder household. For instance, while the number of campsites in winter is almost the same among herders, those in summer vary considerably ranging from 4 to 8[98].

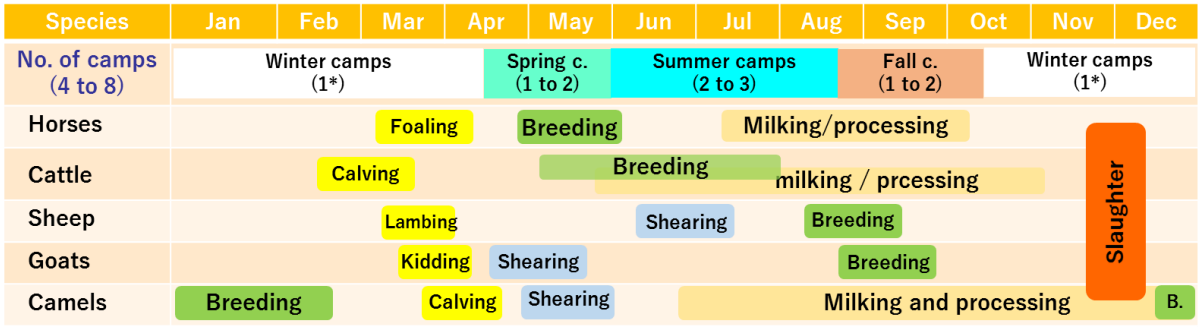
As to the supporting activities for the production of each animal, as shown in the same figure, a great majority of activities such as breeding, milking, shearing, lambing, calving, foaling, or kidding, are done almost in the same period of the year. During the months of November-December, the annual massive slaughter is done for winter preparedness. This activity used to be carried out in all the villages mobilizing hundreds of locals including not only workers of cooperatives (negdel) but also officers of municipalities, school teachers, as well as students. Nevertheless, slaughter may be done on an ad hoc basis[99]. Especially,

[98] These numbers could be less or more (*See* Fernandez-Gimenez, M. E. 2006. Land use and land tenure in Mongolia: a brief history and current issues. *USDA Forest Proceedings RMRS-P* 39: 30-36; Lkhagvadorj, D., Hauck, M., Dulamsuren, C. and Tsogtbaatar, J. 2013. *Op.cit*.).

[99] Murphy, D. J. 2011. Going on otor: disaster, mobility, and the political ecology of vulnerability in Uguumur, Mongolia. Ph D. Thesis, University of Kentucky.

during August, since school starts in September, the parents need money for learning materials, some fees, and the like.

Table 3.16 Activity Calendar of the Mongolian Herder



*there could be practices called otor, a short-term long-distance movement of herders with their livestock

As to fattening periods, even though in Mongolia, all five animals are used for meat eventually, horses and camels are not recognized as meat providers at all. As discussed earlier, beef and sheepmeat are predominantly the main sources of meat. Table 3.17 shows the average fattening periods of animals that were classified according to sex. Here, the figures shown are from castrated male animals which are raised exclusively for meat purposes while female ones are normally culled animals after the use for breeding. That's why the periods of fattening for female animals are considerably longer than those of castrated animals.

Table 3.17 Average Fattening Periods of Main Livestock Species (year)

Types	Cattle	Sheep	Goats	Horses and camel
Castrated animals	3-4	3-5	4-5	For culling
Female animals	More than 8	More than 8	More than 8	

Source: JICA Project Tam interviews from local officers[100].

As briefly explained in the footnote of Table 3.16, otor might be practiced before the massive annual slaughter of fattening animals rapidly searching for quality pastures[101]. In such a case, the temporal movement is not led by the whole family but by only some members of the household, normally male members. This traditional practice has been done mainly for two purposes: in winter for compensating lack of grass, and in summer for fattening.

(3) Processing

The very first step in meat processing is animal killing. As mentioned earlier, in Mongolia, more than 90% of the meat products in marketing circulation are not derived from the proper channels, namely, official slaughterhouses. Besides, home slaughter is the norm. Nevertheless, one of the most important points to be recognized here is that, unlike most countries including Japan, in Mongolia, home slaughter is not an illegal practice but it's a tradition. Even to this day, a great majority of Mongolian herders kill animals according to their old-fashioned method[102], and the same is true of sending out carcasses to a market. Also, some meat

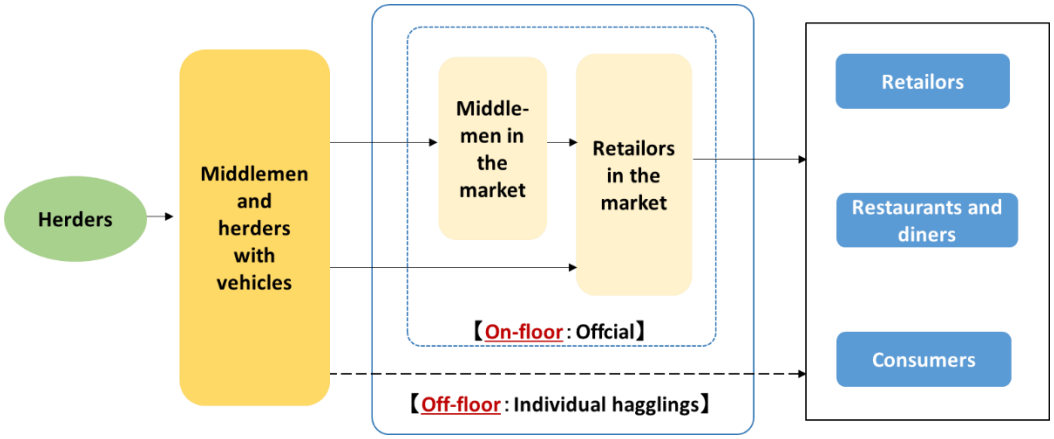
[100] Miaki, T. 1996. *Op.cit*.
[101] Dorligsuren, D., Batbuyan, B., Densambu, B. and Fassnacht, S. R. 2012. Lessons from a territory-based community development approach in Mongolia: Ikhtamir pasture user group In Restoring community connections to the land. Fernandez-Gimenez, M. E., Wang, X., Batkhishig, B., Klein, J. A. and Reid, R. S. (eds.) CAB International, UK.
[102] In the case of large animals such as cattle, even in Mongolia, operators kill the animals, firstly, by stunning, cutting a

products such as jerky are prepared at home (Figure 3.36).

In the case of live animals for the market, mostly before winter, be it through an abattoir or a large meatpacker, a great majority of herders sell them to middlemen as shown in Source: JICA Project Team

Figure 3.30. Currently, large-scale slaughter as conducted in the negdel era is not the norm, but annually the government decides on an amount of meat for winter reserves to ensure the food security of its people, especially those in larger cities such as Ulaanbaatar. This policy is done in coordination with large private meat companies by counting on their storage capacities. In Ulaanbaatar, until recently, live animals could be brought into the markets located in the central parts of the city. Nowadays, however, this is not the case anymore in a municipal ordinance enacted in 2003. Afterward, two districts near the capital city, called Emmert and Nalaikh, were newly developed for primary meat processing (slaughter and butchery), after which a great majority of products are sent out to the largest meat wholesale market in Mongolia, called Khuchit Shonhor[103]. Thus, this market is a lifeline for most city dwellers in this capital. Source: JICA Project Team

Figure 3.35 shows the flow of the meat products that come in to, and out from the Khuchit Shonhor. Hundreds of middlemen, as well as some large-scale herders, bring their products into the market, and some of them do their business not through official channels inside the market but through individual orders, so-called off-floor trading, for instance, in the parking lots. Such situations are tangible in Figure 3.35, Figure 3.37 and Figure 3.38.



Source: JICA Project Team

Figure 3.35 Processed Meat Flow at Khuchit Shonhor Market

The meat reserves as winter preparedness are a traditional practice in Mongolia called ideshi which means originally food or consumption, and this term is commonly used for the household as well as massive storage

carotid artery and then letting it bleed. In the case of smaller animals such as sheep or goats, however, firstly they make a small incision in the abdomen along the midline of an animal, and by putting his/her hand squeeze the aorta until the sheep or goat collapses. They do not let the blood spill outside (Nomoto, Y. 2018. Rethinking of food education in Japan based on the animal killing method in Mongolia. *Journal of Mongolian Studies* 30: 5-24.)

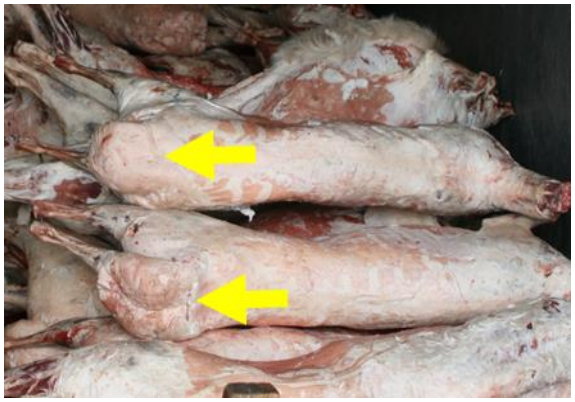
[103] Maytsetse, B., Shimizuike, Y. and Iizawa, R. 2006. Changes and the actual state of Mongolian meat market and distribution dystem－A case study of Ulaanbaatar city's Khuchit Shonhor food market. *Review of Agricultural Economics* 62: 89-97. (in Japanese)

as a national policy[104]. From late November onwards, in Mongolia, ambient temperatures fall well below zero degrees Celsius, thereby enabling people, especially in rural areas to take advantage of Nature's huge freezer, by which the meat reserves can be stored without becoming perished during the winter season. In practice, however, in the case of Nature's freezers, the meat quality including palatability is not guaranteed. In 2018, the government designated approximately 5.5 million head of livestock as reserves, which accounted for 18% of the total. As mentioned earlier, these carcasses were stored in the freezers of different meat processing companies[105]. In the case of these companies, animals are killed not by the traditional method but by a modernized one which, as with the case of larger animals, such as cattle, cutting a carotid artery and letting it bleed.

Last but not least, it would be important to mention livestock by-products in Mongolia. For instance, Mongolian local sheep, called fat-tailed sheep and known for their distinctive large tails and hindquarters, have baggy fat deposits in the hind parts (Figure 3.39). In herder households, the fat from these deposits is commonly used mainly for cooking. According to some studies, it may reduce the risk of arteriosclerosis cardiovascular diseases[106]. Among others, sheep intestines for sausage casing or placentas, which are highly recognized animal by-products for commercialization, are available abundantly in Mongolia.

Figure 3.36 Beef Jerky Prepared in a Ger

Figure 3.37 Khuchit Shonhor Wholesale Market (inside market)



[104] Qinfu, S. and Erden, C. 2014. A though on subsistence and food in Inner Mongolia: past and present prospects *In* Glocol booklet. P.9-22. Osaka University. (in Japanese)
[105] *Montsame* 2018. 687: P.5. (in Japanese)
[106] Tsunoda, K. 2010. Sheep (Chap.4) *In* History of animal breeding: domestic animals. Syoda, Y. (ed.). Yusyo kan. (in Japanese)

Figure 3.38 Khuchit Shonhor Wholesale Market (off-floor)

Figure 3.39 Fat Accumulations of Fat-tailed Sheep Carcasses Indicated with Arrows

(4) Marketing/Sales

In Mongolia, as shown in Source: JICA Project Team

Figure 3.30, a variety of different marketing or sales methods are available. Besides, in the case of large cities such as Ulaanbaatar, nowadays, there are some "made to order" type approaches as well[107]. Thus, including these newly established meat supply chains, the price range may vary more than the average prices shown in Table 3.12. As to price fluctuations, while the farm-gate prices stay relatively the same range, the retail prices vary considerably depending on a given shop. For instance, according to a recent survey, the beef price in Ulaanbaatar ranged from 8,000 MNT to 1500 MNT/kg[108].

Also important is the fact that the prices of livestock products at each stage of a supply chain fluctuate considerably with the seasons. This is, naturally, a direct consequence of the market mechanism. In the case of the meat supply chain in Mongolia, since the massive animal slaughter occurs just before winter, there is a tendency for the price to start dropping gradually after summer towards the slaughter season and to increase after winter peaking in May when the meat stocks run low[109]. Apart from this general fluctuation, there could be minor changes in or around the national festivals such as the Chinese New Year and the Naadam in July. One other thing about the seasonal fluctuation that should be added is that, in general, animals on the grassland lose weight by 20 to 30% during the winter[110]. Thus, this is another factor that makes the farm-gate price lower. Besides, in the case of the price build-ups in the meat supply chain, there is one thing to be kept in mind. In general, 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, middlemen, processors, or even wholesalers have to at least double the price per unit, otherwise, they will be lost. An example of the breakdown of the prices and expenditures for a cow, all the information that was gathered from a middleman at Khuchit Shonhor, is given in Table 3.18.

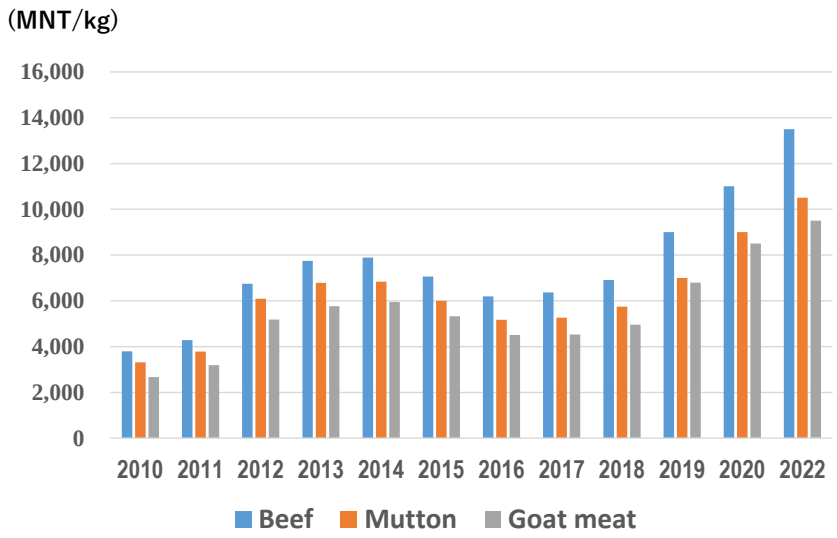
Table 3.18 Example of the Price Build-ups and Expenditure

Items		Prices	Remarks
-Animal species	Live cow	1,000,000～1,350,000 MNT/head	Season-dependent
-Expenditures	Killing costs	25,000 MNT/head	For butchers
	Transport	20,000 MNT/head	
	Health note	±15,000 MNT/head	Protocol for selling
	Total	±60,000 MNT/head	

Source: JICA Project Team

[107] As of 2016, there was a shop called Enkh-Arslan that used to sell quality meat after receiving orders. Its frequent customers were the wealth in Ulaanbaatar including expatriates. After the pandemic, however, unfortunately almost all the shops of that kind have folded.
[108] JICA. 2017. *Op.cit*.
[109] Byambabaatar, I. and Thrift, D. E. 2015. Who easts quality meat: consumers and the national meat reserves program in Mongolia. *Health Environment* **1**: 1-15.
[110] Kemp, D. R., Han, G., Hou, X., Michalk, D. L., Hou, F., Wu, J. and Zhang, Y. 2013. Innovative Grassland Management Systems for Environmental and Livelihood Benefits. Proceedings of the National Academy of Sciences. *National Academy Sciences* 110: 8369–8374.

Additionally, the retail price fluctuations by year of the meat derived from the three animal species are given in Figure 3.40. It is obvious that although the fluctuations by year are noticeable, the order according to price remains the same over the past years. Also noteworthy to mention is that although the figure does not show the data in the year 2021, in which the pandemic was rampant, based on the increase observed in the year 2022, it seems that the prices were, in general, on the increase.



Source: Household Socio-Economic Survey by National Statistics Office, and others

Figure 3.40 Trend of Retail Meat Prices from 2010 to 2022

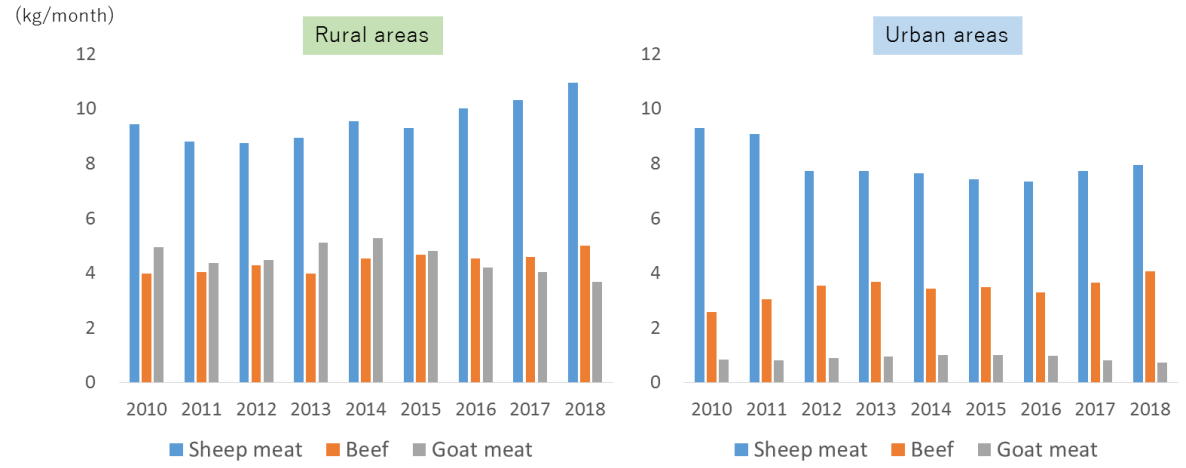
Another type of meat supply, especially for the city dwellers, which is not a commercial one but considerable in terms of its share, would be provisions made by their relatives' herding in rural areas[111]. Since the origin of such provisions is totally traceable, most city dwellers feel comfortable with them from a point of view of food safety.

(5) Consumption

As mentioned earlier, the average meat consumption in Mongolia is the highest in Asia. On the other hand, as shown in Figure 3.41, there is a difference between rural areas and cities, or between animal species. While both in rural and urban areas, the general tendency of beef and sheepmeat consumption is about the same, goat meat consumption shows an obvious contrast. Based on this figure, city dwellers seem to find goat meat less attractive than their counterparts in rural areas.

Since the livestock population explosion is getting exacerbated, especially by goats due to cashmere production, utilizing goat meat more aggressively in the meat supply chains would be pressing. These points will be described in detail in the Import/Export and Prospects of Domestic and International Markets sections.

[111] Janzen, J. 2005. *Op.cit.*



Source: Household Socio-Economic Survey by National Statistics Office

Figure 3.41 Trend of Monthly Meat Consumption in Rural and Urban Areas from 2010 to 2018

Concerning the grading system, which is highly common in other countries, there is virtually no market differentiation for product quality in Mongolia. Mostly, the price differentiation occurs not based on the quality but the type of cuts[112]. Nevertheless, freshness is a highly recognized aspect of meat selection. According to a study conducted by 260 urban consumers in Ulaanbaatar, more than 90% of respondents admitted that they did not prefer frozen meat[113], revealing a possible drawback of natural freezers. Because, based on another study on climate change conducted in 2014 in Mongolia by a joint team of the Ministry of Environment, Japan, and Chuo University, in which a photovoltaic deep-freezing system was used for sheep carcasses, and a taste test of frozen sheep meat was done by inviting a group of more than 40 local people including herders, all of the participants responded that they loved it, suggesting that the capacity of Nature's freezer to maintain meat quality, especially freshness, might be poor. Thus, concerning the use of the natural freezer, apart from its freezing capacity, a function to keep the freshness within the ideal range should be developed in the future.

(6) Imports/Exports

Concerning the international trade of meat products, the most important issue is by definition export promotion. Mongolia, a self-sufficient country in meat except for chicken and some pork mainly for delicatessen, used to export about 20% of the total meat production to the COMECON member countries during the socialist era[114]. Naturally, all those trading activities stopped with the end of socialism. At the beginning of the 21st century, however, meat exports resumed, and have been on the rise since. The volume of exports reached 26,000 tons in 2010[115] and as of 2018, coupled with the government's encouragement, an amount of 55,000 tons of meat crossed the border[116].

Under the circumstances, to promote meat exports more strategically, including goat meat, the most

[112] For instance, fillet is more pricey than meat cuts wit bone, or loin than rump, etc.
[113] Byambabaatar, I. and Thrift, D. E. 2015. *Op.cit*.
[114] JICA. 2016. *Op.cit*.
[115] Customs Authority of Mongolia (www.customs.gov.mn).
[116] Munkhdelger, B. 2020. The Meat Processing Industry in Mongolia. *International Journal of Scientific and Research Publications* 10: 516-518.

challenging task to be addressed immediately would be an improvement on animal health protocol in light of international standards such as antemortem and post-mortem veterinary inspections at slaughtering plants and quarantine regulations. As a prospective trading partner, Mongolia, broadly known as one of the Foot-and-Mouth Disease (FMD) and, recently, Peste des Petits Ruminants (PPR) endemic countries, would be imposed a number of restrictions such as health certificates by prospective client countries. Besides, it should be remembered that just because Mongolia could manage to get all the animal health protocol issues sorted does not guarantee a deal for trade. In this meaning, retrospectively, the backing the Soviet Union gave Mongolia was truly enormous.

Concerning the animal species for export, unlike the socialist era in which sheep and cattle were principal sources, nowadays, the horse is the most common species for meat exports because of its immunity against most problematic infectious diseases such as FMD or PPR, thereby excluding the horse meat from the list of possible causes for those diseases. In 2016, horse meat accounted for as much as 87% of the total meat export (8,500 tons) [117].

As to trading partners, China, together with Russia, is by definition most crucial to the national economy of Mongolia. Because China conditionally lifted the ban on meat exports just recently, Mongolia now can export heat-treated meat products even ruminant ones. Therefore, the volume of exports to China is now on the increase, accounting for about 80% of the total exports[118]. By contrast, the presence of Mongolia in China as a trade partner seems to be insignificant. According to a recent report, meat imported from Mongolia accounts for less than 1% of the total in China[119]. Therefore, Mongolia, without being at the mercy of those superpowers, should take a firm but resilient measure to promote exports. For instance, as to China, this neighbor could be not only a trading partner but also a country of transit through which some meat products pass to enter a country of destination. In such a case, according to the president of the Mongolian Meat Association, China becomes intractable. Coincidentally nowadays, Vietnam and Laos have shown their interest in importing both sheep and goat meat from Mongolia[120], for which diplomacy between China and Mongolia as well as all the necessary arrangements of animal health protocol[121], as suggested by various donors, would be the most important factors in achieving success.

On the other hand, some niche markets are, though slowly, expanding their share steadily. As mentioned earlier as the by-product utilization, sheep intestines for casing or placentas are among them. Between 2016 and 2019, the export amount of these by-products increased exponentially from 8.4 tons to 2,357.9 tons[122]. Of them, sheep intestines are being exported to Japan as well as some European countries. One of the most advantageous features of this by-product is its exceptional standing in the light of animal quarantine. In general, as suggested by the World Animal Health Organization (OIE), raw meat and by-products of ruminants from FMD-endemic countries or regions are banned. Nevertheless, raw intestines of ruminants

[117] Khyargas, T. 2019. *Op.cit*.
[118] *Montsame* 2019. 740: P.5. (in Japanese)
[119] GIZ. 2017. Analysis of priority markets for diversification of export of products from Central Asia. German Cooperation.
[120] *Montsame* 2019. 702: P.5. (in Japanese)
[121] UNIDO and Government of Mongolia. 2011. Strategic directions on industrial policy in Mongolia. United Nations Industrial Development Organization.
[122] Mongolian Statistical Yearbook, 2019.

such as sheep or goats can be allowed to be exported when salt-cured in accordance with the official method. Naturally, the final decision would be dependent on each country, but, in Mongolia, this feature seems to be providing a good opportunity to local herders as well as traders. Figure 3.42 and Figure 3.43 were taken in a small-scale plant, jointly owned by two parties, one being Japan and the other Mongolia, for the primary processing of sheep intestines and then exporting to Japan via air.

Figure 3.42 Cleaning of Intestines of Sheep for Casing

Figure 3.43 Signboard of the Joint Venture

(7) Prospects of Domestic and International Markets

As described earlier repeatedly, although its prospect as a meat product is not promising, we believe, the goat meat industry should be encouraged in some way to mitigate the ongoing grassland degradation. Export promotion could be an option but in terms of domestic utilization, how to increase consumption, especially in urban areas would be another pressing task (*See* Figure 3.41). According to a survey conducted by the project team asking 86 urbanites in Ulaanbaatar why a great majority of Mongolians do not prefer goat meat, the top two answers are as follows: “Goat meat has some effects to cool your body, and with long and harsh winters in Mongolia, it is not suitable.” and “Goat fat becomes solid easily.” Of them, the latter might be a piece of lore because the melting point of animal fats is not necessarily dependent on an animal species but on the composition of fat types, namely, fatty acids. In general, the melting point of lipid and hardness of meat fat is closely related to the concentration of stearic acid[123]. Although there are some types of acids that are unique to a given species, the common deciding factors for the fat composition are the type of cuts and/or feeds. Thus, since in Mongolia, there is virtually no difference in the feed between animal species, it seems to be unreasonable to assume that only goat meat fat becomes solid easily. All in all, it would be interesting to investigate further this peculiar phenomenon on a scientific basis.

On the other hand, according to interviews made with large meatpackers in Ulaanbaatar, it would be true that a great majority of city dwellers do not prefer goat meat but unknowingly they do consume it. Here, it should be mentioned that in Mongolia, there is a special term called “bog” which means small ruminants such as sheep or goats. Thus, a variety of prepared products including buuz, one of the most popular and traditional foods normally prepared by using sheep meat, are in reality mixed with a good amount of goat meat as well in most factories. Then, the label of a product will appear bog. It shows that in terms of

[123] Wood, J. D., Richardson, R. I., Nute, G. R., Fisher, A. V., Campo, M. M., Kasapidou, E., Sheard, P. R. and Enser, M. 2003. Effects of fatty acids on meat quality: a review. *Meat Science* **66**: 21–32.

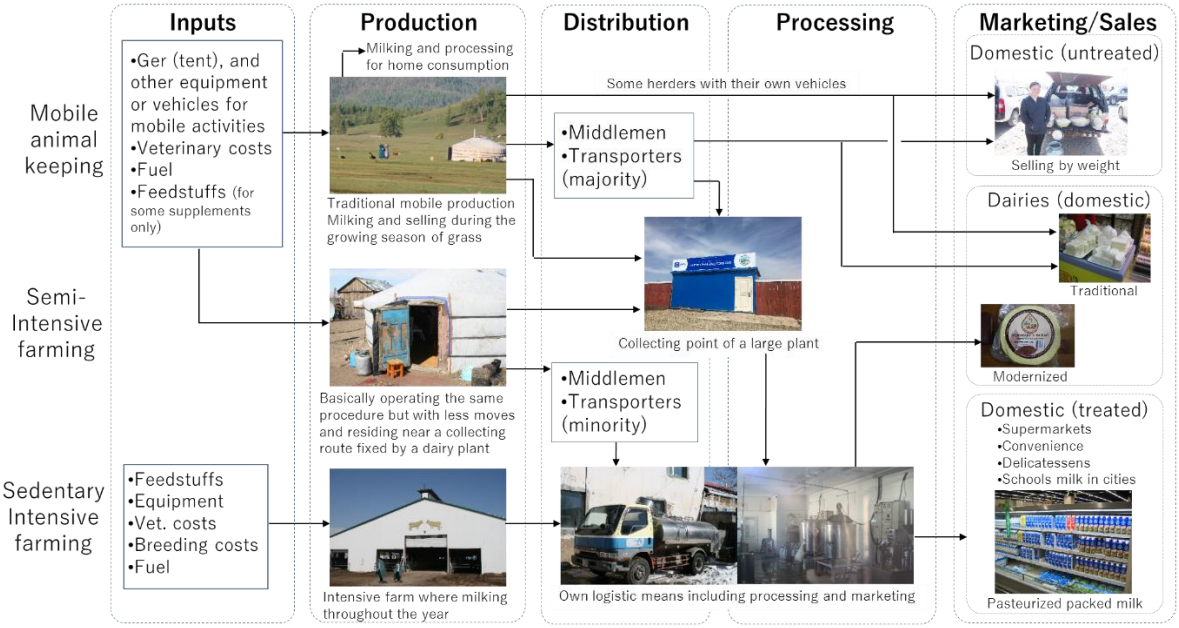
palatability, urbanites accept goat meat without difficulty as their rural counterparts (Figure 3.41). Thus, it seems that urbanite's dislike of goat meat is not intrinsic but rather psychological, thereby suggesting that it could be used more as an ingredient for processed meat products.

Lastly, we will touch upon one of the frequently voiced subjects about Mongolian foodstuffs, especially meat. In Mongolia, you may hear people talk about the meat saying that Mongolian meat is organic and safe because all the animals are grass-fed. Considering the general situation in industrialized countries where almost all the animals are kept confined under stress and fed on preservative-added commercial feed, thereby causing negative impacts on food safety and, consequently, fear for consumers[124], it might be true that the animals on the natural grassland of Mongolia give a more advantageous position to Mongolia to develop a meat value chain. In fact, some researchers, based on this point, made recommendations for expanding into international markets[125]. Nevertheless, here again, the most challenging homework to achieve success is the improvement in the animal health protocol system as well as the traditional out-of-slaughterhouse killing.

Linked to this point, one other thing that seems to be less treated yet highly important is the validity of the alleged safety of Mongolian meat. For instance, it is by definition true that almost all the animals with herders feed on natural grasses, thereby, making them organic creatures. In reality, however, almost all animals are administered occasionally with some medications for various purposes such as veterinary treatment or prevention during their lifetime. Concerning medications, drugs or biological preparations such as vaccines have their instructions including withdrawal periods during which users (veterinarians or farmers) cannot sell their animals or harvested products such as milk. Thus, as long as users abide by the regulations, animals or their products will be safe and organic. In Mongolia, however, virtually there is no control on the use of veterinary drugs[126], including antibiotics which have been arousing controversy on the threat of antimicrobial resistance in developing countries[127]. Thus, to take advantage of its grass-fed organic products, Mongolia has to put one more task on the agenda.

[124] Weber, K. (ed). 2009. Food, INC.: How industrial food is making us sicker, fatter and poorer and what you can do about it. Participant Media, USA.
[125] Khyargas, T. 2019. *Op.cit*.
[126] Khaliun, C. 2017. Rich in livestock – poor in regulation. *UB Post* January 26.
[127] Ayukekbong, J. A., Ntemgwa, M. and Atabe, A. N. 2017. The threat of antimicrobial resistance in developing countries: causes and control strategies. *Antimicrobial Resistance and Infection Control* 6: 47-54.

3.2.10 Milk and Dairy Products



Source: JICA Project Team

Figure 3.44 Conceptual Diagram of Supply Chain of Milk and Dairy Products

(1) Inputs

Basically the same will apply to this section as mentioned in the previous *Meat section*. As shown in Table 3.15, and Source: JICA Project Team

Figure 3.44, one of the noticeable differences would be the provision of supplementary feed for milking animals. This is because, during late fall and winter, grass is becoming scarce. Thus, herders need some additional feedstuffs to keep milking their animals. Besides, milking is done daily which is a contrast to the fattening activity[128].

(2) Production

Here again, basically the same is true of this section as the *Meat section*. Concerning animals for milking, as described earlier, all five livestock species could be milked, of which by definition cows and mares are most common. Mares are used exclusively for fermented milk, airag. In some areas such as Govi regions where camels are preferably raised, they could be milked as well, and their products are highly recognized as shown in Table 3.14.

Concerning the season for milking, although explained earlier that it coincides with the growing season of grass, exactly speaking, it all depends on each species as shown in Table 3.16. Camels seem to have a longer milking period than other species due to their intrinsic feature[129]. In any case, during a certain period of the year, almost all the herders stop milking[130]. Therefore, the milk plant owner who buys milk from herders is

[128] Humphrey, C. 1978. *Op.cit*.
[129] Mattiello, S. 2016. *Op.cit*.
[130] In the case of Mon Fresh Milk Company in Ulaanbaatar, one of the large plants, the number of herders selling milk drops from ca 400 to about 40 during the months of November to March.

forced to cease their business or replace the loss with some substitutes such as imported milk. Currently, there are approximately 470 milk plants (*See* Table 3.11), a great majority of which are small-scale operations, remaining inactive during the suspended period. By contrast, larger plants which are the few and only in larger cities can use exported powdered milk for compensation.

(3) Processing

For all dairy products, in terms of processing, the single most important factor is milk hygiene, especially in the production site, namely, dairy farms. Hygienic handling, rapid cooling, and then bringing the harvested milk as soon as possible to a milk collecting point or center are essential. To do so, logistic arrangements would be indispensable. In Mongolia, however, as is often the case in developing countries[131], the milk collecting and transporting system is barely streamlined. This aspect explains eloquently the figure shown in Table 3.11. Only 10% of the total milk production is processed through official channels, namely, dairy plants. Larger dairy companies are currently trying to establish a collection system, especially in urban areas. Although results are not tangible for the country as a whole, these efforts are deserve-worthy.

On the other hand, in some plants, processing into more elaborate dairy products such as pet-bottled airag, arkhi, a vodka-like liquor made from cow's milk, or even another liquor of camel milk with some therapeutic properties[132] as well as traditional dried cheese-like products such as curd and aarool (Figure 3.45) are available. Also, in herder households, some primitive dairies are still prepared both for their consumption and selling (Figure 3.46).

Figure 3.45 Aarool and Curd for Sale in a Shop

Figure 3.46 Traditional Cheese Making in a Ger

(4) Marketing/Sales

Since Mongolia has a variety of species of milking animals, the farm-gate prices of raw milk vary considerably. In addition to cow's milk, whose price is shown in Table 3.12, for instance, milk of yak, a closely related species to cattle, fetches a price more than twice that of cow's milk due to its scarcity. Likewise, camel milk is sold at a higher price. According to the information we gathered in a market in Bayankhongor aimag, the price is three times as high as cow's milk. Besides, in the case of raw milk sold by weight in any

[131] Moffat, F., Khanal, S, Bennett, A., Thapa, T. B., and George, S. M. 2016. Technical and Investment guidelines for milk cooling centers. FAO, Rome.
[132] Ishii, S. and Komiyama, H. 2010. Property and manufacturing method of fermented camel's milk (Hoormog) made in Mongolia. *Milk Science* 59: 125-130. (in Japanese)

place around a town as shown in Figure 3.29, naturally, prices would be much lower.

Also important in pricing issues is its seasonality. As already mentioned, in winter, a decline in production is noticeable. Based on the market mechanism, in the winter months the farm gate price increases, almost twice that in summer which is shown in Table 3.12. As will be described below, there are some commercial operations intentionally milking during the winter season to sell their milk at a higher price. By contrast, some plants cease receiving milk from herders to avoid over-supply during the summer season. In this meaning, a governmental program called the "Meat and Milk campaign[133]" to transform surplus milk in summer into powdered milk so that the powdered milk stock can be used in winter as an import substitution industrialization was, we believe, highly commendable.

(5) Consumption

As shown in Table 3.10 and Table 3.5, milk consumption in Mongolia is the highest in Asia. Traditionally, in Mongolia, they had two main food groups: the white foods from spring to summer, and the red foods from fall to winter. Of course, white foods mean milk and dairy products, and in the past, they used to be the only foods people could consume during those seasons. Nowadays, however, similar to the case of meat, there is a large difference in consumption between rural areas and cities. While in rural areas the average consumption per capita ranges from 200 to 250 kg/year, in cities, it stays at as low as 50 to 80 kg/year[134].

(6) Imports/Exports

As to imports, as mentioned earlier, butter and powdered milk are the main products. As shown in Table 3.19, the export volumes are volatile because they are all dependent on the amounts of shortages which are not always predictable. Concerning the impacts of COVID-19, due to the dysfunction of a distribution network system in Mongolia, the amount of imported butter doubled in the year 2021.

Table 3.19 Imports of Butter and Powdered Milk (ton/year)

Items	2014	2015	2016	2017	2018	2019	2020	2021
Powdered milk	5,784.2	4,652.9	7,652.0	N/A	N/A	N/A	N/A	N/A
Butter	143.2	224.2	292.4	408.8	327.5	225.9	264.5	531.0

Source: National Statistical Office

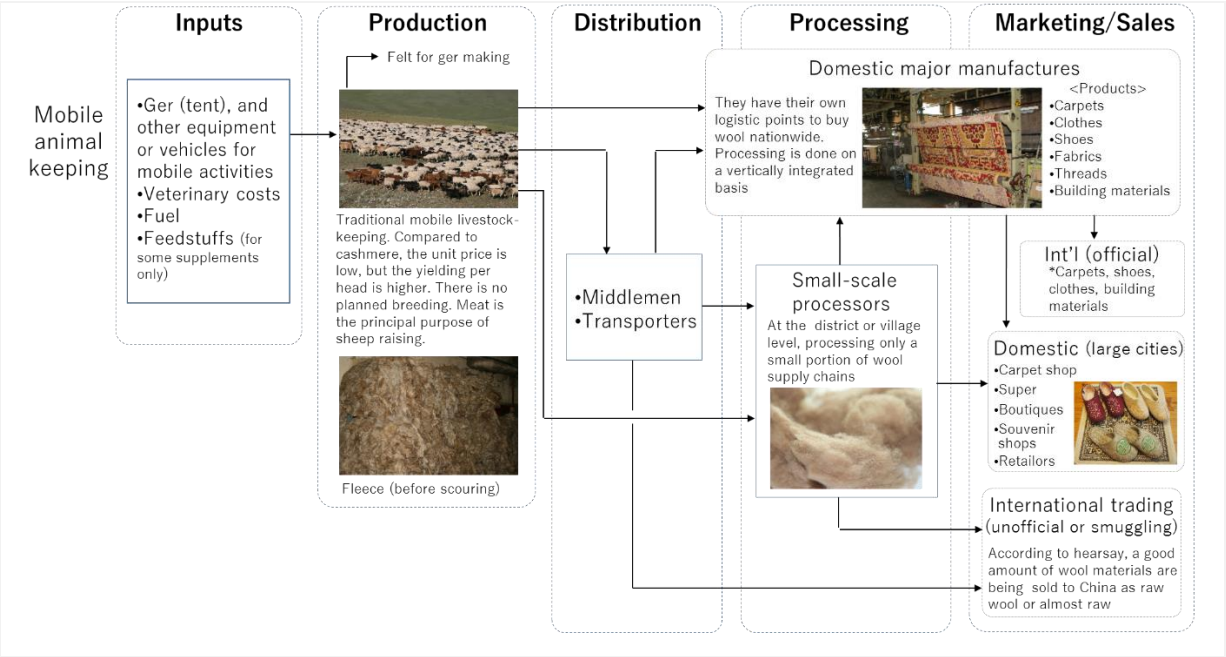
By contrast, concerning statistics on exports, there seems to be no official data available. Nevertheless, according to the president of the National Dairy Development Board of Mongolia, who, on the other hand, runs her small cheese factory, exclusively using yak milk, though a small amount, the factory exports to some Central Asian countries such as Kazakhstan. Also, in Mongolia, some expatriate small-scale cheese-makers are trying to expand into international markets[135]. Also, important is that a Mongolian traditional dairy product, aarrol, mentioned earlier, is currently an export item as pet food manufactured by one of the major pet food companies in Japan, which could be browsed on the Internet.

(7) Prospects of Domestic and International Markets

[133] JICA. 2017. *Op.cit*. Also, in September, 2020, MOFALI announced that a subsidy would be available for dairy farmers who are selling their harvested milk to one of the registered dairy plants with the aim of increasing the volume of milk production during the winter season.
[134] National Statistical Office (2010-2011).
[135] There are some cheese-making plants owned by Japanese and American citizens.

According to the aforementioned pet company, the type of pet food is diversifying considerably, and currently, there is an increased demand for a kind of pet food called a pet treat or snack, for which Mongolia dairy products could be a good source because of the positive impression Mongolian grass-fed animals possess. Among them, a fresh milk pack for the dog, one of the managers of the sales department says, could be a most potential product. Here, a piece of homework one must do to handle milk for dogs would be a lactose-free milk issue. As broadly known, except for humans, all adult mammals, unlike their infants, cannot digest lactose. Thus, to prepare a pet food product that contains fresh milk, it should be lactose-free. According to the president of one of the major dairy plants in Mongolia, in terms of the technique, this hitch could be worked out rather easily by installing a set of machinery. In terms of finances, however, since the machinery is costly, firstly, its demand and profitability should be evaluated carefully.

3.2.11 Wool



Source: JICA Project Team

Figure 3.47 Conceptual Diagram of Supply Chain of Wool Product

(1)Inputs

Please refer to the meat section.

(2) Production

Although all five animals are raised on the same Mongolian grassland, exactly speaking, each animal has its preference for the grazing site as well as the type of plants. Also, herders decide the site for grazing depending on the species as well as the production stage of milking animals. In general, small animals such as sheep and goats, and female animals in milk remain near the campsite while larger animals generally graze far from the campsite[136].

[136] Humphrey, C. 1978. *Op.cit*.

Regarding shearing, as shown in Table 3.16, nowadays a great majority of herders cut the wool only once a year around June. In the past, however, sheep used to be shorn twice, the other being in fall. According to herders interviewed during the survey, wool fibers cut off in July are longer and less greasy than those in fall. Thus, by mixing both of them, herders can make felt easily.

In addition to the frequency of shearing, a shearing tool seems to have significance in fleece quality, and thus, marketability. According to a study conducted by an international organization, the fact that most herders use scissors for shearing has much to do with their second-rate fleeces[137]. This remark may have an idea in common with the comments made by the president of the Mongolian Wool and Textile Association, saying "To improve our woolen products, we would like to introduce a sheep-shearing machine for herder groups which could be used by sharing with other herders."

(3) Processing

As shown in Table 3.11, there are about 360 wool processing plants, of which only a few plants (ca 10) have a capacity of 1,000 tons or more per year. The main processed items are clothes, shoes, carpets, and semi-processed materials such as woolen threads, clothes, fabrics, or felts. Also important recently are novel uses of wool such as insulators as a building material or organic fertilizers. According to a report, in Mongolia, more than 80% of building insulators are made of Styrofoam[138].

Lastly, one of the challenges that the wool industry is facing in Mongolia will be mentioned. According to the president of the Mongolian Wool and Textile Association, during the scouring, the teeth of the machine so often get obstructed with the debris of paint, especially permanent type, left on fleeces. For animal identification purposes, herders mark their sheep with the paint as shown in Figure 3.48.

(4) Marketing/Sales

As already mentioned, the profitability of wool is the lowest among all the livestock products derived from mobile livestock-keeping, especially in comparison with its counterpart, cashmere, which fetches a farm-gate price about seventy times that of wool. By contrast, since wool can be said to high high-yielding per head among animal fibers in Mongolia, the total amount of fiber for sale could be higher. According to a report, a herder household with 120 sheep harvested a weight of about 500 kg of fleeces[139].

By contrast, as shown in Table 3.12, an accumulation in the price build-up of wool products is noticeable, exceeding the ratio of value-added of cashmere. Incidentally, woolen slippers, shown in Source: JICA Project Team

Figure 3.47, is currently available in some shops dealing with Mongolian goods in Japan

(5) Consumption

Concerning animal fibers including wool, their consumption means the amount of fibers used for processing, especially for end-products. As already shown in Table 3.11, the consumption of wool fibers,

[137] *Montsame*. 2019. 726. *Op.cit*.
[138] EU, Czech Republic and People in Need. 2014. Market research report on sheep wool building insulation. EU, Czech Republic and People in Need, Ulaanbaatar.
[139] JICA. 2019. *Op.cit*.

especially in Mongolia is very low. Nowadays, wool can be used not only for clothes but also, as mentioned earlier, for building insulators or organic fertilizers. In practice, however, where the largest demand is found has long been the apparel industry. In this respect, the low domestic consumption of wool fibers in Mongolia may be attributed not to the current livestock industry in Mongolia but the not yet fully developed garment industry. For instance, in the case of the US, which is not a recognized country as a wool producer like Australia, it raises a considerable number of sheep and even in the 1990s used to produce approximately half the fleeces Mongolia does currently (ca 33,700 tons/year) [140]. Furthermore, the most striking feature is that it imports more than double the amount of wool it produces. Then, together with those it already has, the US manufactures the end-products doubling the total wool consumption[141]. This is a reflection of the enormous capacity the American apparel industry has developed. To increase its domestic consumption of wool, Mongolians' counterparts should pay due attention to this fact.

(6) Imports/Exports

As to the international trade of wool, only export information is available, suggesting that there are no imports of woolen products. Table 3.20 shows the exports of semi-processed wool and cashmere fibers. Although its significance in the trade balance is not prominent, in terms of the volume, it is steadily on the increase overwhelming cashmere which has stayed about the same recently. According to the information gathered from the Mongolian Wool and Textile Association, a great majority of the increased amount of wool is being exported to China where, curiously, a good amount of fibers, especially fine ones, are used to mix in with cashmere products. Concerning the impact caused by the pandemic, while cashmere stayed much the same, wool almost halved in the year 2020 and even less in 2021.

Table 3.20 Exports of Semi-processed Wool and Cashmere Fibers (x 1,000 tons/year)

Items	2013	2014	2015	2016	2017	2018	2019	2020	2021
Wool	2.4	7.4	11.5	14.1	16.1	12.2	14.8	8.5	5.3
cashmere	4.1	4.0	5.0	5.4	5.4	5.3	5.7	6.3	6.0

Source: National Statistical Office

(7) Prospects of Domestic and International Markets

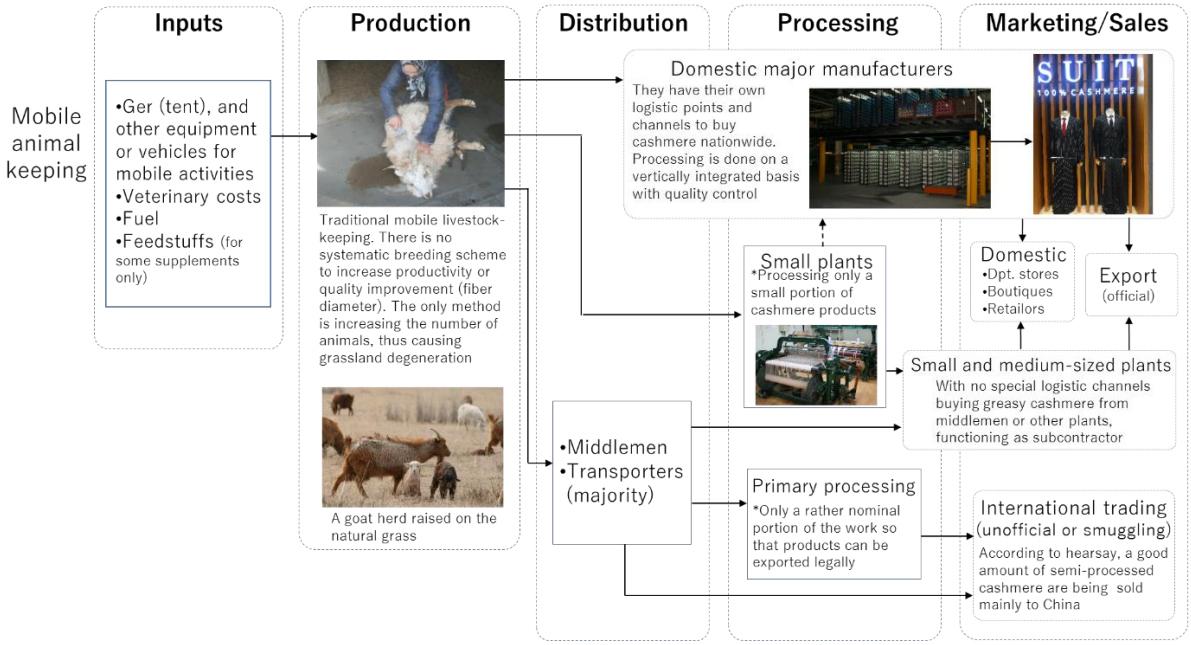
As mentioned earlier, a large proportion of wool fibers are consumed in the apparel industry compared to other woolen materials such as building insulators or organic fertilizers. In reality, however, man-made fibers have been increasingly dominating the textile industry, thereby eclipsing the share of wool. It was as low as less than 2% in 2013[142]. In the case of Mongolia, to increase wool consumption, it would be possible to take a two-pillar strategy; internally (domestic), boosting the apparel industry, and externally (export), aiming at exporting more building insulators. According to a trader dealing with the woolen building insulators in Ulaanbaatar, one of the challenging downsides they are now trying to work out is how to cleanse the raw wool of all grease and dirt thoroughly as their foreign clients require.

[140] Mongolian Statistical Yearbook, 2019.
[141] Steller, R. 1998. Industry & Trade Summary: Wool and related Animal Hair. Office of Industries U.S. International Trade Commission Washington, DC 20436
[142] Data from Japan Chemical Fibers Association. 2013.

Figure 3.48 Sheep Marked with Paint for Identification

Figure 3.49 Bare Grassy Slope due to Over-grazing

3.2.12 Cashmere



Source: JICA Project Team

Figure 3.50 Conceptual Diagram of Supply Chain of Cashmere Product

(1)Inputs

Please refer to the meat section.

(2) Production

Here again, basically the same is true of this section as the *Meat section* except for the increasing number of goats, thereby distorting the size and composition of herds. As mentioned earlier, especially in winter sheep and goats were herded together, because the longer hair of the sheep kept the goats warm, and for that purpose, they should be in the right proportions, the ratio of goats to sheep standing at 3:10. Since the numbers of sheep and goats are comparable, these traditional techniques to protect the herd do not function at all, especially for goats.

Also important is the aforementioned issue about the selection. The quality of cashmere is dependent on

the thickness of the fiber. In general, the thinner the better. In Mongolia, it is widely accepted that the average diameter of cashmere fibers is becoming thicker, and that's why a planned breeding program is needed[143]. Since the quality deterioration of fibers is prominent, it would be reasonable to improve the goat herds through genetic selection. As mentioned earlier, this challenging task should be done very carefully, especially paying attention not only to the thickness of the fiber but also other advantageous traits the Mongolian goat has and should not lose, such as the highly recognized length, body, and shine of Mongolian cashmere has as well as the evolutionary adaptability Mongolian goat herd developed over hundreds of years.

(3) Processing

As shown in Table 3.11, one of the most serious problems in the cashmere industry is its low percentage of utilizing raw materials domestically for the final products. On the other hand, it would be true that in Mongolia this is by definition one of the most specialized and integrated industries, including logistics. Also, a number of cashmere manufacturers have the capacity to be OEM[144].

One other problem the cashmere industry has because of its scarcity is mislabeling, including all those cashmere products blended with other cheaper animal fibers. According to interviews conducted at the KE'KEN Textile Testing & Certification Center in Tokyo, Japan, and some major Japanese Trading Companies, nowadays, authenticity is the most crucial aspect when it comes to the international trade of cashmere products. Thus, they suggest, that issues such as a certificate of origin, and traceability would be the norm in the near future.

(4) Marketing/Sales

Be it Marketing/Sales, or Consumption which is the next section, the most important and challenging task is how to boost the process of adding value to cashmere products domestically. As shown in Table 3.12, in the case of the cashmere supply chain, the average price at each stage of production, even the farm-gate price, is much higher than that of the wool supply chain. Thus, the relative losses could be less. Also, unlike wool or any other livestock products, herders seldom have difficulty in selling, though the prices may vary considerably. Nevertheless, as the vice president of the Mongolian Wool and Cashmere Association emphasized, the apparel industry is in urgent need of reinforcement, especially technical improvement.

(5) Consumption

As already mentioned in the previous section, the same could apply to Consumption. It would be true that cashmere, compared to any other livestock products, enjoys an exceptionally advantageous position of contributing considerably to exports where the great majority of products are minerals and ore concentrates (*See* Table 3.7). Nevertheless, it does not mean that there is no room for improvement in the cashmere industry. Rather, as exactly mentioned earlier, the Mongolian cashmere apparel industry still has huge potential for increasing its revenue by improving the manufacturing system.

(6) Imports/Exports

The countries or regions providing the climate and geography that are conducive for herding cashmere

[143] Restall, B. J. 2001. USAID cashmere breeding program evaluation: Mongolia. USAID.
[144] Almost all of the major manufactures have a capacity for it.

goats producing high-quality fiber are so limited that it is only natural that this rare fiber is by nature one of the most recognized items for international trade. In this respect, Mongolia, being one of the few, should capitalize on this advantage. According to the interviews conducted at the Mongolian Wool and Cashmere Association, and the aforementioned cashmere plant: Tanilag, as of 2019, Mongolia produced more raw fibers than China which had long been the world's largest supplier of cashmere[145]. Thus, all the more reason, it seems that the Mongolian apparel industry, together with the textile industry, is in urgent need of innovative reform. This could mean that in the future, if given the chance, Mongolia might be an importer of cashmere fibers to manufacture more complete products as China does[146].

(7) Prospects of Domestic and International Markets

All in all, together with the improvement in the cashmere garment industry, another highly serious concern over the cashmere industry, especially from a point of view of sustainability, would be the ever-increasing number of goats, thereby degenerating the grasslands significantly. Since Mongolian mobile livestock-keeping is heavily dependent on the natural grassland, the land degeneration may cause not only the cashmere industry but also the entire livestock industry, or in the worst-case scenario, the national economy itself to collapse eventually. Therefore, keeping the number of goats within a reasonable range from a point of view of the carrying capacity as well as improving the productivity of fibers by selecting based on the scientific data is crucial. To do so, the establishment of proper culling programs and, as repeatedly mentioned earlier, novel goat meat supply chains are of paramount importance.

<Box 1> Cashmere and Contraband and China (CCC)

In Mongolia, as the vice president of the Mongolian Wool and Cashmere Association explained, it is common to hear traders talk plausibly about the smuggling of cashmere, especially to China. In reality, however, the lie of the land about the cashmere smuggling, it seems, has not yet been elucidated totally because all the information came to us not personally but allegedly. Thus, during the survey, we interviewed a couple of anonymous traders by making the following questions:

Q1: How do Chinese traders (smugglers) make contact with Mongolian herders?

-They do not make contact personally with herders. They, firstly, make contact with Mongolian traders (changes) and give them an advance. Then, those Mongolian traders buy raw cashmere by visiting personally herders.

Q2: When do they visit?

-In general, before the Chinese New Year, the traders give herders some advance assuring herders that they will buy raw cashmere at a fixed price comparable to the average market price of a given year.

Q3: How large of a group of Mongolian traders is visiting?

-In general, two of them.

Q4: Do sometimes Chinese traders come to the ger as well?

-Mongolian traders only.

[145] NRI. 2009. Infrastructure fortification for industries in East Asia: Certification and quality control issues of Mongolian cashmere in 2008. Nomura Research Institute, Ltd, Japan. (in Japanese).
[146] Steller, R. 1998. *Op.cit*.

Q5: What language do traders commonly use?

-Mongolian only.

Q6: Are all those Chinese traders, in reality, from Inner Mongolia?

-No. such a case is very rare.

Q7: What are the transport and logistic methods?

-From a ger to the village or aimag center, they use a small truck. They have s storage facility near the center. Then, when the volume of collected fiber reaches a fixed amount, which is normally around 10 tons, they bring it to a small scouring plant.

Q8: How do they cross the border?

-Since raw cashmere cannot be exported, some truly primitive processing will be done such as hand selection by picking up debris from the fibers, or simple scouring, after which the "processed cashmere" will be transported in a container with a capacity of 20 ton by using a large truck.

Q9: Do they have any processing plants in Mongolia?

-Yes. Currently, there are about 20 small plants as mentioned in Q7, and they are jointly owned by both Mongolian and Chinese traders.

Q10: What is the method of payment?

-In cash in MNT on the spot.

Q11: Why does herder sell cashmere not to Mongolians but to Chinese?

-Normally, herders do not know that their end clients are Chinese. They sell their product unknowingly to the Chinese.

****

According to the comments made by the aforementioned traders, they are not smuggling at all in the usual sense because, though nominally, they do some processing before the export. In any case, one of the most noticeable aspects of this business is that Chinese traders stay behind the scenes.

3.2.13 Honey

Mongolian beekeeping was introduced by the Soviet Union in 1959 and incorporated into state-owned farms. Although it was once significantly reduced due to the dismantling of the state-owned farm during the transitional economy, it became active in the latter half of the 2000s after the One Village One Product project by UNDP and the distribution of bee colonies by the international NGO World Vision.

Since 2013, Japan has continued technical cooperation with beekeepers and veterinarians through a subsidized project by the Ministry of Agriculture, Forestry and Fisheries and a JICA grassroots technical cooperation project. So far, Japan has the largest support for beekeeping. In the ADB Agriculture and Rural Development Project, which started in 2017, beekeeping was one of the target fields utilizing the results of the JICA project. Until 2019, low-interest loans for beekeeping companies, certification acquisition support, training for veterinarians, etc. were provided from the ADB project.

(1) Inputs

Beekeepers obtain their inputs through individual importers, beekeeping dealers, or domestic production.

The situation for each input is as follows.

1) Bee colonies

Importing bee colonies requires a veterinary certificate from the exporting country and border quarantine, but quarantine officers have very limited knowledge of bees. Those who have imported have testified that the quarantine has never opened the hive and that the veterinary certificate of the exporting country had been already prepared before the bees to buy were decided. It can be said that the health status of bees (presence or absence of pests) is not checked in Russia, which is an exporting country, or Mongolia, which is an importing country. Bees have transboundary infectious diseases such as foulbrood that need to be reported to the OIE, and many of them are highly infectious and spread worldwide. Although foulbrood has not yet been confirmed in Mongolia[147], it occurs worldwide frequently, and the risk of influx is very high[148]. It is necessary to enhance the quarantine system, such as improving the capabilities of quarantine officers.

2) Hive and frame

Most bee hives and frames are produced in Mongolia. In the northern region, it is often made by local woodworkers. Some beekeepers make their own.

The standards for hives and frames are very important for the breeding of honeybees, but in the past, woodworkers had made nest boxes without knowledge of beekeeping. The standards were not met, which hindered the improvement of productivity. However, in recent years, under the guidance of the JICA grassroots technical cooperation project, the standards for domestically produced hives have become suitable for the ecology of honeybees, and MNS of nest box standards have been established (Figure 3.51). It was expected to improve productivity because ADB has distributed the hives with the correct standard free of charge, and bee dealers are now selling them.


Left: frames with large variation (2016), right: A set of hives sold by beekeeping dealers (2019)
Photo: JICA grassroots technical cooperation project "BeeDep-MONGOL"

Figure 3.51 Flames

3) Tools for beekeeping

A kiosk in Shamal Soum, Selenge Aimag has been selling beekeeping equipment, and until around 2017, many beekeepers came here to buy them. Some beekeepers went shopping in Russia and bought them, or asked people who went to Russia to buy them. From around 2017, shops for beekeeping equipment were

147 "The Honey Bee Pathosphere of Mongolia: European Viruses in Central Asia", Khaliunaa Tsevegmid et al., 2016
148 In May 2020, a suspected case of American foulbrood was reported and a sample was brought to the State Central Veterinary Laboratory, but no bacteria were identified. However, Japanese and FAO beekeeping experts (4 person) who saw the images of the colony all said that American foulbrood was strongly suspected.

opened in Ulaanbaatar and started businesses, making it easier for beekeepers to obtain tools. Shops selling beekeeping equipment have also been established in the Selenge Aimag Center, and trading through the beekeeping stakeholder community on social networking sites is also active. In some cases, honey companies sell inputs and tools to contract beekeepers. E-payment is now available everywhere, and there is also a home delivery service in Ulaanbaatar. Transportation by bus or train is also carried out in rural areas, and the access environment for tools has been dramatically improved.

4) Veterinary medicine for bees

In April 2020, an Order from the Chief of the General Agency for Veterinary Service "General guideline for veterinary services and hygiene requirements to be implemented in bee farms" was issued. According to this guideline, bee medicines registered by the National Veterinary Drug Registration must be used, but there are only four types registered in Mongolia, all of which are medicines for varroa mites control only. The four types of varroa mite control medicines were developed by the Honeybee Health and Medicine research laboratory in the Institute of Veterinary Medicine, but they are manufactured by hand, with a maximum production of only 40,000 per year. In many cases, the varroa mite control medicine is used twice per year, in spring and autumn, and about 2 sheets are used per hive, so only about 8000 bee colonies can be covered, which is very short.

There are no registered medicines in Mongolia for fungicides, antibiotics, etc., and these medicines including varroa mite control medicines come from neighboring countries, especially Russia. Individuals go to neighboring countries to buy. Although some are accompanied by a translation into Mongolian, many instructions for use are given only in Russian or Chinese, and it is considered that beekeepers often do not fully understand how to use them. Until around 2016, some beekeepers used medicines that were sprayed directly onto the hive[149]. There is also concern about the acquisition of resistance to mite control agents. There is still great anxiety about the use of medicines.

Figure 3.52 Conteiner Awareness

5) Packages

Beekeepers store honey in storage containers after harvesting. The storage containers that have been widely used in the past have been converted to containers approved for food use due to carcinogenic and other food safety issues.

However, in recent years, packaging containers have rapidly diversified. This is because beekeepers have begun to import and sell honey jars, the establishment of an EC site and transportation route for Mongolia has made it easier for individuals to import, and “changes” and honey companies have begun to manufacture honey products. Not only jars but also packaging containers made of food plastic were beginning to be used. Besides, it has become easier to obtain materials such as labels and promotional

[149] Hives are a place for storing honey, and there is an extremely high risk of direct exposure of agents to honey, food.

items. However, the choice is limited due to the full reliance on imports, and for markets such as Japan, where consumers are highly demanding in terms of packaging, it is very difficult to provide products that meet their needs. Prices are also highly volatile for the same reason: due to logistical disruptions caused by COVID-19 and global inflation, the price of containers has skyrocketed to around double the pre-COVID level.

Figure 3.53 Honey Filled in Reused Jars Sold at the "Autumn Green Day 2020" Exhibition (left) and Honey Purchased in Ulaanbaatar in January 2023

(2) Production

The Mongolian beekeeping season begins in late March. Hives are brought out from wintering houses in late March, the bee colonies start to grow, and the honey harvest season begins from June to mid-August. After that, beekeepers prepare for wintering and bees overwinter from the beginning of November. It is common to place bees near their homes in the spring and then move to the apiary. During the summer, it is common to move the apiary 2-3 times to follow the flowering and return to near home around mid-September (Figure 3.54)

When beekeeping was introduced in 1959, Shaamal Soum, Selenge Aimag was selected as one of the beekeeping areas, and bee colonies were brought in from the Soviet Union. Selenge Aimag is located in the northern forest area and has relatively abundant plant resources as a source of honey. In the forest conservation and livelihood improvement project carried out by World Vision in the 2000s, bee colonies were distributed mainly in Shaamal Soum. Currently, beekeeping is carried out throughout Mongolia, mainly in Selenge, Darkhan-Uul, Dornod, and Tuv Aimags, but Selenge is still the main beekeeping region.

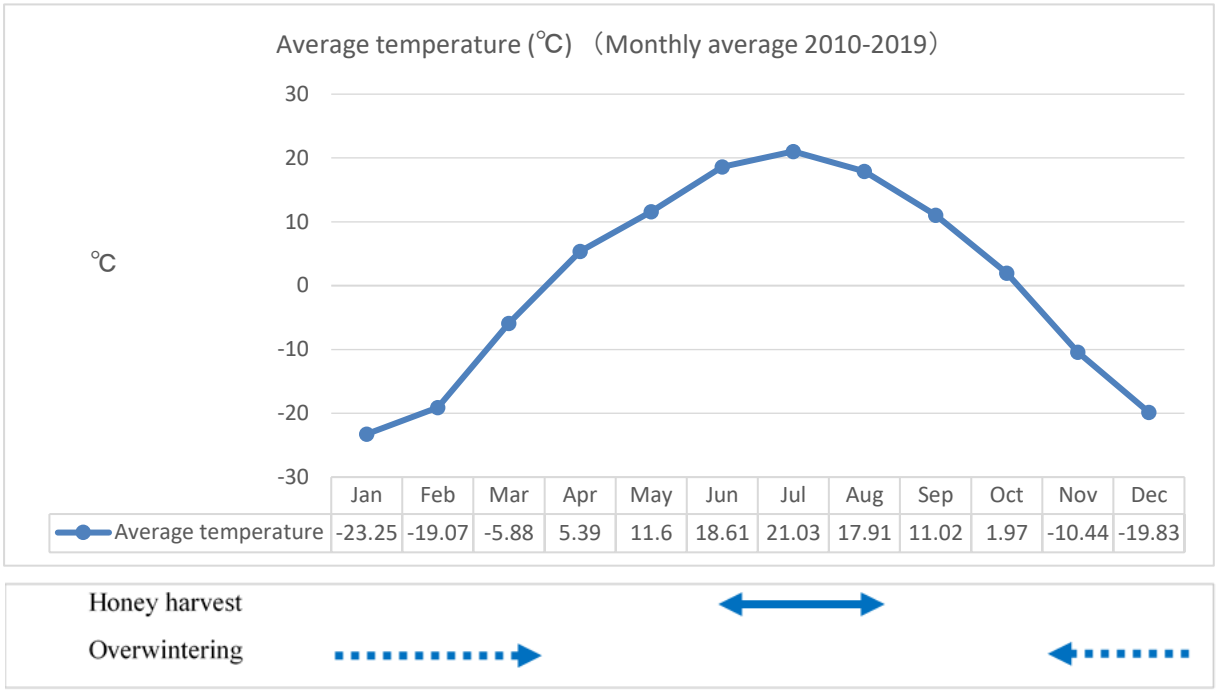
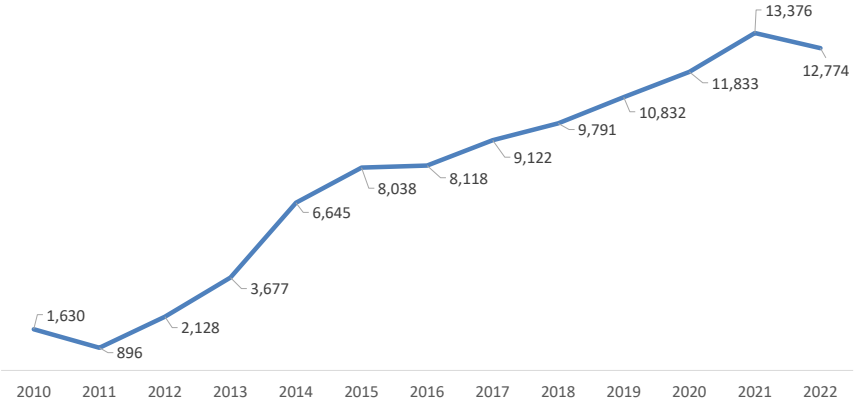


Figure 3.54 Beekeeping Season in Mongolia

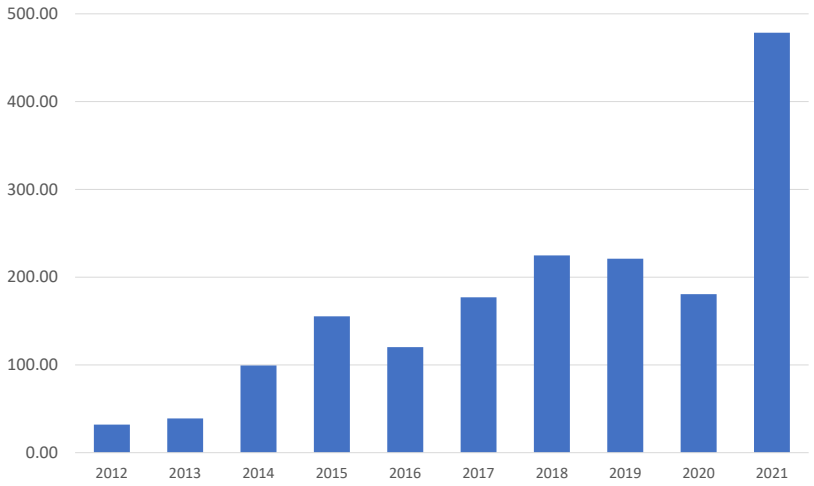
The number of bees is expanding rapidly (Figure 3.55) and along with this, the production volume of domestic honey is also increasing rapidly (Figure 3.56). The number of beekeepers is also increasing, and it is said that the number of beekeepers, which was about 200 in 2010, exceeded 400 in 2014 and 600 in 2016, and has increased to around 1000 as of 2022[150]. Most beekeepers are family-owned part-time producers, but there are also beekeeping companies that employ workers to raise bee colonies and agribusiness companies that operate beekeeping as part of their business.



Source: National Statistics Office of Mongolia

Figure 3.55 Changes in the Number of Bee Colonies: 2010-2022 (thousand colonies)

[150] According to the Mongolian Beekeeping Association and the Mongolian Beekeepers Association Supreme Council



Source: FAO STAT

Figure 3.56 Changes in the Production Volume of Domestic Honey: 2012-2021 (t)

In the production process, (1) productivity, (2) pest control, and (3) overwintering are issues.

From the viewpoint of the honey harvest period and sunset time, Mongolia is not so bad environment for beekeeping. The annual amount of honey harvested per colony in Mongolia is about 8 kg in natural grasslands and about 25 kg in agricultural land, and some beekeepers have annual honey amount of 5 kg or less per colony, but it should be possible to harvest more honey. In the JICA grassroots project, 30 kg/colony is set as the target, but some beekeepers harvest about 50 kg of honey per colony, and the beekeeping technology varies widely among beekeepers. There are many cases of bee colonies being stolen and uncontrolled swarms, which also reduce productivity.

Besides, varroa mites are widespread, affecting many bee colonies. Although there are no statistics, the number of consultations from beekeepers and colony observations show a rapid increase in varroa disease and Deformed Wing Virus transmitted by varroa mites. There are many outbreaks of Chalkbrood and Nosema disease. Furthermore, in the summer of 2020, Sacbrood was first confirmed, and there were multiple cases of suspected American foulbrood. By varroa mites and foulbrood, the colony may collapse at once in some cases, and proper breeding management is required. It is important to control honeybee infectious diseases throughout the region because honeybees are transferred to each other, but few veterinarians have knowledge about the ecology and pests of honeybees, and the knowledge and skills of beekeepers are lacking.

Overwintering is an unavoidable part of Mongolian beekeeping. In areas where beekeeping is popular, wintering houses are built, and many beekeepers put colonies there to overwinter[151]. The failure rate for overwintering is said to be around 19%[152], but it varies greatly depending on the state of the bee colony in autumn. The risk is high because all the colonies can be lost if the management in autumn, especially the varroa mite control, is not successful. Since overwintering requires construction costs and storage fees, it is also necessary to balance the cost with the risk of overwintering failure.

[151] In the JICA grassroots technical cooperation project, a technology for overwintering in the garden was developed for the wintering of small beekeepers.
[152] Interview with Mihachi

These production problems are directly linked to the production cost of honey and are a factor that causes high prices. In Mongolia, where there is competition from imported products, high prices mean a decrease in competitiveness.

To solve these problems, it is indispensable to raise the level of beekeeping technology. Honeybee research and development of beekeeping techniques have been slightly attempted at the Institute of Veterinary Medicine, but no systematic research and development has been carried out. The beekeeping technical manual issued by the JICA Grassroots Technical Cooperation Project is used in training conducted by beekeeping associations and donors, and so far it is almost the only beekeeping textbook.

(3) Distribution

Many beekeepers, including beekeeping companies, fill their honey and sell it directly to consumers at events or on the roadside by themselves. Some beekeepers say that their inventories are increasing due to the rapid increase in beekeepers and honey production, and gradually, wholesale sales to honey manufacturers have increased.

There are not many cases, but some beekeepers consign honey to supermarkets and local markets. Most of the food booths in the market and supermarkets in the market have Mongolian honey. There are cases of purchase, but most of them are consignment sales, and if they are sold, the beekeeper receives only the sold amount.

Around 2017, Gachuurt started selling as a honey manufacturer. Since then, the number of honey manufacturers has increased, with Mihachi expanding its honey collection and distribution business in addition to honey produced by its beekeeping department, and Permaculture Development LLC also having a group of beekeepers to collect and sell honey. In January 2023, the supermarket chains in the capital counted 15 companies with products in their supermarkets, including three that had already obtained HACCP.

This is considered to have been triggered by the following. In addition to the fact that consumers in Ulaanbaatar, the main market, began to buy honey mainly from supermarkets, COVID-19 led to a sharp rise in the price of bottles and other packaging materials, and restrictions on movement within the country slowed down beekeepers' sales activities. According to a honey market survey conducted in 2021, 46% of consumers buy honey from major supermarket chains and 18% from neighborhood supermarkets.

The distribution channels are gradually becoming more complex, with the former simple 'beekeeper to consumer direct' distribution now passing through companies and retail outlets.

As the distribution process is developing into one involving business entities, quality is gradually improving. Previously, beekeepers did not have access to the needs and requirements of the market and did not see the need for quality control. However, by doing business with honey companies and supermarkets, they are now required by their business partners to comply with standards, analyze ingredients in laboratories, attach certificates, etc. The issuance of general guidelines for beekeeping and the establishment of a system in which veterinarians are involved in the management of the bee population and the quality of honey have also contributed to the improvement of quality. Mongolia has a honey standard (MNS 6294:2019), which

sets standards for sugar content (moisture), foreign matter, and general bacterial contamination. For the consumer in general, sugar content and foreign matter contamination are the easiest to distinguish. In the past, it was common to see honey with a significantly lower sugar content than the standard, or products contaminated with bee parts or waste, but such products are now less common in supermarkets in Ulaanbaatar.

When companies procure honey from beekeepers, they pay the beekeepers on the spot, while sales are made on consignment and the company is not paid for the sales until several months later. Securing money for honey procurement is a problem. The short production season means that enterprises carry a lot of stock, which costs them dearly. Stable supply is essential for distribution through supermarket chains and for export, which requires increased procurement by enterprises. It is necessary to reduce the financial burden on enterprises and stabilize their cash flows.

(4) Processing

As mentioned above, beekeeping companies have been born and are being filled in the manufacturing process. Since Mihachi, one of the major manufacturers, commercialized nut honey with pine nuts from Mongolia in 2016, honey products with pine nuts, almonds, lemons, etc. have been developed. In 2022, Mihachi also started producing and selling honey cookies. On the other hand, processing into non-food products has not yet progressed.

Honey is used in beverages and confectionery, and PET bottled beverages such as sea buckthorn juice with honey and honey lemon are often found in Mongolia as well. In order to support such mass production, it is necessary to deliver products of stable quality, including flavor and color, in stable quantities and at specified timings. However, the flavor and color of honey are greatly affected by the flowering status of the nectar source plant and the honey collection status of the bees, and the beekeeper cannot control it. The equipment for decolonization and deodorization has become a huge facility, which is unrealistic to introduce in Mongolia. It is necessary to consider how to process various types of small-scale products, such as combining them with local ingredients and using them for cooking in restaurants. The project launched an event called 'Honey Week' in November 2021 to encourage the use of honey in restaurants. Fourteen restaurants participated in the event and were asked to use honey in their beverages and food. Five of the restaurants that participated in the event are still using domestic honey, including some restaurants that had been using honey before the event.

Figure 3.57 Honey Food Sold at the Exhibition

(5) Sales and Consumption

The honey market is expanding year by year.

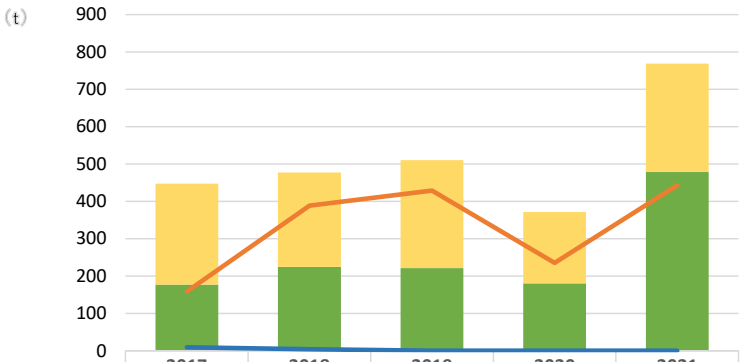
On the other hand, consumers have limited knowledge of honey: "There are many spoofing of honey distributed", "sweet because it added sugar", "crystallized product is not natural honey (or non-crystallized product is not honey)", there are assumptions and misunderstandings. Furthermore, in Mongolia, both natural

honey and artificial or sugar-added honey are labeled as "honey" and are sold together on the same shelf in supermarkets. Artificial honey is indicated to contain sugar in its ingredients, but not many consumers check the label carefully. Some consumers may assume that artificial honey is natural honey and buy it, while others may confuse artificial honey with natural honey and doubt the authenticity of the honey.

Consumers' selection criteria for honey are "domestic", "delicious", "cleanliness", and "safety", and there are increasing opinions that they do not like dirty products[153]. Until around 2017, honey products with honeybee legs and bodies were sometimes sold "to appeal to real honey", but in the 2019 survey, there were no consumers who wanted to buy those with honeybee bodies and legs. At the Autumn Green Day 2020 exhibition, beekeepers reported that honey in cute jars sold overwhelmingly well, and the design and cleanliness have captured the hearts of consumers. In response to these trends, honey sold in supermarkets today is often sophisticated in design.

Consumers often drink honey by dissolving it in hot water, and it is also used as a substitute for medicine. It is rarely used in yogurt dairy products or cooking. Per capita honey consumption in Mongolia is low, at about two-thirds of the world average[154]. In the future, providing honey information to consumers from the production side and introducing various ways of eating will contribute to the steady expansion of the honey market.

(6) Export and Import



	2017	2018	2019	2020	2021
Import (t)	270	252	289	191	290
Production (t)	177	225	221	181	479
Export (t)	9	4	0	0	0
Consumption (t)	159	389	429	235	443

Source: ITC

Figure 3.58 Changes in Honey Import/Export Volume

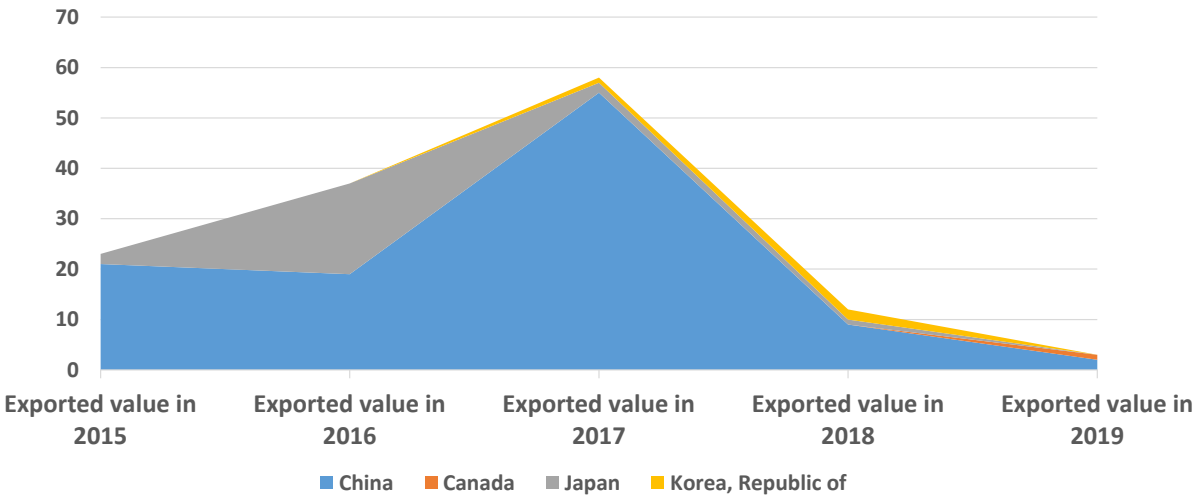
For many years, honey has been dependent on imports. In recent years, domestic production has increased, but it has not been able to cover the domestic market. On the other hand, there are inquiries from Chinese companies about honey from Mongolia. Mongolian honey has been popular at exhibitions held in China. On the other hand, negotiations with China on honey exports are still underway and official exports are not

[153] Provided by JICA Grassroots Project "Autumn Greenery Day 2019 Exhibition Consumer Survey by Beekeepers" (74 questionnaires)
[154] FAOSTAT (accessed March 2023)

yet possible. Exports will be possible once negotiations have been concluded and exporters have been pre-registered. In the case of food exports, China requires companies to obtain HACCP certification and honey manufacturers must comply with this. When it comes to exports, it is necessary to ship a considerable amount stably to improve productivity and build a stable collection system.

Food safety is China's top priority concern, and violations such as residual medicines and pesticides pose a high risk of disruption or market abandonment. In addition, honey is very often disguised as its place of origin. Export requires production process control and traceability. A honey traceability system has been developed under the project and is now being used, and the Research and Development Centre for Food, Agriculture, and Light Industry under MOFALI is responsible for dissemination.

Honey is one of the luxury items, and there is a need for unknown taste in developed countries. Japanese honey companies also collect honey of various flavors from all over the world and provide it to consumers, and in that respect, there is a need for honey from Mongolia. For these reasons, Mongolian honey has been exported to Japan (2016 and 2022), but it is not priced competitively. About 90% of Japan's imported honey is from China, but the CIF price is around JPY 300/kg, which is a big gap from Mongolian honey[155]. Prices are not an issue in the Chinese market, and it is not a good idea to aim only for price competitiveness, however, in the international market, it is necessary to be more or less price competitive.



Source: International Trade Center

Figure 3.59 Export Value by Partner Country (1,000 USD)

(7) Issues and Challenges

The three major issues in beekeeping today are unstable production, unstable quality, and high costs.

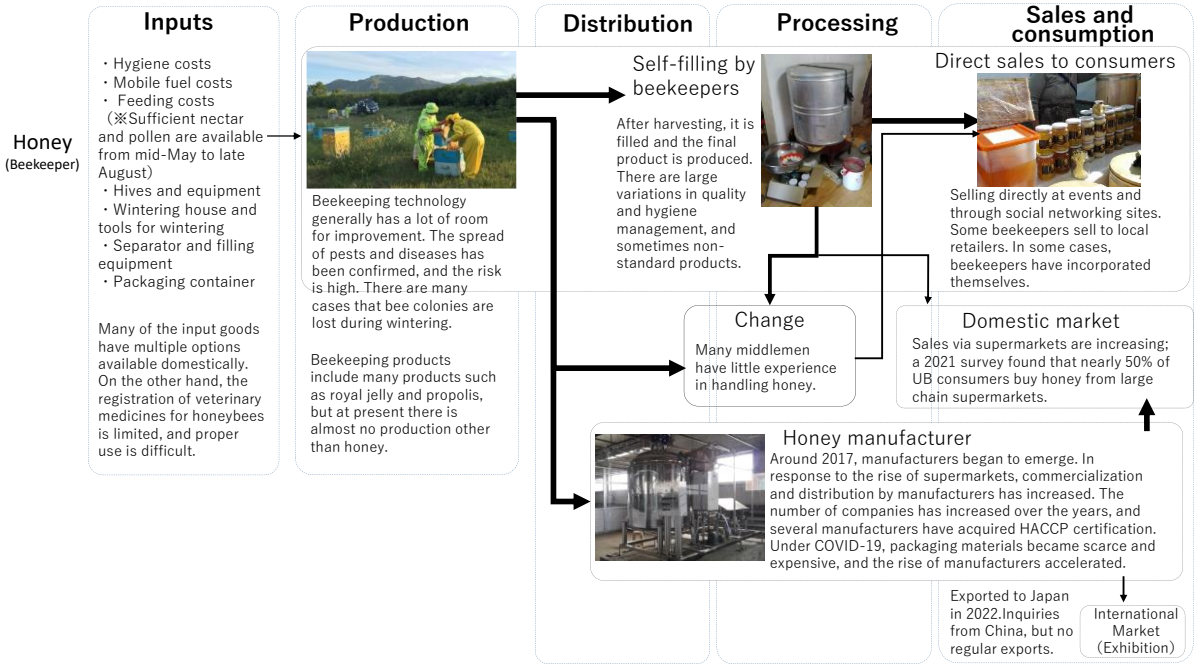
Since the beekeeping techniques of individual beekeepers differ greatly and the productivity is low as a whole, the production cost does not decrease. In addition, pests and diseases occur frequently, and some beekeepers overwinter with weak colonies and lose all. Failure to overwinter greatly reduces productivity.

[155] The value of honey imported from Mongolia was JPY5, 588/kg compared to JPY279/kg from China. (Cumulative total for Jan-Dec 2022, Trade Statistics, Ministry of Finance)

With the import of colonies, the risk of new bee pests and diseases invading and spreading to Mongolia is extremely high.

It is important to continue to work with beekeepers to improve their beekeeping technologies, including controlling pests and diseases.

Besides, many beekeepers set up apiaries in the distance and move repeatedly. The current situation is that beekeepers cannot evaluate the source of honey and do not calculate costs. There are cases where production volume cannot be expected while moving apiary costs only. When beekeepers are responsible for everything from production to marketing, sales costs, and sales labor are excessive, but many beekeepers are still unaware of this. Beekeepers are required to think about how to spend and sell, including the labor costs of the beekeepers themselves.



Source: JICA Project Team

Figure 3.60 Conceptual Diagram of Supply Chain of Honey

As a quality risk, the problem of residue is serious. There is little coordination between agriculture and beekeeping, and beekeepers have no information about when, where, and what pesticides are applied. The effects of pesticides on nectar and honey have not been studied in Mongolia. Insecticides also affect honey bees. In addition, as mentioned above, there is also the fact that veterinary medicines for honeybees are individually imported and used "freely". Veterinarians, quarantine officers, and food inspectors who should normally be involved in pest and disease control and honey quality control have an insufficient understanding of beekeeping and have not been able to contribute to quality improvement and safety assurance.

Under these circumstances, it is necessary to establish a control point somewhere in the value chain. Once a control point is established, safety and quality can be checked there. Strong customers who present their requirements to beekeepers and demand compliance are needed for food safety and good quality. In the honey

value chain, one of the control points is the honey manufacturer. Manufacturers can put appropriate pressure on beekeepers through specifications and purchasing behavior. Collecting honey at the manufacturer makes it easier to thoroughly record production and control honey quality. It will be easier for inspectors to check. In addition to the introduction of a honey traceability system, a honey GAP is currently being developed, and quality control methods and monitoring systems are being established from input goods to production, filling, and marketing.

Beekeeping products include products such as royal jelly and propolis, and services such as pollination, in addition to honey. In particular, pollination is very important in terms of beekeeping income and improvement of agricultural productivity. New beekeeping styles such as forest conservation or supplementary income from the use of rangelands such as winter lands may be possible. New products and services for the beekeeping industry in Mongolia will be developed not only by individual beekeepers but also through involvement with various stakeholders.

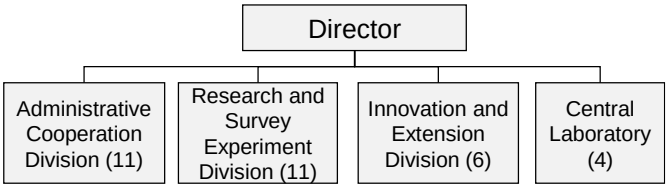
3.3 Current Status and Issues of Government and Private Services in Agro-pastoral Sector

3.3.1 Agricultural Extension

Agricultural extension services are provided by the Food, Agriculture, Light Industry Research and Development Center (R/D Center). This organization was established in the summer of 2020 by merging the National Agricultural Extension Center (NAEC) and the ARMONO, which were under the jurisdiction of MOFALI. In addition to the above, various donors and NGOs also play a role in agricultural technology extension, but only on a local or temporary basis. It summarizes the current status and challenges of agricultural extension activities mainly by the former NAEC.

(1) Food, Agriculture, Light Industry Research and Development Center (R/D Center)

The R/D Center is an organization under the jurisdiction of MoFALI, and its various activities are financed by the MoFALI budget. 15 staff members of NAEC as of 2020 will be integrated into the R/D Center, and by 2023 there will be about 35 staff, more than half of which are technology staff. The R/D Center also collaborates with Aimag and Soum in the agriculture and livestock sector, conducting various surveys and training programs. Specifically, the R/D Center's staff provides training on agricultural techniques and systems to the aimag agricultural department and soum agricultural officers, and aimag and soum staff provide training and guidance to disseminate the information to farmers as needed.



Source: JICA Project Team based on the interview with R/D Center

Figure 3.61 R/D Center Structure

The main role of the Center has been taken over from the former NAEC to formulate the National Comprehensive Development Plan, the National Policy on Food and Agriculture, the National Basic Policy on Social and Economic Development, and the National Policy on Science and Technology. Besides, within the framework of the innovation program policy and other policies, NAEC also provides technical assistance to agro-pastoralists and improves their productivity through the introduction of new technologies and equipment, as well as training and extension services. Specific activities in each field and related major laws and regulations are summarized in the table below.

Table 3.21 NAEC Activities in each Field and Related Major Laws and Regulations

Field	Activity	Laws and regulations to be observed, and related policies
Livestock	Training and exchange meetings on pastoral livestock technology, formulation, and provision of manuals, collaboration with various related organizations, the extension of results of scientific and technological projects and research, etc.	National Policy on Food Agriculture Industry, Law on Livestock Gene Pool, National Policy on Pastoralists, Mongolian Livestock National Program, National Program for Promoting Intensive Livestock Industry
Agriculture	Training and agricultural extension, collaboration with various related organizations, the extension of results of scientific and technological projects, and research, etc.	Law on Agriculture, Plant Protection, Agricultural Insurance, and Seeds, National Program on Vegetables and Fruits, Regulations on Traceability and Registration for Food of Plant Origin, Regulations on Pesticides and Chemical Fertilizers, etc.
Food	Training and exchange meetings on food and food technology, collaboration with various related organizations, the extension of the results of scientific and technological projects, etc.	Food Law, Food Security Law, Organic Food Products Law, National Program on Healthy Food and Healthy, National Program on Packaging, Meat and Milk Campaign, etc.
Light Industry	Training and exchange programs for light industrial technology, collaboration with various related organizations, the extension of the results of scientific and technological projects, etc.	Innovation Act, National Program on Industrialization, National Program on Cashmere, National Program on Packaging, etc.
Veterinary	Training and exchange programs for veterinary technology, collaboration with various related organizations, the extension of results of scientific and technological projects, and research, etc.	Law on Livestock Health, Veterinary Drugs and Preparations, Livestock Gene Pool, National Program on Livestock Health, Regulations on Preservation and Protection of Drugs, Veterinary Quarantine, Certification and Security Mark of Veterinary and Health, etc.

Source: JICA Project Team

3.3.2 Research and Development

Research and development institutions in the agriculture sector are as follows

- Higher Education Institutions: Mongolia University of Life Sciences (Faculty of Veterinary Medicine, Animal Industry and Biotechnology, Engineering and Technology, Agro-Ecology, Economics and Business, Graduate School, and College of Agriculture in Darkhan). The university is one of the largest universities in the field of agriculture and pastoralism, with about 10,000 students, 5,500 undergraduates, 2,800 master students, and 700 doctoral students. Also, the National University of Mongolia and the Mongolian University of Science and Technology have faculty related to the sector. (https://en.muls.edu.mn/)

- Research Institute: Institute of Veterinary Medicine, Research Institute of Animal Husbandry, Plant Science and Agricultural Institute, Plant Protection Research Institute under the Mongolia University of

Life Sciences

- The Biocombinat State-owned Factory, State Central Veterinary Laboratory, State Veterinary Drug Quality Control Laboratory under the Veterinarian Agency
- National Center for Zoonotic Disease (NCFZ) (https://nczd.gov.mn/?page_id=9291&lang=en)
- In the field of light industry, there are the Mongolian University of Science and Technology (MUST), and the Food, Agriculture, Light Industry Research and Development Center under MOFALI.

3.3.3 Agricultural Organization

In 2019, there were 4,572 cooperatives country. The regional distribution of cooperatives is as follows: 1,373 in the Western region (5 aimags), 1,299 in the Khangai region (6 aimags), 786 in the Central region (7 aimags), and 92 in the Eastern region (3 aimags) and Ulaanbaatar[156].

The National Association of Mongolia Agricultural Cooperatives (NAMAC) is a nationally active farmers' organization. As of 2020, NAMAC consists of 493 member federations and 128,000 pastoralists and farmers. The organizational structure is as follows: union> provincial agricultural cooperatives> NAMAC. The union pays an annual membership fee of 150,000-300,000 MNT to the provincial cooperative (the amount is decided by the provincial cooperative), and the provincial cooperatives in 21 aimag pay an annual membership fee of 350,000 MNT to NAMAC. The total amount of these annual fees is about 7, 35,000 MNT, which is in the form of a liability guarantee for the cooperative rather than a fund for activities. The issues of the organization are to promote marketing (sales and consumption of products from the cooperative through a joint sales system) and to match project programs with the cooperative. The scale of production has remained small due to limited sales channels and volume.

3.3.4 Food Hygiene Management

(1) Laws and Regulations Related to Food Hygiene Management

Target 2.5 of “Long-term Development Policy Vision 2050” aims to create a healthy and comfortable environment that meets living needs and secures food safety. In particular, the introduction of food traceability, slaughter under sanitary and controlled conditions, hygiene control system, and improvement of inspection function as “establishment of record system through manufacturing and distribution of foods, enhancement of quality control and food security structure” and harmonization of international standards, strengthening of corresponding to transboundary infectious diseases, health management of livestock and ensuring to access to safe food access for all citizens as “supply of safe and nutritious food” is aimed.

Under the “Sustainable Development Vision 2030” as well, development goals in agriculture and livestock fields are set. Goal No. 1 aims to promote advanced technology and innovative development and to create a sanitary environment with a view to exports by introducing international standards. Goal No. 2 aims to ensure access to safe food for citizens and set the numerical target of meat, milk, and dairy products that are

[156] NSO (2019) “Statistical Yearbook 2019”

processed at the plant, and slaughterhouse under sanitary controlled conditions.

Additionally, the "National Policy on Food and Agriculture 2015-2025" set a medium-term target related to food hygiene management is set. The target, is an increase in meat and milk treatment in slaughterhouses and milk plants, control at all stages of the food chain, the establishment of a registration and certification system, ensuring of the safety of input goods, manufacturing goods comply with maximum residue limit, improve labeling and package to ensure safety and to reduce the impact on the environment at all stages of food-chain, enforcing quality control of catering meals, management of food safety risks, corresponding to international trend and issues, database building on production, import and export and food balance and creating linkage with food safety data and consumer education are aimed.

In Mongolia, the Food Law was revised and became effective in 2013. Food Safety Law also became effective in the same year. In Food Law, "food security" is defined as "a possibility of a stable and sufficient use of qualitative, nourishing and safe food during the entire life of a human independent from economic and social conditions, the geographic location of the country" (Article 3.1.2). "Food hygiene" is defined as "all conditions and measures applied along the food chain necessary to ensure the safety of food" in Food Safety Law (Article 4.1.5). There are several laws and regulations related to food hygiene management as follows (Table 3.22)[157];

Table 3.22 The Laws and Regulations Related to Food Hygiene Management

Laws and regulations	Outline	Approved/most recent revision
Food Law	Regulations on matters related to providing nutritious and safe foods to the people in a stable and accessible manner.	Approved in December 2012 Revised in January 2023
Food Safety Law	Regulations on matters related to ensuring the safety of food products and their raw materials at all stages of the food chain.	Approved in December 2012 Revised in January 2023
Water Law	Regulations on water resources and watershed protection, proper use, and restoration.	Approved in May 2012 Revised in January 2023
Genetic Resources Law	Regulations on registration, identification, conservation, protection, sustainable use, and research of livestock genetic resources.	Approved in December 2021 Revised in January 2023
Animal Health Law	Regulations on animal health and hygiene of livestock and animal origin products and their raw materials.	Approved in December 2017 Revised in January 2023
Law on Quarantine and Inspection for Transferring Animals, Plants, Raw Materials, and Products with Their Origin Through the State Border	Regulations on animal and plant quarantine operations at borders.	Approved in November 2002 Revised in November 2022
Law on Cultivated Plant Seeds and Sorts	Regulations on crop genetic resources, seed inspection, and seed production.	Approved in October 2021 Revised in November 2022
Law on Plant Protection	Regulations on phytosanitary work for disease, death, rodent damage, and weed control of grasslands and cultivated plants.	Approved in November 2007 Revised in January 2023
State Inspection Law	Regulations on the legal framework, purpose, means, etc. for national inspection and audit work.	Approved in January 2003 Revised November 2022

[157] Food Safety Law Article 2

	Implementation of on-site inspections and unannounced inspections to maintain the health of the people's body, society, and environment.	
Law on Hygiene	Compliance with hygiene regulations, ensuring occupational safety, providing hygiene education to employees	Approved in February 2016 Revised in July 2023
Law on Stock Exchange of Products of Agricultural Origin and Raw Materials	Regulations on the supply, storage, transportation, trading, etc. of agricultural products, setting the establishment and organization of Agricultural Exchanges and legal grounds.	Approved in June 2011 Revised November 2018

Source: JICA Project Team

Resolution 36 of the Parliament "On some measures and initiatives to establish food supply and security" also includes measures on food hygiene and quality control. Strengthening the legal system, including reviewing the Food Law and Food Safety Law and revising standards and criteria, strengthening control over food business operators and developing human resources within companies, and strengthening incentives and monitoring for quality control are among the measures stated. All laws and programs mentioned above focus on food hygiene management.

(2) Administration on Food Hygiene Management

The National Food Security Committee, which is directly under the Prime Minister, is the higher authority responsible for coordination and decision-making on the stable supply of safe and healthy food. Food hygiene management is treated as part of food security. The Ministry of Food, Agriculture and Light Industry, the Ministry of Health, and the Ministry of Social Protection are members of the National Food Security Committee. The Ministry of Food, Agriculture, and Light Industry is responsible for food hygiene control, the Ministry of Health for public health and nutrition, and the Ministry of Social Protection for ensuring access to food for the poor. Previously, the General Agency for Specialized Inspections (GASI) was also represented on the committee, and GASI was responsible for inspections in accordance with the legislation of the ministries, but this has now been dissolved. It has been incorporated into the relevant ministry as an inspection department and agricultural and pastoral products are now managed by the Department of Industrial Inspection, which has been incorporated into MOFALI. GMPs and GHPs to be complied with by food business operators were taken care of by the Department of Inspection of the Ministry of Health, while the Department of Inspection Management was established under the Chief Cabinet Secretary and coordination has begun. The GASI inspectors who were assigned to each Aimag were also incorporated into the relevant departments.

The Food Safety Law stipulates that each business operator is obliged to manage food hygiene at every stage of the food chain. Food business operators must obtain MNS certification (product certification), the national standard set by the Mongolian Agency for Standardization and Metrology (MASM), on their products. Food products are inspected by an inspection laboratory accredited by MASM, and the food business operator applies to MASM for certification for the product with the inspection report. Once certified, the food business operator will sell the product with an MNS number or the mark of “MASM certificate”. The supervision of these food business operators used to be carried out by the GASI, which had significant

powers, including on-site inspections and penalties for offenders, and also provided food hygiene training for food business operators. These powers have now been devolved and are held by the various ministries.

(3) Inspection Organizations

The National Laboratory for Food Safety and Standards (NRL) was under GASI but has now been transferred to MASM. There are also branch laboratories in each state that conduct inspections and they now belong to MASM, except the laboratories in Altanbulag on the Russian border and Zamin-uud on the Chinese border which were transferred to the Customs Service. According to Article 15 of the Food Safety Law, the NRL is designated as the only reference laboratory in Mongolia and is required to carry out the following businesses; ①Implementation and recommendations of food safety tests, ②Database of inspection results by accredited inspection bodies, ③Definition of food safety and obtaining approval from related government agencies, ④ Approval of risk assessment guidelines, ⑤ Development and certification of inspection methods and implementation of inspection, ⑥Coordination between accredited inspection agencies and guidance to them, ⑦ Recommendations for food hygiene management and technical regulations, ⑧ Guidance on food testing methods and sampling. In a case, that the food business is inspected by an accredited inspection agency and the results are questionable, the NRL rules.

Besides, MOFALI also owns the State Central Veterinary Laboratory (SCVL). SCVL deals mainly with livestock diseases but also conducts safety inspections and standard inspections for some livestock products.

(4) Standard and Certification

Standards and certifications are important for exports. Interest in international standards is increasing year by year in Mongolia as well. For example, the number of certifications (number of valid certifications) for ISO 9001, a quality management system standard, was 188 at the end of 2021, a significant increase from 61 in 2019. Of the 188 certifications in 2021, 26 were for food, 6 for leather, and 2 for textiles. The number of ISO 22000, food safety system standards, was 18 at the end of 2021, also up sharply from 8 in 2019[158]. The introduction of HACCP has also gradually begun. Currently, only two certification bodies handle HACCP certification, but technical standards for meat and honey are in place and companies are increasingly interested[159]. The Mongolia Export Development Project (EDP), to be implemented by UNIDO in 2021 with funding from the World Bank, provides technical assistance to improve Mongolia's accreditation and certification capacity. By training experts in services related to international certification, the project supports SMEs in non-mining sectors to strengthen their export capacity and expand their access to export markets. Efforts are also being made to ensure the equivalence of international certification. In organic certification, for example, EDP is analyzing legal documents, selecting potential crops and foodstuffs, and attempting to make specific revisions to Mongolian regulations in order to ensure equivalence with Chinese organic certification. The EDP also actively supports Halal certification. Some meat companies have obtained all related certifications such as ISO 22000, HACCP, FSSC 22000, and Halal for export[160]. More and more

[158] ISO Survey (https://www.iso.org/the-iso-survey.html)
[159] Interviews, January 2023.
[160] Interviews, June 2023.

companies will be seeking international certification in the future.

(5) Issues in Future

In the domestic market, as mentioned above, the quality of products is controlled by MNS, and products are distributed according to certain standards. However, among the products produced by small factories or individual manufacturers, even if the products have MNS attached, the contents are out of standard in some products in the market. It is desirable to strengthen monitoring by inspection departments and to implement training for micro-businesses by the government.

For livestock products, the "Origin Certificate[161]" issued by a veterinarian should be attached to raw materials and products throughout every process of the value chain from nomads to retailers through distributors and slaughterhouses. Nomads contract with the village veterinarian to diagnose livestock diseases, administer veterinary medicines under the control of the veterinarian, and record them.

Under the system, all livestock products distributed in Mongolia will be labeled with an Origin Certificate, which will identify which nomads raised the livestock and how the diseases were controlled. However, operational issues were pointed out in the past, such as discrepancies between the quantities stated on the Origin Certificate and the quantities distributed[162]. Since then, policing by the police at county borders has been strengthened, and in 2023, GAVS control and penalties for offenders were further tightened for meat. From 2024 onwards, the plan is to expand the scope of strengthened control to all livestock products, which shows the seriousness of the Mongolian Government's commitment to livestock product quality control. The completion of a Mongolian Animal Health Information System (MAHIS) a comprehensive livestock production information system, and the computerization of information on the production and distribution of livestock products, have also contributed to the strengthening of controls.

Regarding the livestock sector, the Mongolian Government is focusing on introducing and promoting GAP and GHP, intending to promote meat exports in particular. In order to mitigate the effects of transboundary animal diseases that make meat exports difficult, the IFC's meat project is attempting to introduce compart mentalism through feedlots, but this should be separated from nomadism. Resolution 36 also sees increasing the share of meat through slaughterhouses as one challenge. Meat is greatly affected by transboundary diseases, and when exporting, there are cases in the partner country that require the identification of the production area and distribution route. Recently, many slaughterhouses have been constructed in the suburbs of Ulaanbaatar, but many of them have not been treated hygienically, and standardization of slaughterhouses and slaughtering procedures is an issue[163].

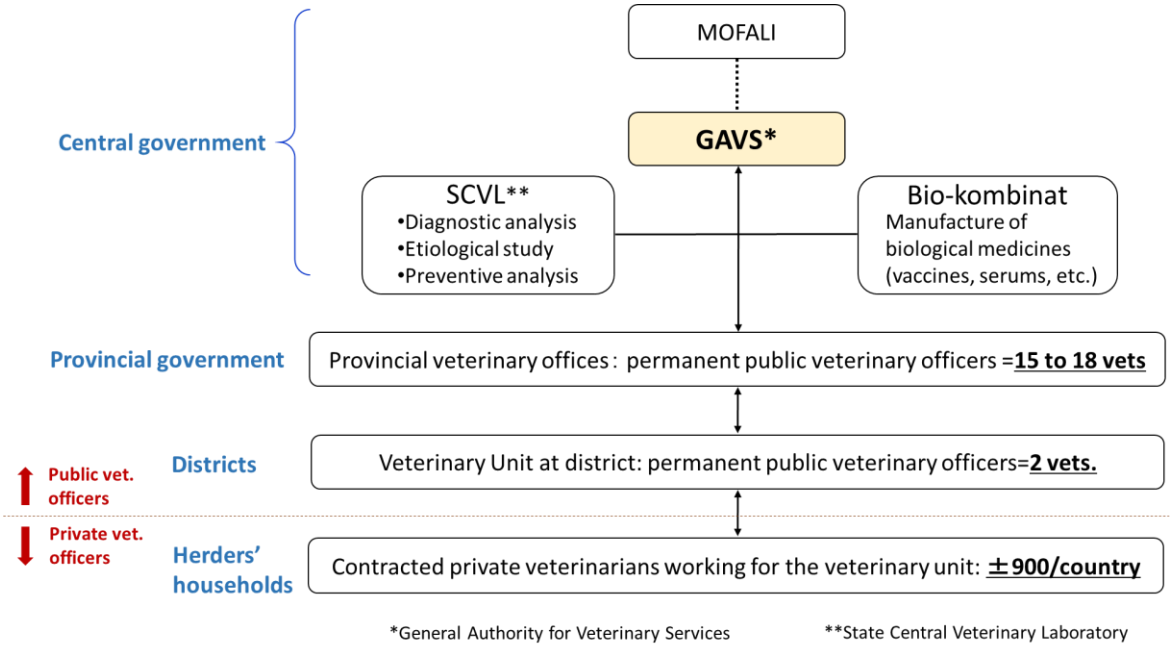
Quality assurance of food through the food chain is important for obtaining international certification. Additionally, to strengthen the national certification system, regardless of whether it is a domestic system or international certification, it is necessary to raise the overall level. The system has been established and the

[161] Although the term "certificate of origin" is used, it is a record of production details such as producers (nomads), medication details, and disease history.
[162] MONALIS p.3-102
[163] Interview survey on 28 October 2020

introduction of international standards is progressing. There are inspection laboratories in every Aimag, and an environment has been created in which food business operators can inspect their products and raw materials. The NRL and SCVL are also allocated facilities such as inspection equipment and an ordinary budget, and the basic finances are in place. In the future, to ensure the operation of the system, it is necessary to provide strong guidance and incentives from government agencies, train food business operators, and develop related human resources. It is also important to put reasonable pressure from the market on business operators. For that purpose, consumer education and public relations activities, disclosure of violators, and quality control requirements from downstream to upstream by expanding B to B will be effective.

3.3.5 Veterinary Service

The headquarters of all the activities related to veterinary services is the General Authority for Veterinary Services (GAVS) which was newly established in 2018 as an independent agency yet under the umbrella of MOFALI.



Source: JICA Project Team

Figure 3.62 Organizational Chart of the Animal Health System

(1) Animal Health System

Figure 3.62 shows the animal health system in Mongolia, as a whole. GAVS, together with the twin institutes, State Central Veterinary Laboratory (SCVL) and Bio-kombinat, under its administration, controls all the veterinary services in Mongolia. SCVL, established originally in 1965 during the socialist era, has the objective to conduct all diagnostic analyses and veterinary investigations for prevention. SCVL works in coordination with veterinary laboratories belonging to the provincial veterinary offices[164]. In terms of biosafety level, SCVL has a facility with level 3, in which operators can handle, for instance, rabies among

[164] A new communication network system was introduced between SCVL and regional veterinary laboratories.

important and highly contagious animal infectious diseases. Bio-kombinat, whose establishment goes as far back as 1923 before the socialist era, manufactures more than 20 necessary veterinary biological products such as vaccines for Sheep pox, Goat pox, and currently for FMD as well, which was not available until recently. Although its deterioration is obvious, this longstanding institute still functions in the original historical building near Ulaanbaatar (*See* Figure 3.64 and Figure 3.65). Thus, an alleged refurbishment project by the Hungarian government would be timely and ideal[165].

Concerning the provincial level, as shown in Figure 3.62, a provincial veterinary office functions as a "control tower", which could be a part of a provincial common building for government offices or an independent building on the premises of the common building. For instance, in the case of Tuv aimag, near Ulaanbaatar, an independent veterinary office is in use for which 15 to 18 veterinary officers work (Figure 3.66). They always keep in touch with SCVL veterinary officers, especially when an outbreak of animal infectious diseases occurs in their region. Also, all those preventive veterinary services such as vaccinations against FMD, which are obligatory and thus given free of charge by the government, are provided through this channel to all the veterinary units situated in each district[166]. In a great majority of cases, a veterinary unit has its office in the district office where local private veterinarians visit. Those private veterinarians have their quota of work for vaccination or health checks on a contracted basis. Generally, a four-year term is the norm and can be renewed. This system shows a strong resemblance to that of the Japanese Association of Animal Health for Livestock Products[167]. In the case of Mongolia, however, unlike their Japanese counterparts, Mongolian private veterinary practitioners are highly dependent on this contract for their livelihood. They visit the veterinary office once in a while for various reasons such as provisions for veterinary medicines, OJT training, or a contract renewal (*See* Figure 3.67). In the case of the private veterinarians working in Tuv aimag, the number of herder households they habitually attend to may range between 40 and 300, resulting in them treating approximately 35,000 head of animals per year. Hardly surprisingly, their working conditions are far from ideal.

(2) Domestic and International Border Control

In Mongolia, there is an Act for regulating animal health, which is divided into 5 chapters with 16 verses and 150 short divisions[168]. The Act defines clearly almost all the aspects of animal health including border control. Judging from the interviews we conducted with veterinary officers at the border checkpoints and the Mongolian Veterinary Association, however, full compliance is by definition not the case.

Linked to border control, from a viewpoint of animal health, important is the physical structure of fences of the border barrier. Unfortunately, in Mongolia, as shown in Figure 3.68, it is a mere simple steel fence,

[165] Mongolia News Letter, p.2 Vol.774, 2020
[166] The information shown here is based on an interview made in GAVS in October, 2020. Nevertheless, based on some other sources of information, for instance, at Mongolian Veterinary Association, the total number of private veterinarians working directly with herders is around 1,400. Thus, due attention should be given.
[167] Japanese Association of Animal Health for Livestock Products (JAAHLP), as headquarters, has its JAAHLP branch office in each prefecture in Japan. At the prefectural level, each JAAHLP branch office provide necessary services such as vaccinations through prefectural animal hygiene office where the JAAHLP branch has its post. The private contracted veterinary practitioners working for the JAAHLP are called "appointed veterinarians".
[168] Please refer to the following web address: http://www2.gunmanet.or.jp/noro/200.htm.

thus it is not in proper condition. As mentioned earlier, Mongolia, an FMD and other important diseases endemic country has to avoid by any means the intrusion of the source of infectious agents. For instance, in the case of the FMD virus, it is highly contagious and can be spread by a variety of mechanisms including windborne dispersion over a long distance[169]. In Japan, for instance, in compliance with the recommendations made by OIE[170], a restricted zone of 10 km to 20 km in width has to be set up and maintained around the site where an outbreak occurred. Likewise, Mongolia should take action, hopefully, in coordination with its neighbors.

In this respect, a conversation made between Mongolia and its two neighbors, China and Russia, mediated by the OIE regional representation office for Asia and the Pacific, was one major first step. A plan for improving the border control protocol including free trading of livestock products in limited zones, 3 sites near the Mongolia-Russia border, and 7 sites near the Mongolia-China border, was being forged strategically. Unfortunately, however, it seems that to date there has been no progress at all.

(3) Important Infectious Disease Outbreaks in Recent Years

As mentioned earlier, Mongolia is a landlocked country surrounded by Russia and China where sporadic outbreaks of highly contagious and important diseases such as FMD, Classical Swine Fever, Newcastle Disease, PPR, Sheep and Goat pox, Africa Swine Fever, Blue Tung, Lumpy Skin Disease occur[171]. Thus, unlike Japan, which capitalizes on its geographical advantage of being an island, border control is extremely challenging. In fact, among the diseases mentioned above, PPR and African Swine Fever are both recent incursions.

Table 3.23 shows details on recent outbreaks including measures taken. Of them, concerning FMD, due to its devastating impact not only on livestock losses but also on the national economy, including international trading, further information is given in Figure 3.63. Concerning the animal health protocol for trading livestock products, it may vary considerably depending on a given country. In the case of Japan, for instance, products derived from ruminants are not permitted to be imported while some other countries such as Iran may import lamb or mutton from Mongolia as long as sheep for slaughter have been raised in an area where an FMD outbreak has not occurred for some fixed number of years[172]. As shown in Figure, these are Bayankhongor, Hovd, Govi-Altai, and Zavhan aimags, which are all in the western regions. Nevertheless, one other thing should be mentioned here. Concerning both Govi-Altai and Hovd aimags, although these aimags are FMD-free regions domestically, they are bordering on the Xinjiang Uyghur Autonomous Region belonging to China where an FMD outbreak occurred in December 2019. Thus, even in the western regions

[169] Mikkelsen, T., Alexandersen, S., Astrup, P., Champion, H. J., Donaldson, A. I., Dunkerley, F. N., Gloster, J., Sørensen, J. H., and Thykier-Nielsen, S. 2003. Investigation of airborne foot-and-mouth disease virus transmission during low-wind conditions in the early phase of the UK 2001 epidemic. *Atmospheric Chemistry and Physics* **3**: 2101–2110.
[170] For a landlocked and FMD endemic country such as Mongolia, it would be almost impossible to eradicate the virus. By contrast, however, it would be possible to zone a particular area, surrounded by another area as buffer zone for establishing a FMD free zone where there has been no outbreak for a fixed period of time. Animals raised in such a zone are, naturally, FMD free and could be exported (Divangar, S. 2016. Member update on FMD control and the roadmap: Country Report-Mongolia. Shanghai, China 24-25 March 2016.).
[171] Japanese Association of Animal Health for Livestock Products. 2007. Important exotic diseases. JRA special fund.
[172] Based on interviews conducted in one of the major meat packers in Mongolia in October, 2020.

of Mongolia, precautions should be taken (Figure 3.63).

Table 3.23 Important Livestock Disease Outbreaks in Recent Years

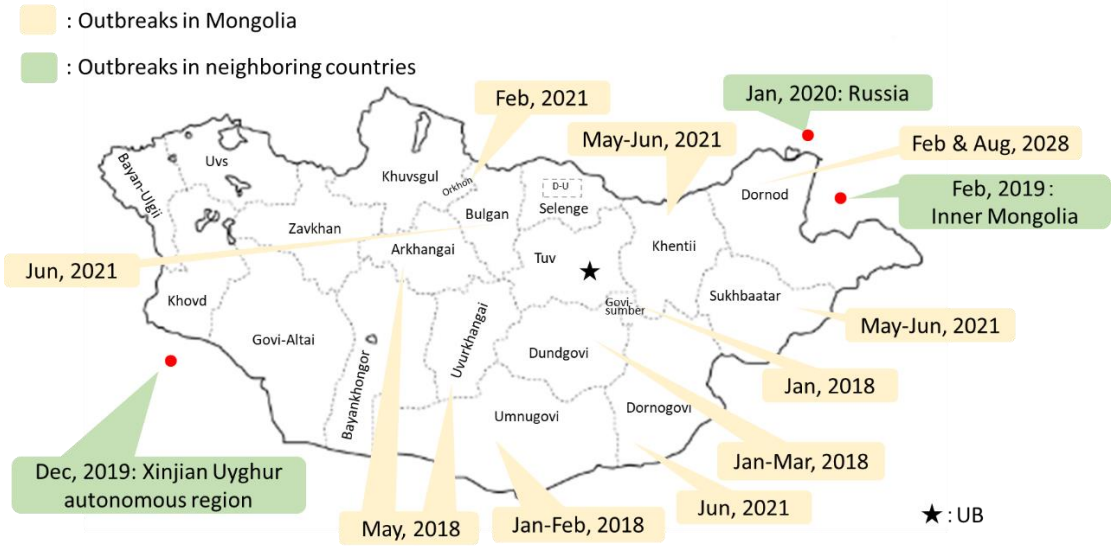
Diseases	Timeline and locations of outbreaks	Measures taken
Foot and Mouth disease (FMD)	-2022: Last outbreak in Mongolia (concerning the other outbreaks, please refer to Figure 3.63)	Domestically manufactured vaccines
Peste des Petits Ruminants (PPR)	-November to December 2016 in Hovd aimag -January 2017 in Hovd aimag (wild animals)	Vaccines imported from India
Sheep and Goat Poxes	-June 2015 in Sukhbaatar aimag -2017 (aimag n/a)	Domestically manufactured vaccines
African Swine Fever	-January 2019 in the northern region (the first case reported)	None (no vaccines available so far)

Source: JICA Project Tam based on the information gathered in GAVS in October 2020, and other statistics[173].

PPR is another intractable disease that used to be endemic exclusively in Africa. Recently, however, due to the negative impact of globalization, the disease has spread rapidly reaching Asia through the Middle East[174], and in 2016 the first case of PPR was reported in Mongolia as well. Unlike FMD, the prevalence of PPR is different, occurring rather in Hovd aimag, one of the western regions. Also important is that a case from saiga antelopes, one of the most renowned wild animals in Mongolia, was identified. Since a vaccine against PPR is not yet available in Mongolia, according to GAVS, Bio-kombinat is now taking priority over all other medical research.

Also, sheep and goat poxes are important ones, which are under control thanks to vaccines manufactured domestically. Another threat to the Mongolian livestock industry, though it is not a species for mobile animal-keeping, is African Swine Fever. This disease, together with Classical Swine Fever, is highly contagious and may have a devastating impact on the pig-raising industry. In common with PPR, it was endemic only in African countries. Then, it spread over the Asian regions including China and Russia[175]. Thus, we believe, the incursion was only a matter of time.

[173] An evaluative report for Mongolia Livestock Program II, 2020, MAFF in Japan.
[174] Z. Koshemetov. 2009. Epizootological analysis of PPR spread on African continent and in Asian countries. *African Journal of Agricultural Research* 4: 787-790.
[175] From the websites of OIE and MAFF, Japan.



Source: based on the information gathered in GAVS and MAFF, Japan

Figure 3.63 FMD Outbreaks in Mongolian Including Areas Bordering Mongolia after 2018 Onwards

Linked to animal health, there are some not necessarily epidemiological but important issues as shown in Table 3.24. First of all, in terms of zoonosis, Brucellosis, Tuberculosis, and Glanders should be kept in mind. These diseases are not so contagious as, say, FMD, but they are all zoonotic diseases that may pass from a given host animal to a human. For instance, Brucellosis causes cows to abort while humans suffer from febrile symptoms. Both Tuberculosis and Glanders affect the lungs, and, depending on the stage, may invade the pulmonary alveolus, leading to the form of a nodule, a tuberculoma. Thus, prevention is highly important not only for animals but also for humans. As to routes of transmission, consumption of raw milk harvested from infected animals with Brucellosis or Tuberculosis is most common. Thus, the single most important preventive method is to boil raw milk. Concerning Glanders, a project for investigation of this disease, jointly operated by JICA and Japan Science and Technology Agency (JST), called Science and Technology Research Partnership for Sustainable Development (SATREPS), was launched in November 2020.

Regarding the next topic dealing with parasitology, preventive measures are available even in rural areas of Mongolia. In practice, however, only a small number of herders practice deworming. According to the president of the Mongolian Leather Industry Association, low compliance with this practice is so serious that a re-emerging disease is rampant which is caused by larvae of a species of parasitic fly, burrowing into the exposed flesh, thus leaving skins damaged with blemishes[176]. During the socialist era, as mentioned earlier, the veterinary services including deworming were fully equipped thanks to the negdel. Nevertheless, due to the collapse of the negdel, the problem came into the scene again.

Concerning deficiencies, an indirect yet most crucial cause would be a chronic lack of adequate feedstuffs (grasses), which has much to do with the repeatedly mentioned grassland degradation. In the short-term, or

[176] In the US, they have a similar parasitic fly called screwworm. For further information, please refer to Vloedt, V. and Butt, B. 1990. The New World Screwworm eradication programme in North Africa: An international effort aims to stop the spread of the health-threatening pest. *International Atomic Energy Agency Bulletin* 4: 35-41.

as palliative treatment, supplements could be effective. In the long-term, however, practical and sustainable grassland management, which will be established by the central government, together with local governments and herder groups, would be a must.

As to zud disasters in winter shown in the "others" category, this problem, since one of the main causes is a lack of preparedness for winter, could be said, if not all, as a man-maid problem, especially among younger generations. In the past, all those traditional techniques to support a nomadic way of life were passed down from generation to generation. It seems that, currently, this traditional system is not functional as before. Nevertheless, curiously, such a situation was observed even in the socialist era. Mr. Sambu, a son of a herder family and an ex-president of the state considering the low standard of the techniques among herders of that time, prepared a technical handbook called "Advice to herdsmen", and distributed it to all the herders. Such a provision made by the government should be encouraged again, updating the version. In this respect, the negligence of herders in abiding by the regulations of veterinary drugs, another topic in the "other" category, would be an important one. As shown in Chapter 3.2.2, the negative consequences caused by the inappropriate use of antibiotics are serious and these are, supposedly, attributable to herders' negligence. In reality, however, since Mongolian herders, traditional pastoralists, are not fully aware of these modern medications yet, we believe, public officers, especially veterinarians and para-vets should be responsible for enlightening herders. Concerning the last topic dealing with rodent problems caused by Brandt's Vole in the grasslands, according to a study, it could be worsened where desertification is obvious due to climate change and/or over-grazing[177].

Table 3.24 Additional Issues on Animal Health to be Addressed

Categories	Issues to be addressed	Measures
Zoonosis	-brucellosis -Tuberculosis -Glanders	Periodic surveillance, checks, improvement of border control, raw milk boiling, etc.
Parasitology	-Scabies -Screwworms	Periodic deworming
Deficiencies	-Vitamins -Minerals	Supplements, improvement of grassland management, etc.
Others	-Off-spring health such as calf health -Zud (due to lack of preparedness for winter) -Negligence of herders in abiding by the regulations of veterinary drugs, especially withdrawal periods -Grassland degeneration by Brandt's vole (Microtus brandti)	Livestock appropriate technique extension, Livestock index insurance, etc.

Sources: Based on interviews in related institutes and an evaluative report for Mongolia Livestock Program II, 2020.

Last but not least, an alleged outbreak of Bovine Spongiform Encephalopathy (BSE) in Mongolia should be mentioned. In August 2018, in a local paper (*News Desk*), the first case of BSE was reported on two cows in Darkhan-Uul aimag. In reality, however, the case was almost immediately denied by GAVS by announcing

[177] Sawamukai, M., Hoshino, B., Ganzorig, S. and Asakawa, M. 2011. The habitat evaluation of Brandt's Vole (Microtus brandti) in Mongolian degenerated pastureland using remote sensing method. *Journal of Rakuno Gakuen University* **35**: 45-53. (in Japanese)

that it was false information and that the case was Rabies in cattle[178]. Even for a moment, this shaking world news seems to have caused panic among Mongolian citizens. Nevertheless, such a case, logically speaking, will never be the case in Mongolia unless the country permits the import of meat and bone meal (MBM) contaminated with infectious agents, namely, a BSE prion. In the past, a huge amount of the MBM, as a feed ingredient, was imported from the UK to various countries, especially where farm animals were raised intensively, which is not the case for Mongolia. Then, around 1980[179], when the UK changed its method for rendering the MBM, the contagious BSE prion is thought to have originated. Afterward, the agent was rapidly spread worldwide with the MBM, as a vehicle. Nevertheless, since Mongolia did not import any MBM during the crucial period, namely, around 1980[180], it would be safe to say that as to the possibility of the occurrence of BSE, it is almost negligible.

(4) Educational System of Veterinary Medicine

In Mongolia, there is only one university that has a School of Veterinary Medicine belonging to the Mongolian University of Life Sciences (SVM/MULS, Figure 3.69). It was established in 1942. Table 3.25 shows the main subjects given to undergraduate students for which a group of approximately 30 veterinary educators is responsible. The number of undergraduates ranges considerably from 150 to 300. Almost all the educators who graduated from SVM/MULS during the period of the socialist era went to universities in one of the countries of the former Eastern Bloc to earn a Ph.D. According to a report[181], there are some drawbacks pointed to, especially from the perspective of veterinary education.

Table 3.25 Main Subjects of SVM/MULS*

No.	Subjects
1	Epidemiology, Pharmacology
2	Anatomy, Physiology
3	Surgical medicine, Obstetrics
4	Animal Health
5	Microbiology, Virology

*School of Veterinary Medicine belonging/to Mongolian University of Life Sciences
Source: JICA. 2013. *Op.cit.*

Thus, it is natural to see various donors working with SVM/MULS. For instance, JICA is one of them, having finalized a project for Strengthening the Capacity for Human Resource Development in the Field of Veterinary and Animal Husbandry (2014-2020), then another, Swiss Agency for Development and Cooperation (SDC) with an animal health project[182], and still another Korean International Cooperation

[178] Please refer to the following URLs http://outbreaknewstoday.com/mad-cow-disease-reported-mongolia-86924/, https://www.pressreader.com/mongolia/the-ub-post/20180820/281530816869002>.
[179] Ozawa, Y. 2001. Bovine Spongiform Encephalopathy: Current situation and problems. *J Vet Med Sci* 63: 5-13. (in Japanese)
[180] Mongolia is not in the list of countries which were categorized as "likely" in the geographical BSE risk assessment (Ozawa, Y. 2003. Bovine Spongiform Encephalopathy: Current situation and problems: BSE in Asia. *J Vet Med Sci* 65: 9-15. (in Japanese)), and according to the information gathered from ex-officers in MOFALI and SVM, Mongolia has not imported any MBM since 1960 onwards.
[181] JICA. 2013. Report for formulating a project for Strengthening the Capacity for Human Resource Development in the Field of Veterinary and Animal Husbandry. Japan International Cooperation Agency. (in Japanese)
[182] Apart from SVM/MULS, MOFALI, and other governmental agencies were included as supporting entities (SDC. 2016. Introduction to the Animal Health Project. Swiss Agency for Development and Cooperation. *Mongolian Veterinary Medicine* 6: 4.).

Agency (KICA). Of them, an improvement made by the aforementioned JICA project, especially in the course curriculum of SVM would be one of the most revolutionary changes. As one might expect, the former curriculum, as well as syllabuses, was totally dated. Now, the new curriculum includes subjects nowadays recognized as crucial and obligatory in most developed countries, such as Animal Communication, Livestock Aethiology, Zoonosis, Veterinary Ethics, Animal Welfare, Companion Animal Medicine, and Livestock Methodology. Also important is that JICA will launch another project for Strengthening the Practical Capacity of Public and Private Veterinarians shortly to focus on graduates or work veterinarians by providing them with OJT.

Thus, it seems somehow ironic that Mongolia lacks a good veterinary and livestock education system while it is by definition one of the most recognized pastoral countries whose national economy is highly dependent on livestock. Table 3.26 shows briefly the results of the questionnaire by asking 26 private veterinarians working in Tuv aimag some relevant questions such as how they feel about working as a veterinarian, or if they think they get paid well.

Table 3.26 Results of Questionnaire by Asking 26 Private Veterinarians in Tuv Aimag in 2016

No.	Questions	Yes	No	Yes and No
1	Are you satisfied with your salary*?	0	20	6
2	Do you find your job rewarding as a veterinary professional?	26	0	0
3	It is indeed difficult to find the next generation of veterinarians?	26	0	0
	Main reasons: low salary, the contract is not stable, a long distance to travel to get the mission done.			

*As of 2016, the average annual wage for those veterinarians was 4 to 5 million MNT/year, equivalent to 230 to 280 thousand yen.

Figure 3.64 The Main Entrance of Bio-kombinat

Figure 3.65 Dated Autoclaves

Figure 3.66 Veterinary Office of Tuv aimag

Figure 3.67 Private Veterinarians Visiting the Veterinary Office in Tuv aimag

Figure 3.68 Fences of Border at Zamyn-Uud (Mongolia-China Border)

Figure 3.69 School of Veterinary Medicine of Mongolian University of Life Sciences

(5) Mongolian Veterinary Medical Association (MVMA)

Compared to the long history of SVM/MULS, it is not comparable, but in Mongolia, founded in 1990, there is a functional association for professional veterinarians. As of 2020, there are approximately 3,000 members representing veterinarians working in governmental institutes, inspectors in public and private slaughterhouses, pharmaceutical companies, and private veterinary practitioners. To contribute to veterinary medicine in Mongolia, MVMA works in coordination with relevant institutes such as SVM/MULS and GAVS. Among others, important activities are refresher training courses for professional veterinarians.

3.3.6 Animal and Plant Quarantine

(1) Quarantine System

As of 2022, the responsibility for quarantine was transferred from the General Agency for Specialized Inspections (GASI) to the Customs Agency. Currently, the Quarantine Management Section of the Inspection Procedures Bureau of the Customs Agency manages 18 border quarantine stations.

The law concerning quarantine is the "Quarantine Audit and Management Law for Cross-Borders of Raw Materials and Animal and Plant Origin Products and Animals and Plants" (approved on November 28, 2002). This law has 8 chapters, and 32 articles and has been amended six times, most recently on November 15, 2018. It is currently undergoing its seventh revision. It covers the authority and obligations of quarantine agencies, import/export requirements for agricultural and livestock products, carry-on/take-out by baggage, quarantine related to transportation by vehicle, and risk analysis.


Documents Required for the Issuance Of Import Declaration

1. Request submitted to State Specialized Inspection Agency, Including; Period to export the raw materials and products of plant origin, border point to be passed, detailed assortment, quantity of the goods and products, type of transportation means, route and contacting phone number must be written in detailed.
2. Copy of the State registration certificate of economic entity. For a citizen, copy of National Identification Card.
3. Phytosanitary Certificate of exporter country .
4. Sales contract, Donation contract (similar documents)
5. Copy of the Certificate for introduction of proper practice or supervisory management system
6. Copy of the Certificate of origin of the products
7. Copy of the Import license of strategic food (wheat and grain seeds etc.)
8. Copy of the conclusion of the state inspector (At the period when the cigarette is imported for the first time)
9. Bill of stamp fee /original copy/

Figure 3.70 Import Declaration (English version)

In quarantine, (1) disease management of food, livestock feed, etc., (2) residual inspection (agricultural chemicals, veterinary medicine), (3) labeling inspection, (4) import inspection of raw materials, (5) consistency confirmation with domestic law, and necessary guidance is provided. Import and export products are classified into three stages: high risk, medium risk, and low risk, and the necessary quarantine work is carried out for each. At the quarantine station, low-risk items go through customs clearance and others are sent for document inspection. High-risk products are analyzed in the laboratory. In the laboratory, toxicity tests and microbial tests are conducted.

Until 2022, a checklist of GASI inspections was available on the website and included quarantine-related items. List of enterprises with implemented import risk assessment (list of enterprises exporting livestock, fish, and plant-derived products to Mongolia), import requirements for food ingredients, import requirements for chemicals, export agreements for dairy products to China, list of enterprises exporting meat and meat products to China, and procedures for exporting meat and meat products to China are on the Customs Agency's website.

With regard to phytosanitary quarantine, Mongolia participates in the International Plant Protection Convention (IPPC). For all imports and exports, phytosanitary requirements are established, requiring quarantine inspection of plants, raw materials, products, containers, packaging, and vehicles. Exports are to comply with quarantine conditions agreed with the importing country or with international standards and conventions on quarantine to which Mongolia has acceded, as well as standards, guidelines, and recommendations issued by international organizations. Declaration forms are available in English and Chinese as well as Mongolian.

(2) Animal Quarantine

When exporting livestock products, it is necessary to comply with the sanitary conditions agreed with the importing country. The exporter must be quarantined as specified and issued a certificate certifying that it meets the export requirements. Livestock hygiene conditions have been agreed with Japan for cloven-hoofed animals, horses, and casings (Table 3.27).

For horse meat, processing at a processing facility designated by the Mongolian government is accepted, while for the casing, the Japanese livestock hygiene authority (Animal Health Division, Consumption Safety

Bureau, Ministry of Agriculture, Forestry and Fisheries) dispatches inspectors to Mongolia, inspects the facility and designates the factory that it deems appropriate. For the export of casing, only designated factories are required to process according to the standards specified by the Japanese side. The designated period is two years, and it is necessary to undergo another inspection for the extension. The inspection cost is borne by the Mongolian side. Currently, four companies are designated as casing processing facilities, and all of them are cloven-hoofed animals (cattle, sheep, and goats) only, and pig casings are not permitted.

Table 3.27 Livestock Hygiene Conditions for Export to Japan (January 2021)

Livestock and livestock products		Main conditions
Horse		Processed at a facility designated by the Mongolian government, there were no signs of an infectious disease before and after the killing, and a test certificate was attached, etc.
Cloven-hoofed animal	Animal	Export ban
	Fertilized ovum/semen	Export ban
	Sausage/ham/bacon	Export ban
	Meat/organ	Export ban
Casing		The casing of cattle, sheep, goats, and pigs are all salted and treated at the facility designated by the Japanese Livestock Hygiene Authority. Besides, the inspection certificate issued by the Mongolian competent authority and specified by Japan is attached, etc.
Dairy products		Raw milk from healthy livestock, heat-treated as specified by Japan, with no risk of being contaminated with infectious disease pathogens from milking to shipping, and an inspection certificate attached, etc. The inspection certificate format has been agreed upon.

Source: Japanese Animal Quarantine Service

(3) Issues

While the government is moving toward expanding exports, it is necessary to invite inspectors to carry out inspections in Mongolia, depending on the demands of the importing country. Considering the travel expenses, inspection costs, and efficiency of inspectors, it is realistic for multiple companies to undergo joint inspections, and it is hoped that the stakeholders in the industry will work together to expand exports. If the needs of the importing country are strong, the relevant sector in the importing country may provide funding or technology. Besides, the conditions are individually and specifically determined, and compliance is required. If one company violates, it is possible that the partner country will impose a restriction or the business partner will request the cancellation of the transaction. Industry-wide efforts are needed.

Importing countries often change import procedures and customs acceptance. It is important to always obtain the latest information and to be able to easily confirm the obtained information by those who need it. In addition, information sharing on a private-sector basis may precede that on an intergovernmental basis, and cooperation between industry groups and government agencies is also required. In developed countries, various public support is provided. For example, the information center on the export requirements for livestock products has been centralized and digitized so that the latest information can always be searched, and a consultation desk has been set up for each area under the jurisdiction of the quarantine port. A mechanism for cooperation between industry groups and government agencies has also been established

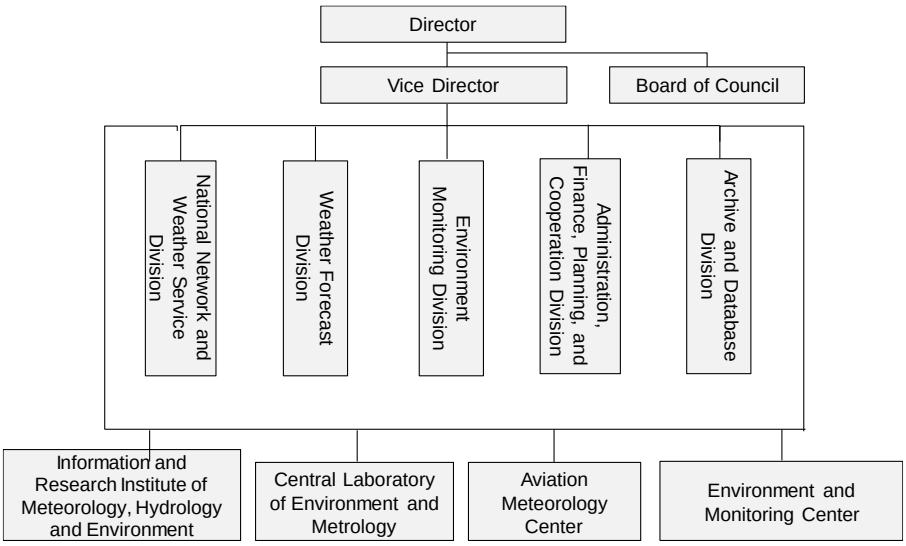
through subsidy projects and the daily sharing of policy information. Electronic procedures are also being developed in Mongolia. China Customs and Mongolian Customs share some quarantine information and are working to simplify import and export procedures between the two countries. However, there are still challenges in information sharing obtaining up-to-date information on export destinations, and negotiating export conditions.

3.3.7 Meteorology Information Services

Meteorological information services in Mongolia are provided by the National Agency of Meteorology and Environmental Monitoring (NAMEM) and the Information and Research Institute of Meteorology, Hydrology, and Environment under NAMEM. These institutes will be summarized as follows.

(1) National Agency Meteorology and the Environmental Monitoring (NAMEM)

NAMEM is responsible for constant monitoring and surveillance of weather and natural environment conditions, providing weather data and forecasts, and providing early warning of potential natural disaster risks. The organization chart and the main tasks of each department are shown below.



Source: JICA Project Team based on the website information of NAMEM

Figure 3.71 Organization Chart of National Agency Meteorology and the Environmental Monitoring (NAMEM)

Table 3.28 Roles and Responsibility of each Department, NAEM

Department/Division	No. of Staff	Roles and Responsibility
National Network and Weather Service Division	9	Management of operational systems for surveillance and monitoring, formulation and implementation of programs, and provision of meteorological information and advice services
Weather Forecast Division	18	Preparation and distribution of short- and medium-term weather forecasts, forecasting and issuing warnings of natural disasters, technical guidance to regional branches, etc.
Environmental Monitoring Division	8	Monitoring and surveillance of environmental conditions including air, water, soil, and radioactivity, provision of environmental monitoring and surveillance services, and inventory studies of air pollution and emissions.
Administration, Finance, Planning, and Cooperation	20	Financial operations, human resource operations, interaction with meteorological agencies and international organizations in various

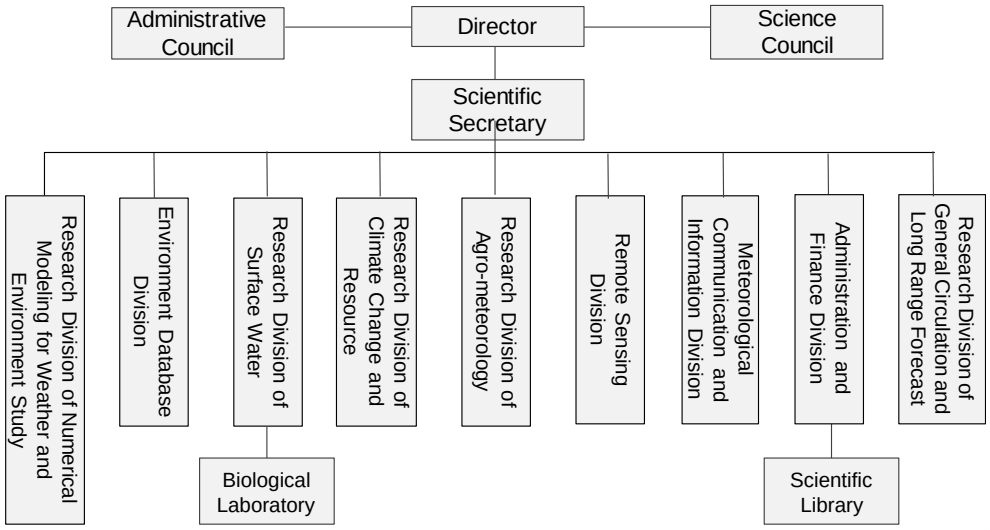
Division		countries, budget management, internal auditing, etc.
Archive and Database Division	9	Construction of various information archives and databases, provision of information, etc.

Source: JICA Project Team

Projects involving NAMEM have hydro-meteorological surveys of grassland conditions using satellite swarm sensors, a project to strengthen Ulaanbaatar's capacity to combat air pollution, etc.

(2) Information and Research Institute of Meteorology, Hydrology, and Environment

Information and Research Institute of Meteorology, Hydrology, and Environment is an organization under NAMEM and is a research institute. The following figure shows the organization chart and the main roles of each department.



Source: JICA Project Team

Figure 3.72 Organization Chart of Information and Research Institute of Meteorology, Hydrology and Environment

Table 3.29 Roles and Responsibility of each Department, Information and Research Institute of Meteorology, Hydrology and Environment

Department/Division	No. of Staff	Roles and Responsibility
Research Division of Climate Change and Resource	11	Database creation, analysis, research, and evaluation related to meteorological information.
Environment Database Division	10	Database creation and archiving related to the natural environment
Research Division of Surface Water	12	Water surveillance and monitoring, flood and water damage prevention, water environment pollution prevention, etc.
Research Division of Numerical Modeling for Weather and Environment Study	9	Development of numerical models of the meteorological environment, atmospheric research and experiments, etc.
Research Division of Agro meteorology	12	Assessment and prediction of the impact of climate change on agriculture, research on agro-meteorological resources, monitoring of weather related to agriculture, collection of current information on drought and cold damage, etc.
Remote Sensing Division	10	Processing and dissemination of satellite data, research, and monitoring related to natural resources
Meteorological Communication and Information Division	10	Collection and dissemination of data on local weather and natural environment, and operation of systems and networks
Research Division of General	7	Research on atmospheric circulation, formulation of long-

Circulation and Long-Range Forecast		term forecasts, etc.
Administration and Finance Division	10	Financial operations, accounting management, etc.

Source: JICA Project Team

Projects involving the Information and Research Institute of Meteorology, Hydrology, and Environment have livestock insurance projects based on a satellite information index, an international cooperation project on drought promoted by the Asia-Pacific Regional Space Agency Forum (APRSAF), etc.

3.3.8 Market Information Service

(1) Collection and disclosure of information

Information on agro-pastoral sector production and distribution is collected by the various MOFALI departments. For example, in the case of agricultural products, the Agriculture Production Policy Implementation and Coordination Department is responsible for the harvest, while the Food Production Policy Implementation and Coordination Department is responsible for processing and marketing. The Industrial Inspection Bureau inspects sowing and harvesting and, by comparison, checks whether agricultural enterprises are reporting their operations correctly. As milk and animal hair are subject to subsidies and meat to stockpiling, the prices and supply of these products are monitored by the Food Production Policy Implementation and Coordination Department. The Agriculture Production Policy Implementation and Coordination Department and the Industrial Inspection Department are responsible for forecasting the harvest of wheat and other crops. Of the agricultural products, vegetables are also heavily imported, but their distribution is monitored. Production-related data is collected from the soum to aimag to the relevant MOFALI department. For livestock production, data related to livestock, such as the number of animals reared, number of births, number and causes of deaths, as well as data on facilities and equipment, such as wells and meat storage warehouses, are collected; for agriculture, information is mainly collected on grain, vegetables, potatoes, and forage, including fertilizer application and fallow, agricultural machinery, seeds, storage volume, and storage. This information is compiled within MOFALI by the Statistics and Information Department and submitted to the Mongolian State Statistics Office. Consumer prices are published weekly, which also cover foodstuffs. Foodstuffs covered include wheat, bread, rice, sheep meat, beef, horse meat, goat meat, milk, butter, yogurt, eggs, tomatoes, carrots, cabbage, beetroot, and onions. Wholesale prices and other trade information are not published.

Information on the activities of the distributor," Change", is not currently collected, but the preparation of an agro-pastoral industry law, including the management of Change, is under consideration.

The Agricultural Exchange discloses information on traded goods, trading volumes, and trading prices for animal hair, leather, wheat (grains), and oil crops (rapeseeds) that are subject to futures and forward trades. On the other hand, regarding perishable agricultural and livestock products to be used for daily consumption, transaction information is available on TV programs for herders and radio. In addition to public broadcasting, farmers and nomads usually check at the market or gather information on prices themselves from friends and relatives.

(2) Issues

Since the amount of transaction information to be disclosed is limited, it is desirable for producers living in rural areas to have a network in the consumption area and go to obtain the information. This environment creates a digital divide between producers and collectors. In addition, it is difficult for producers to make correct decisions in negotiations for transactions without information.

If the producer can obtain the appropriate information at the appropriate time, the producer can sell it independently. For example, in the case of Japan, the website of the Ministry of Agriculture, Forestry and Fisheries provides breaking news on the market conditions of 30 major central wholesale markets[183]. The contents of the breaking news are the item, the main production area, the quantity, the grade, and the selling price of each grade, and as the price information, the highest selling price (high price), the selling price of the volume zone (medium price), and the selling price of biggest amount among the less than the middle price (low price). It also provides trends compared to the last three days. On the day of the transaction, breaking news is issued as soon as information is gathered, and the production areas consider how much product will be shipped to which wholesale market the next day while observing the transaction status. If it becomes a large production area, the shipping trends of that production area can affect the price movements of the market. Agricultural cooperatives can organize farmers, make shipping plans, and make production plans accordingly. In the current agricultural trade in Japan, the number of transactions that do not go through the wholesale market is increasing, but the transaction price in the wholesale market is recognized as the standard price in the region.

It is also important for producers to obtain information about market requirements and needs. For sales to supermarkets and other retailers, the products must meet the requirements of the supermarkets, and the producers must understand the needs and requirements of the supermarkets. Measures such as expanding contract sales between producers and retailers/processors to deliver downstream requirements to producers, motivating collectors to play as the information providers, or the local government's support for the production of agricultural and livestock products corresponding to market needs can be considered.

In the case of export, in addition to the requirements of business partners and markets, there are matters required by the tariff system, food safety, quarantine, etc. As quarantine standards, food safety, and inspection priorities change frequently, it is necessary to collect up-to-date information. Also, these rules and export procedures are generally complicated. It is necessary to respond to each partner country and product, and detailed information services are required. The Mongolian Chamber of Commerce and Industry provides export support services, but many things need to be dealt with individually, and it is often changed as a result of intergovernmental discussions, so close cooperation with the government is necessary. For reference, in Japan, the Japan External Trade Organization (JETRO) provides necessary information by country and by industry on its website. Regarding Mongolia, following the conclusion of the Japan-Mongolia Economic Partnership Agreement, they provide information related to the EPA together with the "EPA Utilization

[183] https://www.seisen.maff.go.jp/seisen/bs04b040md001/BS04B040UC010SC999-Evt001.do

Manual-Japan-Mongolia EPA Version"[184]. In addition, the Japan Chamber of Commerce and Industry is conducting a certificate of origin issuance project[185] based on an EPA, and an EPA consultation desk[186] has been established as a project commissioned by the Ministry of Economy, Trade and Industry.

Regarding quarantine as well, it is desirable to build a website where livestock hygiene conditions, plant import/export conditions, etc. can be confirmed for each partner country, and information on consultation counters can be obtained[187].

3.3.9 Agricultural Credit and Agricultural Insurance

Table 3.30 shows the loan services provided to agricultural and livestock workers. According to the NSO, as of the end of June 2020, the outstanding balance of loans to pastoralists was about MNT 683 million[188].

Table 3.30 Bank Loan Services

Bank	Type of Loan	Maximum loan (MNT)	Term limit	Annual interest rate (%)	Loan conditions
Khaan bank	Pastoral loan	10Million	24 months	21.6	Priority for insured persons
	Loans for livestock index insurance subscribers	10Million	24 months	18	The index premium must exceed the loan amount, and the insured person must own more than 100 animals
	Home loan for pastoral	100Million	84 months	15-15.6	20% deposit, an insured person owns at least 700 sheep
	Small loans for labor market support	10Million	24 months until 2023.10.9	7.2	Only some areas are covered. Must create and sustain employment. Must have been selected and trained by a prefectural labor organization. (This loan is not limited to the agriculture sector)
Caption bank	Pastoral loan	30Million	30 months	22.8-28.8	
State bank	Pastoral loan	30Million	24 months	26.4-22.8	
	Loans for livestock index insurance subscribers	30Million	24 months	18	
Khas Bank	Organic Mongol Program	Corporation: 60Million Individuals: 20Million	36 months	12	Must have been approved by the Organic Mongol Program Team
Development Bank of Mongolia	Agricultural Loan		12 months	3	Cabinet Order of April 15, 2020, approves a total of 150 Billion MNT in funding. (Actual results are unknown)

Source: JICA Project Team

The Mongolian National Reinsurance JSC provides insurance services for the agricultural and pastoral sector under the livestock index law, and its shareholder is the Ministry of Finance. There are three types of insurance related to agriculture and livestock: 1) livestock index insurance, 2) wheat index insurance, and 3)

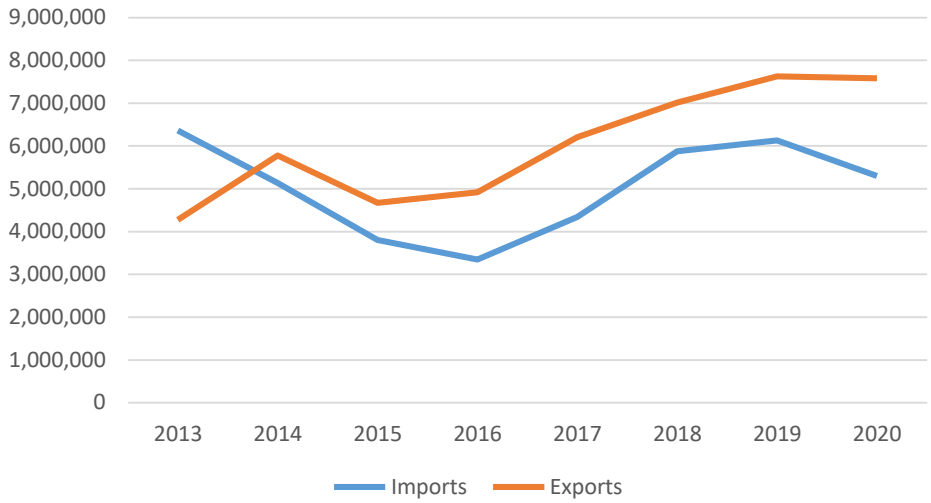
[184] https://www.jetro.go.jp/world/asia/mn/jmepa.html
[185] https://www.jcci.or.jp/gensanchi/3_mongol.html
[186] https://epa-info.go.jp/conference/
[187] (USA) https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/export, (Japan)
https://www.maff.go.jp/aqs/hou/require/index.html、https://www.maff.go.jp/pps/j/search/detail.html
[188] NSO, https://www.1212.mn

intensive livestock insurance. In terms of agricultural credit, 400 cooperatives within the National Mongolian Agricultural Cooperative have a financial role and provide loans to farmers.

3.3.10 Trade Promotion

(1) Trade Policy and Current Situation

Figure 3.73 shows the trends of trade value. Although exports declined due to falling coal prices, they bottomed out in 2015 and trade increased as the economy improved in 2017.

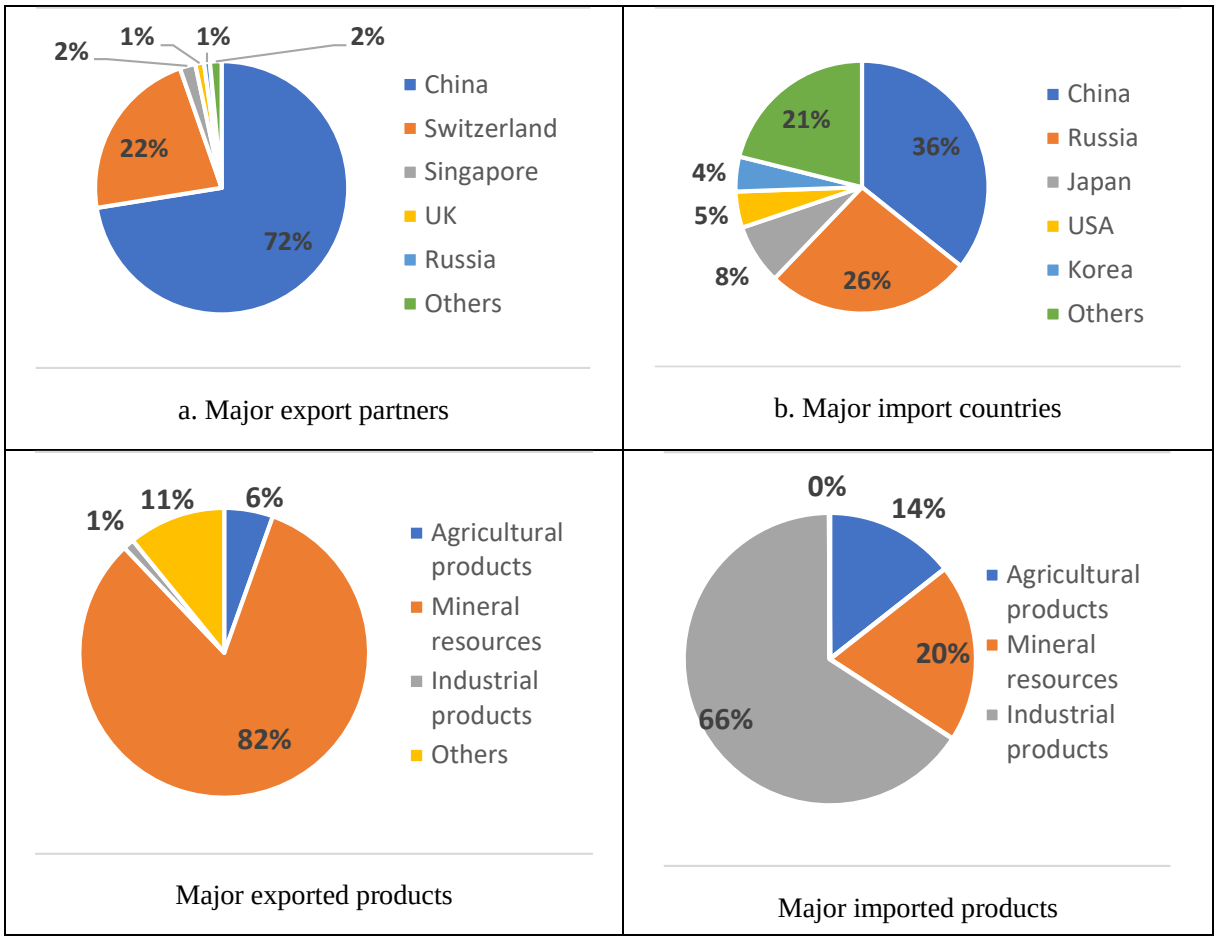


Source: World Integrated Trade Solutions

Figure 3.73 Trade Value Trends in Mongolia

Commodity trade value in 2021 was 9247 million USD for exports, 6849 million USD for imports, and a surplus of 2398 million USD[189]. The number of export items was 899 in 2021, a significant decrease from pre-COVID-19, and in 2019, the number was 1,178. The number of export destination countries in 2021 was 64, also down from 78 in 2019, pre-COVID-19[190]. China was the top export partner, accounting for 82.6%, followed by Switzerland at 9.41%, Singapore at 2.75%, South Korea at 2.42% and Russia at 1.22%. The presence of China is still overwhelming. Underground resources accounted for 67.8% of the top export products, followed by agricultural products with 7.8%[191]. Raw materials accounted for 85.67% of commodity exports, followed by intermediate goods 12.71% and consumer goods 1.13%. Compared to 2018, the share of intermediate goods has increased.

[189] WTO Country Profile: https://www.wto.org/english/res_e/statis_e/daily_update_e/trade_profiles/MN_e.pdf
[190] World Integrated Trade Solution https://wits.worldbank.org/CountryProfile/en/MNG
[191] WTO Country Profile



Source: World Bank (https://wits.worldbank.org/) and WTO (https://www.wto.org/)

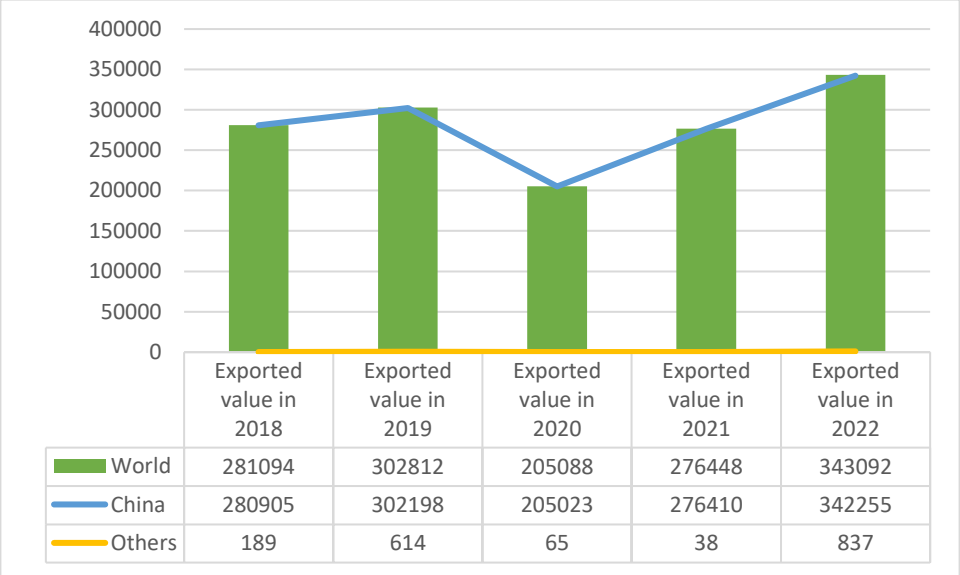
Figure 3.74 Major Partners and Products of Export and Import (2021)

(2) Import and Export Status of Agricultural Products

In 2021, Mongolia exported 462 million USD of agricultural products. The largest was fine or coarse animal hair, which was exported 276 million USD, accounting for about 59.7% of the export value of agricultural products. Next was other nuts, fresh or dried at 85 million USD, about 18.4%, followed by Other prepared or preserved meat at 38 million USD, about 8.2%, Animals' guts, bladders, and stomachs at 15 million USD, about 3.2%, and meat of horses, asses, mules at 14 million USD, about 3%.

Regarding exports, China is the largest partner country, and in some cases, such as animal hair exports, China accounts for most of the exports (Figure 3.75)[192]. On the other hand, the spread of COVID-19 infection has triggered a relative decline in the presence of China, which has a zero-COVID policy and is committed to reducing food safety risks, in meat exports (Figure 3.76).

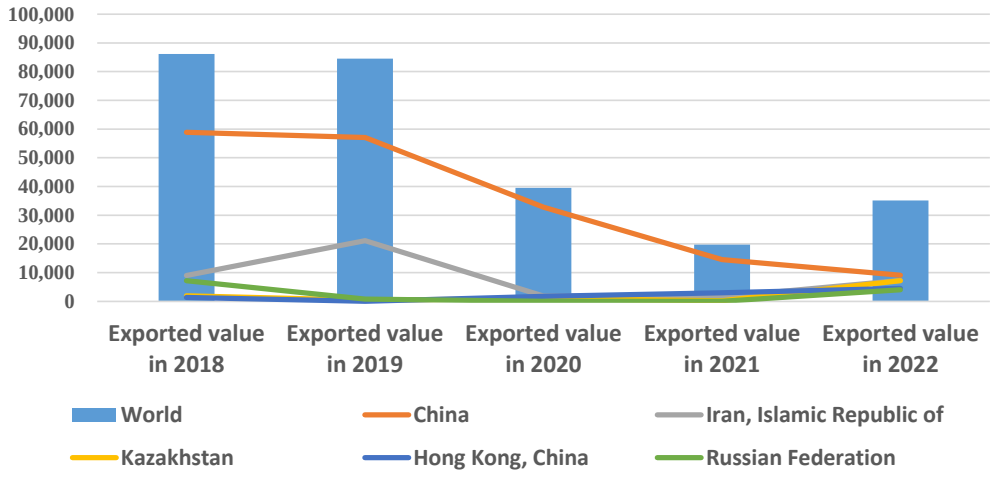
[192] Exports of cilia and coarse animal hair to China in 2021 was $276,410,000, almost 100% of the total value.



	Exported value in 2018	Exported value in 2019	Exported value in 2020	Exported value in 2021	Exported value in 2022
World	281094	302812	205088	276448	343092
China	280905	302198	205023	276410	342255
Others	189	614	65	38	837

Source: International Trade Center

Figure 3.75 Changes in Animal Hair Exports (1,000 USD)



Source: International Trade Center

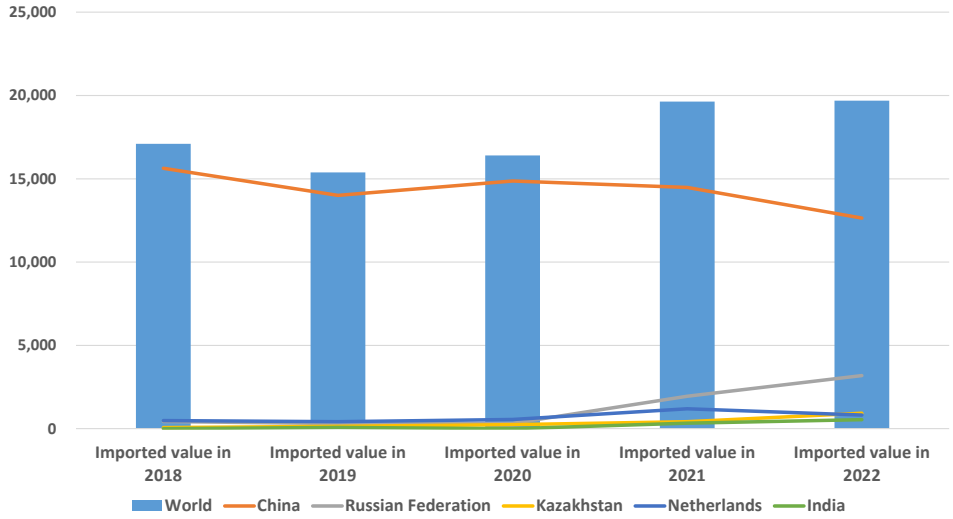
Figure 3.76 Changes in Meat Exports (1,000 USD)

Also in 2021, Mongolia imported 964 million USD of agricultural products. Other food preparations (US $ 96 million), Chocolate and other cocoa food (USD 67 million), Wheat and meslin (USD 61 million), Cigars, cheroots, cigarillos (USD 61 million), Bread, pastry, other bakers' wares (52 million USD), etc. were imported[193].

In addition, the import value of dairy products is also increasing every year and is close to doubling in 2022 compared to the pre-COVID-19 level. Among dairy products, powdered milk is the largest import value, but other dairy products such as cheese are also increasing. Together with the trend towards imports of prepared food products, this provides a glimpse of changing and diversifying food preferences. As a result of importing a wide variety of products, there is a relatively large variation in import partner countries.

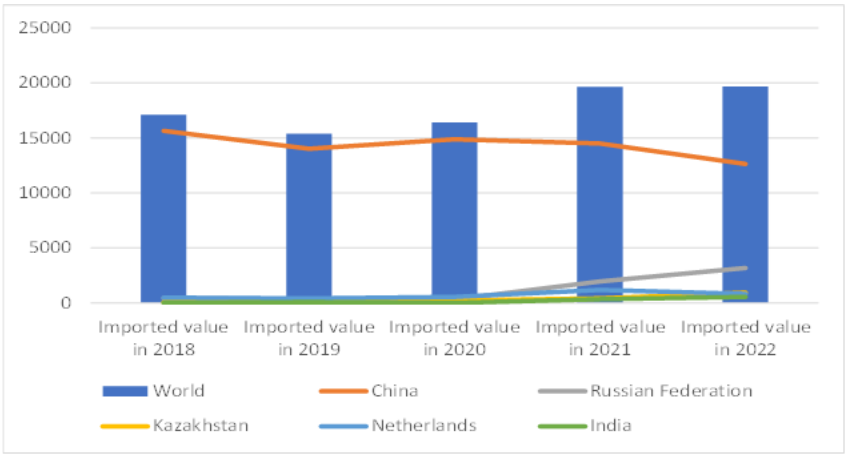
[193] WTO Country Profile

Vegetable imports are also strong, with China remaining the main import partner here.



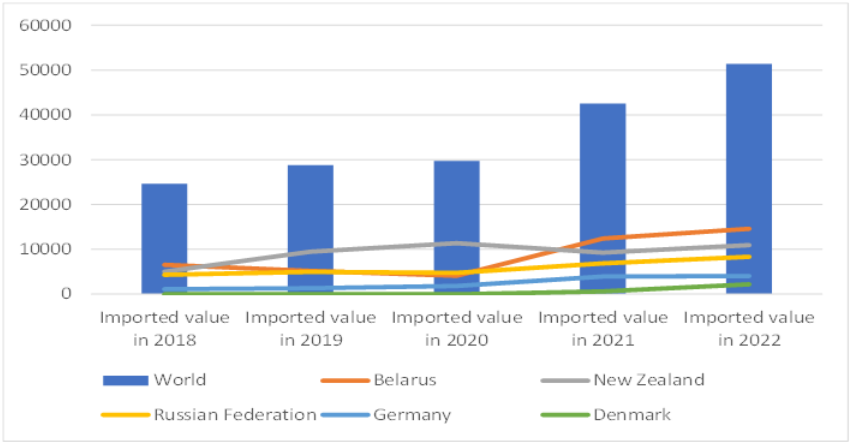
Source: International Trade Center

Figure 3.77 Changes in Prepared Food Import Value



Source: International Trade Center

Figure 3.78 Changes in Vegetable Import Value



Source: International Trade Center

Figure 3.79 Changes in Dairy Products Import Value

(3) Export to Promising Markets

Mongolia joined the WTO in 1997 and subsequently signed an economic partnership agreement with Japan in 2016.

In September 2020, Mongolia officially joined the Asia-Pacific Trade Agreement, with tariff reduction measures commencing in January 2021. Although Mongolia applied for membership in 2015 as well as 2009, the conditions were not met at those times. Trade with APTA member countries was large, accounting for 86.3% of exports and 38.3% of imports[194]. Particularly, China accounted for an overwhelmingly large proportion, accounting for 84.3% of exports. 90% of Mongolia's exports to China were mineral resources.

In 2021, it had a trade surplus of $ 5,142.75 million with China. Meanwhile, it had a trade deficit of $ 8.28 million with Bangladesh, $ 85.44 million with South Korea, $ 170,000 with Laos, $ 1.36 million with Sri Lanka, and $ 63.34 million with India[195].

Under the APTA agreement, Mongolia has accepted an average tariff reduction of 24.2% on 366 items such as chemicals, minerals, chemical fibers, machinery, marine products, legumes, spices, and animal and vegetable oils. APTA came into effect on 1st January 2021, and tariffs on exports to China were significantly reduced. For Mongolian products that have received a certificate of origin, for example, in the case of leather products, tariffs have been reduced by 35%. Tariffs on sheep and goat casings have also been reduced by 50%. Besides, in the case of exports to South Korea, there are many clothes and fats regarding agriculture and pastoral products, and the tariffs are also partially reduced. On the other hand, exports to India have a lot of leather and animal hair, but Mongolia is out of scope. In Bangladesh, Sri Lanka, and Laos, there is almost no record of exports of agricultural and livestock products (2021).

1) China

Intergovernmental talks are held regularly with China, and at the 16th talks, the expansions of distribution of light industrial products, agricultural and livestock products, especially meat and wheat were considered. Mongolia and China also agreed to cooperate in expanding bilateral logistics and rail transport196.

In recent years, China has tentatively lowered the import tax rate every year for items that are in short supply to expand imports and has applied a tax rate lower than the most favored nation tax rate (MFN tax rate) for WTO member countries. In 2019, the tax rate for 706 items was reduced, and tariffs on rapeseed pomace for feed and fertilizer were reduced to zero. Similarly, in 2020, the provisional import tax rate was applied to 859 items. Due to the influence of classical swine fever, the tariff rate on pork has also been reduced. From January 1, 2021, 883 items have been reduced. Tariffs on horse meat, canned meat, and animal hair, which are the main agricultural products that Mongolia exports to China, were not subject to reduction. As mentioned in the previous section, the APTA tariff rate has been applied to the trade between Mongolia and China since Mongolia joined the APTA.

[194] ITC, 2022
[195] Mongolian Customs (https://www.customs.gov.mn/)
[196] Mongolia News Letter, Vol.47, 2020

In addition, China is actively expanding free trade and concluding FTAs. Agreement tariff rates on products from ASEAN, Chile, Pakistan, New Zealand, Singapore, Peru, Costa Rica, Switzerland, Iceland, Australia, South Korea, and Georgia, which have FTAs, have been further reduced. For horse meat (hs code 0205), which is an export item of Mongolia, the MFN tariff rate is 20%, while 6% for Switzerland, 12% for South Korea, and zero for Chile, New Zealand, Peru, Costa Rica, Iceland, Australia, and Georgia. MNF of Canned meat (hs code 1602) is 5%, Pakistan 12-6%, Switzerland 4.5-3.6%, South Korea 6-4.8%, and 0% on Chile, New Zealand, Singapore, Peru, Costa Rica, Iceland, Switzerland, Australia and Georgia. Regarding animal hair (hs code 5102), MNF is 9%, while Pakistan is 4%, and tariff rates of Chile, New Zealand, Peru, Costa Rica, Switzerland, Australia, South Korea, and Georgia are zero.

2) Japan

The value of trade with Japan in 2021 accounted for 0.2% of the value of exports and 6.6% of the value of imports[197]. It can be said that EPA has not contributed to exports as expected.

3) Korea

Mongolia has been also continuing intergovernmental talks with South Korea to build a strategic partnership. The fifth round of discussions was held on November 24, 2020, and indicated a policy to consider at the working level toward an agreement on hygiene and quarantine standards for agricultural and livestock products. The South Korean side has proposed a working-level meeting to conclude a bilateral economic partnership agreement[198].

(4) Promotion of trade in agricultural products

Imports and exports were severely affected by COVID-19. For cashmere, Chinese buyers were unable to trade due to restrictions on entry, resulting in a significant drop in prices[199]. Customs clearance at the Chinese border was stalled, making it temporarily difficult to obtain various commercial goods such as packaging and sewing supplies, causing prices to rise, and Mongolian goods were additionally required to comply with COVID-19 when exporting to China.

The Mongolian Government is working to promote trade, including securing transport through the China-Mongolia-Russia Trilateral Economic Corridor initiative and simplifying customs clearance procedures, which it is promoting jointly with China. It strongly promotes the computerization of trade procedures, based on its awareness that trade procedures are costly and time-consuming, and is also working on a One Stop Service for trade procedures.

The Mongolian Government is also active in participating in various exhibitions and holding them in Mongolia to promote exports. Regarding leather, the "leather processing brand development project" has started in Darkhan-Uul and Khovd aimags. As part of this project, it was announced that a leather

[197] World Integrated Trade Solutions（https://wits.worldbank.org/CountryProfile/en/Country/MNG/）
[198] Mongolia News Letter, Vol.47, 2020
[199] NIKKEI Newspaper, 19 May 2020 morning edition

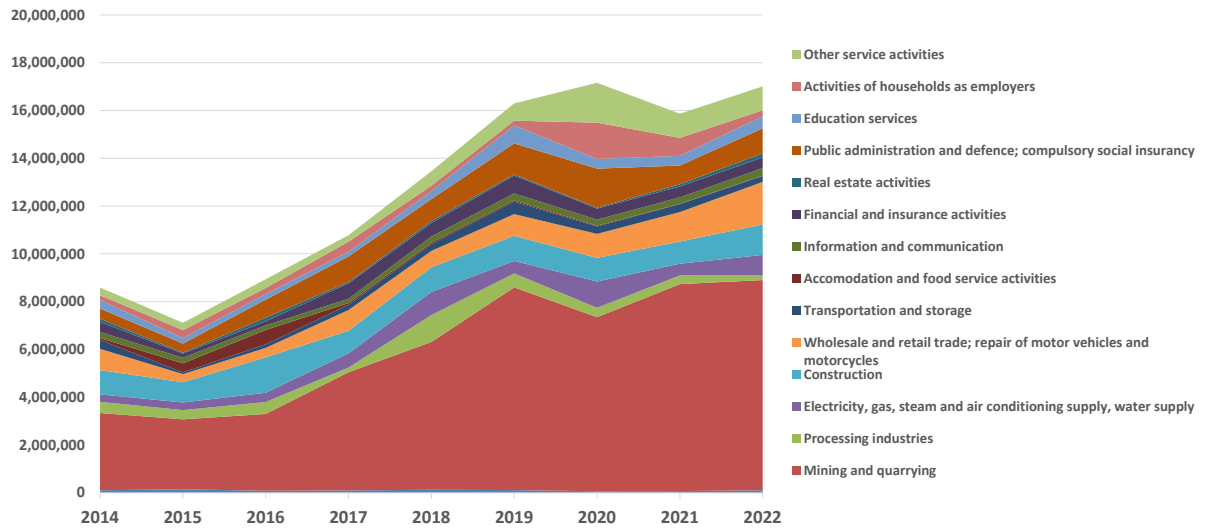
improvement and shoe manufacturing factory that meets international standards will be established.

Regarding cashmere, the goal was to process 60% of domestic cashmere to the final product in Mongolia. In addition, it is said that the export of cashmere, which was greatly affected by COVID-19, will be resumed. In a situation where it is difficult to participate in overseas exhibitions and trade fairs, it is also aimed at developing sales channels using EC sites[200]. The online exchange of opinions between major international cashmere manufacturers and herders was held in October 2020 with the support of UNDP and others. Sharing information and needs is extremely important for quality control and stable production and distribution, and such opportunities will be meaningful for future cashmere exports. Also in October 2020, the "Sustainable Cashmere Industry" conference was held in Switzerland, hosted by the Permanent Mission to Mongolia in Geneva. International organizations involved in economics and trade participated in the conference to consider promoting exports of sustainable cashmere industry development from the perspectives of preventing pasture deterioration, improving productivity, improving the livelihoods of nomads, and livestock hygiene[201].

3.3.11 Investment Promotion

(1) Trends in Investment by Sector

According to the trend in sectoral investment over the past 10 years, it is clear that the total amount is mostly linked to investment in underground mineral resources. In 2016, investment in resources was around 36% of total investment, but in recent years it has accounted for around 50%.



Source: Mongolian Statistical Information Service

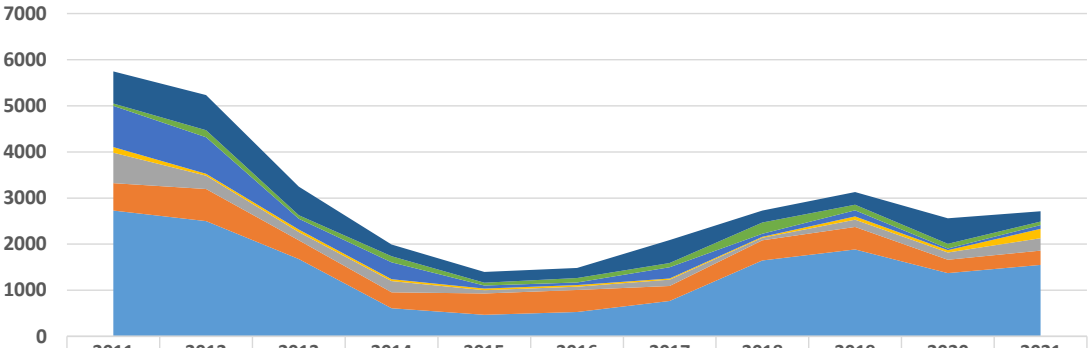
Figure 3.80 Trend in Investment Amount by Sector (mil. MNT)

In foreign direct investment, the substantial growth in foreign direct investment in the wake of the resource bubble in 2011 was followed by a sharp deterioration in the economic environment due to falling

[200] Mongolia News Letter Vol. 42 (22 October 2020)
[201] Mongolia News Letter Vol.44 (5 November 2020)

coal prices; it began to rise in the mid-2010s, but declined in 2020 and 2021, following the expansion of COVID-19 infection (Figure 3.81).

The Mongolian economy, which had been on a downward trend until 2016, has since picked up, and the economic growth rate has remained strong at 5.3% in 2017, 7.2% in 2018, and 5.1% in 2019. Economic changes and trends in investment in the 2010s have been linked to trends in mineral resource prices and the Chinese economy, and the Mongolian economy has been continuing to be dependent on mineral resources[202].

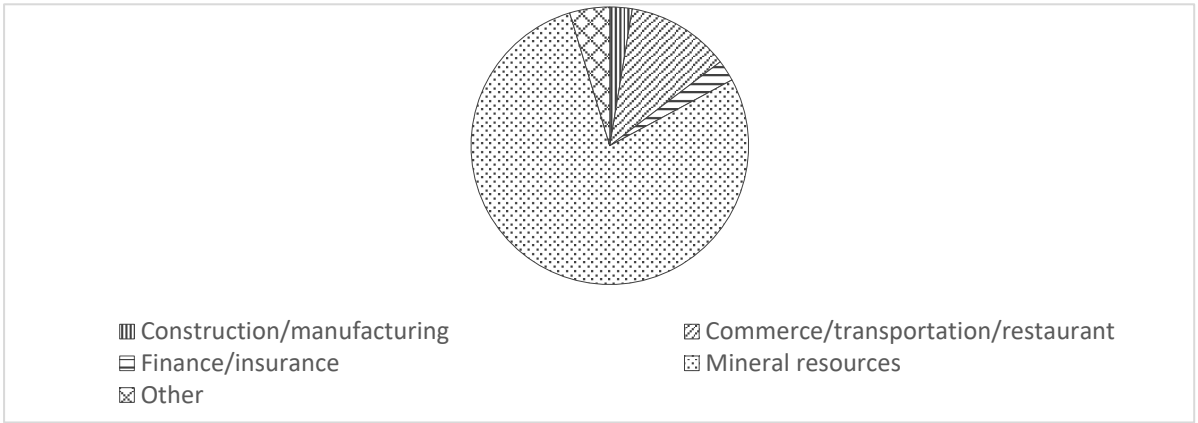


	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Others	694.1	759.8	617.9	251.4	233.7	220.7	493.7	261.9	277.7	554.2	226.2
Japan	54.1	154.9	78.6	132.3	61.3	94.3	91.8	243.7	121.8	98.9	74.6
Luxembourg	890.1	790	232.9	366.3	65.9	59.1	247	64.2	127.5	37.4	78.7
UK	123.6	43.5	54.8	40.9	31.8	33	25.1	19.3	74.6	51.8	207.0
Singapore	659.2	288.7	178.8	244.7	72	73.2	135.1	54.7	155.8	155.5	267.7
China	595.7	695.8	404.9	344.5	462.9	475	327.3	437.4	486.6	289.4	307.3
Canada	2728.5	2499.3	1678.2	611.4	468.7	531.1	766.3	1647.5	1886.8	1373.1	1552.0

Source: Mongolian Statistical Information Service

Figure 3.81 Trends in FDI (mil. USD)

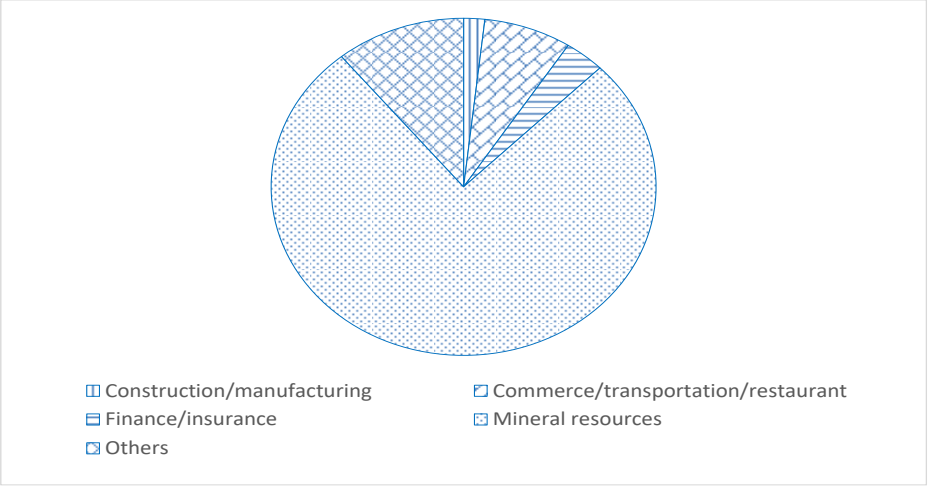
Most of the amount in FDI is also invested in underground mineral resources. In the mid-2010s, when resource prices fell, its share temporarily dropped to about 60%, however, before and after that it was around 80%. A comparison of 2011 and 2021 shows that the prevailing situation of a single mineral resource has not been broken.



[202] Coal prices fell by about 20% in 2010 compared to the previous year. After that, it continued to decline, and in 2015 it bottomed out at 50% compared to 2010. After that, it rose moderately.

Source: Mongolian Statistical Information Service

Figure 3.82 FDI Sector Composition (2011)



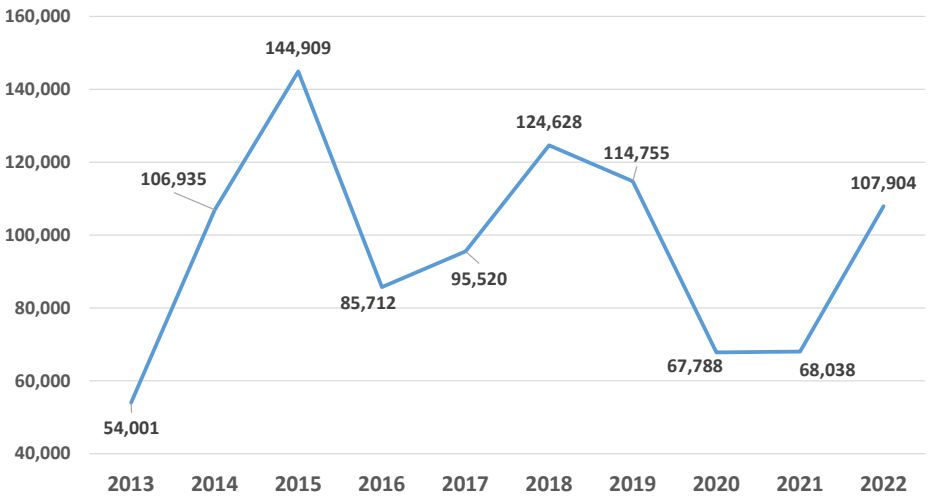
Source: Mongolian Statistical Information Service

Figure 3.83 FDI Sector Composition (2021)

(2) Investment in the Agricultural Sector

The Mongolian Government is trying to break away from such large dependence on underground mineral resources. The Government emphasizes value-added production policies in agriculture and livestock to promote industrial diversification by strengthening the non-mining sector and expanding employment[203].

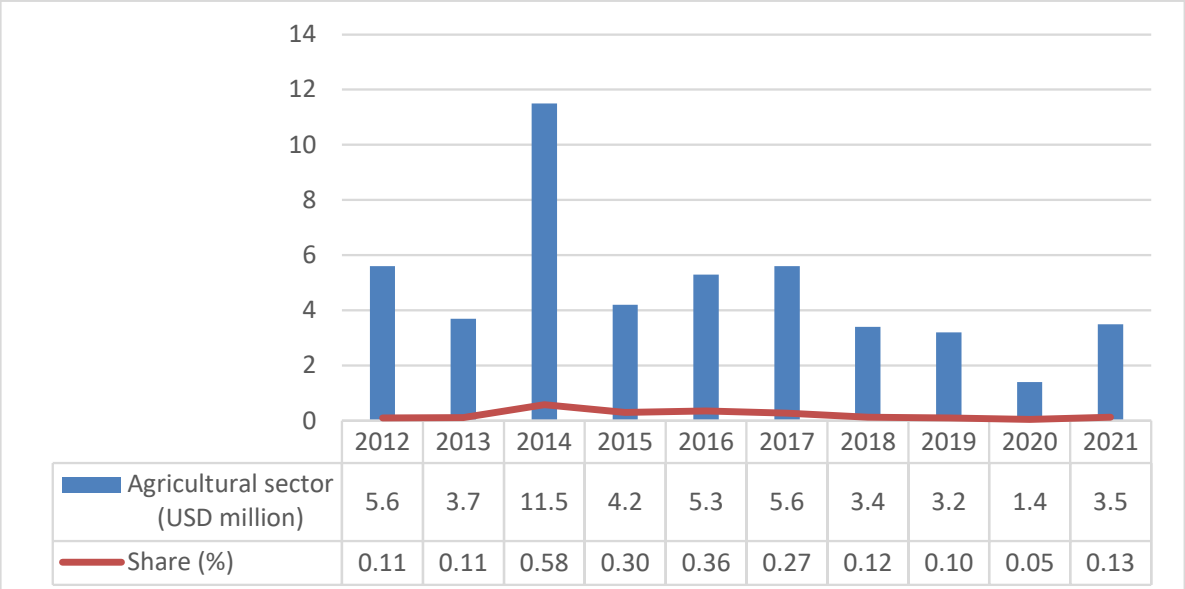
On the other hand, investment in the agricultural sector from 2012 to 2021 is shown and it can be said that it is gradually increasing. FDI inflows into the agricultural sector during the same period ranged from $ 3.4 million to $ 11.5 million and were only 0.1-0.6% of the total (Figure 3.85).



Source: Mongolian Statistical Information Service

Figure 3.84 Changes of Investment in the Agricultural Sector (mil. MNT)

[203] JICA Business environment guide 2020, JICA, May 2020



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Agricultural sector (USD million)	5.6	3.7	11.5	4.2	5.3	5.6	3.4	3.2	1.4	3.5
Share (%)	0.11	0.11	0.58	0.30	0.36	0.27	0.12	0.10	0.05	0.13

Source: Mongolian Statistical Information Service

Figure 3.85 FDI and Share in the Agricultural Sector

(3) Investment Environment

1） Improvement of the Investment Environment

In Mongolia, business-related laws and regulations have been developed such as investment law, labor law, company law, corporate registration law, tax law (General Tax Law, Corporate Income Tax Law, Individual Income Tax Law), accounting law, intellectual property law (patent/copyright law, trademark registration law), mediation law, bankruptcy law, small and medium-sized enterprise law, and the business environment has been improved recently.

Regarding investment, policies have been adopted to reduce the burden on businesses by improving the start of the business and the tax system (Table 3.31). The investment environment is free and investors are rarely subject to investment restrictions. Transparency has also been improved through constitutional reforms and judicial reforms, but at the same time, foreign investors complain about the long time it takes for court rulings and enforcement and the heavy-handed treatment of Mongolians with political backgrounds and state-owned companies[204].

Table 3.31 Improvement of the Investment Environment

Year	Field	Content
2008	Tax payment	Reduction of cost burden and simplification of the procedure by reducing profit tax rate and updating tax code
2009	Tax payment	Reduction of cost burden by reducing employee social insurance rate
2012	Credit grant	Improvement of the credit information system by eliminating the minimum loan amount included in the database
2013	Small investor protection	Investor protection by strengthening requirements for disclosure of transaction information
	Credit grant	Improvement of access to credit information with authorization from the credit referral office and guarantee of the borrower's right to inspect their data

[204] U.S. Department of State “2023 Investment Climate Statements: Mongolia” (https://www.state.gov/)

	Start of business	Simplification of entrepreneurship by eliminating the minimum capital amount of limited liability companies
2014	Securing electricity	Improve power supply by streamlining internal processes of utilities, applying time limits at the connection stage, and eliminating test costs during installation
	Construction approval	Simplification of construction permits by eliminating the need for government technical reviews of building plans for low to medium-risk construction projects
	Start of business	Simplification of entrepreneurship by eliminating the notarization of company laws and establishment permits and registration of the new company with the local tax office
2015	Tax payment	Simplification of tax payments by introducing electronic systems for corporate tax, VAT, and social security contributions
	Small investor protection	Strengthening protection for minority investors by introducing requirements for public corporations to issue transaction information within two business days
2016	Credit grant	Improvement of access to credit information by the start of distributing data of credit ledgers from utility companies credit ledgers begin distributing data from utilities
	Start of business	Simplification of entrepreneurship by reducing the time required to register a new company
2017	Tax payment	Simplification of tax payment by introducing an electronic system for tax filing and payment
2018	Credit grant	Increase access to credit by introducing new legislation on pledges of movable property and intangible property and setting up new collateral registration
2019	Execution of contract	Simplification of contract enforcement by reducing plaintiffs' prepaid fees for enforcement of judgments

Source: World Bank, Doing Business https://www.doingbusiness.org/en/reforms

In 2016, the Investors Protection Council (IPC) was established, consisting of ministers, the Director General of the Cabinet Secretary, senior ministry officials, and representatives of the private sector, including NGOs, which was transferred to the NDA in 2019 (the NDA was reorganized into the Ministry of Economic Development (MED) in 2021). The public-private advisory board was set up under the IPC in 2017, aiming for equal participation of public sectors, private sectors, and investors in policymaking on investment and business environments. Further, with regard to investor protection, the NDA, with the cooperation of the World Bank Group International Finance Corporation (IFC), launched the Systemic Investor Response Mechanism (SIRM)[205] in June 2020[206]. The SIRM enables investor complaints to be received and monitored for processing, and the electronic system allows investors to seek timely grievance redressal anywhere in the world. Delays caused by the exchange of official documents between government agencies were prevented and a database of grievance procedures was established.

2） Provision of Investment Information

The Mongolian government is providing business-related information to attract investment in Mongolia. Currently, the Ministry of Economic Development (MED) is responsible for foreign investment attraction and the Mongolian Chamber of Commerce is in charge of issuing certificates of origin, holding exhibitions, and arbitrating commercial affairs[207].

The MED operates a website for investors, INVEST IN MONGOLIA, which provides foreign investors with centralized information on registration, social insurance, taxation, immigration, and other relevant

[205] https://ipc.gov.mn/contentdetail/04aa7ee4-b4c7-42e3-b2ca-09531ed9125b
[206] Mongolia News Letter Vol. 768 (18 June 2020)
[207] JICA 2020

ministries and public authorities' public services related to foreign investment. Information such as the Investment Guidebook, an overview of the tax system, and the working environment is also available. The latest version of the Investment Guidebook is the 2020 edition, available in English and Chinese. The guidebooks showed the business environment, tax legislation, and how to set up a company in Mongolia.

3） Investment Law

The Investment Law was enacted in 2013, stipulating that domestic and foreign companies should be treated equally. Foreign investors have access to the same investment opportunities and receive the same protection as Mongolian investors. Whether an investment is foreign or domestic is determined by the investment residence, not the nationality of the investor. The law creates a more stable tax environment and provides incentives for investors. The preferential treatment for foreign companies stipulated in the previous Foreign Investment Law has been abolished. On the other hand, the Investment Law provides tax breaks for investment in priority sectors such as the agricultural sector and light industry[208], and the preferential treatment for foreign companies in these sectors has been enhanced. Especially in the agriculture and livestock sector, investments in grains, potatoes, vegetables, fruits and berries, milk, and forage crops are eligible for a 50% tax break[209]. The outline of the investment law is described below. It is currently in the process of being revised in line with the long-term development policy Vision 2050 and the policy to improve the investment environment set out in the New Recovery Policy[210].

Table 3.32 The Outline of the Investment Law

Chapter 1	General rules
Article 1-5	Purpose, related laws, definitions of terms, scope of law, investment form
Chapter 2	General legal guarantee
Article 6-7	Legal guarantee of investment, investors' rights and obligations、
Chapter 3※	Rights of Government Agencies
Article 9	Rights and obligations of government agencies
Chapter 4	Preferential treatment
Article 10-12	Method of preferential treatment (tax or non-tax)、 tax preferential treatment, non-tax preferential treatment
Chapter 5	Investment environment
Article 13-20	Retainment of tax rate and scale, tax to hold, retainment certificate, issuance conditions and period of retainment certificate, application of retainment certificate, issuance of retainment certificate, invalidation of retainment certificate, investment contract
Chapter 6	Investment by a foreign government-owned corporation
Article 21-22	Investment by a foreign government-owned corporation, application and receipt of permission
Chapter 7	Others
Article 23-24	Responsibility of law violators, legal effect

Note) ※ There was a clause on the authority of the central government as Article 8, but it was abolished in May 2015.

[208] Investment Guide, 2018, TDB Tokyo Office
[209] JICA 2020
[210] https://investmongolia.gov.mn/

The preferential treatments stipulated by the Law are as follows.

Table 3.33 The Preferential Treatments Stipulated by the Law

Tax preferential treatment	● Tax exemption ● Tax reduction ● Advance depreciation expenses to be deducted from taxable income ● Carrying over the deficit amount to be deducted from taxable income ● Employee training expenses can be deducted from taxable income ● Exemption from tariffs on imported technology and equipment for the following construction during the construction period ✓ Construction of factories for construction materials, oil, livestock products, and export products ✓ Product manufacturing using nanotechnology and innovation technology ✓ Power plants and railroads
Non-tax preferential treatment	● Long-term land occupancy (up to 100 years) ● Simplification of procedures in special economic zones and industrial parks ● Preferential treatment in the fields of infrastructure, manufacturing, science, and education ● Preferential treatment for funding innovation projects ● Measures such as residence permits for foreign investors and their families

4） Attracting foreign investment in the agricultural sector

The INVEST IN MONGOLIA called for investment in the agricultural sector. The report mentioned buckwheat, rapeseed, and soybeans for cultivated agriculture, and also mentions feed production as a by-product. It also mentioned ensuring food safety and the potential of organic farming. In addition, light industries such as leather products, cashmere products, wool products, and woodwork products and small and medium-sized businesses including dairy products processing and food industries were listed as potential investment destinations in the report. In the report, it was said that potential exports from high-value industries include meat, cashmere, and animal hair products (yak hair, wool, camel hair), making it Mongolia's most traditional industry while growing under new strategies.

In particular, cashmere, wool products, and leather are expanding into the manufacture and export of final consumer goods as well as raw materials, and some companies undertake OEM production from companies such as Italy[211]. As for meat, neighboring China imports beef and mutton from Mongolia for more than US $ 3 billion annually, and some countries such as the Middle East and Vietnam have a demand for goat meat. In Bulgan Aimag, there are examples of efforts to improve fattening methods to improve meat quality[212]. Mongolia's red meat industry, one of the world's leading livestock-owning countries, has high potential as an investment destination in the long run[213].

Table 3.34 Agriculture and Livestock Sector Listed as a Promising Investment Destination

Livestock	Crop production	Foods	Animal-origin products
* Livestock production by nomadic system * 70.9 million livestock	* Crop production without chemical fertilizers and pesticides	* Milk production * Meat production * Fermented products	* Cashmere wool products * Leather product

[211] Data collection survey for agriculture and livestock sector in Mongolia: final report, JICA, 2017
[212] Same as above
[213] Invest Reform Map for Mongolia, IFC, 2018

・ 4.2 million horses ・ 4.7 million cows ・ 400,000 camels ・ 32.1 million sheep ・ 29.3 million goats	for the last 50 years * 1.2 million ha of arable land * Cultivation area 600,000 ha	*Processed wild berries	

Source: Investment Guidebook 2019, NDA

(4) Issues

To attract investment, especially from overseas, it is important to have confidence in the Mongolian economy and the sector in which it is invested or to have an expected return. Although the Mongolian government has improved the legal system and improved the investment environment, it has been reported that in some cases the cumbersome bureaucratic and judicial procedures for establishing a company can take 18-24 months, that there is inconsistent application of regulations and laws between the central, aimag and soum jurisdictions, and that local inspectors have a lack of expertise[214].

The limited investment in the agricultural sector may be due to the expected return is not so large or confidence being shaken. Since Mongolia is a landlocked country, the transportation cost for export is high, and the procedure cost and time for going through each process also increase. The Mongolian Government is also working to simplify procedures and reduce time, and the investment climate improvements that have been implemented by the NDA and other relevant bodies are continuing. In domestic logistics, the road and rail network is still not well developed and there are still many transport constraints, but paved roads have been extended and road conditions have improved significantly in recent years. To attract investment, public investment in transportation and storage infrastructure related to promising sub-sectors is required.

In Mongolia, where the population is small and the domestic market is relatively small, exports are important in attracting investment. International certification and hygiene and quality control, including improvement of veterinary services, are major issues for exporting agricultural and livestock products. In this context, the fact that the Long-Term Development Vision 2050 and Sustainable Development Vision 2030 cite strengthening quality assurance systems, ensuring a stable supply of raw materials, and improving transport and logistics, including the development and expansion of road and transport networks, and that donors are implementing projects targeting these areas will be favored by investors. Ongoing efforts are also being made to improve paved roads, bridges, and power lines, to obtain input from the private sector on the taxation system, and to computerize administrative procedures. In addition, the fact that consideration for the natural environment and working environment is included in all national programs can be evaluated from the perspective of promoting investment.

Mongolia's agriculture and livestock sector has many low-complexity products, and even in the export market, it is below the average complexity of its product categories[215]. Less complexity often means that there is price competition with alternatives. A wide variety of more complex and knowledge-intensive production, that is, manufacturing and shipping of highly processed, unique, and guaranteed functionality is

[214] https://mn.usembassy.gov/2023-investment-climate-statement-mongolia/
[215] IFC 2018

desired.

3.3.12 Infrastructure

(1) Transportation

- Road: The total length of roads in 2019 was approximately 111,000 km, of which the total length of paved roads was 9,781 km and the total length of unpaved roads was 100,323 km. In terms of road types, the total length of national roads is about 14,920 km (2019), of which 47.4% are unpaved, 43.4% are asphalt paved, 6.2% are gravel paved, and 1.4% are improved soil roads. As for the number of automobile users, the number of users in 2019 was approximately 170,000 per year, and the volume of cargo trading was about 40.85 million tons per year.

- Air transportation: The number of air passengers in 2019 was approximately 1.62 million per year, of which 430,000 were domestic passengers and 1.19 million were international passengers. The volume of air cargo trading was 576,100 tons per year. Chinggis Khaan International Airport is located 16 km from the center of the capital city of Ulaanbaatar and has a capacity of an annual passenger of 1.4 million per year. New Ulaanbaatar International Airport was constructed 50 km from the center of Ulaanbaatar and opened in July 2021. Its capacity of the annual passenger is expected to be 2 million passengers, and the airport capacity is 12,000 flights per year. International flights in 2019 were served from major cities in Asia such as Tokyo, Osaka, Guangzhou, Baotou, Hailar, Erlian, Manzhouli, Tianjin, Beijing, Hohhot, Ulan-Ude, Irkutsk, Moscow, Istanbul, Bishkek, Berlin, Frankfurt, Hong Kong, Singapore, Seoul, Busan, Nur-Sultan, Bangkok, Sydney, etc. The regional airports with domestic routes are mainly in Asian cities. 13 regional airports have domestic flight routes, and the number of passengers and their locations are shown in the table below.

Table 3.35 Number of Annual Airport Passengers in Mongolia (2019)

Airport	Passenger per year	Location	Related Mines
The Chinggis Khaan International Airport	Approximately 1,620,000	Ulaanbaatar	
Khovd Airport	23,650	Khovd aimag	
Deglii Tsagaan Airport	15,177	Uvs agimag	
Ulgii Airport	23,960	Bayan- Ulgii agimag	
Dalanzadgad Airport	13,324	Umnu-Govi agimag	
Khanbumbat Airport	275,466	Umnu-Govi agimag	Oyu-Tolgoi Mine
Murun Airport	16,863	Khuvsgul agimag	
Choibalsan Airport	6,121	Dornod agimag	
Donoi Airport	3,409	Zavkhan agimag	
Ovoot Airport	14,873	Umnugovi agimag	Nariin Sukhait Mine
Altai Airport	11,055	Govi-Altai agimag	
Tavan Tolgoi Airport	1,930	Umnugovi agimag	Tavan Tolgoi Mine
Bayankhongor Airport	2,416	Bayankhongor agimag	

Source: JICA Project Team based on" NSO Year book-2019" "Road and transportation sector statistics 2018-2019"

- Railway: In 2019, the number of rail passengers was about 2.95 million, and the freight volume traded was approximately 28.14 million tons. The total length of the railway is 1,943 km. The Main and branch lines of the railway are shown in the table below. There are 65 railway stations from the northern border to the southern border, and the most

major station is Ulaanbaatar Station.

Table 3.36 Outline of Railway in Mongolia

Main and Spur Lines	Total extension (km)
Ulaanbaatar Railroad Trunk Line	1,110 km
Salkhit-Erdenet spur line	164 km
Darkhan-Shariin Gol spur line	63 km
Bagakhangai-Baganuur spur line	96 km
Tolgoit-Songino spur line	21 km
Khonkhor-Nalaikh spur line	13 km
Airag-Bor-Under spur line	60 km
Sainshand・Zuunbayan spur line	50 km
Ereen Tsav・Bayan Tumen spur line (Eastern part)	238 km

Source: JICA Project Team based on" NSO Year book-2019" "Road and transportation sector statistics 2018-2019"

(2) Water and Sewage, Electricity, Communication

The rate of water supply was 49.5% in Ulaanbaatar in 2019[216]. In 2016, the sewerage system was 27% in Ulaanbaatar, 18%, and 6% in Aimag Center and Sum Center, respectively[217].

The national electrification rate is 96.7%, and Ulaanbaatar is almost 100% electrified except for a few areas[218].

In 2015, the number of telephone subscriptions was 142 per 100 people, which is higher than the population, and more than 90% of these subscriptions were for mobile phones. The number of internet users was 39.40 per 100 people in 2015, a dramatic increase over the 2.62 per 100 people in 2010. Then, the total number of Internet users in 2019 was 5,450,600, which is much higher than the total population. In 2019, there were 355,100 landline subscriptions and 6,214,700 mobile phone users, of which 4,418,900 were active. Both numbers are much higher than the total population in Mongolia, indicating the widespread use of mobile phones[219].

(3) Economic Corridor, Channels of International Trade

The "Mongolia-Russia-China Economic Corridor" is a representative economic corridor in Mongolia.

In 2016, the leaders of Mongolia, Russia, and China will link Mongolia's development initiative, Russia's "Eurasian Economic Union" development policy, and China's "One Belt, One Road" initiative, to stimulate economic trading among the three countries. Thirty-two projects are planned to be implemented within this framework, covering sectors such as road transportation, industry, border/customs/quarantine, energy, environment, science and technology, education, health, and agriculture. Besides, the main channels of international trade will be shown as follows.

・ Land Route: Zameen-Ude Station, Sukhbaatar Station, Gashuun Sukhait Border Checkpoint (for

[216] NSO Year-Book 2019
[217] SDGs Report 2019 by NDA, http://nda.gov.mn/backend/files/WPzFZwDaebnpM4M.pdf
[218] SDGs Report 2019 by NDA, http://nda.gov.mn/backend/files/WPzFZwDaebnpM4M.pdf
[219] NSO Year Book2019

Mineral export by trucks), Nariinsukhait Border Checkpoint (for Coal export by trucks).

- Seaway: Mongolia does not directly face the sea, but it has import and export routes to third countries through China. It is transported by rail to Tianjin via Zameen-Ude Station, and then imported and exported by seaway from Tianjin port.
- Airway: air routes to foreign countries are developed, starting from Genghis Khan International Airport.

(4) Industrial Zone

The major industrial zones in Mongolia are the Altanbulag Free Economic Zone, Tsagaannuur Free Economic Zone, and Zamiin-Uud Free Economic Zone. In terms of industrial cluster zones (special zones), government decisions have already been announced to develop the industrial parks listed in the table below[220][221].

Table 3.37 Major Industrial Parks

Location	Name of Industrial Park
Ulaanbaatar Area	・ Emeelt Light Industry and Technology Park ・ Nalaikh Construction Material Factory Technology Park ・ Baganuur Heavy Industry and Technology Park ・ Bagakhangai Heavy Industry and Technology Park
Umnu Govi aimag	・ Bayan Govi Nutag Heavy Industry and Technology Park
Darkhan-Uul aimag	・ Darkhan Industrial and Technology Park
Orukhon aimag	・ Erdenet Industrial and Technology Park

Of these, the Emeelt Light Industry and Technology Park, which is being considered for development as a city-run project in Ulaanbaatar, has been renamed the "Emeelt Eco-Industrial Park. Workdbank, IFC, and UNIDO are supporting the development of this industrial park, and a feasibility study is currently underway with the support of these development partners[222]. The industrial park is expected to be a manufacturing base for internationally competitive export products, with plants for meat processing, wool and cashmere processing, and leather processing, as well as world-standard wastewater treatment facilities.

[220] UB City Website: https://zasag.mn/m/ulaanbaatar/view/16292
[221] Ministry of Mining and Heavy Industry, http://www.mmhi.gov.mn/public/more/id/381
[222] https://montsame.mn/en/read/321381

Chapter 4 Pilot Activities

4.1 Overall of the Pilot Activities

The purpose of these pilot activities (PA) is to extract knowledge and lessons learned through the implementation of pilot activities that contribute to the improvement of VC in the agro-pastoral industry in Mongolia, and to reflect them in the M/P. A total of 11 pilot activities will be implemented under this project, and two of them are selected by the project based on the proposals prepared mainly by local chambers of commerce and industry and private companies as local proposal-based PAs. The target sectors of the pilot activities are agriculture-related with a total of 4 activities and pastoralism-related (including fisheries) with 7 activities (Table 4.1).

Table 4.1 List of Pilot Activities

No.	Product	PA Title	Contents	Direction	Organization in charge
1-1	Vegetable	Pilot Activity for Expanding the Production and Supply Period of Vegetables	The objective is to expand the production and supply period of domestically grown vegetables by introducing greenhouse seedling and transplant cultivation and improving cultivation techniques.	Import substitution	MOFALI
1-2	Oil crop	Pilot Activity for Production and Marketing of Edible Oil	To expand the cultivation of oilseed rape as a raw material for processing in domestic oil mills, technical training will be provided using resources in Mongolia.	Import substitution	MOFALI
1-3	Sea buckthorn	Pilot Activity for Sea Buckthorn Value Chain Improvement Project	Strengthen the competitiveness of Mongolian sea buckthorn products by clarifying their nutritional and functional components and improving marketing.	Export promotion	MOFALI
1-4	Mushroom	Pilot Activity for Promotion of Domestic Production of Mushroom	Conducting cultivation tests of mushrooms, including shiitake, and activities aimed at stimulating mushroom consumption.	Import substitution	MOFALI
1-5	Meat	Pilot Activity for promotion and consumption of Goat and Sheep meat	Conducting production and sales tests of processed goat meat products and sales tests of unused resources (hooves, etc.) as pet food.	Export promotion・ Consumer Evocation	MOFALI
1-6	Milk, daily products	Pilot Activity for increasing milk off-take through improvement of milk collection facility	Improvement of milk production and sales volume by improving the situation of milk collection routes.	Import substitution	MOFALI
1-7	Wool/ cashmere	Project Activity to promote domestic consumption and export of wool and cashmere products	Testing the potential for improving the logistical efficiency of and quality of raw materials for wool and cashmere by developing regional logistics centers.	Export Promotion	MOFALI
1-8	Honey	Pilot Activity for Honey Processing and Supply Chain Improvement	The goal is to improve distribution with a view to exporting honey to China. The specifications requires beekeepers to produce in line with market needs, thereby stabilizing supply and guaranteeing quality.	Export promotion Import substitution	MOFALI
1-9	Livestock products	Pilot Activity for the development of local	The project is to develop and test the operation of a two-way information exchange digital platform between the public and private	Development of regional bases	MED

No.	Product	PA Title	Contents	Direction	Organization in charge
		information platform system	sectors.		
1-10	Yak wool	Pilot Activity for processing improvement of yak wool products	Improving the quality and productivity of yak wool products by updating processing equipment and providing technical training for staff.	Local industry development	MNCCI, Private companies
1-11	Fish processing	Pilot Activity for raw fish processing	Examining the feasibility of providing fish to local residents and tourists throughout the year by surveying the fisheries resources of Lake Khyargas and developing a raw fish processing plant.	Local industry development	MNCCI, Private companies

Source：JICA Project Team

4.2 Results and Lessons Learned from each Pilot Activity

4.2.1 Pilot Activity for Expanding the Production and Supply Period of Vegetables

(1) Outline of PA

Table 4.2 Outline of PA for Expanding the Production and Supply Period of Vegetables

Item	Content
Title	PA for Expanding the Production and Supply Period of Vegetables
Period	Mar 2021 to Dec 2023
Target area	Ulaanbaatar, Darkhan-Uul Aimag
Organization	Department of Coordination of Agriculture Policy and Implementation (MoFALI), Private companies (2), Mongolian Greenhouse Federation, horticulture farmers, etc.
Outline	Vegetable production and supply in Mongolia does not meet domestic demand and there is room for improvement in domestic production and supply. In this PA, three PAs were implemented as follows. 1) PA for introduction of excellent seeds and varieties of vegetables In order to improve productivity and quality by introducing excellent seeds and varieties from a Japanese seed company, we tried to demonstrate the effectiveness of excellent seeds that prefer a cool climate. We also researched the institutional aspects of seed importation and variety registration in Mongolia. 2) PA for introduction of raising seedlings and improvement of cultivation techniques in cucumber production and processing through contract farming. The project verified whether the introduction of greenhouses and forced cultivation techniques would expand the amount and timing of harvest in comparison with conventional farming methods. 3) PA for early raising seedlings of tomato using greenhouse An early raising seedling trial in facility-based horticulture using excellent tomato varieties was conducted in Ulaanbaatar.

Source: JICA Project Team

(2) Background and Objectives

The annual vegetable production in Mongolia is approximately 150,000 tons (in 2022), and is on an increasing trend, although annual fluctuations are observed. The main vegetables produced in Mongolia were mainly cabbage, carrots, turnips, and beets during the socialist era, but since the transition to a market economy, there has been a shift to a variety of vegetables such as onion, cucumber, tomato, pepper, garlic, etc. However, the production and supply of domestically produced vegetables have not kept pace with the demand, and since about 30-40% is dependent on imported vegetables from China, Russia, etc. It is necessary

to increase the production and supply of Mongolian vegetables through import substitution. The objective of this PA is to expand the production and supply of domestically produced vegetables. The content of the verification was to verify whether it is possible to expand the production volume, quality, and supply period by improving cultivation techniques, such as the introduction of raising seedlings and transplant cultivation in greenhouses and forced cultivation.

(3) Activities Carried Out in PA

1) PA for Introduction of Excellent Seeds and Varieties of Vegetables

i) Cultivation Trial of Excellent Seeds and Varieties

This PA was carried out by having a Japanese seed company provide vegetable seeds (tomato, cucumber, and onion) that are expected to be adapted to the Mongolian climate. The project conducted a cultivation trial from 2021 to 2023 in cooperation with the Mongolian Greenhouse Federation and its members. The table below shows information on the varieties grown in the trial.

Table 4.3 Information on Varieties Grown in the Trial

Vegetable	Variety	Trial Year	Characteristics of the Variety
Tomato	Va F1	2021, 2022	Normal size tomato, early maturing variety, suitable for long-term cultivation and high yield in a short period of time, long storage life, disease tolerance
Cucumber	Al F1	2021, 2022	Beit Alpha (fruits short type), suitable for cool climates, stable bear fruit, disease tolerance
Cucumber	St F1	2021,2022, 2023	Beit Alpha (fruits short type), high yield with fruit set at each node, maintains yield even under high temperature conditions, disease tolerance
Cucumber	Bu F1	2021, 2022	Beit Alpha (fruits short type), high yield, excellent fruit enlargement, disease tolerance
Onion	Tia	2022	Very early maturing variety, excellent fruit enlargement, northern type (adapted to cool climate), late bolting, slightly shorter storage period
Onion	Tib	2022	Northern type (adapted to cool climate), excellent early maturing, long storage period, good fertility

Source: JICA Project Team

i)Import/Export Procedures

Regarding the import of seeds, on July 12, 2021, the Japanese seed company shipped seeds from Japan and the Mongolian Greenhouse Federation received the seeds in Mongolia on July 24. Similarly, in 2023, seeds were shipped from Japan on April 12 and received in Mongolia on April 20. The following section summarizes the import procedures required in Mongolia.

ii) Variety Registration in Mongolia

The process of variety registration in Mongolia is as follows: 1) Conduct a cultivation trial (1-2 years) to compare the variety with conventional varieties in Mongolia, 2) Soil and water quality inspections of the trial plots and pesticide residue tests of the harvested products are required, 3) Prepare reports on cultivation trial (variety information, morphological and biological characteristics, productivity, quality of harvested products, etc.), 4) Submission of an application for registration to the Mongolian Seed Committee (and

possibly a field inspection), 5) Approval of the registration by the Mongolian Seed Committee. The committee is composed of MoFALI officials in charge of seed, members of industry organizations, and private companies. The Mongolian Greenhouse Federation applied for variety registration to the Mongolian Seed Committee at the end of 2022 for the varieties that were trialed. In addition, an application for registration of a cucumber variety (St F1), which was trialed in 2023, will be submitted to the Seed Committee at the end of 2023.

2) PA for Introduction of Raising Seedlings and Improvement of Cultivation Techniques in Cucumber Production and Processing through Contract Farming

This activity was conducted in cooperation with a food manufacturing company (GBT Trading LLC, which has "Gazar Shim brand") and about 20 vegetable farmers. Cultivation trials were conducted in Darhan Uul aimag in two farming methods, including the introduction of new greenhouse and cultivation techniques (1) direct sowing in plots with mulching and drip irrigation systems, and (2) planting of seedlings from raised seedling pots in plots with mulching and drip irrigation systems. Specifically, in 2021, sowing was done in the middle of May, harvesting started in late July, and was completed by the middle of September. In 2022, sowing was done in late May and early June, and harvesting started in late July and was completed by September 5. In 2022, due to a particularly cold climate, the sowing date was later than in previous years and the harvesting ended earlier than in previous. In addition, the expansion of harvest volume and timing compared to conventional farming methods was analyzed.

3) PA for Early Raising Seedlings of Tomato Using Greenhouse

In this activity, in cooperation with a Mongolian company (Everyday Farm LLC) engaged in vegetable production and sales, early-stage seedling trials were conducted in Ulaanbaatar using a good quality tomato variety from the Netherlands in greenhouse horticulture. For tomato varieties, the Mongolian agent (Dutch Mongolian Trade Office) selected medium-sized tomatoes (F1 Dofu) and small tomatoes (F1 Cheramy) from Rijk Zwaan of the Netherlands, and imported seeds in March 2021. However, the procurement of seeds was delayed for several weeks due to the Covid-19 disaster. The seeds were sown in the greenhouse in the middle of March, and after about 2 months of seedling growth, the seedlings were sold and the seedling sales were completed in June. In this activity, we verified the needs for vegetable seedlings and whether profitability could be secured in terms of raising and selling vegetable seedlings.


Tomato seedlings in the greenhouse


Greenhouse of a farmer who purchased tomato seedlings from Everyday Farm LLC

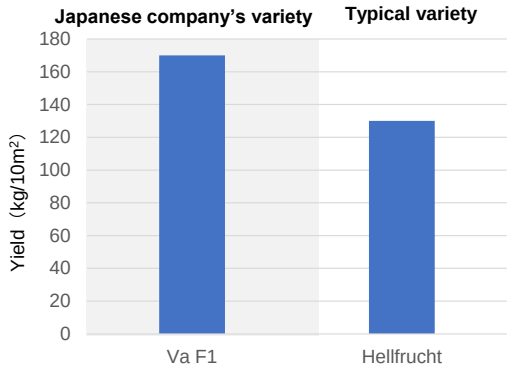
Figure 4.1 Photos of Tomato Production Trial

(4) Results and Issues

1) PA for Introduction of Excellent Seeds and Varieties of Vegetables

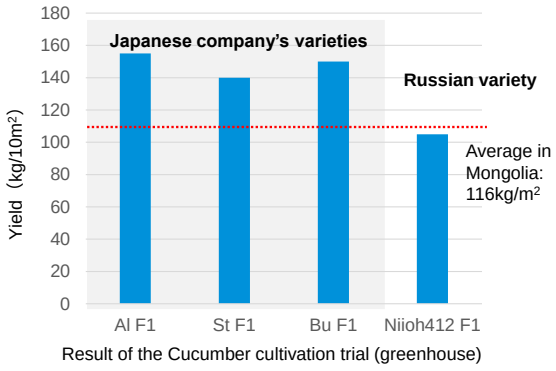
i) Cultivation Trial of Excellent Seeds and Varieties

In this PA, one tomato variety, three cucumber varieties, and two onion varieties were trialed cultivation in 2022 for vegetable seeds from the Japanese company. While the yield of the typical tomato variety in Mongolia in the control area was 130 kg/m2, the yield of the Japanese variety in the experimental area was 170 kg/m2, an increase of about 30%. As for cucumbers, the yield of the Russian variety in the control area was 105 kg/m2, while the average yield of the Japanese variety in the experimental area was 155 kg/m2, a 47% increase in yield, and a much larger yield than the Mongolian average of 116 kg/m2. Thus, the Japanese company's varieties are well suited to the Mongolian environment and their productivity is higher than that of conventional varieties. In addition, the farmers who conducted the trial cultivation highly evaluated the Vayana tomato variety for its excellent longevity ability to withstand transportation, and good taste. The cucumber varieties were evaluated for their good taste, sweetness, lack of pest infestation, and excellent longevity after harvest. In addition to selling the cucumbers for Change, farmers have expanded their sales channels, such as wholesaling them to restaurants that improve high unit prices for their good taste.



Source: JICA Project Team

Figure 4.2 Result of Tomato Cultivation Trial (greenhouse)



Source: JICA Project Team

Figure 4.3 Result of the Cucumber Cultivation Trial (greenhouse)

Experimental plot of tomato varieties
No pest or disease occurred and the growth was good

Experimental plot of cucumber varieties
Good growth, stable fruit, and high yield

Figure 4.4 Growth of Superior Varieties

ii) Import/Export Procedures

The Greenhouse Federation and the Japanese seed company collaborated on the procedures for seed export in Japan and seed import in Mongolia. The procedures for import/export procedures as of April 2023 are as follows: 1) the importer submits an application and necessary documents from the exporter to the Customs and Tariff Agency; 2) the Customs and Tariff Agency issues an import statement; 3) the exporter encloses the necessary documents and ships the seeds; 4) the importer goes to the DHL office at the airport (which also houses customs and quarantine officials) to the application for the issuance of an Import Statement is made by the importer.

Applications for the issuance of import statements are to be submitted to the Customs and Tariff Office via online application, but no application format is provided. Therefore, the importer must prepare the application form with the required items in writing. In addition, the importer must be registered as a legal entity in Mongolia. Table 4.4 summarizes the items that must be included in the application form and the necessary documents to be prepared by the exporter.

Table 4.4 Necessary Documents Related to the Import and Export of Seeds

Document	Applicant	Necessary items in the document
Application for import statement	Importer	Items required to be included in this application are imported items, quantity and unit price, border checkpoint of import (e.g., Genghis Khan International Airport for airfreight), shipping route (e.g., airfreight, land route, etc.), import period, packaging condition, processing condition, label (e.g., photograph used for packaging), name, affiliation and address of applicant, revenue stamp fee is 10,000 MNT. *However, for Mongolian strategic crops (wheat, grain seeds, etc.), it is required MoFALI's permit.
Documents prepared by the exporter	Exporter	1) Documents related to the transaction such as invoice, receipt, etc., 2) Certificate related to the quality of the seeds, 3) Phytosanitary Certificate (required for shipment), 4) Certificate related to production and quality control if they have (ISO, HACCP, etc.). Note 1) and 2) are required when the importer applies to obtain an import statement. 3) Is required at the time of shipment from overseas.
Contract Agreement	Importer, Exporter	An agreement between the importer and exporter regarding the sales and purchase is needed if they want. The agreement must include the items in the above application form.

Source: JICA Project Team

МОНГОЛ УЛСЫН ЗАСГИЙН ГАЗРЫН ТОХИРУУЛАГЧ АГЕНТЛАГ
МЭРГЭЖЛИЙН ХЯНАЛТЫН ЕРӨНХИЙ ГАЗАР
АМЬТАН, УРГАМАЛ, БУТЭЭГДЭХҮҮНИЙ ИМПОРТЫН МӨДӨГДЭЛ
02010515

Figure 4.5 Import Statements Acquired in 2021

ХҮНС, ХӨДӨӨ АЖ АХУЙ, ХОНГОН ҮЙЛДВЭРИЙН ЯАМ
БАТЛАМЖ
ALYA F1

Figure 4.6 Certificate of Variety Registration

iii) Variety Registration in Mongolia

As a result of consultation with the Seed Committee, one tomato variety and one cucumber variety were approved as promising varieties, and two cucumber varieties were approved as candidate varieties. Once a variety is registered as a promising variety in Mongolia, import restrictions on seed imports will be removed and the variety can be freely sold, and it may also be eligible for subsidized seed procured through the government budget. Under this system, the government publicly announces seed procurement, and registered seed registrants bid on each variety and win the bid to supply seeds. In addition, promising varieties can be applied to native varieties in the future by expanding the area of cultivation. Once a variety is registered as a candidate variety, which is the preliminary step to registering a promising variety, a certain amount of the variety can be imported for experimental cultivation. Table 4.5 shows the results of variety registration in Mongolia.

Table 4.5 Result of the Variety Registration

Vegetable	Variety	Trial year	Information on the variety of registration
Tomato	Va F1	2021, 2022	Registered as a promising variety at the end of 2022. 10,000 seeds were traded between the Mongolian Greenhouse Federation and the Japanese company in 2023.
Cucumber	Al F1	2021, 2022	Registered as a promising variety at the end of 2022. 10,000 seeds were traded between the Mongolian Greenhouse Federation and the Japanese company in 2023.
Cucumber	St F1	2021,2022, 2023	Registered as a candidate variety at the end of 2022 andas a variety available for import and sale at the end of 2023.
Cucumber	Bu F1	2021, 2022	Registered as a candidate variety at the end of 2022. Based on the results of trial cultivation and variety characteristics, it was decided not to apply for promising variety.
Onion	Tia	2022	Although trial cultivation was conducted in 2022, the application for variety registration was canceled due to delays in sowing time and the inability to cultivate the target variety in time.
Onion	Tib	2022	Although trial cultivation was conducted in 2022, the application for variety registration was canceled due to delays in sowing time and the inability to cultivate the target variety in time.

Source: JICA Project Team

2) PA for Introduction of Raising Seedlings and Improvement of Cultivation Techniques in

Cucumber Production and Processing through Contract Farming

GBT Trading LLC procured 637 tons of cucumber in 2021, of which approximately 175 tons were procured from farmers who participated in this PA. Interviews with the farmers revealed that harvesting started about 10 days earlier with the farming method (1) and about 15 days earlier with the farming method (2). In addition, the mulching method was found to maintain soil temperature and weed control, resulting in a longer harvest period and higher yields. Weeding frequency was reduced from three times to one time, which also proved to reduce labor costs. As shown in Table 4.6, farming method (1) was more profitable due to its lower initial cost, while farming method (2) was less profitable than farming method (1) due to its higher initial investment. However, due to delays in the procurement of materials and equipment such as greenhouses due to COVID-19 and flood damage to a few farmers, yields and profitability may be further improved if seedlings are grown earlier in the greenhouse. In any case, these farming methods are effective in Mongolia, which has continental cool climate characteristics and can contribute to increasing vegetable production and supply.

Table 4.6 Result of the PA by Each Farmer

No.	Farming method	Start date of harvest	Sales volume (kg)	Cost for materials (MNT)	Sales (MNT)	Sales-cost (MNT)
1	(1)	2021/8/06	25,833	2,569,000	30,289,800	27,720,800
2	(2)	2021/8/05	22,411	4,210,600	25,442,100	21,231,500
3	(2)	2021/8/01	20,420	4,186,600	22,868,600	18,682,000
4	(1)	2021/8/01	15,889	2,682,000	18,661,100	15,979,100
5	(1)	2021/8/09	13,529	958,000	15,925,000	14,967,000
6	(1)	2021/8/08	13,292	958,000	15,321,400	14,363,400
7	(1)	2021/8/14	10,262	2,858,000	12,284,400	9,426,400
8	(2)	2021/7/29	9,075	4,187,100	10,479,800	6,292,700
9	(1)	2021/8/08	8,426	981,500	9,842,200	8,860,700
10	(1)	2021/8/05	6,703	958,000	7,794,200	6,836,200
11	(1)	2021/8/08	6,624	463,000	7,581,800	7,118,800
12	(2)	2021/7/25	5,135	4,210,600	5,725,500	1,509,500
13	(1)	2021/8/16	4,065	958,000	4,540,400	3,582,400
14	(1)	2021/8/09	3,693	486,500	4,330,500	3,844,000
15	(1)	2021/8/18	2,671	958,000	3,114,800	2,156,800
16	(1)	2021/8/03	2,563	958,000	2,973,700	2,015,700
17	(2)	2021/7/26	2,454	4,210,600	2,712,000	-1,498,600
18	(1)	2021/8/04	1,664	981,500	1,942,900	961,400
19	(2)	2021/8/06	464	4,187,100	502,200	-3,684,900
20	(1)	-	-	981,500	-	-981,500

Source: JICA Project Team

In 2022, GBT Trading LLC procured 750 tons of cucumber, of which about 185 tons (equivalent to 275 million MNT) were procured from farmers participating in this PA. The farm-gate price in 2022 was 1,500-1,600 MNT/kg, and the PA was successful in increasing unit yield by about 40% compared to conventional farming methods. The three farming methods trialed were farming method, and these yields were farming method (1) was 14.4 tons/ha, farming method (2) was 20.4 tons/ha, and farming method (3) was 9.5 tons/ha. All of the farming methods (1) and (2) increased yields compared to traditional farming methods (3), especially (2), which resulted in more than double the unit yield compared to traditional farming methods. In addition to the increase in the yield, many advantages were obtained, such as the ability to start harvesting 10-14 days earlier than with traditional farming methods, the realization of forced cultivation, increased

frequency of harvesting, and reduced labor costs, especially for households with low labor force. The new farming methods (1) and (2) proved to be very useful in Mongolia as well as in 2021.

3) PA for Early Raising Seedlings of Tomato Using Greenhouse

Information on tomato seedlings produced and sold by Everyday Farm LLC is organized in Table 4.7 Profitability of Tomato Seedling Production and Sales (2021) Revenues were substantially in the red, and it proved difficult to earn profits from the raising and sale of quality vegetable seedlings with high unit sales prices.

Table 4.7 Profitability of Tomato Seedling Production and Sales (2021)

Tomato Variety	No.of sowed seedlings	No.of sold seedlings	Unit sales price (MNT/seedling)	Income (MNT)	Total Cost (MNT)	Benefit
Dofu	3,000	2,122	1,568	3,328,000	7,832,500	-4,504,500
Cheramy	3,000	1,303	2,904	3,783,900	12,233,500	-8,449,600

Source: JICA project team.

This was due to delays in seeding following the Covid-19 disaster, various cost increases due to the occurrence of Covid-19 cases within the company, limited marketing activities following the lockdown (customers tend to make purchase decisions after seeing the actual product), and the fact that many Mongolian farmers were not willing to pay the selling price of the best varieties rather than the Many Mongolian farmers prefer low-priced varieties (mainly from China) to high-quality varieties, so the number of units sold did not increase. However, according to interviews with farmers who purchased the seedlings, these tomato seedlings grew well and were highly rated for their yield, taste, and other qualities, and sales of the harvest were strong.

4) Challenges

i) PA for Introduction of Excellent Seeds and Varieties of Vegetables

- The import of high-quality seeds for vegetables is dependent on imports from overseas, but when seeds are imported, tariffs and value-added taxes of approximately 14% are levied. Since this is a significant amount of money for importers, it would be desirable to exempt the imports of only those crops for which domestic seed production is not sufficient, from customs duties and VAT.
- The lack of seed import agents in Mongolia, as well as the scarcity of English-speaking human resources in private companies, NGOs, and other human resources, can be a bottleneck in terms of foreign trade and import/export. The project has provided support to the PA in seed import/export transactions between the Japanese company and the Mongolia Greenhouse Federation.
- Currently, there are no clear laws and regulations regarding the provision of genetic resources, and there is no agreement between Mongolian and Japanese research institutions regarding the purpose and content of research, including the taking out of genetic resources. The researcher stated that if such laws and regulations existed, it would not be difficult to obtain export licenses from the MoFALI and the Customs and Tariff Agency.

ii) PA for Introduction of Raising Seedlings and Improvement of Cultivation Techniques in

Cucumber Production and Processing through Contract Farming

- In the case of cultivation in greenhouses, it is especially important to determine the timing of sowing and harvesting, because the cool climate affects the cultivation season.
- In the case of contract farming with processing companies, some farmers sell part of their harvest to "Change" without waiting to do business with the contracting company. Farmers are expected to comply with transactions with contract partners and to accurately assess profitability.

iii) PA for Early Raising Seedlings of Tomato Using Greenhouse

- The situation has improved in many supply chain stages (production, sales, etc.), but the challenge is the lack of profitability in the raising seedling stage. In discussions with Everyday Farm LLC, it was also noted that to increase profits from seedling production, it is necessary to receive orders from farmers in advance and decide on the variety and quantity of seedlings, and that labor costs as a percentage of the unit cost of seedlings can be reduced to about 30%. However, even if the labor cost could be reduced to 30%, plus an increase in the number of seedlings sold, profits would finally turn into the black. Currently, many individual farmers still produce vegetable seedlings from sowing, and we conclude that it is not easy to make a profit from raising seedlings and sales in Mongolia under the current circumstances.

(5) Findings and Lessons Learned

The findings and lessons learned through the PA are summarized as follows.

- The excellent seeds and varieties possessed by the Japanese seed company are useful and applicable to Mongolia's environment, and provide an opportunity for the company to expand their business opportunities. For Mongolian farmers, since these quality varieties have high productivity and profitability can be improved, it can be beneficial for vegetable production and supply if farmers import them or the government provides policy support for imports.
- Contract farming is effective for strengthening the vegetable value chain in Mongolia, as both processing companies and producers can reduce profitability and risks. It is conceivable that contract farming will continue to spread and expand, and it would be desirable for the government to support this trend.
- While it is the government's policy to improve vegetable self-sufficiency, farmers and companies tend to pursue profits, but there are high costs and risks associated with winter facility cultivation and seedling business in early spring. If the government continues its policy of increasing vegetable self-sufficiency, it is necessary to continue the electricity subsidies and priority vegetable subsidies that the government has provided in the past because of the risks involved for farmers.
- The selection of appropriate varieties of vegetables that respond to Mongolia's natural environment, appropriate cultivation techniques, and introduction of greenhouse horticulture will contribute to the expansion of vegetable production and supply. On the other hand, since the demand for vegetables is also increasing year by year, it is desirable to research and promote excellent domestic and foreign

varieties, and to provide support for greenhouse horticulture and cultivation techniques.

4.2.2 Pilot Activity for Production and Marketing of Edible Oil

(1) Outline of PA

Table 4.8 Outline of Project of Production and Marketing of Edible Oil

Item	Content
Title	Project of Production and Marketing of Edible Oil
Period	Jan. 2022 to Dec. 2023
Target Area	Selenge Aimag
Organization	Crop Production Policy Implementation and Coordination Dept. of MOFALI, Oil Milling Company, Producers of Rapeseed
Outline	MOFALI supports the plan to expand domestic production and distribution of rapeseed oil as a substitute for imported edible oil. Mustard seed rape (Brassica juncea, yellow rapeseed) and oilseed rape (Brassica napus, black rapeseed) are currently cultivated in a rotation cropping system with wheat and fodder crops for export to China. The Project aims at expanding rapeseed production as a material of Mongolian oil mill. For that, Mongolian human resources will be used for training and technical assistance for potential rapeseed producers.

Source: JICA Project team

(2) Background and Objectives

Most of the edible oil consumed in Mongolia depends on imports from abroad. In Mongolia, rapeseed is a promising oil plant, and although the cultivation of rapeseed and mustard has expanded to a certain extent, most of it is exported to China as a raw material. There is a large-scale oil mill in Mongolia but their operating conditions are not sufficient. In order to improve this situation from the viewpoint of food security, the government has announced a policy of strengthening the supply chain from the production of raw material rapeseed to the processing of edible oil.

The pilot activity aims to support the expansion of rapeseed production for domestic oil mills. To this end, the government will try to develop support systems and measures, strengthen cooperation between rapeseed producers and oil mills, and expand consumption by showing the superiority of rapeseed oil.

(3) Activities Carried Out in PA

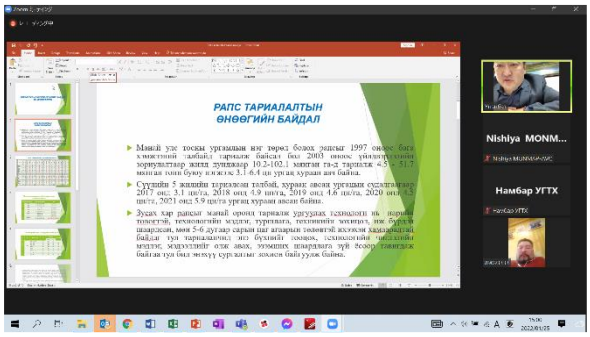
1) Training / Seminar

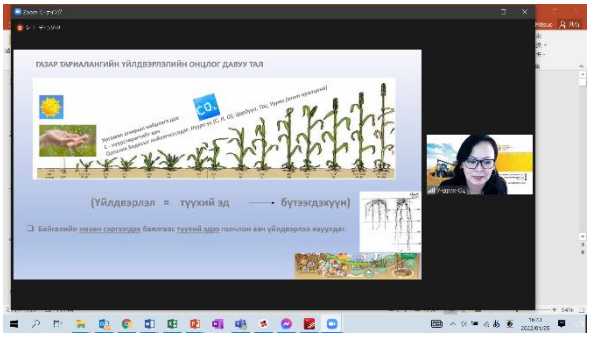
Based on discussions with stakeholders and site visits to oilseed rape producers and oil mills, it was decided to hold a seminar on oilseed rape production technology. This is because it was found that although the oil mills are well equipped, the production of oilseed rape as a raw material is not sufficient due to technical and distribution problems of the farmers. The unit yield of oilseed rape in Mongolia averages about 0.5-0.6 ton/ha, and needs to be brought closer to the world average of 2.0 ton/ha. In addition, it is recognized that the production of mustard seed, which competes with rapeseed, needs to be countered by favorable purchase conditions for Chinese exports.

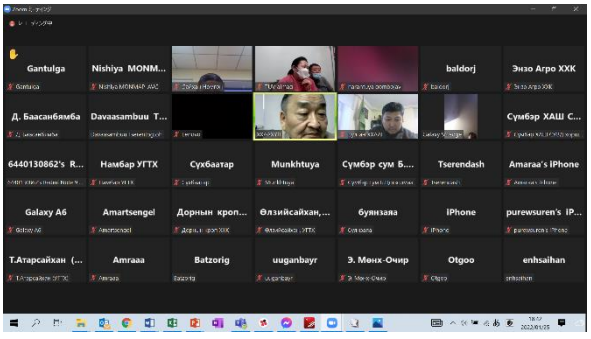
The following is a summary of the training conducted on January 25, 2022, which was conducted online due to COVID-19 and attended by more than 100 farmers and other interested parties. With the cooperation of Takikawa City, Hokkaido, Japan's rapeseed producing region, a lecture on the current state of oilseed rape

production in Japan and cultivation methods was also given. The seminar was meaningful, with many questions and answers from the participants.

Purpose:	From the perspective of food security, it is necessary to provide the necessary knowledge to supply raw materials to edible oil mills in Mongolia, cultivate, manage, and harvest oil plants, introduce harvesting methods and techniques, and introduce appropriate rotation cultivation by growers and protection of soil fertility. This training will provide oilseed rape growers and agricultural producers interested in producing oilseed rape with an explanation of the government's policies to support oilseed rape production, an explanation of oilseed rape production techniques, soil management techniques, and information on oilseed rape production in Japan to encourage the development of oilseed rape planting plans for the 2022 crop year.
Date:	January 25, 2022, 14:00-17:00
Target:	oilseed rape growers and agricultural producers (total 164 companies and individuals)
Method:	Online (Zoom from MoFALI)
Contents:	Government policy on promotion and support of oilseed rape production [B. Unenbat; Director of Dept. of Agriculture, MoFALI] [B. Odonkhoo; Senior expert of Dept. of Agriculture, MoFALI] Cultivation techniques of oilseed rape in Mongolia (seed, variety, plant protection, harvest, etc.) [O. Munkhjargal; Professor of University of Life Sciences] Oilseed rape production in Japan – Case study of Takikawa city [Mori Takanobu; JA Takikawa] Effect of oilseed rape production to soil fertility [B. Undrakh-Od; CEO of National Farmers Association of Mongolia] Soil nutrition for oilseed rape [B. Amarsanaa; Head of Agricultural Expert Association of Agricultural Engineers] Question and answers [MoFALI/JICCA Team]







Following this seminar, a forum was held in March 2022 by MoFALI and the National Farmers' Association in Mongolia to prepare for planting, and a field seminar was scheduled to be held around August, during the oilseed rape flowering season. However, the field training scheduled for the summer was cancelled due to

circumstances at MoFALI. Instead, there was a field event sponsored by the oil pressing company, to which we sent a video message calling for a change from mustard seed to oilseed rape.

The project side participated in a forum held in March 2023 by the oil miller, MoFALI, and the National Farmers Association, where we explained the situation of edible oil and rapeseed in the world and Japan as a background and called again for the promotion of rapeseed oil production in Mongolia. In addition, a Rapeseed Cultivation Guide prepared by the Project was distributed to the agricultural producers who participated in the forum. At this forum, specific discussions on actual oilseed rape cultivation and trade were held among the participants, and preparations were made for oilseed rape planting in 2023.

2) Rapeseed Production Guide

A guide to oilseed rape cultivation in Mongolia was developed, together with oilseed crop experts and soil specialists from the Mongolian University of Life Sciences. Based on a booklet on oilseed rape cultivation prepared by the experts, a single sheet of paper with revised content for farmers was prepared. Two versions were produced: a full version (A3 size, double-sided) with the technical content organized according to the items, and a simplified version (A4 size, single-sided) with only the important items reorganized in an easy-to-read format according to the farmers' cultivation procedures. Thousand copies of each were printed and distributed to interested parties through MoFALI and the National Farmers Association.

Rapeseed Production Guide (Full Version, Front)

нь авцалдаа сайтай хөрсөнд-1.0-1.5 см, шаварлаг хөрсөнд – 1.5-2.0 см, хөнгөн хөрсөнд -2.0-2.5 см түүнээс дээш байна.

7. Хог үргамалтай тэмцэх

Хог үргамалтай тэмцэхдээ хөрсийг боловсруулж эхлэхээс авахуулаад эртнээс тэмцэж эхлэх хэрэгтэй.

Рапс тарих талбай нь олон наст хог үргамлаас сайн цэвэрлэгдсэн байх шаардлагатай. Талбайд дээрхи хог үргамал их байгаа тохиодолд намар глифосат агуулсан бэлдмэл хэрэглэнэ.

Бэлдмэлийг цаг уурын тааламжтай нөхцөлд (хөрс чийглэг, халуун цаг үүртай үед) нэг наст үет хог үргамлыг 2-4 навчтай үед, олон наст хог үргамлыг хамгийн багадаа 4-5 навчтай, 10-20 см өндөр болсон үед хэрэглэнэ.

Рапсын талбайд ихэвчлэн нэг наст болон олон наст (хиаг) үет хог үргамал тархдаг учраас тэдгээрийн эсрэг тэмцэхэд өндөр

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зарцуулалтын норм 200-300 л/га. Хор цацагчийг сэлгэж ашиглахдаа пестицидийн аппаратыг сайн угааж цэвэрлэх хэрэгтэй. Мөн талбайд гербицид цацах зориулалттай чиргүүл машинуудыг ашиглана.

Хор цацагчийг ажиллуулах үед штангийг үргамлын өндөрт нь тохируулна. Агрегатын хурдыг тухайн цацагчийн горимд бариулан явуулна. Рапсын химийн боловсруулалтыг зөгийн зуны нислэг дууссаны дараа, цэцэглэлтийн төгсгөл үед хийнэ.

9. Өсөлтийн бодис хэрэглэх

Рапсын үргамлын хажуугийн мөчир, хонхорцгийг их хэмжээгээр нэмэгдүүлэх, улмаар үргацыг дээшлүүлэхэд өсөлт тохируулагчийг хэрэглэнэ.Өсөлт тохируулагч бодисыг рапсын 4-6 навчтай болсон үед, мөн ишний идэвхитэй өсөлтийн үед хэрэглэнэ.

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үр ашигтай, нийтлэг үйлчилгээтэй гербицид хэрэглэнэ. Үүнийг таримлын хөгжлийн аль ч үе шатанд хэрэглэх боломжтой.

8. Өвчин хортонтой тэмцэх

Зусах рапс нь үргалтын хугацаа богинотой учраас өвчинд нэрвэгдэх нь харьцангуй бага байдаг.

Рапст хөнөөл учруулдаг гол хортон нь тоонолжин цэцэгтний үсрэгч цох (соёолоттын үед), рапсын цэцэг идэгч, шөвгөр хошуут, рапсын таслагч, байцааны бөөс харин өвчнөөс альтернариоз, пероноспориоз, хар хөл, склеротиноз, саарал ялзрал болон фузариоз байна.

Өвчин хортонтой тэмцэхэд зориулалтын инсектицид, фунгицидийг ХХАА-наас таргасан зөвшөөрөл, зааврын дагуу хэрэглэнэ. Цацахдаа зориулалтын хор цацагчуудыг ашиглана. Ажлын шингэний

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10. Десикаци хийх

Десикаци хийснээр рапс нь хурдан, жигд хатаж, цаг уурын нөхцлийг харгалзахгүйгээр тохиромжтой хугацаанд буюу түүнийг хийснээс хойш 5-7 хоногийн дараа хураах боломж бүрдэнэ. Мөн үрийн чийгийг багасгаж, хураалтын дараах хатаалтын зардлыг бууруулна.

Шууд хураалт хийх боломжтой болсноор хураалтын хаягдлыг хамгийн бага хэмжээнд байлгана. Ингэснээр рапсын үрийн чанар, тосны гарц дээшилнэ. Десикаци хийхдээ зориулалтын ажлын шингэнийг ашиглана. Рапсын нийт хонхорцогны 50% нь хүрэнтсэн үед десикацийг хийнэ.

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11. Хураалт

Рапсын талбай олон наст хог үргамлаар бохирдсон, харилцан адилгүй болцтой, өвчин, хортонд нэрвэгдсэн үед ангилан хураалтыг хийнэ.

Ангилахдаа рапсын хажуугийн мөчрөөс дээшгүй, 30-35 см-йн өндөрт хадна. Валыг 5-7 өдөр хатаах ба энэ үед хонхорцог дахь үр бүрэн болсон, үрийн чийг 10-12% хүртэл буурсан байна. Хатсан валыг үр тарианы комбайнд подборщик зүүж цайруулна.

Ангилан хадсан рапсын үр 10-12%-ийн чийгтэй болсон үед цайруулалтыг 3-4 өдөрт багтаан хийнэ. Хураалт үргэлжлэх хугацаа үүнээс хэтэрвэл хэт хатаж, талбайд хаягдал ихээр гарах нөхцөл бүрдэнэ. Цайруулалтын үед комбайны хурд 5-6 км/цаг загоны урт 1500 метр байхад 4 явалт буюу 2 эргэлттэй байна.

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бүхий комбайнуудыг ашиглана.

Мөн шууд хураахдаа үр тарианы комбайныг ашиглана. Комбайныг ажилд бэлтгэхдээ жижиг үртэй үргамал хураах учраас тохируулга болон чигжээсийг маш нягт нямбай хийнэ.

12. Хураалтын дараах үрийн боловсруулалт

Рапсын үрийг цэвэрлэх, хатаахад сэнс-шигшүүр болон сэнс-шигшүүр-триер ашиглаж цэвэрлэдэг зориулалтын машинуудаар хийнэ.

Рапсын үрийг цэвэрлэхэд бөөрөнхий болон гонзгой дөрвөлжин нүхтэй шигшүүрийг үрийн хэмжээнээс хамаарч ашиглана. Шигшүүр нь Б1- дугуй, 2.0-3.0 мм; Б2- дугуй, 2.5-3.0 мм; В- дугуй, 0.9-1.9 мм; Г- гонзгой дөрвөлжин, 0.9-1.0 мм хэмжээтэй байна.

Зусах рапсын үрийг хатаахад модон болон уурхайн хатаагчийг ашиглана.

15

Рапсыг ангилан хадахдаа 6.3; 7.0; 7.5; 8.5 м гэх мэт өргөн авцтай жаткануудыг өргөн хэрэглэнэ. Мөн өөрөө явдаг жатканг ашиглан дан болон давхар мөрлөх зориулалтаар ашиглана.

Рапсыг комбайнаар шууд хураана. Хураах үед рапсын навч нь бүрэн унасан, дээд, доод хэсгийн мөчрүүд нь шарласан, гол иш нь шар ногоон өнгөтэй болсон, дээд хэсгийн мөчрийн хонхорцог шар өнгөтэй, үр нь өөрийн үндсэн хар өнгөө олсон, чийг нь 15-18%-аас доошгүй байна.

Хураалтыг орой болон өглөөний чийглэг үед хийнэ. Шууд хураалтын өндөр нь үргамлын дундаж өндрийн 30-40%-д байна. Гэхдээ рапсын хажуугийн мөчрөөс дээшгүй байна.

Рапсыг хураахад хүрдэт цайруулах ангитай, 160 орчим моринь хүчтэй хөдөлгүүр

14

13. Хадгалалт

Рапсын үр амархан муудаг. Тийм учраас түүний үрийг удаан хугацаанд чанартай хадгалахын тулд үр нь гэмтээгүй, маш сайн цэвэрлэгдсэн, бүрэн гүйцэт боловсорсон байх ёстой. Рапсын үрийн хадгалах үеийн чийг 8-10%-иас хэтрэхгүй байна. Үүнийг баримтлаагүй тохиолдолд үрийн соёололт муудна. Тиймээс үрийг удаан хугацаанд хадгалахад үрийн чийг 7-8% байх нь хамгийн тохиромжтой.

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Rapeseed Production Guide (Full Version, Back)

Figure 4.7 Rapeseed Production Guide (Simple Version)

3) Educational Activities

Activities to increase the consumption of rapeseed oil were not handled in the pilot activities as they were not urgent due to the fact that the production of rapeseed oil is below the market needs. A trend toward an increase in the amount of rapeseed oil handled by general retailers was observed due to the efforts of the oil mills. Discussions will continue with the oil mills regarding future development.

The progress of the main activities is shown in the following table.

Main Activity	2020		2021				2022				2023			
	Q-3	Q-4	Q-1	Q-2	Q-3	Q-4	Q-1	Q-2	Q-3	Q-4	Q-1	Q-2	Q-3	Q-4
Development Direction														
Training/Seminar														
Rapeseed Production Guide														
Education Activities														

(4) Results and Issues

The results of this pilot activity will be examined by increasing the production of oilseed rape and edible oil in Mongolia. The production of Rapeseed, which includes both oilseed rape and mustard seed rape, has fluctuated between 63,000 ha and 99,000 ha annually in the statistical reports for 2017-2021. According to MoFALI, the Rapeseed planted area in 2022 is expected to be well above the initial target of 66,410 ha. The target area for Rapeseed planting in 2023 is set at 66,410 ha, the same as in 2022. In order to secure sufficient area for wheat, the staple food, it is necessary to control the Rapeseed planted area within a certain range, and it is important to lower the proportion of mustard seed rape in Rapeseed, which was estimated to be around 80% at the beginning of the project, and to raise the proportion of oilseed rape. According to the expert at the University of Life Sciences, the proportion of oilseed rape is gradually increasing. But it is difficult to determine a result pf the PA at this point because the yield per unit area as Rapeseed varies greatly each year due to climatic factors, and because no distinction is made between mustard seed rape and oilseed rape. On the other hand, the production of rapeseed oil is on the rise, and the oil company reported that the production had reached 1,200 tons by 2022.

In order to expand oilseed rape production for edible oil production, training is an effective first activity to motivate oilseed rape growers to expand their planting plans during the winter months. In response to this, a government support system will be established, including an import and distribution plan for quality seeds and a support plan for fuel for farm machinery, according to the planting plans of the producers. Although MOFALI has so far prepared a training plan but has been unable to implement it due to lack of budget. However, once the effectiveness of the online training is confirmed, it is expected to be continued in the future.

Technical support resources could also be picked up during the development of the training plan. A leading oilseed plant research scientist at the University of Life Sciences is expected to be the backbone of the technology related to oilseed rape production. He has proposed to the government to proceed with the project as an edible oil project as one of MOFALI's national projects. He has written three books on oilseed plants and is compiling a handbook on oilseed rape production guide in 2021. This could be used as a basis for a

re-edited cultivation guide for general producers.

On the other hand, since oilseed rape has been incorporated into a rotational cultivation system with wheat and other crops, support for field crop agriculture as a whole is also considered necessary. There is the National Farmers Association as a producer organization and the Mongolian Association of Agricultural Engineers as a researcher organization, each of which has technicians related to crop rotation systems, soil management, no-till cultivation, etc., which are expected to function to promote stable production of oilseed rape as one of field crops. Coordination between the government support system and these organizations is considered important and will be coordinated through the implementation of this training program.

(5) Findings and Lessons Learned

The findings and lessons learned through this pilot activity can be summarized as follows.

- Research on oilseed rape cultivation technology has been conducted at the University of Life Sciences and other institutions on oilseed crops and has been compiled in books and contributed to variety registrations. On the other hand, oilseed rape producers are inexperienced in oilseed rape production. Because oilseed rape is the second crop after wheat, technological improvement is not a priority, its productivity remains low. In order to disseminate research results to common producers, it is considered necessary to provide continuous training programs with easy-to-understand materials.

- Agricultural producers incorporate Rapeseed into their crop rotation system with wheat and grass, and control its acreage according to the status of other crops. When government wheat procurement conditions deteriorate, they take measures to reduce wheat plantings and increase Rapeseed plantings. Extreme fluctuations in production are undesirable in terms of food security in the country, and a stable wheat procurement system should be maintained. In response to the increase in oilseed rape production, it is essential to adopt a policy of increasing oilseed rape while decreasing mustard seed rape in the Rapeseed breakdown.

- Although oilseed rape is ready to be accepted as a raw material on the oil company, they have been struggling to expand its domestic production. Therefore, the oilseed rape purchase conditions are being improved through corporate efforts, while the farmers continue to prefer to cultivate mustard seed rape for exporters, which offer a high unit price and cash settlement. In order to reduce the dissatisfaction of both parties, it is desirable to mutually agree on purchase conditions before planting, and the government may effectively support such contract cultivation.

- In response to the government's policy of increasing self-sufficiency in edible oil, companies tend to pursue profits. Oil mills are not necessarily limiting their sales of rapeseed oil to the domestic market, but are also looking to export, and have begun exporting to South Korea by 2022. It is necessary to stimulate domestic demand for rapeseed oil and encourage domestic shipments by boosting the relative unit price.

4.2.3 Pilot Activity for Fruits (Sea Buckthorn)

(1) Outline of PA

Table 4.9 Outline of PA for Sea Buckthorn Value Chain Strengthen Project

Item	Content
Title	PA for Sea Buckthorn Value Chain Strengthen Project
Period	Mar 2021 to Dec 2023
Target area	Ulaanbaatar, Tuv
Organization	Department of Coordination of Agriculture Policy and Implementation (MoFALI), Mongolian National Association of Fruits and Berries, 5 private companies, EU TRAM
Outline	The competitiveness of Mongolian sea buckthorn products in the international market is not high. This PA aims to strengthen the value chain and enhance the competitiveness of Mongolian products by (1) strengthening the value chain through the introduction of excellent varieties of fruit trees and the development of a seedling center, and (2) marketing Mongolian sea buckthorn products (clarifying their nutritional content and functional properties, etc.).

Source: JICA Project Team

(2) Background and Objectives

Fruit and berry production in Mongolia is about 1,800 tons (2019), with sea buckthorn accounting for about 90% of production. In addition to the distribution of sea buckthorn fruits and products within Mongolia, a portion of these products are exported to international markets. However, the ingredients and functionality of sea buckthorn products have not been fully provided to domestic and international markets and consumers, and the competitiveness of Mongolian sea buckthorn products is not high in the international market. The objectives of this PA are to enhance the added value and competitiveness of Mongolian sea buckthorn by (1) strengthening the value chain through the introduction of quality varieties and the development of a seedling center, and (2) marketing Mongolian sea buckthorn products (to clarify their nutritional content and functional ingredients). The verification will include: (1) whether the production seedlings of domestic and foreign quality varieties can be produced and sold under the Mongolian environment, and (2) whether the sea buckthorn products (juice, jam, powder, etc.) of Mongolian companies can meet the market needs (mainly in terms of quality) in the international market. This PA was conducted in cooperation with the Mongolian National Association of Fruits and Berries, EU TRAM, and the results of the analysis were shared in order to avoid duplication of products to be analyzed. EU TRAM is analyzing sea buckthorn oil produced by Mongolian companies.

(3) Activities Carried Out in PA

1) Strengthening the Value Chain through the Introduction of Excellent Varieties of Fruit Trees and the Development of Seedling Center

In collaboration with the Mongolian National Association of Fruits and Berries and the Mongolian University of Life Science, this PA supported the development of a fruit tree seedling center at the site of the University in Bornor. Specifically, in accordance with the seed and nursery standards established by the Association, planting of fences and windbreaks, construction of wells for water supply, construction of plastic greenhouses, and field preparation were carried out, and then the best varieties of fruit trees (the project support was only for sea buckthorn) were procured, some seedlings were planted in the open field, some were

planted in greenhouses, etc. Some seedlings were planted in the open field and some in greenhouses, and seedling cultivation was started in the summer of 2022. A total of 1,200 seedlings of four varieties of sea buckthorn, which were originally planted at the university plot in Ulaanbaatar, and five newly procured varieties, were grown on a trial basis.

Sea buckthorn seedlings procured from multiple regions

Procured domestic wild sea buckthorn varieties

Figure 4.8 Fruit Tree Seed Center

2) Improvement of Marketing of Mongolian Sea Buckthorn Products

In this PA, under the cooperation of the Mongolian National Association of Fruits and Berries and private companies, private companies provided sea buckthorn products, and the MONMAP requested SGS, a German company, to analyze the ingredients. Table 4.10 shows the products that were analyzed for ingredients.

Table 4.10 Products Provided by Private Companies

No.	Company name	Products
1	Uvs Food JSC	Sea buckthorn pure juice
2	Uvs Food JSC	Sea buckthorn condensed juice
3	Uvs Food JSC	Sea buckthorn jam
4	Khaan Jims LLC	Sea buckthorn pure juice
5	Eco Erdene LLC	Sea buckthorn jam
6	Teso LLC	Sea buckthorn powder with oil
7	Teso LLC	Sea buckthorn pure juice
8	Shar Doctor LLC	Sea buckthorn pure juice

Source: JICA Project Team

On the other hand, interviews with Japanese manufacturing companies did not reveal any companies importing raw materials from Mongolian sea buckthorn. However, among the interviewed companies, we confirmed that there is a private company that imports sea buckthorn dried fruit as a raw material from other countries. The Project received a response that we could consider using dried sea buckthorn from Mongolia as long as it met the cost and company specifications. The company does not use frozen or chilled fruit, but only dried fruit as raw material because they extract oil from the fruit to manufacture their products and do not need the water content of the fruit.

(4) Results and Issues

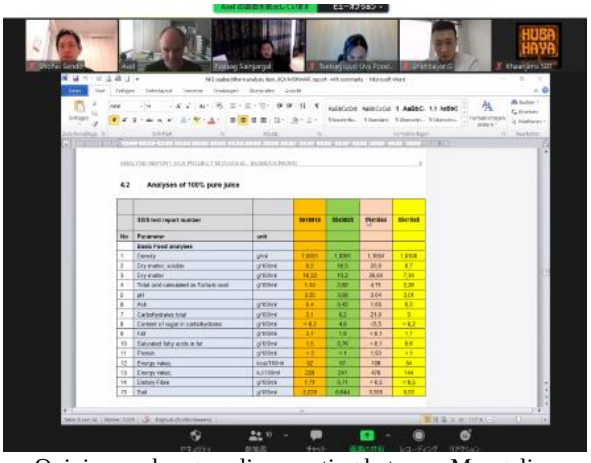
1) Strengthening the Value Chain through the Introduction of Excellent Varieties of Fruit Trees and the Development of Seedling Center

As of June 2023, about 60% of the 1,200 sea buckthorn seedlings planted in 2022 survived and growing, and about 40% had died. Thus, varieties suitable and unsuitable for the soil and climate near Bornor were screened. The Mongolian government improves the fruit tree value chain by establishing seedling centers throughout the country, and this seedling center is positioned as a leading example. Although it takes time to grow seedlings of fruit trees, this is an effort to produce and sell seedlings based on the needs of farmers, and it is expected to improve the production of raw materials for fruit products and the quality of products, thereby increasing the value of products.

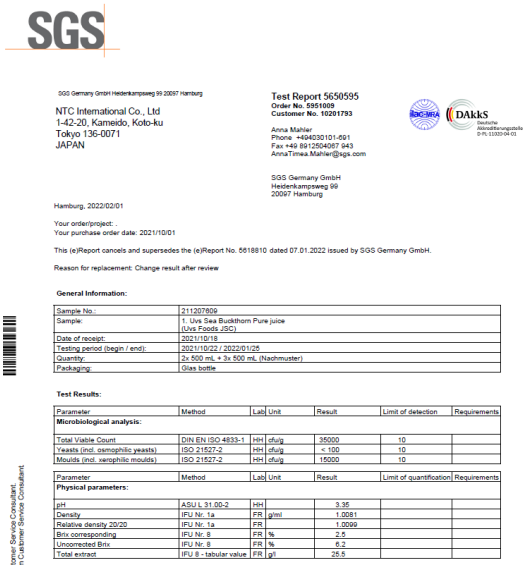
2) Improvement of Marketing of Mongolian Sea Buckthorn Products

The following is a summary of the verification results of the component analysis and evaluation of sea buckthorn products through the SGS. Pure juice is a product of Uvs Food JSC, Khaan Jims LLC, and Shar Doctor LLC, and its quality is better than that of other countries' products, and there is potential to develop sales channels in the EU market. Concentrated juices from Uvs Food JSC and Teso LLC were low in vitamin C, carotene, fat, fiber, etc., and did not have high commercial value compared to competing products. Teso LLC's powder was found to contain pesticides, which are banned in the EU, and this verified that there were issues with the raw materials and primary processing steps. An online meeting was set up between the Mongolian companies and SGS to share evaluation results and exchange opinions on these results, which will be used for future manufacturing and marketing activities.

Product samples are provided free of charge by each manufacturing company



Opinion exchange online meeting between Mongolian companies and SGS



SGS

SGS Germany GmbH Heidenkampsweg 99 20097 Hamburg

NTC International Co., Ltd
1-42-20, Kameido, Koto-ku
Tokyo 136-0071
JAPAN

Test Report 5650595
Order No. 5551009
Customer No. 10201793

Anna Mahler
Phone +49403010 1-591
Fax +49 8912504067 943
AnnaTimea.Mahler@sgs.com

SGS Germany GmbH
Heidenkampsweg 99
20097 Hamburg

Hamburg, 2022/02/01

Your order/project: .
Your purchase order date: 2021/10/01

This (e)Report cancels and supersedes the (e)Report No. 5618810 dated 07.01.2022 issued by SGS Germany GmbH.

Reason for replacement: Change result after review

General Information:

Sample No.:	211207609
Sample:	1. Uvs Sea Buckthorn Pure juice (Uvs Foods JSC)
Date of receipt:	2021/10/18
Testing period (begin / end):	2021/10/22 / 2022/01/25
Quantity:	2x 500 mL + 3x 500 mL (Nachmuster)
Packaging:	Glas bottle

Test Results:

Parameter	Method	Lab	Unit	Result	Limit of detection	Requirements
Microbiological analysis:						
Total Viable Count	DIN EN ISO 4833-1	HH	cfu/g	35000	10	
Yeasts (incl. osmophilic yeasts)	ISO 21527-2	HH	cfu/g	< 100	10	
Moulds (incl. xerophilic moulds)	ISO 21527-2	HH	cfu/g	15000	10	

Parameter	Method	Lab	Unit	Result	Limit of quantification	Requirements
Physical parameters:						
pH	ASU L 31.00-2	HH		3.35		
Density	IFU Nr. 1a	FR	g/ml	1.0081		
Relative density 20/20	IFU Nr. 1a	FR		1.0099		
Brix corresponding	IFU Nr. 8	FR	%	2.5		
Uncorrected Brix	IFU Nr. 8	FR	%	6.2		
Total extract	IFU 8 - tabular value	FR	g/l	25.5		

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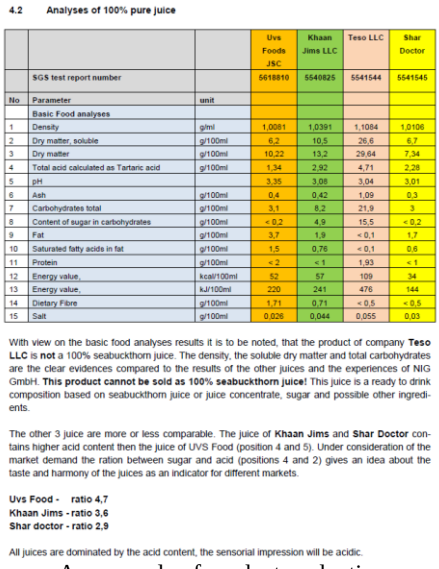
n Customer Service Consultant.

An example of product composition analysis



4.2 Analyses of 100% pure juice

			Uvs Foods JSC	Khaan Jims LLC	Teso LLC	Shar Doctor
	SGS test report number		5618810	5540825	5541544	5541545
No	Parameter	unit				
	Basic Food analyses					
1	Density	g/ml	1,0081	1,0391	1,1084	1,0106
2	Dry matter, soluble	g/100ml	6,2	10,5	26,6	6,7
3	Dry matter	g/100ml	10,22	13,2	29,64	7,34
4	Total acid calculated as Tartaric acid	g/100ml	1,34	2,92	4,71	2,28
5	pH		3,35	3,08	3,04	3,01
6	Ash	g/100ml	0,4	0,42	1,09	0,3
7	Carbohydrates total	g/100ml	3,1	8,2	21,9	3
8	Content of sugar in carbohydrates	g/100ml	< 0,2	4,9	15,5	< 0,2
9	Fat	g/100ml	3,7	1,9	< 0,1	1,7
10	Saturated fatty acids in fat	g/100ml	1,5	0,76	< 0,1	0,6
11	Protein	g/100ml	< 2	< 1	1,93	< 1
12	Energy value,	kcal/100ml	52	57	109	34
13	Energy value,	kJ/100ml	220	241	476	144
14	Dietary Fibre	g/100ml	1,71	0,71	< 0,5	< 0,5
15	Salt	g/100ml	0,026	0,044	0,055	0,03

With view on the basic food analyses results it is to be noted, that the product of company **Teso LLC** is **not** a 100% seabuckthorn juice. The density, the soluble dry matter and total carbohydrates are the clear evidences compared to the results of the other juices and the experiences of NIG GmbH. **This product cannot be sold as 100% seabuckthorn juice!** This juice is a ready to drink composition based on seabuckthorn juice or juice concentrate, sugar and possible other ingredients.

The other 3 juice are more or less comparable. The juice of **Khaan Jims** and **Shar Doctor** contains higher acid content then the juice of UVS Food (position 4 and 5). Under consideration of the market demand the ration between sugar and acid (positions 4 and 2) gives an idea about the taste and harmony of the juices as an indicator for different markets.

Uvs Food - ratio 4,7
Khaan Jims - ratio 3,6
Shar doctor - ratio 2,9

All juices are dominated by the acid content, the sensorial impression will be acidic.

An example of product evaluation

Source: Analyzed and evaluated by SGS

Figure 4.9 Marketing Activities for Sea Buckthorn Products.

(5) Findings and Lessons Learned

The findings and lessons learned through the PA are summarized as follows.

- It can be said that the cultivation system for fruit trees has been established to a certain degree, with the Association and others taking the lead in developing standards and manuals for seedling centers and fruit GAP. On the other hand, although manuals have been developed, the productivity of fruit trees is not still high because farmers are not yet at the stage where they can practically utilize them. In addition, because cultivated and wild varieties are mixed in the farmland, manufacturers are not able to link the characteristics and merits of each variety to the production of their products, leaving room for improvement in the quality of the final products. Therefore, it is reasonable to develop seed and seedling centers nationwide to produce raw materials by variety, and the use of the technical manuals that have been developed by the producers would improve productivity and quality.

- In improving the marketing of PA, Mongolian sea buckthorn products have found potential for expanding sales channels in overseas markets. It is hoped that the government and the private sector will research and identify target markets and work toward exporting these products in the future.

- The Mongolian government has already launched the Billion Tree Campaign, which is a major tailwind for domestic tree and fruit tree production. It is desirable to promote exports of sea buckthorn since it meets domestic demand while promoting domestic substitutes for other fruit trees that do not meet domestic demand is desirable to consider from an efficiency standpoint.

- The associations and the university have human resources for fruit tree production, and private companies are responsible for a certain scale of operations (production, sales, and export) as manufacturing companies. A collaborative effort between industry, government, and academia would be effective in strengthening the fruit tree value chain.

4.2.4 Pilot Activity for Promotion of Domestic Production of Mushroom

(1) Outline of the PA

Table 4.11 Outline of PA for Promotion of Domestic Production of Mushroom

Item	Content
Title	Promotion of Domestic Production of Mushroom
Period	Sept. 2021to Dec. 2023
Target Area	Ulaanbaatar
Organization	Food Production Policy Implementation and Coordination Dept. of MOFALI, Mongolian Mushroom Value Chain NGO, Mushroom Producers
Outline	● Supporting the formation and development of clusters of mushroom producers in Mongolia ● Stimulation of consumption of mushrooms including oyster mushrooms produced in Mongolia ● Cultivation test and preparation of cultivation guidelines for shiitake mushroom aiming at product diversification ● Preparation and approval of standards for mushroom production

Source: JICA Project Team

(2)Background and Objectives

The consumption of mushrooms in Ulaanbaatar is about 220 tons a year, or about 150 g per capita, according to the estimate of the Mongolian Mushroom Association. This is very small compared to the 12,820 g per capita in Japan, but it is assumed that the economic level and lifestyle of urban residents will change in the future, leading to a more diversified diet.

Currently, most of the mushrooms consumed in Mongolia are imported from China, with the exception of wild white mushrooms, which are dominated by shiitake and mushrooms. Small-scale production of oyster mushroom and king oyster mushroom is taking place in the country, and the Association is working to scale up production; in 2018, production of oyster mushroom reached about 9 tons, but production declined due to COVID-19 and remained at around 2 tons. In 2023, the number of producers will increase and the production will reach the level of 6 tons.

Under these circumstances, the Project Team considers ways to expand domestic mushroom production with the aim of replacing imports. Specifically, the following measures will be taken: (1) conducting experimental cultivation of shiitake mushroom, which has many needs, to establish production technology; (2) supporting the expansion of consumption of oyster mushroom, whose production is expected to expand due to the cluster; and (3) establishing production standards for mushrooms in Mongolia.

(3) Activities Carried Out in PA

The PA plan to promote domestic production and distribution of mushrooms was explained at the PMU meeting on April 22, 2021, and its implementation was approved. Thereafter, discussions were held with the Mushroom Association (official name: Mongolian Grown Mushroom Value Chain NGO), which is the main implementer, regarding specific implementation details and cost-sharing. These details were confirmed with JICA, and full-scale activities began in October 2021.

Currently, a cluster, albeit small, has been formed around the Mushroom Association. There are 65 entities,

both companies and individuals, involved in the mushroom supply chain in Ulaanbaatar and Tuv aimag. Of these, the Mushroom Association has formed a cluster of 10 active entities to share roles and strengthen the production system. This cluster will be the main implementer of the PA.

Source: Mongolian Mushroom Association

Figure 4.10 Cluster of Mushroom Production in Mongolia

1) Establishment of Cultivation Technology of Shiitake Mushroom in Mongolia

This project aims to establish a domestic production technology for shiitake mushrooms, which are currently in the greatest demand in Mongolia. Normally, shiitake mushrooms are grown on broadleaf tree growing in temperate zone, but since there is no suitable material in Mongolia, it is necessary to use alternative materials such as needle-leaved trees, wheat straw, and oil cake. As a test cultivation, a test cultivation plan was developed combining three varieties of shiitake mushroom fungi (Chinese, American, and Korean) and five different culture media materials such as cedar, birch, and larch bark and leaves, sawdust, and wheat straw with wheat bran and other nutrients. The team of mushroom researchers and growers from Mongolian Mushroom Association and University of Life Sciences has conducted the test since October 2021. However, due to COVID-19, it took a long time to procure the seed fungus from China, and the imported seeds were dried and unusable.

Wheat and oats were compared as culture media for producing mycelia from seeds fungus grown on agar medium, with oats being the best. Various media for producing mushrooms from mycelia were tested, including a medium mixed with birch sawdust, and mushrooms were found to develop. It was found that shiitake cultivation is possible without hardwoods, but not enough mushrooms were produced to allow commercial cultivation. So, continue trials are required aiming at establishing a cultivation method at a level of commercial cultivation.

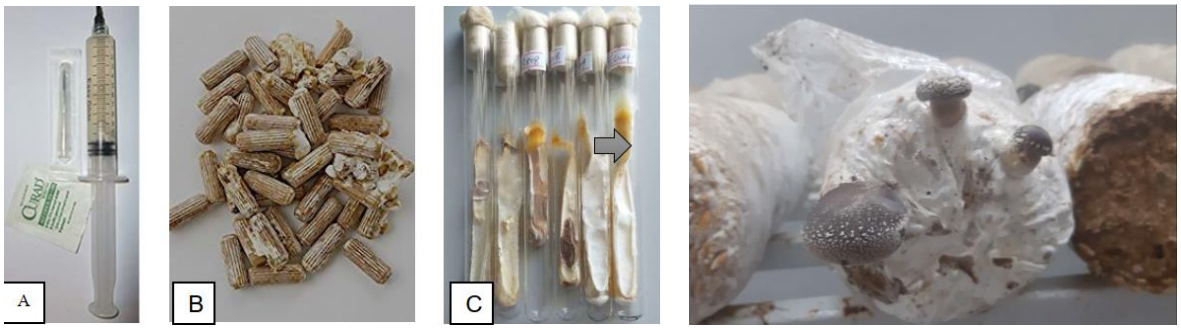


Figure 4.11 Mushroom Cultivation Process

2) Publicity to Increase Mushroom Consumption

In order to increase domestic consumption of mushrooms and correspondingly expand domestic production, it is necessary to educate consumers through public relations activities. As a public relations activities, the project team has supported to post various video contents and posters on Muug.mn, Mongolia's only information news site dedicated to mushrooms. The contents to be created include dialogues between mushroom experts and related parties, introduction of the mushroom production cluster, mushroom cooking methods, and other related news.

In addition to this online publicity, the Mushroom Association has participated in a number of events, some of which have included tasting sessions, in an effort to raise awareness and increase sales of its products. The demand for mushrooms is expected to increase.

3) Preparation of Standards of Mushroom Production

In order to promote the expansion of mushroom production in Mongolia in the future, the MOFALI is seeking to establish cultivation standards. Until now, a standard specific to mushrooms was prepared in 2010, but MOFALI aims to prepare a comprehensive standard for five types of mushrooms (champignon, shiitake, enoki, king oyster, and oyster mushrooms) in response to changing conditions and the potential for production. The proposed table of contents for the mushroom production standards to be prepared is as follows.

1. Mycelium:

    1) specifications, 2) requirements for the workplace, 3) technical procedures, 4) requirements for equipment, and 5) sanitation requirements.

2. Culture medium:

    1) specifications, 2) requirements for the workplace, 3) technical procedures, 4) requirements for equipment, and 5) sanitation requirements.

3. Mushroom:

    1) specifications, 2) nutrients in the five mushrooms, 3) requirements for the workplace, 4) requirements for equipment, 5) packaging, 6) sanitation requirements, 7) transportation, and 8) storage.

A preliminary meeting was held with a committee consisting of biotechnologists, mushroom growers, mushroom researchers, phytosanitary specialists, agricultural experts, and food scientists to approve MASM.

The need to confirm the current analytical values of the target mycelia, culture medium, and mushrooms was insisted upon, and the application was not immediately submitted.

In response, it was decided to conduct several analyses and establish the Mushroom Association's own criteria, which would be in operation for several years before a formal application could be made. Data is being accumulated and the criteria confirmed based on this data, including the components of oyster mushrooms analyzed in the past and the analytical values of the culture medium conducted this time.

Major Activity	2020		2021				2022				2023			
	Q-3	Q-4	Q-1	Q-2	Q-3	Q-4	Q-1	Q-2	Q-3	Q-4	Q-1	Q-2	Q-3	Q-4
Development Direction														
Production Test of Shiitake														
Publicity of Mushroom														
Mushroom Standard														

(4) Results and Issues

The experimental cultivation of shiitake mushrooms, led by mushroom researchers at the University of Life Sciences, has yielded some results, but the production volume leading to commercial production has not been recognized. Since broadleaf tree sawdust, which serves as the culture medium, cannot be obtained, it is necessary to find a suitable substitute material. Since the demand for shiitake mushrooms is great among mushrooms, it is hoped that further trials will be continued in the future.

On the other hand, production methods have been established to some extent for oyster mushrooms, king oyster mushrooms, and champignon mushrooms, which have been produced to date, and it is hoped that production standards will be established in the future to promote the sale of domestically produced mushrooms. Currently, the producers' association is establishing its own standards and is working to put them into practice. It is expected that national standards will be formally established in a few years.

Publicity activities aimed at increasing mushroom consumption are being actively promoted mainly by the Mushroom Association through Internet publicity and participation in various events. In 2023, the expansion of domestic mushroom production is being touted from the perspective of food security, and forums and festival events are being held. Continuation of such activities is desired.

(5) Findings and Lessons Learned

The findings and lessons learned through this pilot activity can be summarized as follows.

- It is necessary to establish appropriate mushroom cultivation techniques in the natural environment of Mongolia. It is important to consider the selection of appropriate varieties, selection of culture media materials, appropriate cultivation environment, and marketing methods, so that mushrooms of a certain quality can be produced. It is also desirable to develop cultivation techniques for shiitake mushrooms and other mushrooms that have not yet been cultivated.
- Mushroom association forms a cluster that divides the processes of mushroom production and sales by means of seed propagation, mycelial production, and mushroom mycorrhiza cultivation. Dealers of mushroom production equipment and materials have emerged, and local governments have begun to

provide production and marketing centers. As a result, efficient production and distribution is being realized. On the other hand, the activities of private companies that have been consistently involved in the mushroom production and marketing process have stagnated. Although the size of each participant is not large, it is desirable to maintain and strengthen an efficient division of work in production and sales.

- The importance of mushroom production is becoming widely recognized as forums and other events are being held by domestic stakeholders such as the Mongolian Academy of Sciences and the University of Life Sciences. Demand for mushrooms appears to be on the rise as a result of mushroom exhibits and sales at various events, as well as increased publicity on the internet. With rising incomes and health-conscious consumers, it is expected that food diversification will continue, and demand for domestic mushrooms is rising.

4.2.5 Pilot Activity for Promotion and Consumption of Goat and Sheep meat

The main objective of this captioned project is to mitigate the grassland degradation mainly caused by the livestock explosion seen especially during the post-socialism period. To promote such value chains, creation of businesses by using goat and sheep would be highly important because they are the ones that are on the rapid increase.

(1) Outline of Pilot Activities (PA)

As explained earlier, value chains dealing with goat and sheep meat would be most useful. In reality, however, such value chains have yet to be established, especially those processing by-products of sheep and goat. As such, the following Pilot Activities (PA) are set (Table 4.12).

Table 4.12 Outline of PA for Promotion of Business and Consumption of Sheep and Goat Meat

Contents	Descriptions
Names of pilot activities (PA)	① Novel menu development of goat meat (NMD) ② Goat meat jerky development (GMJ) ③ Pet Food Development by using goat and sheep hooves and horns (PFD) ④ Casing business promotion by using small intestine of sheep and goat (CBP)
Tentative periods	From April 2020 to February 2022
Target areas	Ulaanbaatar and its surrounding areas including Emeelt and Nalaikh
Partners	MOFALI, Private companies including Japanese ones.
Summary	① NMD: Trial of a new product by using goat meat which is, in Mongolia, not so recognized as a staple diet. Thus, all the menus will come in Japanese flavors which are very popular among Mongolian people. ② GMJ: Another trial of a new product by using goat meat, but following the traditional method of Mongolian beef jerky. These new products come in different flavors including Japanese ones such as Teriyaki. ③ PFD : Trial of a pet snack, which is in high demand recently in some countries including Japan, by using by-products of sheep and goats, such as hooves or horns, almost all of which go to waste in Mongolia. ④ CBP : Trial of small intestines of sheep and goat for casing. In Mongolia small intestines from almost all the animals are not in good use. In some other countries, however, small intestines of sheep and, sometimes, goats are being used for sausage making.

Source: JICA Project Team

(2) Background and Objectives of PA

As shown above, all the PAs have the objectives to stop or alleviate the livestock explosion thereby mitigating the grassland degradation. Nevertheless, since all these PAs are business-oriented activities, the objectives would not be fulfilled without profit. Thus, the marketability would be crucial to the success of the PAs, and this is the point to be proven in all the trials. The explanation about this will be given as follows:

1) Novel Menu Development of Goat Meat

PMU	MOFALI (Livestock Policy Implementation Coordination Department)	Business partners	Makh Market Ltd.

In this PA, though challenging, not sheep and goat but only goat meat was tried because the number of goat population is on the increase most prominently. As repeatedly explained in the Interim Report, the underlying causes are: 1) Goat is not popular as a staple meat provider, 2) Most herders try to keep as many goats as possible to get cashmere fibers which are, by definition, the most marketable livestock product for them, and 3) Goats, they say, have a habit of eating grass down to the roots, thereby worsening the grass degradation. In any event, the establishment of goat meat value chains would be most welcome. Thus, the most important point to be proven in this PA is:

- ✓ **Is a Novel Goat Meat Menu marketable in Mongolia?**

Considering this point, we have done the following: 1) Careful selection of flavors, which, we thought, would attract most Mongolian consumers, and 2) Emphasis on the social and environmental contribution which could be done by consuming goat meat as much as possible.

2) Goat Meat Jerky Development

PMU	MOFALI (Livestock Policy Implementation Coordination Department)	Business partners	Bolor Khee Ltd., Jinst Murun Ltd

The focal points the project team took into account for this PA are as follows:

a) According to Bolor Khee Ltd., the traditional Beef jerky is very popular and its market is stable in Mongolia. And when processed, it is not easy to tell which meat is which, so, using goat meat might not be a weak spot in making jerky.

b) According to Jinst Murn Ltd., the population of the black goat in Khövsgöl aimag, which is renowned for its fine cashmere fiber, is getting aged obviously, and, as a result, their fiber quality is worsening. Thus, a value chain in which meat from old goat is constantly being used would be most ideal.

c) According to Bolor Khee Ltd., since jerky is a dried product whose moisture content is about 10 %, it

would be financially reasonable to export it by air[223].

d) There are countries or regions, such as Korea, where "Black Goat" has its own value which could be used for a commercial product, even branding.

Thus, the points to be proven in this PA is as follows:

- ✓ **Is Goat Meat Jerky marketable in Mongolia as beef jerky or even replacing it?**
- ✓ **Are there needs of Goat Meat Jerky in countries[224] where consumption of goat meat is common? And if so, is it still profitable for Mongolian traders by exporting it by air to those countries?**
- ✓ **Is it possible to commercialize goat meat jerky made with "Black Goat" as product branding?**

3) Pet Food Development by Using Goat and Sheep by-products (hooves, horns)

PMU	MOFALI (Livestock Policy Implementation Coordination Department)	Business partners	Golden Goat Ltd, Nomad Pets Ltd., Ochir Daginas Ltd. from Mongolia, and two anonymous companies from Japan

In Mongolia, even by-products such as bone, blood, tendon, hooves, and horns from sheep whose meat is most popular and, therefore, the most consumed meat, are not being utilized accordingly. On the other hand, in a growing number of countries including Japan, market share of the pet snack industry is on the increase in which those livestock by-products are used as most important raw materials. Thus, pairing the pet food companies in need of raw materials, for instance, in Japan, with those meat traders in Mongolia who waste by-products constantly appears to be most reasonable. Nevertheless, this type of business is not easy because Mongolia is one of those endemic countries where important infectious diseases in terms of animal health are rampant such as Foot and Mouth Disease (FMD), thereby making it unable to export a majority of livestock products. On the other hand, however, according to the information the project team gathered through conversations with the quarantine office[225], it turned out that there are some livestock products which could be imported to Japan from Mongolia as long as they were treated appropriately[226], and hooves as well as horns of sheep and goats are in the list of accepted items[227]. Therefore, as a first step, the team with Mongolian business partners prepared samples of hooves for pet snack, and photos of samples were already sent to each of Japanese pet food company. Fortunately, both companies shown their interest in the samples (Figure 4.12). Besides, one of the two companies stated that "since all the hooves we use are of cows or buffaloes, the size is not always suitable for small dogs. Thus, hooves from sheep and goats, we believe, would be more appropriate for smaller dogs which are now more common among dog owners." Thus, the points to be proven in this PA are as follows:

[223] Many traders avoid exporting livestock products from Mongolia overland to third countries other than China and Russia because of the many conditions imposed on going through China.
[224] For instance, Vietnam and Lao are recognized countries where goat meat consumption is common (*Montsame*. 2019. **740**: P.5. (in Japanese))
[225] Ministry of Agriculture, Forestry and Fisheries.
[226] Apart from hooves, small intestines for casing are in the list of accepted items.
[227] With heat treatment, for instance, by boiling for more than an hour, after which items are packed in a sanitary manner.

✓ **Are pet snacks made with hooves of Mongolian sheep or goats marketable in Japan?**

And,

✓ **Is the business sufficiently profitable for Mongolian trader as raw material providers?**

Figure 4.12 Hooves after Primary Processing

Figure 4.13 Sheep Intestines during Cleaning

4) Casing Business Promotion by Using Small Intestine of Sheep and Goat (CBP)

PMU	MOFALI (Livestock Policy Implementation Coordination Department)	Business partners	Golden Goat Ltd.

Among livestock by-products, offal including intestines is relatively being utilized as a foodstuff. Nevertheless, small intestines, whose layer is so thin, are not in good use for cooking (Figure 4.13). But, for casing this thinness could be an advantage, and especially sheep intestines are commonly used in some countries such as Germany because it is much longer than small intestines from other species[228]. Thus, in this PA the team decided to try intestines for the casing in Japan not only by using sheep but also goat intestines. The points to be proven are as follows:

✓ **Are intestines for casing marketable in Japan especially by using goat intestines?**

Lastly, the type of market each PA aims for will be given broadly in Source: JICA Project Team
Figure 4.14.

PA①: Market opening in Mongolia is foremost though it would be ideal if possible to expand into international markets in the future.

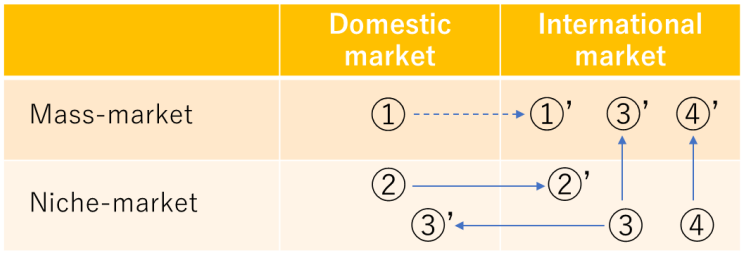
PA②: Though aiming for the domestic market first, it looks to the international market as well, even having international mass-market in mind.

PA③: Mainly aiming for the international market. According to the Nomad Pets, however, even in Ulaanbaatar some shops specialize in pet snacks. Thus, there could be a possibility of domestic market. Also, if the trend continues, it should aim for mass international market.

PA④: Although "casing" is being used in Mongolia, they are artificial coming from China, and, according

[228] According to Golden Goat Ltd., the length of intestines of sheep and goats are appx.10 m and 3.5 m, respectively.

to meat packers, there are no needs of small intestines for that. Thus, domestic market would be negligible. On the other hand, there could be a possibility of mass international market.



[Pilot Activities]
① Novel menu development of goat meat (NMD)
② Goat meat jerky development (GMJ)
③ Pet Food Development by using goat and sheep hooves (PFD)
④ Casing business promotion by using small intestine of sheep and goat (CBP)
Source: JICA Project Team

Figure 4.14 Categorization of Market for Each Pilot Activity Dealt with in the PA for Promotion and Consumption of Goat and Sheep Meat

(3) Activities Realized as PA

1) Novel Menu Development of Goat Meat

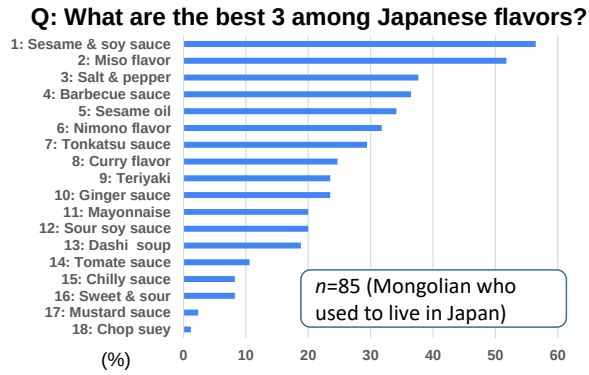
Due to the pandemic, there has been a tremendous delay such that: 1) Japanese consultants could not visit Mongolia, 2) the business partner, Makh Market, banned external individuals from getting in the factory for a long time. During this period the team tried to maintain communication with them through E-mail, On-line mediums, and, finally, in October of 2021, the Japanese consultant in charge visited the site in person. The main activities are as follows.

Activities	Year 2020					Year 2021											
	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Decision of flavors																	
How to label the meat type																	
Products testing events																	

Some relevant information on the afore-mentioned topics will be given below:

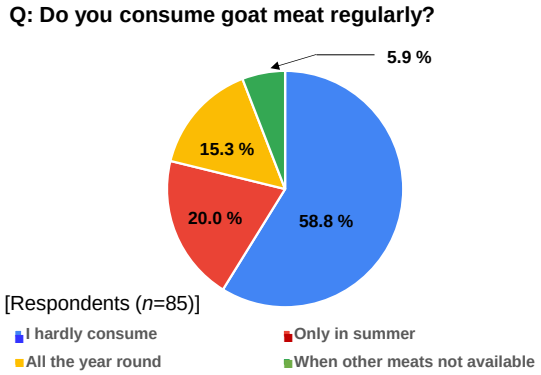
i) Decision of flavors

To offer "something new" to Mongolian people the team, as mentioned earlier, decided to use Japanese flavors for this novel menu of the goat meat cuisine. The decision was made based on the results of a feedback survey in which 85 Mongolian returnees from Japan participated. The Figure 4.15 shows the results of the survey after the consideration of which three flavors were chosen for the trial: 1) Sesame & soy sauce, 2) Teriyaki Barbecue, and 3) Curry.



Source: JICA Project Team

Figure 4.15 Results of Feedback Survey



Source: JICA Project Team

Figure 4.16 Questionnaire on goat meat

Also, important is another set of results of a question: "Do you consume goat meat regularly?" which shows that the great majority of Mongolian people do not consider goat meat as their staple diet. Thus, the team should be highly aware of this (Figure 4.16).

ii) How to label to meat type

In Mongolia, although the goat meat is not popular, it does not mean that goat meat is not consumed in Mongolia. Apart from home-slaughter at Gers (herders' houses), a number of traditional cuisines such as Mongolian dumplings (Buuz), which are supposed to be made with Sheep meat, contain a considerable amount of goat meat being mixed with sheep meat when sold at the market or served at local diners. It means, in practice, that a lot of Mongolian people consume goat meat unknowingly. Thus, the team discussed with Makh Market technical staff whether the new products should go expressly under the name of goat meat or just as mixed meat from small ruminants (=sheep and goats) since showing clearly the origin of meat (=goat meat) may dissuade consumers from buying the products. In fact, Makh Market insisted that the product not go as goat meat. Nevertheless, after the discussion among PMU members, an alternative that the product goes under the name of goat meat was chosen unanimously stating that "since we are promoting more consumption of goat meat to alleviate grassland degradation by destocking the goat population, the product should be recognized as goat meat product."

iii) Products testing events

At the beginning, the events were supposed to be held at some gathering places such as large supermarkets or shopping malls. We contacted the following as candidates: 1) Shangli-La, 2) Nomin supermarkets, and 3) E-mart. The responses from them were shown below:

	Possibilities	Conditions
Shangli-La	Rejected	—
Nomin supermarket (HQ)	Acceptable	-No direct heat -After the pandemic
E-mart	No response	—

Source: JICA Project Team

Thus, virtually, the results can be interpreted that the event in those places had no possibility, at least, in

the year of 2021. Then, through the conversation among PMU members, the team asked MOFALI to gather participants in the event but not by gathering some place but at the office, and, finally, officers of MOFALI, Ulaanbaatar municipality and JICA Mongolia office received a set of samples to test on 18th November, 2021 (*n*=230).

2) Goat Meat Jerky Development

As the PA①, there was a considerable delay, but since this PA started at the end of 2020, lost time is less than the previous PA. The main activities done are as follows.

Activities	Year 2020					Year 2021											
	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Procurement of Black Goats																	
Products testing events																	
Information gathering on export																	

i) Procurement of Black Goats

As explained earlier, based on the comments made by Jinst Murin Ltd. the team decided to buy in the black goat from them. Then, the carcasses were processed at the factory of Bolor Khee Ltd. (Figure 4.17, Figure 4.18).

Figure 4.17 Black Goat from Khövsgöl aimag

Figure 4.18 Vacuum Packed Goat Meat Jerky

ii) Product testing events

The event, together with NMD, was done on the same day. The flavors used were the following three: 1) Barbecue, 2) Garlic, and 3) Teriyaki.

iii) Information gathering on export

Due to the quarantine protocol, meat jerky made with ruminants cannot be imported into Japan from Mongolia. Nevertheless, as explained above, there are some countries into which even Mongolian meat can be imported, and Vietnam and Lao are two of them. Besides, the Mongolian government sent an official mission to Vietnam and Lao, and exchanged a MOU on the meat export from Mongolia to the two countries[229]. Thus, to begin with, the team has decided to now gather information about the needs of goat meat jerky in

[229] Montsame. 2019. Vol.702

both countries.

3) Pet Food Development by Using Goat and Sheep by-products (hooves, horns)

One of the distinguishing features of this PA is that all the companies from Mongolia run an established business regarding meat or by-products processing, thus, trying to get the benefit of using hooves which are produced during the handling. Thus, the objective is to give an opportunity to those local companies to get in the pet food market in Japan. Nevertheless, each side has no information about their business partners or due to the physical distance between Mongolia and Japan or the language barrier, there is no fluent communication. The team, at the beginning, tried to connect three Mongolian and two Japanese petfood companies, then, having all the twists and turns of the plot, currently the team is working with the two Mongolian factories with their associates as well as coordinating with a petfood related association in Japan (Figure 4.19).

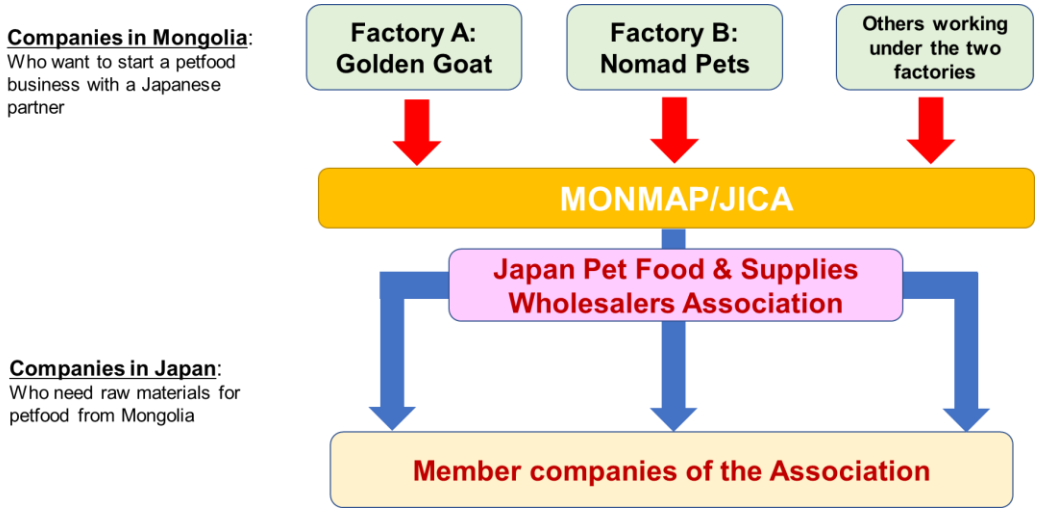


Figure 4.19 Summarized Flowchart of pet Snack Business by Using by-products

Since the PA is transboundary, the animal sanitary issue, including logistics, would be the most crucial hurdle. The main activities done are as follows.

Activities	2020		2021				2022				2023			
	Q-3	Q-4	Q-1	Q-2	Q-3	Q-4	Q-1	Q-2	Q-3	Q-4	Q-1	Q-2	Q-3	Q-4
Negotiation with Mongolian companies														
Feeling out Japanese companies														
Primary processing stage														
Export protocol issue														
Trials by showing samples														
Evaluation by Japanese companies														
Business launch in Japan														

i) Negotiation with Mongolian companies

At the beginning, during the period from October, 2020 to December, 2021, a total of 4 Mongolian

companies participated in this PA, and currently, as shown below, two of them are ongoing. Among them, especially Golden Goat Company is most active creating a strong tie with the Japan Pet Food & Supplies Wholesalers Association (JPFSW).

Table 4.13 Coordination with Local Suppliers

#	Names	Main activities	Primary treatment	Remarks
1	Eco Food Ltd.	Food processing	Cleared	Withdrawn
2	Golden Goat Ltd.	Casing, petfood	Cleared	Casing
3	Ochir Daginas Ltd.	Meat processing	Cleared	Hoping horse offal as well, withdrawn
4	Nomad Pets Ltd.	Dog treat	Cleared	Their specialty is horse offal, now hoping hooves of small ruminants

ii) Feeling out Japanese companies

The team was in negotiation with two anonymous companies in Japan which expressed their interest in the PA. The first is one of the largest pet food companies and the other one of the most recognized supermarkets. In reality, however, the demand of both such as raw material quality and shipping frequency was so high that their Mongolian counterparts could not make it. In the meantime, the team started working with an aforementioned association called JPFSW including its member petfood shops.

iii) Primary processing stage

As one can imagine, in Mongolia, hooves as raw material, have no costs at all. In practice, however, primary processing, which requires removing a thin portion of the bottom of the hoof, is by definition painstaking (Figure 4.20, Figure 4.21). Then comes heat treatment and sanitary packing according to the quarantine protocol[230], meaning that those companies which do not fulfill those procedures cannot be a candidate. By contrast, regarding horns, the primary processing is not so demanding as hooves.

Figure 4.20 Pre-primary Treatment

Figure 4.21 Post-primary Treatment

iv) Export protocol issues

By definition, the quarantine protocol of Japan is one of the strictest ones. Therefore, importation of meat or its derived products into Japan from those countries where relevant infectious diseases are rampant including Mongolia is extremely limited thereby demanding a set of documents issued by the authorities such

[230] All the intestines, which are all derived from healthy individuals recognized by an accredited veterinarian, are then to be handled in a sanitary manner in a sanitary environment.

as National Veterinary Institutes as well as the Customs Office[231]. Concerning this process, by trial and error[232] the team could have gathered all the necessary information to import the aforementioned products from Mongolia into Japan.

v) Evaluation by Japanese companies

The team sent the aforementioned two companies and the Japan Pet Food & Supplies Wholesalers Association (JPFSW) by asking them for the evaluation. Unfortunately, none of them gave us a promising result (Table 4.14 Evaluation of Samples by National Pet Food and Supplies Wholesalers Association). Just recently, however, the team received a notice from JPFSW saying that some retailors would like to give a try again to goat horns. Besides, through these evaluation processes, some retail shops that were the members of the JPFSW showed their interest in horse by-products to which the team together with Mongolian companies answered positively, saying that they would receive the samples soon. This trial was very successful because the JPFSW displayed those samples when they participated in a pet food fair called Inter Pet in April, 2023 (Figure 4.22) and the association got a number of the expression of interest letters.

Table 4.14 Evaluation of Samples by National Pet Food and Supplies Wholesalers Association

Items	Results	Reasons	Remarks
Hooves	N/A	Hooves were crumbly, so they might choke dogs, especially, small dogs which are currently very common in Japan.	
Horns	N/A	Not so crumby as hooves but no demand for now.	To be checked again
Others	By-products of horses would be necessary.		

Also important is that although to Japan only hooves and horns are the products which can be imported in terms of quarantine protocol, there are other countries that can receive Mongolian ruminant by-products. The aforementioned Nomad Pets companies would one of them which took advantage of this difference in quarantine practice. The company recently has started exporting goat by-products such as horns and ears to Russia and these products are being now very popular (Figure 4.23).

[231] An English certificate from the customs office is required.
[232] On the first of December, 2021, the team members, as their carry-on bags, brought a set of products including hooves and some horse offal. Nevertheless, all the products were rejected due to some errors in endorsements. One of the comments is that a veterinarian for inspection should be an officer working for National Veterinary Institutes (not any other public institutes)

Figure 4.22 Pet Food Fair in Japan: Inter Pet

Figure 4.23 Snacks Made of Goat Ears and Horns

4) Casing Business Promotion by Using Small Intestine of Sheep and Goat (CBP)

Small intestines can be imported into Japan as long as they are treated and stored salt-cured in a factory authorized by both Mongolian and Japanese governments. Currently, there are four factories for this purpose in Mongolia, and Golden Goat Ltd. is one of them. On the other hand, a candidate for business partner in Japan is to be found, and probably this is one of the most crucial aspects in this PA. The main activities done are as follows.

Activities	Year 2020					Year 2021											
	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Negotiation with casing companies																	
Negotiations with Japanese companies																	
Export protocol issues																	
Evaluation by Japanese companies																	

i) Negotiation with casing companies

As to this activity, since Golden Goat Ltd. has previous experience of exporting small intestines to Japan, all the logistic arrangements were made successfully.

ii) Negotiation with Japanese companies

As to candidate partners in Japan, one of the project members who is in charge of Business Promotion and Activity Appraisal, felt out a sausage processor in the northern part of Japan, and found that the company had interest in the PA, especially the use of goat small intestines. Also, they showed us their positive attitude toward the reason why the PA tried to promote goat meat or its by-product consumption.

iii) Export protocol issues

Concerning the quarantine protocol and inspections on arrival at Narita, shipments passed successfully the customs in April, 2021. Nevertheless, it turned out that the address of Golden Goat Ltd. given on the shipment

tag was different from that in the list of the authorized factories in Mongolia. Then, after a couple of months of consideration, the shipment was finally incinerated in July, 2021. During this period, unfortunately the Japanese candidate company became disenchanted with the PA, therefore, informing us of their decision to cancel the participation.

(4) Results of Trials and Areas to be Addressed

1) Novel menu development of goat meat

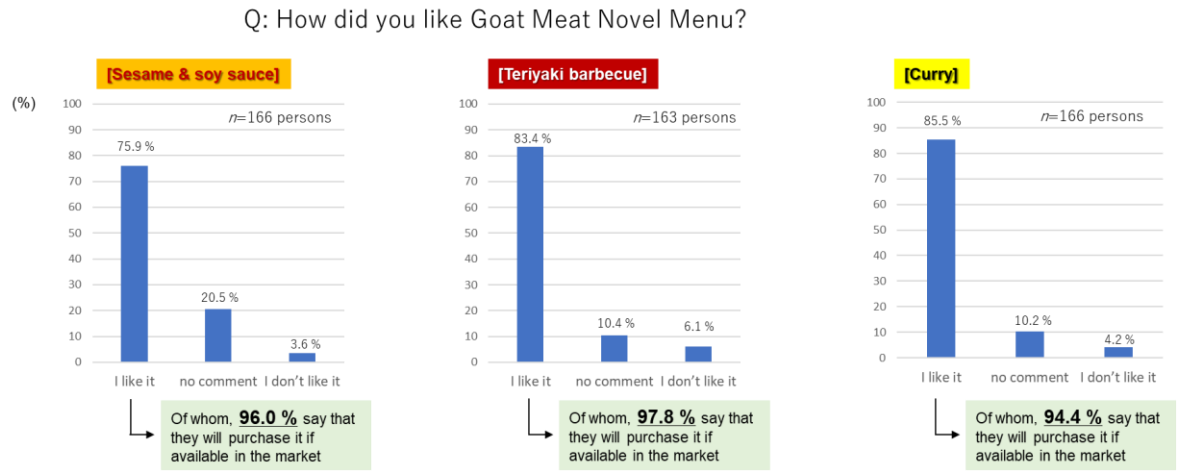
A total of 230 Mongolian officers participated in the testing event fulfilling the target number which is more than 100 participants. The details were given below:

Table 4.15 Breakdown of Distribution of Tasting Samples

Age bracket (%)				Gender (%)
20～29	30～39	40～49	50～60	
22.0	30.5	30.5	17.0	53.3 ; 46.7
Institutes				**No. participants**
MOFALI				120
General Agency				40
MOFALI related agencies including Otor office				51
Ulaanbaatar municipality (small and medium-sized businesses promotion department)				15
JICA Mongolia Office				4
Total				230
Recovery rate= **72.6%** （167 / 230）				

Source: JICA Project Team

Then, the reaction of the participants to the sample, which is the result of a simple questionnaire asking them about their liking, will be given below (Figure 4.24).



Source: JICA Project Team

Figure 4.24 Results of feedback on Goat Meat Novel Menu

As the results clearly shown, more than 75% of the respondents answered saying that "I liked it" (in the case of Teriyaki Barbecue and Curry flavors, more than 80%). Besides, almost all the respondents answered positively stating that, if available in the market, they would purchase the product. Also, some

recommendations were made by the participants. The most relevant ones are as follows:

- Better promote more and more why goat meat should be consumed more.
- Better highlight more the benefit of the goat meat
- Concerning the amount for the package, I would be happy if you provide 200g, 400g, 1kg, and 5 kg.
- Package design should be attractive.
- Better start with an introductory price
- Better include more information about the good quality the goat meat has.
- Better finish the meal as less greasy as possible.
- It would be ideal if the meat is a bit tenderer.

Based on the results mentioned above, the team discussed the next step. There were three most possible cases the team assumed: 1) No possibility, 2) Worth trying again with modification, and 3) Encouraging as a new product. Here, our understanding was that if the results suggested the case "2)", the project would support again financially. On the other hand, if the results were promising, which was the case "3)", the business partner, Makh Market Ltd. would launch a new product on its own. Thus, since the results of Teriyaki Barbecue and Curry were highly promising, now Makh Market has decided to start a new line of these products while, concerning Sesame & Soy sauce, the team again might be assisting again for re-trial.

Therefore, concerning the point to be proven:

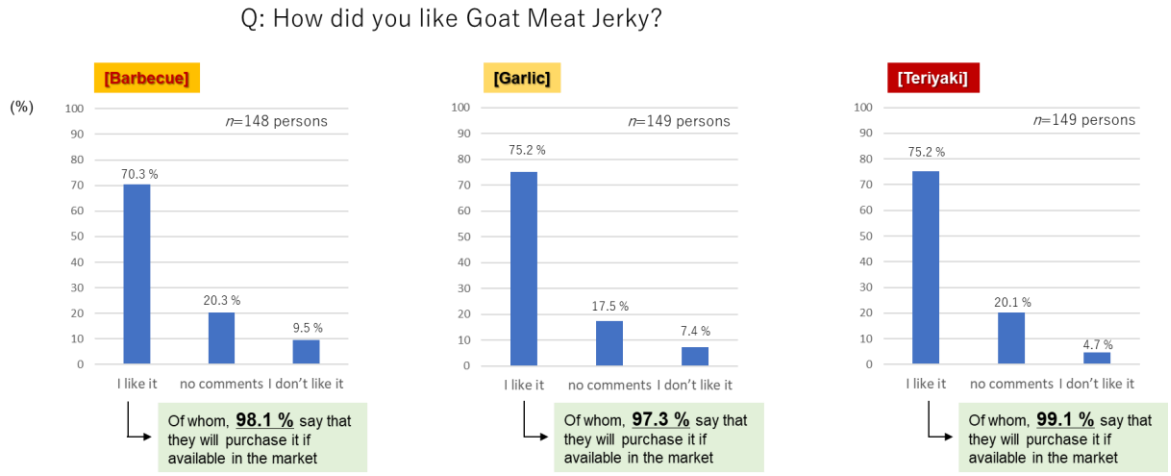
- ✓ **Is a Novel Goat Meat Menu marketable in Mongolia?**

It would be safe to say that, at least, those two flavors seem to have tangible marketability.

2) Goat Meat Jerky Development

Concerning the testing event of this PA, as explained earlier, it was held together with the NMD, thus, the same number of people participated. The number of respondents, however, was different from that of NMD. The details are: Gender ratio (M/F) =52:48, Recovery rate (152/230) =66.1 %.

Then, the reaction of the participants to the sample will be given below (Figure 4.25):



Source: JICA Project Team

Figure 4.25 Results of Feedback on Goat Meat Jerky

Although outshined by the NMD, the feedback results of GMJ were far from being unpromising since more than 70% of the respondents stated that "I liked it", especially Garlic and Teriyaki flavors (> 75%). Also important is that the great majority of those positive respondents showed their interest in buying the products if available commercially.

The following were some relevant comments from the feedback:

- Better promote more and more why goat meat should be consumed more.
- Better highlight more the benefits of the goat meat, especially those which are not found in other types of meat
- A 100 g pack, instead of 50 g one, would be better.
- A stick type would be better (10 cm long).
- Better start with an introductory price
- Should be a bit tenderer.

Based on the results of the feedback, the team discussed the next step with Bolor Khee Ltd. As the discussion made in the NMD, in this PA the following three cases were considered: 1) No possibility, 2) Worth trying again with modification, and 3) Encouraging as a new product. Then, in the case of Bolor Khee Ltd., they decided to start selling the goat jerkies in a restaurant, which is run by Bolor Khee Ltd., as a snack for drinks, then, feeling out the customers, they will make a decision again.

On the other hand, concerning the use of Black Goat for the jerky, according to the technical staff of Bolor Khee Ltd., it was indifferent. Rather, the meat used for the jerky, which came from older goats, was clearly tough. Thus, it would be ideal if some special treatment can be done for making it tenderer.

Therefore, based on the current progress, the following two points to be proven in this PA seem to be estimated:

- ✓ **Is Goat Meat Jerky marketable in Mongolia as well as beef jerky or even replacing it?**

And,

- ✓ **Is it possible to commercialize goat meat jerky made with "Black Goat" as product branding?**

Concerning the first point, it was promising. On the other hand, the second one, at least for the use of the jerky, does not seem to be suitable without any modification.

3) Pet Food Development by Using Goat and Sheep by-products (hooves, horns)

As mentioned earlier, since no samples were brought in Japanese companies, progress about the points is to be defined hopefully in the next terms.

Table 4.16 Each Result of Assumption Testing

Items	Results of assumption testing	
	Japan	Other countries
Hooves	All the quarantine issues were finally cleared, but it turned out that none of the retailors considered the item as a promising alternative.	It turned out that in some countries, for instance, Russia the demand was high and the quarantine issue did not stop Mongolian traders from exporting their products into Russia. This would be one of the most important points to be discussed and taken advantage of more for Mongolian petfood businessmen
Horns	Basically same as the hooves case, but currently some retailors mentioned that they would like to give it a try	
Other by-products of ruminants	Due to the quarantine protocol, it was impossible	
Other animal by-products	It tuned out that the demand of horse by-products is high.	Same as on the left

Source: JICA Project Team

4) Casing Business Promotion by Using Small Intestine of Sheep and Goat (CBP)

As already shown in previous chapters, at least it would be safe to say that some of sheep and goat by-products could be promising for commercialization. The results of trials were shown below:

(5) Findings and Lessons

The findings and lessons learnt from theses PA are as follows:

PAs	Findings	Lessons
①NMD	It turned out that a good amount of goat meat is actually being used in the meat industry in Mongolia under the name of Bog meat which means the meat from small ruminants. In reality, however, the consumption rate is still low compared to the growth of the goat number.	Thus, it would be wise and realistic for the Mongolian packers as well as traders to develop "bog" meat businesses, at least for the time being.
②GMJ	Although the results of the taste testing were highly positive, the company, with which the project worked together, did not give the go-ahead to start commercialization because of the fact that the product is made with goat meat	As mentioned above, as a general rule in Mongolia, developing a human food business using goat meat is not promising (petfood should be excluded)

③PFD	Although the quarantine regulations of livestock products into Japan from Mongolia is so strict, it turned out that this is not a mission impossible. The stick ability is the key. Besides, now it is clear to say that Mongolian livestock by-products has a lot of potential for the international petfood industry.	One of the greatest advantages in promoting the petfood value-chain is that the fact of using goat meat would never be a hindering factor. In Mongolia, this fact should be kept in mind and be tapped fully, especially in meat packers.
④CBP	Although the sheep and goat intestines could not be sent to the potential partner in Japan, the team received comments from them that said the goat intestines never be profitable in Japan.	Through the business failure we faced, the team learnt that apart from the principal issues such as type or quality of by-products, careful coordination between stakeholders is the key.

Source: JICA Project Team

4.2.6 Project for Increasing Milk Off-take through Improvement of Milk Collection Facility

One of the important aspects about the dairy industry in Mongolia is that, unlike meat provision, milk production activities are highly dependent on the import, especially in the large city because 1) milk shortage in the winter is severe thus needing imported powdered milk, and 2) the great majority of ingredients of feed for milking is being imported. In Mongolia, the milk retail prices are lower in the large cities than villages in a striking contrast to those of meat. This is because in larger cities, powder milk is available at reasonable prices thereby weakening domestic milk demand. In the period of COVID-19, however, due to the serious shortage of imported milk, escalating costs of feed, and unstable foreign exchange rates, the milk price went up in leaps and bounds.

(1) Outline of the PA

Here, two types of activities were arranged. One is the mass-market type whose objective is to increase the milk off-take through modernized dairy plants by improving milk collection system, and the other is niche-market type which goes with the aim of developing or expanding a Mongolian niche dairy by taking advantage of its own rare products such as yak milk (Table 4.17).

Table 4.17 Outline of PA for Increasing Milk Off-take through Improvement of Milk Collection Facility

Contents	Content
Names of pilot activities (PA)	① Milk off-take increasing through modernized dairy plants by improving milk collection environment (MIC) ② Yak milk cheese production upgrade through milk collection and processing improvement (YMC)
Tentative period	From April 2020 to December 2022
Target areas	① In and around Ulaanbaatar ② Bayankhongor and Ulaanbaatar
Partners	MOFALI, Private companies including Japanese ones.
Summary	① MIC: In Mongolia, the gap between the amount of milk production processed in modern plans and that consumed locally is enormous. Thus, the aim is bringing such underlying milk into the official route. ② YMC: In Mongolia, there are extremely rare dairy products such as camel milk and yak milk, which are not being taken advantage appropriately. Thus, the aim is to try to establish or expand niche dairy businesses by using Mongolian unique products.

Source: JICA Project Team

(2) Background and Objectives of the PA

1) Milk Off-take Increasing through Modernized Dairy Plants by Improving Milk Collection Environment (MIC)

PMU	MOFALI (Livestock Policy Implementation Coordination Department)	Business partners	CYY Ltd., Mon Fresh Ltd.

In Mongolia, broadly speaking, there are two types of milk supply chains. One is the city type in which the chain is based on the imported powder milk and domestic milk while the other is the traditional type, thus, fed by exclusively domestic production. Also important is the seasonality. In the winter, the former is highly dependent on the imported milk while production activities are hardly done in the latter. In the summer, however, the latter may see the production in surplus thereby causing a milk price plunge. Thus, this could be interpreted that in Mongolia the milk production capacity is not low as one can observe during the winter meaning that a more uniform supply of milk throughout the year could be possible by improving the feeding and reproduction management. To do so, it is necessary to establish, for instance, 1) improvement of cooling storage system in milk collection points, 2) expansion of milk collection routes, and/or 3) improvement of milking and shipment conditions for dairy producers (herders). Here, while "1)" and "2)" require a considerable amount of investment, "3)" could be done with a minimum cost such as milk can, filters for mixing milk, or some rope for tying milk can to vehicles to take milk to the nearest milk collection point.

Thus, the point to be proved in this PA is as follows:

- ✓ **Is it possible for dairy farmers and dairy companies to increase milk collection amount just by providing dairy farmers a set of simple tools for milking and shipping?**

Thus, the team will provide these simple tools to farmers through business partners, namely, Mongolian dairy companies.

2) Yak Milk Cheese Production Upgrade through Milk Collection and Processing Improvement (YMC)

PMU	MOFALI (Livestock Policy Implementation Coordination Department)	Business partners	Suun Bilegdel Ltd.

In terms of rarity among dairy products in Mongolia, as mentioned above, camel milk, yak milk, and kumis (fermented horse milk) are among them. Nevertheless, since they are highly perishable, yak milk cheese, which is shelf-stable, was chosen for this PA (Photo 4.2.6.1). Yak milk comes, naturally, from yaks which are normally found in mountain areas. Thus, it is difficult to get it in lowland areas including Ulaanbaatar. This is why the YMC is arranged with a business partner, Suun Bilegdel Ltd. which is situated in Bayankhongor. This small cheese plant has a bulk tank with a capacity for processing more milk than the current amount. Presently, however, because 1) milk off-take from herders is minimum, and 2) equipment for aging cheese is so poor that these factors are, being the law of the minimum, hindering the plant from increasing the yak cheese production. Thus, the aim of this PA is to alleviate or improve the problems or

limitations mentioned above. By doing so, the points to be proven are as follows:

- ✓ **Is it possible for the yak cheese plant to increase the production by increasing milk off-take as well as improving steps for processing cheese including cheese aging?**

Here, as job demarcation between Suun Bilegdel Ltd. and the project team, milk off-take increasing will be done by the former, and improving steps for cheese processing by the latter. Specifically speaking, Cheese cutter, packing machine, Cheese aging chamber and Milk can will be provided for improving the cheese processing by the project.

Lastly, the type of market each PA aims for will be given broadly in Figure 4.26

- **PA①**: Expansion and fortification of the milk collection system of Mongolia, especially in urban areas. For the time being, the domestic market is the main target[233].
- **PA②**: Though aiming for the domestic market, especially for the upper-middle class, it should look to the international niche market as well, because the Suun Bilegdel Ltd. Had some sales figures by selling the product abroad such as Kazakhstan at least before the pandemic

	Domestic market	International market
Mass-market	①	
Niche-market	② →	②'

[Pilot Activities]
① Milk off-take increasing through improvement of milk collection environment (MIC)
② Yak milk cheese production upgrade through milk collection and processing improvement (YMC)
Source: JICA Project Team

Figure 4.26 Categorization of Market for each PA Dealt with in the Project for Increasing Milk Off-take through Improvement of Milk Collection Facility

(3) Activities realized as PA

1) MIC

Due to the pandemic, a management shake-up in CYY Ltd., which lasted from July to August in 2021, and the CEO's long absence of Mon Fresh Ltd., the PA was pending over a long period of time. After a round of "in-office" talks in October, 2021 (Figure 4.29), however, the PA has resumed as planned at the beginning. The main activities are as follows.

[233] However, CYY and other companies have begun to adjust their Long Life packs for long-term storage, implying that they are export-oriented. However, it is not clear whether there is actual demand in overseas markets, and as mentioned in the main text, it is not a good idea to seek overseas markets at this time, as the domestic market has not yet reached a stable supply.

Activities	2020		2021				2022				2023		
	Q-3	Q-4	Q-1	Q-2	Q-3	Q-4	Q-1	Q-2	Q-3	Q-4	Q-1	Q-2	Q-3
Methodology for production expansion													
Procurement of simple tools													
Explanation of the project activities to herders													
Distribution of simple tools													
Data gathering													
Evaluation of activities and data													

i) Methodology for production expansion

After the first personal talks with both companies, the demarcation of our duties was defined as follows:

Partners: Choose and decide the target areas (at the soum level) and herders. Also, organize group activities among them

MONMAP: Provide them with simple tools for facilitating dairy activities

The breakdown of the simple tools is shown below:

Table 4.18 Breakdown of Simple Tools and Purpose of Use

No.	Items	Origin	Purposes
1	Aluminum milk can	Locally	To bring mixed harvested milk to a collection points (40L can)
2	Strainers	Locally	To filter raw milk before miking to avoid debris
3	Strip cups	From JPN	To check abnormalities of milk including mastitis
4	Ropes	Locally	To tie the milk can to for instance a motorbike

Source: JICA Project Team

ii) Procurement of simple tools

Both sides reached an agreement that the project would provide 20 sets of the simple tool package with partner. Then, the partner would give it to the group. By the end of November of 2021, the procurement was completed.

iii) Explanation of the project activities to herders

Considering the pandemic, all those activities were down through partners. Target areas and No. of herders were given below:

Table 4.19 Target Areas

№	Partners	Aimag	Soum	No. of herders
1	CYY	Tuv	Bayanchandmani Ilt Orgil	10
2		Tuv	Arangat Bayankhangai	10
3	Mon Fresh	Tuv	Batsumber	20
Total				40

Source: JICA Project Team

iv) Distribution of simple tools

Distribution of the simple tools was completed during the year 2021, so that the project could get started gathering the data of milk collection at the target area from January of the year 2022 (Figure 4.30, Figure

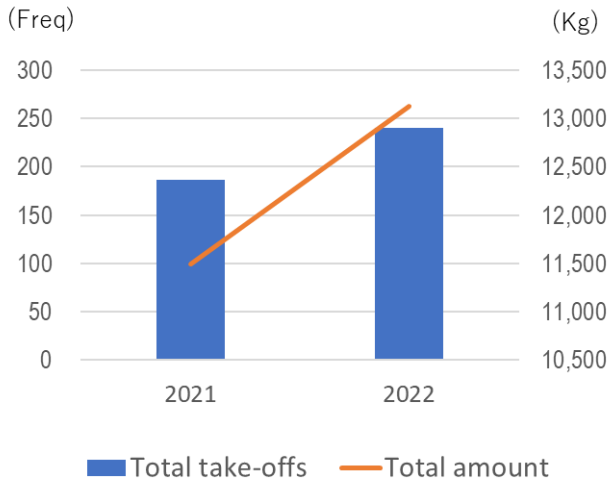
4.31).

v) Data gathering

Data gathering activities were done through each partner during the year 2022. Also, a set of data from the year 2021 was collected for comparison. Here, it would be noteworthy to mention that some herders, dictated by financial reasons, had to leave the field. And in the case of Mon Fresh, they could not find data of the participant herders from the year 2021

vi) Evaluations of data and activities

A set of data, frequency of take-offs and total amount sold, was gathered monthly during the year of 2022 from each herder through the partners. Of them, three of CYY's members left the field due to their financial problems. Regarding the Mon Fresh operation, for some really unknow reason, they could not find the data from the year 2021 with which those from the year 2022 would be compared. Therefore, the evaluation was done by tabulating the data from the rest of the farmers which came from 17 herders of the CYY company (Figure 4.17). It is obvious that both the frequency of take-offs and the total amount of milk sold in 2022 increased in comparison with those from 2021.



Source: JICA Project Team

Figure 4.27 Effect of simple tools in milk production (*n*=17)

Among others, one of the most logical reasons for this increase appears to be facilitation or convenience made by the introduction of the tools by which herders were much more motivated to milk and bring it to their collection point. Also important is that, according to the partners officials, with the help of aluminum milk can, herders could reduce significantly spoilage of harvested milk thereby leading to the increase of the amount of milk collection.

Figure 4.28 Cheese Made from Yak Milk (Suun Bilegdel)

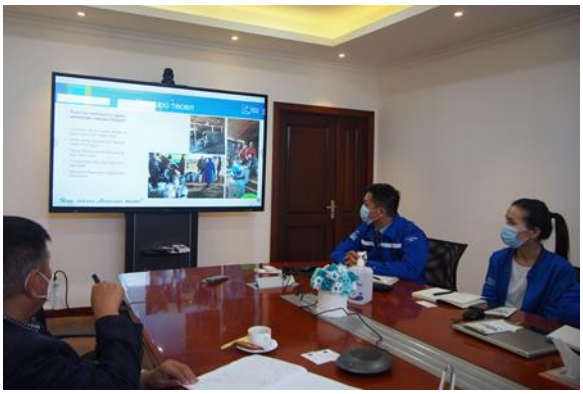


Figure 4.29 Face-to-face Coordination with CYY Company

Figure 4.30 Distribution of Milk Can to Herders

Figure 4.31 Distribution of Other Tools to Herders (strainers and ropes)

2) YMC

This PA was too on hold due to the pandemic. Because cheese making includes in itself a relatively long process for aging, the seasonality, which is definitely one of the most serious limitations in Mongolian agricultural supply chains, seems to be offset in this dairy business. Thus, during the pandemic, the team and the partner managed to gather information on procurement without interrupting the main activities. After the miking season in 2021, however, milk prices including farm-gate ones rose sharply and so did the yak milk. In the case of villages where Suun Bilegdel Ltd. used to purchase raw milk for cheese-making, the farm gate price of yak milk increased prohibitively from 1,200 MNT/L to as high as 4,000 MNT/L. As a result, our business partner Sunn Bilegdel Ltd. had no option but to give up the business, and the PA was no exception. Nevertheless, this should not mean that niche dairy marketing in Mongolia has no potential. Rather, it does. Apart from yak milk, other dairies such as camel milk and fermented mare's milk should be taken advantage of at a most opportune moment.

(4) Results of Trials and Areas to be Addressed

1) MIC

As mentioned in the previous chapter, of 40 herders, strictly speaking, roughly only half of them participated in this trial. Based on the data gathered from those herders, it is safe to say that the introduction of simple tools enhanced the amount of milk collection at the plant level. Besides, according to questionnaires made during the trial asking all the herders about how convenient the tools were, the results were very positive

as shown below:

Table 4.20 Effect on Milk Collection Augmentation

№	Items	CYY		Mon Fresh
		Bayanchandmani Ilt Orgil	Arangat Bayankhangai	Batsumber
1	Aluminum milk can	+++	+++	+++
2	Strainers	++	++	++
3	Strip cups	++	++	++
4	Ropes	+++	+++	+++

Conceived convenience: Excellent=+++, Good=++, Moderate=+, Unnecessary=X

Source: JICA Project Team

2) YMC

As explained above, the PA was suspended.

(5) Findings and Lessons

The findings and lessons learnt from these PAs are as follow:

PAs	Findings	Lessons
①MIC	According to the results of this PA, it seems that the introduction of simple milking tools such as aluminum milk cans, strainers, and ropes enhanced the milk collection amount. Also, the observation made by the partners that by using the milk can as well as the filter herders could reduce the spoilage thereby leading to the increase of the milk collection, would be one of the most striking findings in this PA. Obviously these positive findings would have not been revealed had it not been for group organization arranged by the partners. Thus, the importance of the herder organization cannot be overemphasized.	In this PA the project team worked with a number of 40 herders. In reality, however, there are more herders in the target areas. Among them, a good number of herders are still using inappropriate milking tools such as plastic pet bottles of soda which cannot be washed easily. Thus, it would be ideal for the partner companies if, based on the findings of the PA, they start providing their member herders with a set of simple tools such as aluminum milk can, strainers, and ropes.
②YMC	This PA was suspended.	

4.2.7 Pilot Activity to Promote Domestic Consumption and Export of Wool Products

(1) Outline of PA

Table 4.21 Outline of the PA to Promote Domestic Consumption and Export of Wool and Cashmere Products

Item	Content
Title	Project to promote domestic consumption and export of wool and cashmere products
Period	March 2022 - August 2023
Target Area	Khentii Aimag, Bayan-ovoo district (soum)
Organization	Mongolian commodity exchange (MCE), one nomadic cooperative
Outline	Testing the possibilities of increasing the efficiency of logistics and improving the quality of wool and cashmere raw materials and by providing the necessary equipment and materials for an intermediate distribution center for wool and

	cashmere raw materials, and by providing training to the nomadic associations responsible for the management and operation of the center.

Source: JICA Project Team

(2) Background and Objectives

In recent years, the number of nomads in Mongolia has decreased and the number of livestock has increased, resulting in a six-fold increase in the workload per nomad and a ten-fold increase in the demand for livestock veterinary services[234]. As a result, the livestock industry is faced with the challenge of increasing work efficiency and the availability of workers.

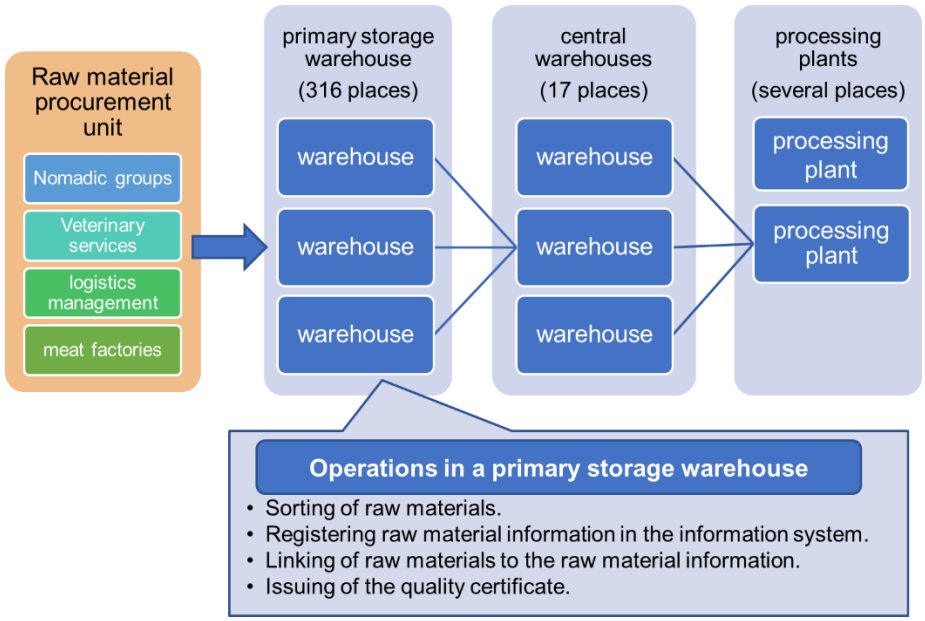
In response to this challenge, MCE planned to set up storage warehouses for raw materials throughout the country to ensure the quality of the raw materials and to develop a transport system, as well as to provide organized shearing and veterinary services. MCE was established in 2013 and is a 100% state-owned enterprise with state ownership, dealing in wool and cashmere, livestock (goats, sheep, cattle, yaks and horses), oilseed rape and wheat.

The MCE plan is to set up primary storage warehouses for raw materials such as wool, cashmere and leather at approximately 316 locations throughout the country (Figure 4.32).The raw materials collected in the primary warehouses are then collected in larger central warehouses (17 throughout the country) before being transported to the processing plants. At the primary storage warehouses, the receiving raw materials are sorted according to type and quality, each raw material is tagged and a quality certificate is issued, and the information on the raw materials (origin, quality, receiving/issuing record, etc.) is registered in the MCE information system. In the case of the wool and cashmere raw materials, the livestock are cleaned and given prophylaxis at the same time as they are sheared, and this information is recorded in the MCE information system. This information is then recorded in MCE's information system, which is used to manage the traceability of the raw material. Edible meat and leather derived from aged and slaughtered livestock will also be distributed under this traceability system.

From the above shearing system, the procurement of raw materials is carried out in four organized sectors: (1) “Nomadic groups or nomadic associations”, which own the livestock; (2) “Veterinary services”, which provide livestock treatment; (3) “Logistics management”, which transports and registers the raw materials; and (4) “meat factories”, which slaughter old livestock.

In this PA, as MCE is planning to conduct a demonstration test of the above plan in Bayan-ovoo district, Khentii aimag, the project provided support for the installation of equipment and training necessary for the operation of the model warehouse and the procurement of raw materials. The results of the demonstration was used to verify the effectiveness of the project and to formulate a plan for the future expansion of the warehouses (e.g. standards for warehouses).

[234] From materials provided by MCE.



Source: MCE

Figure 4.32 Raw Material Procurement and Logistics Picture

(3)Activities Carried Out in PA

After meeting with MCE in May 2020 to learn about the plans for the intermediate logistics warehouses, a visit was made to Bayan-ovoo Soum, Khentii Aimag, the planned demonstration site, in October 2021. After confirming the readiness of the site to take in the trial, the following activities were carried out. The system for registering and managing information on raw materials received at the warehouse was separately prepared by MCE.

1) Establishment of a Primary Storage Warehouse as an Intermediate Logistics Point

Baya A primary storage warehouse was established in Bayan-ovoo Soum to act as an intermediate logistics point. Warehouses that act as intermediate logistics points must be 'certified warehouses' of MCE, which means that they must meet the national criteria for warehouses. One warehouse was selected from the existing warehouses in Bayan-ovoo Soum that met the requirements and was registered as a 'certified warehouse' of MCE after the renovation. A new nomadic cooperative was also organized to procure raw materials from the site and got ready to carry them in and out, at the warehouse.

Most of the development of the information system for managing raw material information at the MCE headquarters has already been completed, and the electronic tags to be attached to raw materials on site and their communication devices (RFID system) have also been received at the headquarters. Now, it is just a matter of adjusting the detailed specifications of the main system to suit the local raw materials and installing the necessary equipment at the site by the MCE, and we have reached the stage where we can start the installation trials.

2) Labour Saving in Shearing with Shearing Machines

In June 2022, shearing training was carried out for nomadic associations in Bayan-ovoo Soum. The trainers

were members of Hovd Aimag production cooperatives who had received shearing training under UNIDO's shearing machine promotion project, and a shearing manual prepared by UNIDO was distributed for the training. In actual shearing, the shearing machines, generators to power them and other equipment are loaded onto trucks and sent to the site where nomads shear. As several shearing machines are used at once, nomads who did not attend the training may use surplus machines to shear wool themselves. The basic use of the machines is simple, making them easy for beginners to use.

3) Improving the Efficiency of Wool Transport Using Compressors

A wool compressor was installed to reduce the volume of the collected wool and improve transport efficiency. The compressor is used after the wool collected from nomads is delivered to the warehouse. By compressing the wool as it is transported from the warehouse to the primary cleaner, the truck load capacity was increased.

The compressor needed to be fixed inside the warehouse with cement and power distribution, so it was installed in the warehouse with the help of the union members who operated the machine and the County wiring contractor. Materials such as string to tie down the wool after compression and hydraulic oil to fill the compressor were also provided.

Shearing training

Shearing using a shearing machine

Wool compression

Carrying out compressed wool

Figure 4.33 Scenes from the Wool PA, Bayan-ovoo Soum, Khentii Aimag

(4) Results and Issues

The establishment of a temporary storage warehouse to serve as an intermediate logistics point had to be abandoned due to delays in the installation of equipment at the on-site warehouse by MCE. The reason for the failure to install the system was the inadequate electrical system, including power distribution and internet environment at the on-site warehouse, which is necessary for the operation of the system. Although MCE had a plan to install the system on site, it was difficult to plan and co-ordinate the details, such as identifying the maintenance items and costs required before installation, and sharing the work process with the people involved in the system, and this did not lead to the realization of the plan. As installation of the system is now very close to being completed, it is expected that coordination within MCE will continue towards the realization of the demonstration.

For labour saving in shearing operations with shearing machines, Table 4.22 shows the results of the verification.

Table 4.22 Efficiency of Shearing Operations

Shearing Methods / Item	by hands	By shearing machines	
	Basis	Year 2022	Year 2023
Operating time per sheep [min/sheep]. (compared to basis)	22	6.0 (0.27)	9.42 (0.43)
Wool collected [kg/sheep]. (compared to basis)	1.0	1.2 (1.2)	1.0 (1.0)

Source: JICA Project Team

The use of shearing machines reduced the shearing time by 1/3 to 1/2 compared to conventional hand shearing. The work time in 2023 was slower than in 2022, because nomads who had not attended the training in 2022 sheared the wool. In addition, 1.2 times as much wool was collected in 2022 as in hand shearing, whereas only the same amount of wool was collected in 2023 as in hand shearing. Although the amount of wool collected is likely to vary depending on the skill of the workers and the condition of the livestock in the year, it is clear that above-average wool collection is possible with the shearing machines.

Regarding the testing of the efficiency of wool transport using compressors, it was found that profitable sales destinations (Primary washing firms) differed depending on the truckload of wool. The nearest primary washing firm from Bayan-ovoo Soum, where the wool shearing was conducted is located in the capital of Khentii Aimag (132 km one way), to which the Soum belongs, and is the only washing firm in the Aimag, buying wool at 1,100 MNT/kg, regardless of the quality of the wool. On the other hand, there are several washing firms in Ulaanbaatar (465 km one way), and some of them price wool according to its quality. The price of wool purchased in Ulaanbaatar in 2023 was 1,000-1,500 MNT/kg. Figure 4.34 below is based on the actual sale of 12,500 kg of wool from Bayan-ovoo County (at the time of purchase from nomads) in 2023 in this PA to a firm in Ulaanbaatar for 1,400 MNT/kg. Selling wool in Ulaanbaatar requires a minimum of 3,400 kg to be profitable at one time, whereas in Khentii Aimag it is profitable as long as at least 1,300 kg is sold. The graph shows that the amount of sales is then more profitable to sell in Khentii aimag up to a load of 11,100 kg, but from the point when the load exceeds 11,200 kg, it is more profitable to sell in Ulaanbaatar. As the truck load for this year was 12,500 kg, it can be concluded that selling wool in Ulaanbaatar was correct.

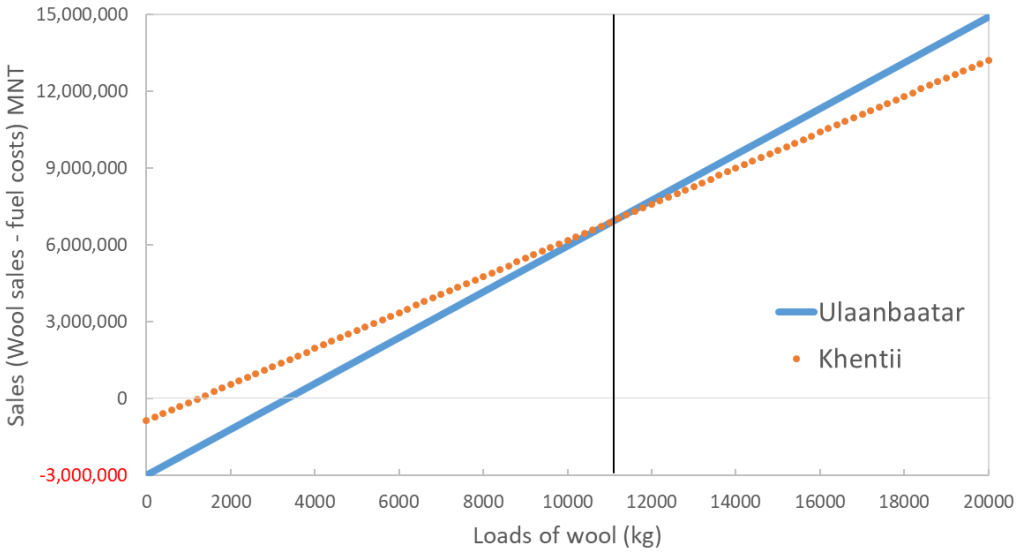


Figure 4.34 Differences in Sales Depending on Sale Destinations for Wool (2023)
※In case there is no change in the type, number and fuel consumption of trucks.

(5) Findings and lessons learned

From the establishment of a primary storage warehouse as an intermediate logistics point, it is important to keep in close contact with the person in charge of the site to ascertain the on-site situation in order to implement the project, especially if the site is in a rural area or other location where it is not easy to visit. It is important to identify the necessary work tasks based on an understanding of the on-site situation, to secure a budget, and to exchange opinions and collaborate with the relevant departments and persons involved.

In sheep shearing, the dissemination of shearing machines to nomads can help reduce their workload. As the blades of shearing machines are easily worn out, it is also important to have a blade sharpening machine to maintain them and a system for updating the equipment. In addition, sheep should not be laid on the ground when shearing. In this PA, when selling wool to a firm, approximately 40% of the volume brought in was estimated as impurity, and the volume traded was reduced to be 60% of the volume brought in. To ensure the sale of wool with a weight closer to the amount brought in, it is extremely important to ensure that nomads do not contaminate the wool with soil or feces by shearing on clean sheets spread on the ground or shearing on the back of the trucks.

When transporting wool, carrying compressed wool by compressors increases truckloads and increases transport efficiency. It then allows wool to be sold to more profitable firms. It is advisable for nomads and nomadic cooperatives to choose a transport method and wool buyer that matches their own geographical conditions.

4.2.8 Pilot Activity for Honey Processing and Supply Chain Improvement

(1) Outline of PA

Table 4.23 Outline of Honey Processing and Supply Chain Improvement Project

Item	Content
Title	Honey Processing and Supply Chain Improvement Project
Period	February 2021 ～ December 2023
Target Area	Ulaanbaatar, Selenge Aimag, Darkhan-Uul Aimag, Khuvsgul Aimag, Dornod Aimag, Tuv Aimag, Henti Aimag
Organization	MOFALI Food Production Policy Implementation and Coordination Department, 2 private companies
Outline	The goal is to improve the supply chain to achieve exporting honey to China. The current supply is unstable, with low quality and high variability. Honey filling companies (honey manufacturers) will enter the distribution process and require beekeepers to produce according to the specifications that inform beekeepers about the market needs, in order to stabilize supply and guarantee quality. In addition, contracts between beekeepers and veterinarians were promoted as part of quality assurance. Beekeeping training was provided for veterinarians to help them build up their knowledge of the beekeeping sector.

Source：JICA Project Team

(2) Background and Objectives

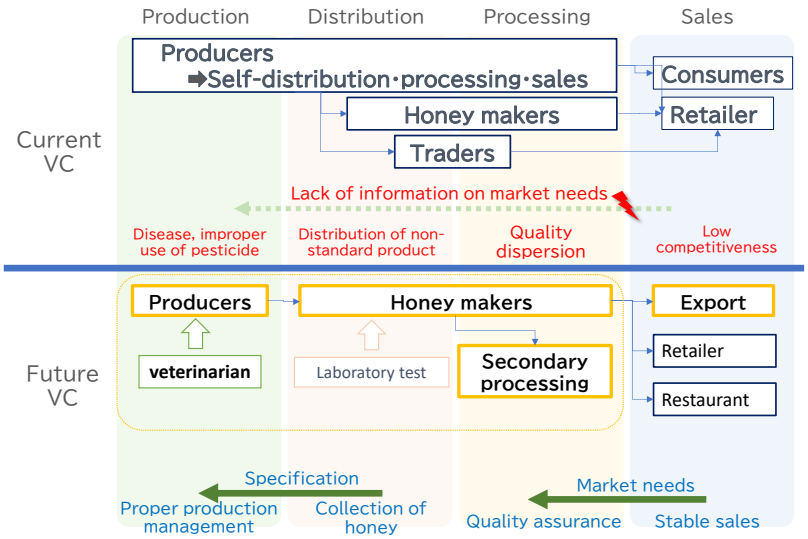
In 2020, honey distribution in Mongolia was dominated by individual beekeepers selling honey directly to consumers. Honey manufacturing companies had emerged, but they were not able to collect enough honey to meet their operational capacities, and were unable to influence the market. Honey was often sold as and when it was available, with wide variations in quality and many substandard products. There are reportedly enquiries from China for Mongolian honey. In Mongolia, where the domestic market is small, the ability to develop export markets has a significant impact on the growth of the industry, and the Mongolian Government is also focusing on developing export products other than mineral resources, with the aim of exporting honey as well[235]. Furthermore, with the opening of more and more major supermarket chains, consumers are shifting their honey purchases from direct purchases from beekeepers to major supermarkets. For exports and supermarket sales, a stable supply in terms of quantity, quality and delivery time is of paramount importance.

On the other hand, market needs were not reaching beekeepers, and beekeepers were not aware of the problems of quality variation and sales instability. In the value chain, as products become "goods" and flow from upstream to downstream, information on market needs and requirements must flow from downstream to upstream at the same time. Upstream beekeepers are in a difficult position to detect market trends and are not accustomed to picking and choosing information. A system was required to ensure that the information necessary for producers is organized and delivered in a way that is easy for them to accept.

(3) Activities Carried Out in PA

In response to this situation, the pilot activity will improve the supply chain to ensure a stable supply, with honey companies at the core (Figure 4.35).

[235] In a beekeeping market survey, more than 60% of respondents said they buy honey in supermarkets (from the "Honey Market Research" survey by MONMAP in 2021).



Source: JICA Project Team

Figure 4.35 Honey Processing and Supply Chain Improvement Project
Responding to Market Needs by Improving the Supply Chain (quality improvement and stable supply)

The specific details of the verification are as follows.

Table 4.24 Activities and Verification

Activities	Verifications
Support for contracts between beekeepers and honey companies.	If companies and beekeepers sign a contract after the company has shown the beekeepers the specifications of the honey, the quality of the honey can be guaranteed. Dealing with companies provides beekeepers with long-term profit security and leads to a stable honey supply.
Support for honey companies to develop processed honey products	By purchasing honey with sugar content below specifications for processing, beekeepers are less likely to sell substandard products as a commodity.
Beekeeping training for veterinarians	If the safety of honey is guaranteed through veterinary control of pests and diseases of the bee colony and monitoring of honey quality, market confidence will increase and exports will be realized. Public sector supervision encourages beekeepers to produce safe honey, leading to a stable honey supply.

Source: JICA Project Team

Two companies (Mihachi (“ Company M “) and Permaculture Development (“ Company P “)) were selected for the pilot activities and signed a Memorandum of Understanding with Company M on 15 March 2021 and with Company P on 1 April 2021, respectively, and started their activities.

Companies entered into contracts with beekeepers to start procurement, and the main requirements set out for beekeepers in the contracts are as follows;

[Main requirements from companies to beekeepers]

(i) Meet the criteria of MNS 6294:2019.
(ii) Designation of the nectar source (e.g. no buckwheat honey must be mixed, must be a wildflower, etc.)
(iii) Submission of nectar source information, apiary and rearing records
(iv) Collect honey in a manner agreed with the buyer
(v) Use of food containers and lids or use of containers and lids provided by the buyer
(vi) Acceptance of on-site inspection by the buyer
(vii) Acceptance of on-site inspection of the apiary by a veterinarian and attachment of the veterinary certificate to the honey

The point '(vii) Acceptance of on-site inspection of the apiary by a veterinarian and attachment of the veterinary certificate to the honey' is an effort target, as the fees for issuing veterinary certificates have not been agreed between beekeepers and veterinarians. In addition, the fact that there are few veterinarians with expertise in beekeeping has led to distrust by beekeepers. The project therefore organized training for veterinarians.

Table 4.25 Training Implemented by the Project

Date	Place (Aimag)	No. of participants	Remarks
June 2021	Darkhan-uul, Selenge	11 (Darkhan-uul) 42 (Selenge)	Training via online Co-organized with BeeDep-MONGOL2 [236]
September 2021	Darkhan-uul, Selenge	2 (Darkhan-uul) 9 (Selenge)	Co-organized with BeeDep-MONGOL2
June 2022	Bolgan, Darkhan-uul, Selenge	14 (Bolgan) 16 (Darkhan-uul) 24 (Selenge)	Co-organized with BeeDep-MONGOL2 and MJ-VET[237]
July 2022	Henti	16	Co-organized with BeeDep-MONGOL2 and MJ-VET
September 2023	Tuv	7	Co-organized with MJ-VET

Source: JICA Project Team

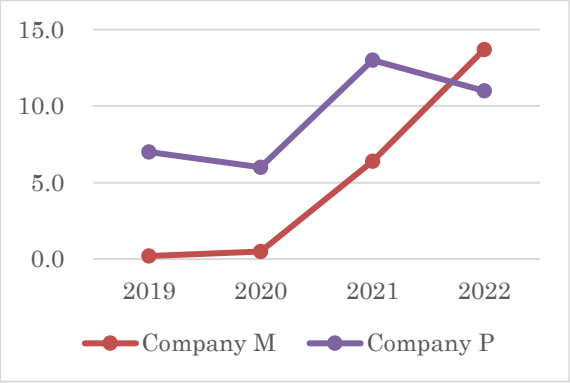
Mongolia has introduced a system of license renewal for veterinarians, obliging them to attend training courses and obtain the prescribed credits within five years before license renewal. The training curriculum also proposed content in the field of beekeeping; an application for credit was submitted by MJ-VET to the General Agency of Veterinary Services for veterinarians who participated in the training in June and July 2022, and 69 were granted credits.

In parallel with veterinary training, the government also promoted contracts between beekeepers and veterinarians, and recommended that veterinarians supervise the management of the production process. The number of beekeepers who signed contracts with veterinarians was 64 in Darkhan-ul Aimag and 22 in Selenge Aimag (2022). However, few certificates have been issued due to a lack of agreement between

[236] JICA Grassroots Technical Cooperation Project "Project on Beekeeping Development to Improve Rural Livelihood in Mongolia" (2019-2022)
[237] JICA Technical Cooperation Project "Project for Strengthening the Practical Capacity of Public and Private Veterinarian (2020-2025)

beekeepers and veterinarians on the fees for issuing honey certificates issued by veterinarians.

The changes in the procurement performance of the two companies during the PA period are shown in Figure 4.36. In interviews with beekeepers, beekeeper A, who had done business with Company M, said that the deal had brought stability in sales prices sales volumes and allowed her to expand her scale. A is also a leading beekeeper in Soum and acts as an intermediary for small-scale beekeepers who wish to do business with Company M. Companies prefer to deal with beekeepers above a certain size from a cost perspective, making it difficult for small-scale beekeepers to deal directly with companies. Therefore, they organize the beekeepers in the soum, bring them up to a certain size and then distribute them to the companies.



Source: JICA Project Team

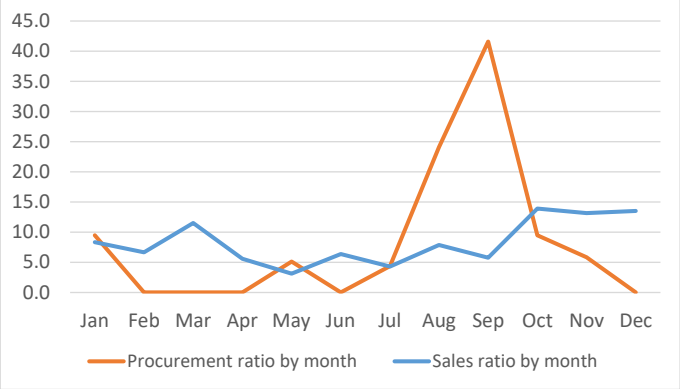
Figure 4.36 Procurement Volumes by Companies Participating in Pas (t)

As the honey on the market is often substandard and low in sugar content, the PA aimed to provide beekeepers with a visible quality standard in the form of a specification and to ensure that only honey that meets the standard is procured through trade by the company. None of the honey sold by the PA participating companies was found to have a low sugar content, and in this respect the trial was successful. Nevertheless, some beekeepers have poor rearing techniques and produce low sugar content. In particular, the 2021 season had a lot of rainfall, which resulted in a fairly large amount of low-sugar honey. The PA supported the development of processed honey products by Company M and provided cooking equipment, with the aim of avoiding the distribution of low-sugar honey on the market and turning it into processed honey products. As a result, honey cookies were successfully commercialized and are now on sale. It can be said that the added value of honey has been further improved as a destination for non-standardized products has been created. On the other hand, however, it was reported that some beekeepers were not making efforts to maintain quality, as they were aware that they could be bought back even if the quality was poor[238]. Producing good-quality honey is a main challenge, and the development of processed products alone has not led to quality improvement. Activities to raise awareness among beekeepers, increased pressure on quality from the market, the development of a quality assurance system and stronger crackdowns on substandard products are needed in parallel. Despite the challenges, the relationship between companies and beekeepers is becoming closer. For small-scale beekeepers in rural areas with little or no access to finance, the ability for companies to settle payments on the spot in exchange for honey is a major attraction. The opportunity to have access to cash when needed is important, and Company M has even started distributing feed and pesticides to contract beekeepers, using honey as collateral. Beekeepers can obtain inputs such as feed and insecticide for mites from Company M when they need them and pay for them after the honey has been collected, thus ensuring a stable production.

[238] Interview with Company M, August 2023.

(4) Results and Issues

It was observed that honey companies become key players in the value chain, thus ensuring security of supply. Contracts enable companies to procure and market products that meet the needs of their target markets in a stable manner. Stability of supply is essential for exports and trade with supermarkets, and therefore distribution through enterprises should be expanded in the future. However, current commercial practices place a heavy burden on companies: monthly procurement trends for the 2022 season show that just over 75% of annual procurement is concentrated in the three months of August-October, with around 42% procured in September. The honey procured is sold over the course of the year, with some fluctuations. Note that year-end inventories amounted to more than 30% of the procurement volume, and in the month with the highest inventories, the company theoretically had the equivalent of 90% of the total annual sales volume. Companies procure honey from beekeepers on a cash on delivery basis. Sales are most often made by selling on credit to large supermarkets, so companies bear the difference between procurement and sales.



Source: JICA Project Team

Figure 4.37 Monthly Honey Sales and Procurement by Company A (%)

Working capital requirements are excessive in relation to profits, forcing them to resort to borrowing. Verification of the PAs showed that trading with companies contributes to beekeepers' scale and stability of production. Most beekeepers have no collateral and are unable to expand their scale even if they wanted to, but stable sales provide a stepping stone to scale up. For small-scale beekeepers who have difficulty in obtaining production materials, the timely provision of materials by companies through receivables is linked to the stability of production. Stability of production is also beneficial for companies, and if contracts are expanded in the future, the amount of production material handled should increase accordingly, which, if done well, is likely to lead to other business opportunities. On the other hand, small-scale beekeepers are often left out of contracts between companies and beekeepers, and the organization of small-scale beekeepers needs to be encouraged. It could also be verified that as long as companies demand quality, wholesale to companies will improve quality. However, as seen in the development of processed low-sugar honey products, a multi-layered and long-lasting approach to quality is needed. As a method of quality assurance, an attempt was made to establish a veterinarian monitoring system and to attach certificates to honey, but this was not effective within the timeframe of the activity. Many beekeepers agree that the veterinarian's role is important, but there is no veterinarian who understands beekeeping and beekeepers feel that the benefits to them are only very roundabout, such as that conscious consumers might care a little when they buy honey. There is a strong distrust of veterinarians who are not directly helped, as they get a lot of money for issuing a single piece of paper.

In the beekeeping sector, the spread of pests and diseases and lack of appropriate materials are also problems, leading to unstable production and increased quality risks, but it can be said that the situation is

currently being improved by the burden on companies. In addition to training veterinarians, it is also necessary to reduce the burden on companies by fostering the human resources and organizations that support the industry, for example by developing and disseminating breeding techniques.

(5) Findings and Lessons Learned

It is important to identify players with significant influence in the value chain. In the case of honey, it was the honey companies. Not only must goods flow stably from upstream to downstream, but information in the form of market needs must also flow from downstream to upstream. It is important to identify and address the processes and factors that slow down the flow of information.

In the Mongolian environment, where the production season is limited, the role of intermediaries such as the processing and distribution sector, which links producers and consumers, is particularly important for security of supply. To ensure that the burden on intermediaries is not too great, the business environment, including finance and research and development, must be improved to ensure long-term stability of supply.

Contracts between producers and processors/distributors etc. are beneficial for both parties. For consumers, it also leads to the advantage that certain products are available when they want them. On the other hand, small producers are often excluded from contracts. To be eligible for contracts, they need to increase their scale or organize themselves

4.2.9 Pilot Activity for the Development of Local Information Platform System

(1) Outline of the PA

Table 4.26 Outline of the PA for the Development of Local Information Platform System

Item	Content
Title	Pilot Activity for the Development of Local Information Platform System
Period	September 2021 - February 2022: System development period March 2022 - March 2023: Trial period for the system introduction
Target Area	Entire region（Trial will be conducted in Bulgan aimag）
Organization	MED, Related provincial and soum officer
Outline	The objective of the Local Information Platform (LIP) is to improve agro-pastoralists' access to VC actors, including market actors, by facilitating communication and information exchange between agro-pastoralists living in rural areas and businesses, municipalities, public bodies, and the state.

Source: JICA Project Team

(2) Background and Objective

In the "National Comprehensive Development Planning Project for Mongolia" conducted by JICA, an F/S survey on the development of an information platform for approximately 300,000 pastoralists throughout Mongolia was conducted, and the results were compiled in a report. Through this survey, it was confirmed that there were needs for information access as shown in Table 4.27 from pastoralists and local government officials[239]. In this pilot project, a local information platform system with functions to meet local needs will be built and introduced on a trial basis to verify whether the improvement of pastoralists' access to

[239] SUPER ASSIST SYSTEMS LLC, 2021, SURVEY ON ESTABLISHMENT ROADMAP OF LOCAL INFORMATION PLATFORM FOR THE PROJECT FOR FORMULATION OF NATIONAL COMPREHENSIVE DEVELOPMENT PLAN

information, especially the promotion of two-way information transmission and communication between livestock product markets and pastoralists, will contribute to the diversification and stabilization of pastoralists' sales channels.

Table 4.27 Information Needs of Pastoralists and Local Government Officials

Information needs of pastoralists	Information needs of local government officials
- Easy access to meteorological information - Easy exchange of information among local government officials and pastoralists - Easy access to administrative information - Easy access to market price information on livestock products - Dissemination of information on sales of livestock products - Easy collection and dissemination of information on theft and disappearance of livestock	- Function to communicate and exchange information with local communities and pastoralists regardless of distance. - Registration of livestock information and registration numbers. - Record of livestock vaccination history. - Management of livestock movement information. - Function to identify the location of herders using GPS. - Function to distribute national information such as relevant regulations and procedures. - Function to communicate user registration, products, services, jobs, advertisements, and other related information. - Function to communicate weather information, product prices, and other information.

Source : Super Assist Systems LLC, 2021, Survey on Establishment Roadmap of Local Information Platform for the Project for Formulation of National Comprehensive Development Plan

(3) Activities Carried Out in PA

1) Study on the System Configuration of the Local Information Platform

Through discussions with the local subcontractor and the Ministry of Economic Development staff responsible for system management, it was agreed to proceed with the system construction shown in Table 4.28.

Table 4.28 System Configuration of the Local Information Platform

System	Function
Main Management System	The foundation of all systems. It is under the jurisdiction of the department in charge of information processing in the Ministry of Economic Development. Controls the input, output, and management of information handled by this system.
Database	Databases handled by the Main Management System. It includes data from various ministries and agencies (weather data, market price data of agricultural products, etc.) and data input from application users (pastoralists and private companies).
Mobile application for pastoralists	An application for pastoralists and farmers to view and input information. The type of information to be handled will be determined based on the needs of the field.
Mobile application for private companies	An application for agro-pastoral companies to view and input information. The type of information to be handled will be determined based on the needs of the field.
Automatic Information gathering system	A system that automatically collects target information from government websites, etc. (to simplify database management).
Web-based dynamic reporting system	A function that outputs information from a database according to the user's purpose.

Source : JICA Project Team

2) Research on Existing Systems

A survey was conducted on similar systems and applications that may have overlapping functions with the rural information platform system. While the Nuudelchin application focuses on administrative information management (livestock registration, traceability, livestock vaccination records, etc.), the Local Information Platform (LIP) system focuses on information exchange between pastoralists and markets

(raw material buyers, etc.). It was also decided that systems already in operation by MOFALI (e.g. Shepherds' Guide website: https://109.mofa.gov.mn) that are highly compatible with the Local Information Platform System would be incorporated into the Local Information Platform System. Since the Nuudelchin application is still in the conceptual stage, the prototype of the local information platform system will be developed first, but the Project will continue to have regular discussions with the Nuudelchin application developers and exchange information with them.

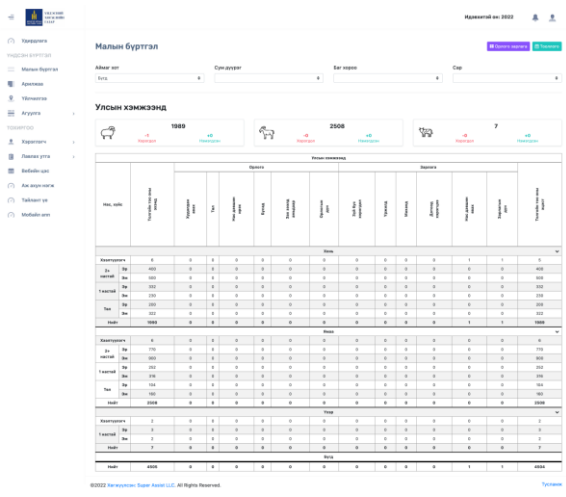
(4) Results and Issues

As of September 2023, the server was finally secured and the system is ready for operation. The project period is still short, but the system is now ready for operation. Although the project period is still short, a system operation test is scheduled to be conducted around November 2023. The system operation test will be conducted as shown in the table below.

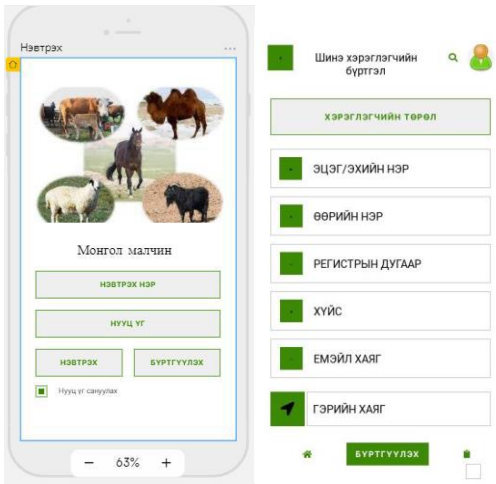
Table 4.29 System Installation Test Contents

Trial	1. Implementing an information sharing system at the Soum level	2. Implementing an information sharing system at the cooperative level
Target area	Khentii aimag, Bayan-ovoo soum	Khentii aimag, Bayan-ovoo soum
Contents of the trial	System implementation and operational testing	System implementation and operational testing
Analysis	- Viewing and analysis of nomadic and union data - Communication of information to nomadic associations and nomads through the system (weather information, market price information, linkage to livestock loss and theft sites, etc.)	- Viewing the livestock management status (mainly herd composition) of the nomads to which they belong - Information transmission to the nomads through the system (provision of information related to wool procurement, collection, shearing services, etc.)

Source: JICA Project Team



A. Nomadic Livestock Registration Report



B. Applications used by nomads

Source: JICA Project Team

Figure 4.38 System Display Screen

(5) Lesson Learned

The delay in implementing the system developed for this pilot project was due to the fact that the MED side did not make progress in securing a server to implement the system, but also because the NDA was reorganized into the MED and the expected server could not be secured, and the construction of a large-scale

server for the Mongolian government, which was supposed to be used as an alternative server, was delayed, causing further delays. The delay was also caused by the delay in the construction of a large-scale server by the Mongolian government, which was supposed to be used as an alternative server. Although it cannot be said that there were no parts of force majeure, in order to verify the implementation of such a system under the limited timeframe of the original project, a thorough preliminary investigation into the feasibility of the verification and the certainty of the prospects should have been conducted. This was a major lesson learned from the perspective of project implementation. We expect to be able to conduct an implementation test of the system itself during the project period, and will organize the findings and lessons learned through this verification based on the results of that test as well.

4.2.10 Pilot Activity on Processing Improvement of Yak Wool Products

(1) Outline of PA

Table 4.30 Overview of the PA on Processing Improvement of Yak Wool Products

Item	Content
Title	Project on processing improvement of yak wool products
Period	March 2022 - August 2023
Target Area	Murun, Khuvsgul Aimag
Organization	Jinst Murun Company, Khuvsgul branch of Mongolian National Chamber of Commerce and Industry
Outline	Verify the improvement of product quality and productivity by updating old yak wool processing equipment and providing training in processing techniques for staff.

Source: JICA Project Team

(2) Background and Objectives

In Khuvsgul Aimag, 30% of the livestock is yak, it is planned to include the strengthening of the yak wool industry in the Aimag policy. Jinst Murun is a large company processing wool in the Aimag, and in 2018 it conducted a yak wool collection and processing trial in collaboration with Mongolian University of Science and Technology, and is now even processing the wool into spun yarn. The company aims to develop its processing technology and produce products for export in the future (Yak wool children's clothing for Germany), and the Aimag is willing to support this company as a model company for the Aimag.

The equipment to be updated includes a washing machine, a dryer and a steam iron, and training is planned on topics related to the cleaning and drying of wool, mainly yak wool, processing techniques such as knitting and frizzing, and quality control. Experts from Mongolian University of Science and Technology and the Institute of Light Industry Research and Development were invited as trainers, and in addition to staff of Jinst Murun Company, local vocational training students were also invited to participate in the training, thereby this is to spread the technology throughout the region.

(3) Activities Carried Out in PA

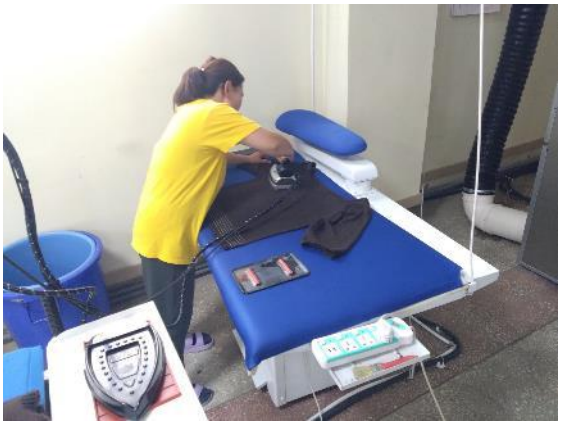
This project, proposed by the Khuvsgul Branch of MNCCI, was selected as one of the local proposal-based pilot activities for the project in June 2021, and the selection of the equipment to be installed and discussions

with the counterpart MNCCI Khuvsgul Branch and Jinst Murun Company started at the end of 2021.

The equipment arrived in April 2022 and full-scale use of the equipment began in May after an approximately one-month adjustment period. During the adjustment work, a professor from the Light Industry Research and Development Centre attached to the University of Science and Technology was invited to set up an operating program (time and temperature) suitable for yak hair.

In June, a five-day training on the use of the new equipment and processing technology was held for employees who actually use the equipment at the company and students from the center of vocational training and production in the Aimag (Figure 4.39).

The updated equipment has significantly improved quality and operational efficiency. It allowed the company to create new products and new brands with a view to exporting them abroad in earnest. The export target is Murun's sister city Baruth/Mark in Germany, where the mayor has already visited the PA company, completed a quality check of the products and decided to collaborate in the production of children's clothing. The new brand name is "KAYAF". Currently, a study is underway to develop new products and confirm export procedures.



Steam irons installed

Training on processing technology

Newly created brand 'YAKAF'.

Display shelves for own products

Figure 4.39 Activities of the Jinst Murun Company

(4) Results and Issues

All of the equipment updated in this PA is used for finishing after the product has been completed.

Finishing is particularly important for clothing products, as the feel of the product is one of the top criteria for consumers' purchase decisions in animal wool garments. Another yak wool garment company in Mongolia imports all detergents used in washing, but pays particular attention to the detergent ingredients. This is because, in addition to heavy metals used in dyes, the quarantine requirements for imported clothing in destination countries also stipulate the ingredients contained in detergents, and each country has its own standards. Selecting the right detergent for each export destination is a major burden for companies.

Yak wool is a new material that is not yet widely known in the garment industry, and introducing its characteristics outside the country is considered to increase global market needs. The three main yak habitats in the world are China, Tibet and Mongolia, but Mongolia's yak wool processing technology is considered superior to that of the other two countries. Increasing the production of Mongolian yak wool products and promoting them to the world is key to gaining the global yak wool market. However, the country's legislation on the trade of yak wool products is not yet in place, and it is desired that this is developed as soon as possible.

(5) Findings and Lessons Learned

In order to promote the export of yak wool products outside the country, domestic yak wool production and processing technologies need to be strengthened, as well as the establishment of a support system for the private sector when exporting. In particular, the following support is required: equipment procurement support for the private sector, as implemented in this PA; the preparation of a list of dyes and detergents that can be used in each destination country; and the preparation of guidelines outlining the procedures necessary for exporting. For Mongolia's small population, it is a natural move for private companies to target overseas markets in their business strategies, and the Government should make policies to reduce the burden of quarantine procedures, which can be a barrier for private companies to expand overseas, as much as possible. Legislation must be promptly introduced to facilitate the smooth import and export of yak wool products, including the import of raw yak wool. It is ideal to take action before the production technology for yak wool products in other countries surpasses that of Mongolia.

4.2.11 PA for Developing the Environment in Raw Fish Processing Facilities

(1) Outline of PA

Table 4.31 Outline of the PA for Developing the Environment in Raw Fish Processing Facilities

Item	Content
Title	Project for developing the environment in raw fish processing facilities.
Period	March 2022 - September 2023
Target Area	Zavkhan Soum and Ulaangom, Uvs Aimag
Organization	Sansar Uguuj Company, Uv branch of Mongolian National Chamber of Commerce and Industry
Outline	Conduct a fish resources survey of Lake Khyargas and develop a raw fish processing facility to test the feasibility of providing and promoting fish food to local residents and tourists throughout the year.

Source: JICA Project Team

(2) Background and Objectives

Mongolia is an inland country, but there are lakes with an area of over 1,000km^2, and many freshwater fish inhabit the freshwater areas of rivers and lakes. The annual per capita consumption of fish is only 0.18kg and fish is not yet a major food, but demand for fish is increasing due to the growing health consciousness of the younger generation in recent years and the promotion of fish diets under the national policy 'the Healthy Mongolia, Healthy Food program'.

Lake Khyargas, in Uvs Aimag, is a salt lake with an area of approximately 1,481km^2 and a water storage capacity of approximately 75km^3, and is a habitat for fish such as Altai Osman, Yellow Osman[240]. The Aimag is also a tourist destination, attracting 40 000 visitors in summer, and the PA implementing company, Sansar Uguuj Company, operates a tourist camp on the shores of the lake and offers fish dishes from the lake.

This PA aims to develop a processing facility for fish caught in Lake Khyargas to provide a stable supply of fish to local people and tourists, and to increase the consumption of fish as a healthy food source. In Zavkhan Soum, where there are no food processing facilities of a scale that would enable commercial sales, this processing facility will be a model facility for the region. In order to prevent the depletion of the lake's fisheries resources, a survey of the fisheries resources of Lake Khyargas, which has been carried out regularly since 2013, will be conducted in advance of the implementation of the PA to determine the annual total allowable catch.

(3) Activities Carried Out in PA

The project, proposed by the Uvs Branch of MNCCI, was selected as one of the Local proposal-based pilot activities for the project in June 2021, and the selection of the equipment to be installed and the business plan with the counterparts, MNCCI Uvs Branch and Sansar Uguuj Company, started at the end of 2021.

As this project utilises the fish resources of Lake Khyargas, a fish resource survey was conducted to confirm the annual total allowable catch by Zavkhan Soum and the Mongolian Fish and Underwater Breeding Association in 2022. Furthermore, meetings were held as appropriate with relevant departments of the Ministry of Nature, Environment and Tourism, which has jurisdiction over the country's fisheries resources.

1) Establishment of a fish processing facility and production of processed products.

Sansar Uguuj Company's campsite on the shores of Lake Khyargas was used as a summer processing facility, while a building owned by the company in Ulaangom was renovated to become a winter processing facility. Processing at the facility began in 2022 after the company received a catch quota of 1t (approximately 400 fish) from the Ministry of Nature, Environment and Tourism through Zavkhan Soum. The main products produced were smoked fish, fried fish and frozen fish products such as fish balls and fillets (Figure 4.40). The products are distributed wholesale to supermarkets and restaurants in the city, as well as being provided as ingredients for hospital meals and school and kindergarten lunches.

[240] Surface Water of Mongolia, Gombo Davaa, (https://web.archive.org/web/20210209073320/http://raise.suiri.tsukuba.ac.jp/new/press/youshi_sugita8.pdf)

The Fish Processing Facility (at Ulaangom)

Smoked Fish

Fish Khuushuur

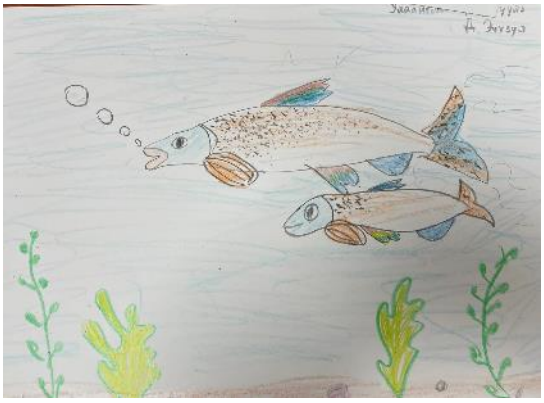
Fried Fish

Figure 4.40 Fish Processing Facility and Fish Dishes

2) Fish Food Promotion Event

A fish food promotion event was held from July to August 2023 with the aim to promote tourism in the Uvs Aimag (Figure 4.41). At the opening ceremony, the governor of the Aimag gave a speech and the project was explained by MNCCI Uvs branch and the PA Company, and fish dishes prepared by several restaurants in the Aimag were served. The main part of the event was a stamp rally to visit the restaurants serving fish dishes in the Aimag, where participants (Local residents and tourists) who collected stamps were given fish products as prizes. In addition, a domestic TV broadcast featured the launch of a fish processing project in the Uvs aimag and the ongoing event, in order to raise awareness of the project and attract tourists from outside the prefecture.

The opening ceremony



Fish drawings by local children at the event

Leaflet on the stamp rally

Figure 4.41 Fish Food Promotion Event

(4) Results and Issues

As a result of vigorous product development and promotional activities by the PA Company, the number of fish products sold in the Aimag and the number of retail outlets and restaurants selling the fish products have steadily increased. Although sales grew steadily immediately after the start of product sales, partly due to the novelty of fish, the sale has been slowing down as time passes. From now on, efforts must be made to ensure that the fish diet that has begun to spread as a result of the project does not end as a temporary boom, but takes root in the eating habits of the local people as a foodstuff representative of the region. The Governor of the Aimag has indicated that he would like to consider adding fish as one of the regional brands of Uvs Aimag, and it is possible to maintain and promote the fish diet through cooperation between the public and private sectors.

In procuring raw fish, the priority is to avoid depletion of fish resources and illegal fishing, and to maintain sustainable fisheries. Since 2000, fishing for industrial purposes has been banned in Lake Khyargas. This is due to the fact that Lake Khyargas is designated as a special national protected area and to prevent depletion of fisheries resources through overfishing. However, fish can be caught for fish stock management if a permission is obtained, and the raw fish used in this project are also caught for this purpose. The catch quota was wholly owned by the fisheries association of Zavkhan Soum with the start of this PA, and the PA Company purchased fish from Zavkhan Soum. Zabkhan Soum, which has few livestock resources, has long wanted to take advantage of the region's abundant fishery resources, and now its wish has come true. The annual total allowable catch must be renewed each year, and the fishing season is limited to winter. This is

because summer is the breeding season for fish and also to prevent water-related accidents. In order to produce and supply products year-round, securing raw fish storage facilities during the closed season is an issue for the future. One solution to the shortage of raw fish is to use fish caught in the nearby lakes.

The current total allowable catch in Lake Khyargas is 20,000 fish per year, and the catch quota allowed to local residents is less than that. The actual catch reported by residents is even less. Although the risk of depletion of fish resources is considered low for now, it is essential to conduct resource surveys on a regular basis in order to accurately assess the quantity of fish resources. Basically, the local government is in charge of conducting resource surveys in the lakes. The Ministry of Nature, Environment, and Tourism provides local governments with survey funds for the purpose of plant protection, but the amount is so small that it is difficult to allocate the funds to fish resource surveys, and local governments usually bear the entire survey cost. As a result, surveys have not been conducted in many areas for years. In areas where fishing is thriving, securing a budget for resource surveys is an issue. In Mongolia, it is mandatory to conduct aquaculture (fish farming) as well, if fishing for commercial purposes. Currently, there are no companies engaged in aquaculture in Mongolia, and aquaculture technology is still underdeveloped. However, considering the future growth of the domestic fishing industry, it is necessary to focus on the development of the aquaculture business as well.

This PA attempted to establish a fish cluster that would bring together stakeholders involved in the use of the fish resources of Lake Khyargas. Members included the Mongolian Fish and Underwater Breeding Association and companies operating lakeside campsites, in addition to public authorities such as Uvs Aimag and Zavkhan Soum. Although no specific activities were undertaken, a list of members was compiled for the establishment of the cluster. This includes companies that had conducted small-scale fish processing in the past. The processing business was closed because of significant issues with packing techniques.

(5) Findings and Lessons Learned

Fish is still an unfamiliar food for Mongolians, but some consumers are willing to try fish if it is available and domestically produced[241]. In Uvs Aimag, local fish is processed and distributed, and restaurants, hospitals and schools in the Aimag have started using fish. It is essential to establish a fish supply system first, and the first step in this process is the development of processing facilities. As many of the population do not know how to cook fish, the keys to spread fish diets are; to produce processed products that are as easy to prepare as possible, and to promote the cooking method as well.

As Mongolia's fisheries resources are all inland water fisheries resources, there is always a risk of resource depletion. To prevent overfishing and ensure sustainable resource use, it is necessary to conduct regular surveys of resource levels and set up a closed fishing season and closed fishing zones. It is desirable for resource management to be led by local authorities and organizations with detailed knowledge of the situation on site. Processors are required to improve storage facilities during the closed fishing season and, if they aim to conduct and scale up the fishery for commercial purposes in the future, they must start developing aquaculture projects as soon as possible.

[241] Consumer Survey in Mongolia, conducted by Dr Amit Morey, Auburn University.

Chapter 5 Industrial Cluster Development

5.1 Outline

Currently, clusters by commodity are being formed in Mongolia with the support of various development partners. Each cluster is basically comprised of people involved in the production, processing, distribution, and sales of the product in question, as well as MOFALI officials and others from the public side, who participate in discussions and activities aimed at identifying factors hindering the strengthening of VC and resolving issues related to the product in question. The formation of industrial clusters as a basis for such public-private partnerships has become particularly prominent in recent years, and it is expected that the scale and types of clusters will continue to expand with the support of development partners, but at the same time, the issue of how to ensure the independent development of such clusters will be examined in parallel. The project will also work in tandem with the verification of how to ensure the self-sustaining development of the clusters.

This project will adopt an industrial cluster approach with the aim of establishing an organizational foundation to promote VC development. On the other hand, as of December 2021, there is currently no clear development plan or guidelines for industrial cluster development in Mongolia. Therefore, this project aims to create the following outputs by the end of the project through demonstration activities related to cluster formation.

- Piloting of initiatives related to the formation of new clusters. Identification of issues for the self-sustaining development of clusters and clarification of the roles of government and private organizations, including chambers of commerce and industry, in promoting cluster development.
- Support for the preparation of development plans, guidelines, etc. for cluster development. At this time, the Small and Medium Enterprise Agency, which is under the jurisdiction of MOFALI, is assumed to be the responsible agency for cluster development.

5.2 Formation of Honey Cluster

5.2.1 Background of Honey Cluster Formation

The beekeeping industry in Mongolia has been expanding rapidly since mid-2010. The production scale has increased from 11 tons in 2010 to 221 tons in 2019. However, competition in the domestic market is intensifying year by year, as evidenced by the import volume of 289 tons and per capita consumption of 130 g/year in 2019[242]. On the other hand, the Mongolian government is working to diversify its export products, and honey is expected to be one of the new export products.

However, in Mongolian beekeeping, at each stage from material input to filling and processing, there are various food safety-related risks due to various factors, such as residues of veterinary drugs and pesticides,

[242] FAOSTAT. It should be noted that in 2021, there is production of 479 t against imports of 290 t. However, it is possible that pre-harvest stocks were released due to the logistics slowdown caused by COVID-19 in 2020.

contamination with foreign substances, contamination with hazardous factors from packaging containers, and distribution of unsanitary honey (Table 5.1). In addition, some of the products do not meet the standards, and there is a large variation in taste and color, and the quality and flavor cannot be determined until the package is opened and eaten. The supply is also very unstable. It is difficult to call it a "product". This is a problem that needs to be addressed by all those involved in beekeeping. In addition, the price of Mongolian honey is very high and not at all competitive internationally. This means that added value, such as the scarcity that only Mongolian honey can offer, is essential. It is necessary to obtain added value based on food safety and stable quality.

Table 5.1 Major Food Safety Risk Factors for Mongolian Honey

Inputs	Production	Distribution	Filling and processing	Sales
・ Lack of sufficient control of bee colony imports ・ Lack of registered drugs ・ Inappropriate drug imports ・ Use of foreign language drugs	・ Inappropriate control of pests and diseases ・ Inappropriate breeding management after the use of drugs ・ Lack of information on pesticide application to honey crops ・ Possibility of contamination of the apiary environment such as soil ・ Lack of interest in hygiene management	・ Use of non-food storage containers ・ Storage and distribution in unsanitary environments	・ Filling and processing in an unsanitary environment	・ Use of non-food containers

Source: JICA Project team

In the case of exports, the units of trade are larger. On the other hand, before COVID-19, individual beekeepers sold directly to individual consumers, and the supply of honey was unstable, depending on the honey collection conditions at the time. This situation needs to be changed to a production and distribution system that lowers food safety risks, aligns quality, builds large lots, and provides a constant supply of quality honey at all times. Production by individual beekeepers needs to be combined to achieve a stable supply. Furthermore, as a landlocked country, logistics to export destinations need to be fully considered. In addition, stable supply requires expanding the wholesale of honey to companies and strengthening sanitation and quality control capacity through honey VCs, but beekeepers and honey companies face difficulties in raising funds for scaling up production and procurement and for quality control.

Against this background, it was decided to form a cluster involving stakeholders including beekeepers, honey companies, logistics companies, financial institutions, and other sectors involved in policymaking, technological development, dissemination, etc., to promote the beekeeping industry in the future.

5.2.2 Activities Carried Out

(1) Discussions by Preparatory Working Group

In the beekeeping industry, reducing food safety risks is one of the top priorities and an industry-wide approach is important. One of the key roles of clusters is to promote sanitation and quality control. Therefore,

in parallel with the formation of the cluster, the development of a Basic Good Beekeeping Practice (hereinafter referred to as 'honey GAP') to be followed by beekeepers and honey companies was considered.

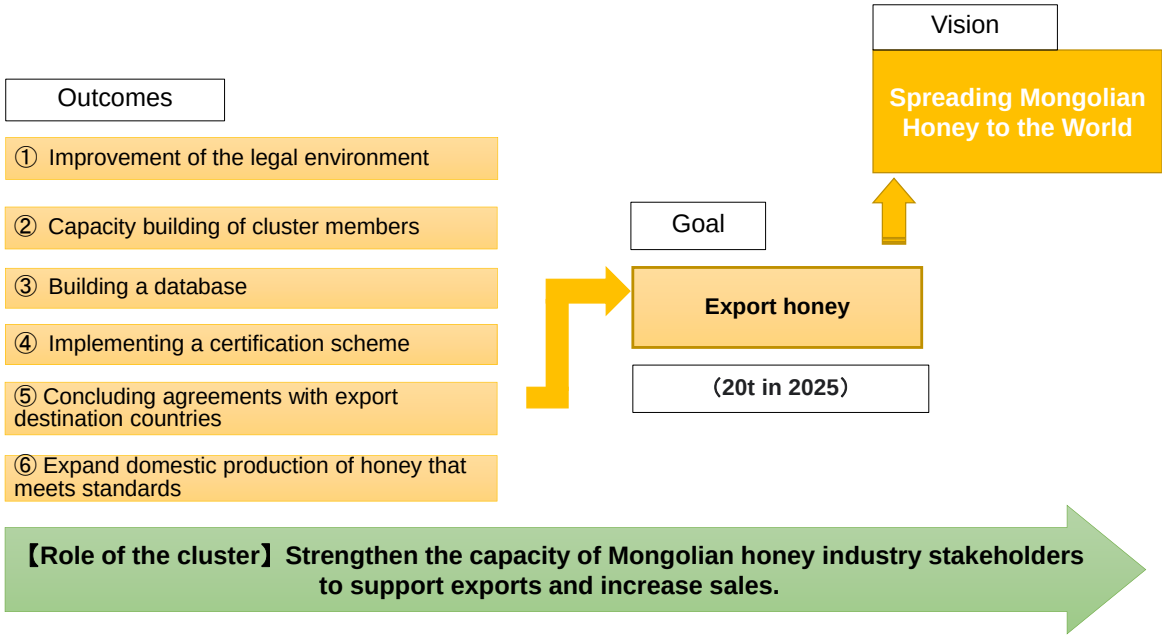
On the other hand, the formation of clusters should have taken more time. In the area of beekeeping, the Mongolian Beekeeping Association and the Supreme Council of the Mongolian Beekeeping Association are the two major NGOs. Both organizations have branches in each aimag, and their members are beekeepers. The main activities of both organizations are beekeeping training, information gathering, and the provision of bee colonies and production materials to beekeepers with the help of the government and donors, but they are competing for members. The Mongolian Honey Producers Association envisions the participation of honey companies and is also working to get honey companies to participate. Most of the beekeepers are small family businesses, and it is assumed that there are 800-1000 families totally in each area. There are also honey-related corporations such as "Changes" and several filling and processing companies, but they are not mutually affiliated. The lack of cooperation among beekeeping stakeholders has had no small impact on the unstable honey supply system.

In light of this current situation, a preparatory working group (hereinafter referred to as "WG") for the formation of a honey cluster was established under the name of the Secretary-General of MOFALI, with the goal of establishing a honey cluster by the spring of 2022, after sufficient and discussion by WG members and a common understanding of the issues.

The secretariat of the WG was provided by MNCCI, which has been involved in cluster formation under the EUTRAM project, and was co-chaired by the Director of the MOFALI Food Production Policy Implementation and Coordination Department and the Director of the MNCCI Project Programme Department.

(2) Purpose and role of the honey cluster

At WG, the vision, goal, and role of the cluster were discussed, and the objective of the cluster activities was confirmed as "aiming to export honey". The articles of association were then drawn up and the honey cluster was registered as an NGO in May 2022.



Source: JICA Project Team

Figure 5.1 Vision, goals, outputs, and roles of the cluster

(3) Activities of the Cluster

An event to mark its establishment was held in October 2022, followed by a membership recruitment seminar in January 2023 and a business matching event in April 2023. There are two types of membership: standard members, which are intended for beekeepers, and gold members, which are intended for honey companies, with annual membership fees set at 300,000 MMT and 1 million MMT respectively; as of July 2023, there were 12 standard members and one gold member company.

Financial institutions participated in a business matching event in April 2023, where the Mongolian Government's low-interest loan program and financial management and business plan preparation for obtaining loans were explained, as well as a lecture on quality control and the need for market research.

(4) Preparation of Basic Good Practices for Beekeeping (Honey GAP) and Related Legal Institutions

Compliance with international standards is essential for export as well as food safety. The first step in creating the Good Practice was to confirm the CAC standard for exporting honey and to create a Mongolian translation of the standard[243]. For CAC standards, the registration of the Mongolian National Standard (MNS) was approved in July 2022 and came into force in August of the same year. MOFALI has made it mandatory to introduce GAPs for each agricultural and livestock product, and GAP formulation was also promoted for honey. In formulating the honey GAP, risks were identified for each process, management methods for risk reduction were organized, and draft standards, confirmation methods, and forms for recording were developed. The content was designed to be consistent with the Order of the Chief of the General Agency for Veterinary Services "General Guidelines for Veterinary Services and Hygiene Requirements to be

[243] Implemented with cooperation from JICA's grassroots technical cooperation project BeeDep-MONGOL2

Implemented in Bee Farms" ("General Guidelines for Beekeeping"), which entered into force in April 2020, and the honey traceability system described below. Key to the introduction of GAP is the certification system. In Mongolia, it has been stipulated that the conformity determination for certification must be done by a third party; GAPs must also be third-party certified, but in the case of third-party certification, the certification body must be paid an audit fee and other fees. Two organizations certify agricultural and food products in Mongolia: SFCS, a private certification body, and MASM, a national organization. The reason why GAP for introduced fruit and vegetables has hardly spread is that farmers are required to pay the costs of certification, but cannot add it to the selling price, and there is no benefit to them. The benefits of GAP are also necessary for its dissemination, as is pressure from suppliers to demand it and to incorporate it into procurement rules. It is also necessary to coordinate with the veterinary certificates issued by veterinarians for honey. The General Agency for Veterinary Services requires veterinary certificates to be issued for livestock products and is stepping up its crackdown on livestock products not accompanied by a certificate, but beekeepers are refusing to pay veterinarians a fee for issuing a certificate. There is some overlap between the content of the honey GAP and the veterinary certificate for honey, and a clear distinction needs to be made between what is controlled by the GAP and what is controlled by the veterinarian so that beekeepers do not bear double the cost.

(5) Development of a Honey Traceability System

In today's international market, ensuring traceability is unavoidable. Honey, in particular, is a food product that is often falsified, with fake products, false honey sources, and falsified production areas. For this reason, we have developed a honey traceability system (hereinafter referred to as "HTS"). The Mongolian Government has been promoting the computerization of the agriculture and livestock industry, and in the livestock sector, the Animal Health Information System (MAHIS) for disease control and other veterinarian services and the Livestock General Information System for the registration of livestock farmers and livestock went into operation in January 2023. HTS is a subordinate system of MAHIS and is also linked with the Livestock General Information Following the operation of MAHIS and the Livestock General Information System, HTS also started operating, with over 400 beekeepers registered as of July 2023. The Food, Agriculture, and Light Industry Research and Development Centre is responsible for the dissemination of the system to beekeepers and honey companies.

(6) "Honey Week" Event Afterwards

In November 2021, Honey Week worked with 12 restaurants in Ulaanbaatar to offer honey dishes and honey drinks, and eight companies still use honey in their dishes and drinks. Three of these companies said they did not care about the origin of the honey, but five of them chose to buy and use domestic honey.

In the summer of 2023, Japanese travel agent H.I.S. organized a beekeeping tour in cooperation with BeeDep-MONGOL2. In Ulaanbaatar, the tour included meals at restaurants participating in 'Honey Week' that offered honey menus made from domestic honey and some restaurants that H.I.S lobbied to develop honey menus for the tour. The honey menus were well received by tour participants and it is possible to develop new uses for honey to increase consumption in the future as opportunities arise.

(7) Results and Challenges

The vision and goals of the cluster were set by representatives of beekeeping NGOs and government agencies, etc., and the honey cluster was finally established. Meanwhile, in May 2022, a cluster called the 'Mongolian Export Honey Cluster' was registered as a legal entity against the honey cluster. This was set up by one WG member with another party and was described as an organization with one honey company and beekeepers as members, with joint production and joint marketing. The clusters oriented in the project are networks, which are consultative forums for stakeholders in the honey value chain, including beekeepers and honey companies as well as governments and research institutions. In the lead-up to the establishment of the cluster, the WG held a number of discussions to promote a common understanding among the main players in the beekeeping industry, but no collaboration was achieved. It is to be hoped that the perspective will shift to competition on the international market, rather than concentrating on the power struggle within the industry. The honey cluster has also yet to start substantive activities, but a series of concrete activities will lead to the sharing of issues and is important for the promotion of the Mongolian beekeeping industry.

The legal system for sanitation and quality control being put in place through the MNS registration of CAC standards, the Honey GAP, and the General Guidelines for Beekeeping is an important step forward for exports. Mongolia is currently negotiating honey exports with China, where the main concerns on the Chinese side are food safety and transboundary disease control. The fact that food safety is monitored by a public organization, that diseases and pests are controlled by veterinarians, and that the production history can be verified by HTS and traced back to the place of origin are major advantages of Mongolian honey, so the system should be established and promoted as soon as possible. On the other hand, beekeepers are responsible for producing good, quality-assured honey, but many of them are small-scale beekeepers. The entire beekeeping industry, including small-scale beekeepers, needs attention, institutionalization, necessary technical development, and dissemination, but organizations with the capacity to take on these tasks have not yet been developed. In addition, in November 2021, the registration of a Mongolian laboratory with the Japanese Ministry of Health, Labor, and Welfare in relation to exports to Japan was completed, which was a step forward towards realizing exports to Japan[244]. As a result, 340 kg of Mongolian honey was exported to Japan in September 2022. However, at that time, it took around four weeks to clear customs in Japan due to incomplete documentation issued by the inspection authorities. A distant cause was the lack of knowledge of the requirements of the export destination amongst the people involved. In exporting, information on the requirements of the export destination must be accumulated and kept up-to-date. Institutions should be urgently coordinated and established to update and share information related to Honey GAP, veterinarian involvement, and HTS in relation to quality assurance, as well as export. The honey cluster is still far from being able to fulfill its function of coordinating experts and disseminating up-to-date information in collaboration with the government, and the government and public authorities need to consciously train the

[244] In order to export honey to Japan as natural honey, it must be analyzed for composition by an inspection body of the exporting country registered with the Ministry of Health, Labor and Welfare (MHLW). The two registered Mongolian inspection bodies are (1) National Reference Laboratory for Food Safety and (2) MOFALI Central Livestock Research Institute, which are registered as bodies capable of carrying out inspections not only of Mongolian food products, etc., but also of products from other countries.

coordinators.

5.3 Efforts of the Cluster Subcommittee

5.3.1 Formation of Cluster Subcommittees

In parallel with the above-mentioned trial project for the formation of honey clusters, a subcommittee was organized to develop guidelines for the development of industrial clusters. The JICA project team served as the secretariat of the subcommittee, while the activities of the subcommittee were conducted under the direction of Dr. Tsevelmaa, a professor at the Faculty of Economics of the National University of Mongolia, who is knowledgeable about cluster policy. In addition to Mr. Uyanga, Associate Professor at the Faculty of Law of the National University of Mongolia, two officials from the MOFALI Policy Planning Department, one from the Light Industry Policy Implementation Coordination Department, two from the Small and Medium Enterprise Agency, and one from the MED Regional Industrial Policy Department participated in the subcommittee from the central government. In addition, an official from the Mongolian Chamber of Commerce and Industry, who represented the private sector and was also involved in the operation of the honey cluster, participated in this subcommittee.

Table 5.2 Members of the Cluster Subcommittee

No.	Name	Organization
1	K.Tsevelmaa	Professor, Faculty of Economics, National University of Mongolia
2	M.Uyanga	Associate Professor, Faculty of Law, National University of Mongolia
3	E.Sugarbayar	MOFALI, Policy and Planning Bureau Staff
4	Ch. Dolgorsuren	MOFALI, Policy and Planning Bureau Staff
5	Boldbaatar	MOFALI, Light Industry Policy Implementation Coordination Office Staff
6	Gerelzaya	Director, MOFALI, Small and Medium Enterprise Agency
7	M.Erdene	MOFALI, Small and Medium Enterprise Agency Staff
8	D. Munkhjargal	MED, Regional Industrial Policy Bureau Staff
9	Oyunzul Sugar	Official, Mongolian Chamber of Commerce and Industry

Source: JICA Project Team

5.3.2 Subcommittee Initiatives

This subcommittee clarified the definition of the term "cluster" and reviewed industrial cluster policies implemented in various countries, including Japan, as well as cluster initiatives being formed in Mongolia, to develop guidelines that can be used by policymakers. The following are the items discussed at the five subcommittee meetings held in total.

Table 5.3 Details of Cluster Subcommittee Initiatives

No.	Theme	Contents of Discussion
1st meeting	Background and Purpose of the Subcommittee Meeting	・ Discussion on the purpose of the subcommittee and its action plan ・ Discussion on the definition of a cluster ・ Review of the Mongolian government's consideration of the implementation of the cluster policy
2nd meeting	Status of Cluster Implementation in Mongolia/ Guideline Development Policy	・ A review of the efforts of the sea buckthorn clusters that are being formed in Mongolia

No.	Theme	Contents of Discussion
		• Sharing of information on honey clusters implemented by the JICA project and export clusters implemented by EU-TRAM. • Sharing of the draft table of contents of the guideline.
3rd meeting	Consultation on cluster policy/guideline development as implemented in Europe	• Report and discussion on the results of the review of cluster policies and systems implemented in Europe. • Review of the progress of guideline development.
4th meeting	Consultation on cluster policy/guidelines development being implemented in Japan	• Review of cluster-related policies implemented by METI, MAFF, and MEXT in Japan. • Information sharing on the monitoring and evaluation system of cluster policies in Japan. • Review of the progress of guideline development.
5th meeting	Share and discuss draft guidelines	• Explanation and discussion on the draft guideline

Source: JICA Project Team

Cluster subcommittee meetings

Cluster subcommittee meetings

5.3.3 Efforts toward Institutionalization

(1) Creation of Guidelines

Based on the examples of cluster policies in Mongolia and other countries, including Japan, organized through the subcommittee meetings, guidelines for cluster policy policies and institutions were developed. Specifically, the guidelines are structured as follows (see Annex).

- Necessity of cluster development and how to use the guidelines
- Definition and functions of clusters
- Cluster policy and institutional structure
- The nature of agro-pastoral cluster policies and how they should be implemented
- Evaluation and monitoring of cluster policy implementation

(2) Use of Guidelines

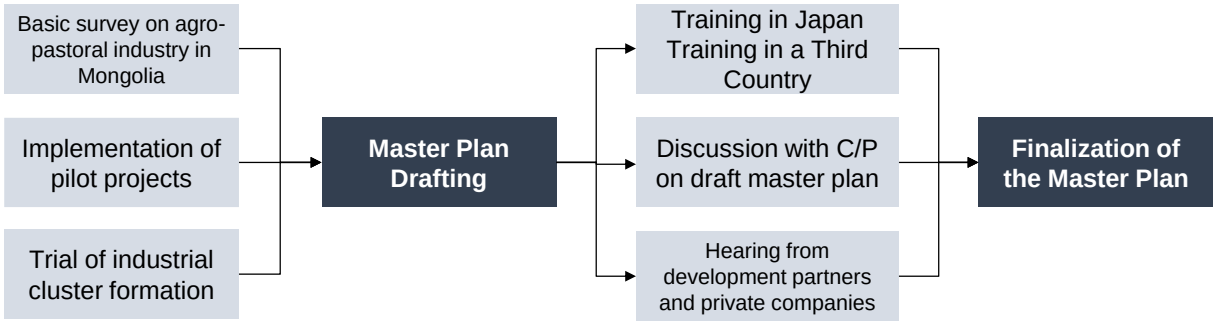
The guidelines were supplied to MOFALI and MED officials, and Professor Tsevelmaa, who was deeply involved in their preparation, held a briefing session for the Ministry's staff. At the same time, the Small and Medium Enterprise Agency is working to establish a system for cluster development, which had not been in motion before. The proposed system, which has been drafted so far, would classify industrial clusters into 1)

export clusters, 2) national-scale clusters, and 3) IMAG clusters, establish criteria for each cluster, and provide support (specifically, priority in obtaining low-interest loans) to clusters that meet these criteria. The cluster system is based on the policy of the MED. Although further time will be required for the institutionalization of the cluster system due to the need for policy discussions with the MED, it is hoped that the knowledge and theories learned in the subcommittee meetings will be used to develop the system.

Chapter 6 Preparation of Master Plan for Agro-pastoral Value Chain Development

6.1 Agro-pastoral Value Chain Development Master Plan Preparation Process

The developing process of this master plan is shown in Figure 6.1. The draft Master Plan was prepared in consultation with the staffs of the implementing organizations such as MOFALI and MED through basic research on the Mongolian Agro-pastoral industry (Chapters 2-3), implementation of pilot activities and lessons learned (Chapter 4), and trial formation of industrial clusters and lessons learned (Chapter 5). The draft master plan was also shared with MOFALI and MED staff and private sector participants when the training programs in Japan and third countries were implemented in order to exchange opinions. In addition, the project team heard opinions on the draft master plan through regularly scheduled JCC meetings and PMU meetings and also shared information about the progress on the preparation of the master plan. Furthermore, the meeting was held in order to exchange views and hear opinions on the draft master plan with various development partners who are providing support and cooperation in the agro-pastoral sector in Mongolia, as well as with various associations aiming to develop industries in specific commodities. This chapter describes the initiatives undertaken by the project, particularly during the planning process of the master plan.



Source: JICA Project Team

Figure 6.1 Developing Process of This Master Plan

6.2 Implementation of the Training Programs in Japan and Third Countries

6.2.1 The Training in Japan

The training sessions in Japan were conducted three times during the project period. In 2021, due to the pandemic of COVID-19, the training could not be conducted in Japan and was held online. However, in 2022 and 2023, the trainings were held in Japan. A total of 21 participants from the government and private sectors of Mongolia took part in this training program throughout the project period. They received lectures on agriculture and livestock logistics in Japan and the promotion of industrial clusters. It provided an opportunity to obtain knowledge in these fields. In addition, the opinions and recommendations were gathered from the participants in group work during the training in order to reflect in the master plan while confirming their validity.

Table 6.1 The Summary of Training in Japan

Year	Type of training	Themes	Participants
2021	Online and Face-to-face	Agricultural and Livestock Logistics and Industrial Cluster Promotion in Japan	MOFALI: 7 persons Private sectors: 5 persons
2022	On-the-job training	Agricultural and Livestock Logistics and Agricultural Cooperative Structure in Japan	MOFALI: 1 person MED: 2 persons
2023	On-the-job training	Agricultural and Livestock Logistics and Agricultural Cooperative Structure in Japan	MOFALI: 4 persons MED: 2 persons

Source: JICA Project Team

In particular, the training in Japan in 2023 was held when completed the draft master plan, and invited the Undersecretary of MOFALI and MED in order to enhance the implementation of the master plan after the project. The draft prepared by the JICA project team included the ideal state of agricultural and livestock logistics distribution in Japan, and the discussions on the master plan that took place based on that on-site inspection were more constructive. At the same time, it was a good opportunity for the JICA project team side to understand the policy points of emphasis which the high-ranking government officials of MOFALI and MED. In addition, the project team also obtained the information that needs to be prepared as policy documents.

The 2nd training in Japan

The 3rd training in Japan

6.2.2 The Training Programs in Third Countries

The third-country training program is intended to "acquire knowledge that will contribute to the development of agro-pastoral businesses in Mongolia through interviews with relevant government organizations and private businesses, and visits to facilities related to production, processing, distribution, and sales (marketing), regarding the actual status of agro-pastoral businesses in third countries. Therefore, the participants are selected not only by government officials but also by private-sector business people engaged in the agro-pastoral business. During the project period, training in third countries was conducted twice in total, the first time was in Kyrgyzstan and the second time was in China (Inner Mongolia Autonomous Region).

Table 6.2 Summary of Third Country Training

Year	Type of training	Themes	Participants
2022	On-the-job training	JICA One Village Onn Product (OVOP) Project in Kyrgyzstan	MOFA: 1 person, MOFALI : 1 person, MED: 1 person, Private sectors: 3 persons

Year	Type of training	Themes	Participants
2023	On-the-job training	Honey distribution and sales in Inner Mongolia	MOFALI: 1 person Private sectors: 3 persons

Source: JICA Project Team

The JICA project, ”OVOP Project in Other Provinces" was the first time of third-country study tour of this project. That training provided an opportunity to learn how to create appealing products and establish a distribution network and sales channels by the public-service corporation of OVOP+1 through an actual site visit of the OVOP project. In particular, the raw materials for agro-pastoral products produced in Kyrgyzstan are similar to those produced in Mongolia. Therefore, the participants were stimulated very much by the variety of products manufactured and sold, and also the methods used to build sales channels through the OVOP project in Kyrgyzstan. In addition, administrative officials who participated in this training program commented that similar efforts should be promoted in Mongolia based on the social impact of the OVOP project (e.g., the creation of employment for women). With the above background, the Master Plan has created an action plan that takes into account the OVOP component as one perspective for rural development.

Courtesy visit to the Embassy of Mongolia in Kyrgyzstan

Courtesy visit to Kyrgyz Ministry of Agriculture

Courtesy visit to Kyrgyz Ministry of Economic and Industry

Lecture in OVOP Shop

Visit to a local workshop for wool products

Visit to local honey association

6.3 Discussions with C/P for preparation of Master Plan

6.3.1 Hold Consultative Meetings on the Master Plan

The project team prepared the draft master plan in consultation with the staff in charge of the implementing agencies of the project, and a consultative meeting was held for the relevant MOFALI department staff responsible for budgeting and implementation of the master plan. 5 persons from MOFALI's Dept. of Agricultural Policy Implementation & Coordination, 7 persons from the Dept. of Animal Husbandry Policy Implementation & Coordination, 8 persons from the Dept. of Light Industry Policy Implementation & Coordination, and 7 persons from the Dept. of Food Industry Policy Implementation & Coordination

participated to the meeting. The consultative meetings were held for each bureau to discuss development programs and action plans that are highly relevant to the bureau's area of responsibility. Through the above efforts, the project team provided an opportunity to deepen understanding of the basic development concept and development policy defined in the Master Plan, as well as the initiatives required by each bureau when implementing the Master Plan. At the same time, the project team received comments and recommendations on the draft and decided to be reflected in the master plan.


Dept. of Agricultural Policy Implementation & Coordination


Dept. of Animal Husbandry Policy Implementation & Coordination


Dept. of Light Industry Policy Implementation & Coordination


Dept. of Food Industry Policy Implementation & Coordination

6.3.2 Holding Workshops Related to the Master Plan

(1) How to Conduct a Workshop

Based on the results of the above-mentioned consultative meeting, the workshop was held regarding the Master Plan with additions and revisions for another consultation and also identified priorities for the action plans organized in the Master Plan. The workshop was attended by a total of 28 participants including staff from MOFALI's Dept. of Policy and Planning with the four related Dept. mentioned above, and it was conducted in the form of group work by each Dept. (Note that the staff of the Dept. of Policy and Planning participated in groups that were more relevant to their positions.). The table below shows the initiatives taken in this workshop.

Table 6.3 Workshop Agenda for the Master Plan

Time	Contents
09:00-09:30	Reception
09:30-09:40	Opening Remarks
09:40-10:00	Lecture 1: Report on progress in master planning, revisions, and how to conduct workshops
10:00-10:15	Break
10:15-11:15	Discussion by Sector 1 (1) MONMAP-AVC members give an overview of the revised Action Plan (2) Gathering of comments on necessary additions and revisions
11:15-12:00	Lecture 2: Explanation of the Analytic Hierarchy Process and Action Plan Evaluation Axis
12:00-13:00	Lunch
13:00-14:30	Sectoral Consultation 2 (1) Identification of priorities for action plans (2) Refinement of plans and preparation of presentation materials related to priority action plans (1. project background, 2. project objectives, 3. achievement targets (KPI), 4. activities, 5. inputs (budget), 6. stakeholders, 7. project implementation schedule, 8. consistency with higher-level plans)
14:30-14:40	Break
14:40-15:40	Sectoral: Presentation of Priority Action Plan and Q&A
15:40-15:55	Future activities, general Q&A
15:55-16:00	Closing remarks

Source: JICA Project Team

(2) Action Plan Priority Identification Process

Priorities for the action plan were identified through the following method using the Analytic Hierarchy Process.

1) Creation of Evaluation Criteria

Evaluation criteria were developed in advance to evaluate the Action Plan with reference to the regulations for business evaluation in Mongolia. During the workshop, the project team gave careful explanations regarding the definitions of these evaluation criteria and evaluation methods, so that all participants could share a common understanding of the evaluation process.

Table 6.4 Action Plan Evaluation Criteria

Evaluation Items	Evaluation Criteria
1 The level of contribution to the Mongolian agro-pastoral industry	Evaluate the contribution of the Mongolian Agro-pastoral industry to the output on a 3-level scale. Score 3 Great contribution to agro-pastoral production output by value-adding Score 2 Large contribution to agro-pastoral production output by value-adding Score 1 Little contribution to agro-pastoral production output by value-adding
2 Technical Conformance	Evaluates the local suitability of the technical aspects on a 3-level scale. Score 3 Actors have plenty of experience in similar activities Score 2 Actors have some experience with similar activities Score 1 Actors do not have experience of similar activities
3 Consistency with Higher Level Policies in Mongolia	Evaluate the consistency with the top policies (Vision 2050) and other policies on a 3-level scale. Score 3 Relevant to the principle of higher-level policies such as Vision 2050 Score 2 Almost relevant to the principle of higher-level policies such as Vision 2050 Score 1 Not relevant to the principle of higher-level policies such as Vision 2050
4 Social and Environmental Impacts	Evaluates the social and environmental impacts on a 3-level scale. Score 3 Little negative impact on the natural and social environment Score 2 Some negative impact on the natural and social environment Score 1 Serious negative impact on the natural and social environment
5 Project duration to achieve goals	Evaluates the length of the project period to achieve the goal on a 3-level scale. Score 3 Within 5 years Score 2 Within 10 years Score 1 More than 10 years
6 Budget scale for project implementation	Evaluates the size of the budget needed to achieve the goals on a 3-level scale. Score 3 Budget allocation for the project in progress Score 2 Relatively low project cost Score 1 Relatively high project cost

Source: JICA Project Team

2) The weighting of Evaluation Criteria

The evaluation criteria were evaluated by all workshop participants because they had different perceptions of the importance of each criterion by themselves. Table 6.5 shows the results of the pairwise evaluation of the evaluation criteria obtained through this process. According to the results, the participants were considered important "6. Budget scale for project implementation" and "3. Consistency with Higher Level Policies in Mongolia" among the evaluation criteria. The former reflects the importance of securing budgets for policy implementation, while the latter reflects a strong recognition of the need to ensure consistency with higher-level policies in policy formulation.

Table 6.5 Results of Pairwise Evaluation of Evaluation Criteria

Valuation Standard	1 The level of contribution to the Mongolian agro-pastoral industry	2 Technical Conformance	3 Consistency with Higher Level Policies in Mongolia	4 Social and Environmental Impacts	5 Project duration to achieve goals	6 Budget scale for project implementation	Geometric mean	Weight per criteria
1 The level of contribution to the Mongolian agro-pastoral industry	1.00	1.46	1.66	1.84	2.52	2.08	1.691	0.155
2 Technical Conformance	1.86	1.00	1.27	1.73	2.99	1.94	1.694	0.155
3 Consistency with Higher Level Policies in Mongolia	3.32	2.39	1.00	3.24	3.03	2.21	2.357	0.215
4 Social and Environmental Impacts	2.34	2.45	1.07	1.00	2.68	1.68	1.737	0.159
5 Project duration to achieve goals	1.38	1.09	1.01	1.06	1.00	1.08	1.096	0.100
6 Budget scale for project implementation	3.10	3.08	2.43	2.63	2.92	1.00	2.372	0.217

Source: JICA Project Team

3) Evaluation of each Action Plan

Once the weighting of the evaluation criteria was organized, the evaluation work was conducted on the individual action plans based on the evaluation criteria in Table 6.4. Since the department predetermined in charge of budgeting and implementing each action plan, the evaluation work proceeded in the form that the staff of each responsible department evaluated each action plan. The results of the evaluation by each responsible department are shown in Table 6.6. The top three action plans were selected as priority projects from the results of the evaluation by each responsible department, respectively.

Table 6.6 Priorities for each Action Plan

Development Program	Action Plan	degree of relative priority	priority plan
Agricultural Policy Implementation and Coordination Bureau			
• 1. vegetable supply chain enhancement program	1-1. Action Plan on expanding vegetable supply period through the introduction of excellent seeds and forcing cultivation	2.593	✓
• 1. vegetable supply chain enhancement program	1-2. Action Plan on promoting market-oriented agriculture	2.221	
• 1. vegetable supply chain enhancement program	1-3. Action Plan on establishing agricultural products distribution system by agricultural cooperatives	2.395	✓
• 1. vegetable supply chain enhancement program	1-4. Action Plan on implementing various training and awareness-raising activities related to simple vegetable processing and consumption	2.127	
• 2. fruit supply chain enhancement program	2-1. Action Plan on strengthening the supply chain based on the Fruit Tree Seedling Center	2.266	
• 2. fruit supply chain enhancement program	2-2. Action Plan on disseminating appropriate cultivation techniques	2.366	
• 2. fruit supply chain enhancement program	2-3. Action Plan on promoting export of sea buckthorn products	2.524	✓
• 3. Oil Crop Supply Chain Enhancement Program	3-1. Action Plan on strengthening of domestic production of rapeseeds	2.264	
• 3. Oil Crop Supply Chain Enhancement Program	3-2. Action Plan on rapeseed production technology development and production support	2.329	
• 3. Oil Crop Supply Chain Enhancement Program	3-3. Action Plan on improving trading system of rapeseeds	2.077	
• 3. Oil Crop Supply Chain Enhancement Program	3-4. Action Plan on enlightening to increase consumption of rapeseed oil	2.025	
• 7. Other Agricultural Supply Chain Enhancement Program	7-1. Action Plan on promoting research and dissemination of mushroom production technology	2.312	

Development Program	Action Plan	degree of relative priority	priority plan
• 7. Other Agricultural Supply Chain Enhancement Program	7-2. Action Plan on establishing national standards for mushroom production	2.132	
• 7. Other Agricultural Supply Chain Enhancement Program	7-3. Action Plan on enlightening of mushroom consumption	2.188	
• 7. Other Agricultural Supply Chain Enhancement Program	7-4. Action Plan on developing fish processing facilities aimed at promoting fish diets	2.065	
Livestock Policy Implementation and Coordination Bureau			
• 4. Meat and Dairy Supply Chain Enhancement Program	4-1. Action Plan on establishing a system for livestock breed improvement	3.000	✓
• 4. Meat and Dairy Supply Chain Enhancement Program	4-2. Action Plan on promoting younger livestock fattening business	2.661	✓
• 4. Meat and Dairy Supply Chain Enhancement Program	4-3. Action Plan on introducing meat grading system based on market needs	1.577	
• 4. Meat and Dairy Supply Chain Enhancement Program	4-4. Action Plan on slaughterhouse modernization	2.068	✓
• 4. Meat and Dairy Supply Chain Enhancement Program	4-5. Action Plan on promoting pet food business by using by-products from livestock	1.277	
• 4. Meat and Dairy Supply Chain Enhancement Program	4-6. Action Plan on improving quality raw milk collection system	1.039	
Light Industry Policy Implementation and Coordination Bureau			
• 5. Animal Hair and Hide Supply Chain Enhancement Program	5-2. Action Plan on strengthening the supply chain of raw wool, cashmere and raw hides based on the herders' cooperatives	2.433	✓
• 5. Animal Hair and Hide Supply Chain Enhancement Program	5-3. Action Plan on establishing a sustainable textile and leather production system	2.303	
• 5. Animal Hair and Hide Supply Chain Enhancement Program	5-4. Action Plan on developing industrial cluster in textile sector	2.433	✓
• 10. Strengthening the business management capacity of SMEs and Agricultural Cooperatives Program	10-1. Action Plan on preparatory study to introduce value chain financing system	2.275	
• 10. Strengthening the business management capacity of SMEs and Agricultural Cooperatives Program	10-2. Action Plan on preparatory study to introduce warehouse receipt system	2.065	
• 10. Strengthening the business management capacity of SMEs and Agricultural Cooperatives Program	10-3. Action Plan on strengthening business management capacity of SMEs	2.325	
• 10. Strengthening the business management capacity of SMEs and Agricultural Cooperatives Program	10-4. Action Plan on strengthening the business management capacity of agricultural cooperatives	2.422	✓
• 11. Regional Agriculture and Pastoral Industry Promotion Program	11-1. Action Plan on developing institutional system to support industrial clusters	2.236	
• 11. Regional Agriculture and Pastoral Industry Promotion Program	11-2. Action Plan on strengthening industry-academia collaboration to improve market competitiveness	2.201	
• 11. Regional Agriculture and Pastoral Industry Promotion Program	11-3. Action Plan on promoting One Village, One Product movement	2.322	
Food Production Policy Implementation and Coordination Bureau			
• 6. Honey Supply Chain Enhancement Program	6-1. Action Plan on developing capacity of beekeeping veterinarians and technology for pests and diseases resistant beekeeping	2.193	
• 6. Honey Supply Chain Enhancement Program	6-2. Action Plan on strengthening market competitiveness of honey products through the introduction of proper quality assurance system	2.022	
• 6. Honey Supply Chain Enhancement Program	6-3. Action Plan on promoting honey exports through honey cluster strengthening	2.171	
• 6. Honey Supply Chain Enhancement Program	6-4. Action Plan on promoting beekeeping industry in collaboration with other industries	1.967	
• 8. Strengthening quality and sanitation management systems for agro-pastoral products program	8-1. Action Plan on strengthening the capacity of food safety administration	2.459	✓
• 8. Strengthening quality and sanitation management systems for agro-pastoral products program	8-2. Action Plan on strengthening export inspection capacities	2.077	
• 8. Strengthening quality and sanitation management systems for agro-pastoral products program	8-3. Action Plan on preparatory survey for post-harvest reduction	2.270	✓
• 8. Strengthening quality and sanitation management systems for agro-pastoral products program	8-4. Action Plan on training human resources in sanitation and quality control	2.280	✓
• 8. Strengthening quality and sanitation management systems for agro-pastoral products program	8-5. Action Plan on strengthening export competitiveness through acquisition of international certification	2.183	
• 9. Promoting Export of Agricultural and Pastoral Products Program	9-1. Action Plan on optimizing trade procedures	2.226	
• 9. Promoting Export of Agricultural and Pastoral Products Program	9-2. Action Plan on strengthening trade negotiation capabilities	2.114	
• 9. Promoting Export of Agricultural and Pastoral Products Program	9-3. Action Plan on strengthening export support	2.248	

Source: JICA Project Team

6.4 Hearing from development partners and private companies

6.4.1 Utilizing FADPG Opportunities

At the FADPG which is a forum for dialogue between MOFALI and MOET, and development partners who provide support and cooperation in the agro-pastoral sector in Mongolia, the project team explained the progress of project and the draft master plan of the project. During the project period, the project team participated four regular meetings of the FADPG for understanding the support and cooperation policies of each development partner. Because of the project team considered to formulate a plans that would be more likely to obtain cooperation from development partners. During the project implementation period, the project team also held discussions with the relevant development partners as necessary, and gathered the opinions and suggestions from these discussions for creating the draft master plan.

6.4.2 Collection of Opinions from the Private Sector

A briefing session on the draft master plan was held on November 28, 2023 for private companies engaged in agro-pastoral businesses. A total of 20 companies participated in the briefing session, which was followed by an overview of the master plan from the project side and a question-and-answer session. The draft of the master plan was sent to the stakeholders that attended the briefing session, and a two-week deadline was set for comments to be received. Opinions and suggestions obtained through the question-and-answer session and comments received will be reflected in the master plan to the extent possible.

Annexes

Minutes of Meetings of Joint Coordinating Committee (JCC) Meeting on the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

List of Annexes :

Annex 1

MINUTES OF MEETINGS
of
First Joint Coordination Committee Meeting
on
The Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia (MONMAP-AVC)

The Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia (hereinafter referred to as "the Project") has been started implementation from 1st April 2020 under a technical assistance of the Japan International Cooperation Agency (JICA) and the Government of Mongolia in accordance with the Record of Discussions (R/D) that was signed on September 26, 2019.

Project Steering Committee (PSC) which will be established under the Government of Mongolia will carry out a series of the works with the support of the JICA Consultant Team. The first Joint Coordination Committee (JCC) was held with officials concerned in attendance at the conference room of Ministry of Food, Agriculture and Light Industry (hereinafter referred to as "MOFALI") on June 3, 2020.

In the meeting, the contents of the Inception Report and the measures against COVID-19 were explained by JICA Consultant Team. The main discussion points and agreed matters in the meeting are described in the attached document.

June 3, 2020

Mr. Kentaro Hotta
Project Formulation Advisor
JICA Mongolia Office

Mr. Tavinjil Choijilsuren
Director, Integrated Policy and Planning
Department, MOFALI

Minutes of Meetings of First Joint Coordination Committee Meeting on The Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia (MONMAP-AVC)

Date	June 3, 2020 15:20 - 16:20 (Mongolian time)
Place	Conference room of MOFALI using Zoom
Attendant	15 attendants from MOFALI, NDA, JICA Mongolia Office and JICA Consultant Team listed in Attachment 2
Agenda	1. Introduction of the Inception Report and measures against COVID-19 2. Questions and Answers
Attachment	Attachment 1: Presentation material (Introduction of the Inception Report and measures against COVID-19) Attachment 2: List of Participants

Agenda

1. Introduction of the Inception Report and measures against COVID-19
2. Questions and Answers

Main Points Discussed

1) Introduction of the Inception Report and measures against COVID-19

The contents of the Inception Report and the measures against COVID-19 were explained by JICA Consultant Team based on the presentation material (Attachment 1). The main points in addition to the presentation material were explained as bellow.

- The number of the pilot activities would be flexible, and the pilot activities do not necessarily have to be successful because those are trial. The important thing is to extract success and failure factors through the pilot projects. JICA Consultant Team welcomes free ideas from Mongolian side.
- JICA Consultant Team have conducted a lot of trial projects outside Mongolia and have knowledge of value chain improvement. On the other hand, the Government of Mongolia understands the situation of Mongolia. Therefore, JICA Consultant Team would like to implement the pilot activities by applying both of the knowledge of Mongolian and Japanese sides.
- As requests from the Mongolian side, five pilot activities presented in the presentation materials (Slide 7) and a pilot activity related to wool were proposed. JICA Consultant Team has some ideas on 1.2.5 (Sea buckthorn, fruits and vegetables, beekeeping) and wool, but we would like to reconfirm the intention of the Mongolian side on 3.4 (3: concept development for agricultural sector products and commodities national logistics network, and 4: value chain on dairy production in the remote local areas).

- In order to promote business based on market needs, the Agricultural Marketing Platform (AMP) will be established as a mechanism to share information related to market needs and to promote communication among related actors. JICA Consultant Team would like to proceed with the management of AMP in a hybrid manner in which the government and the private sector cooperate, but the desirable management system should be discussed between Mongolian and Japanese side at a later date.
- JICA Consultant Team would like to accept any proposals from Mongolian side regarding project management and activities at all times by the end of September.

2) Questions and Answers

- We have already reviewed the Inception Report and recognized the important aspects proposed in the Inception Report. I would like to cooperate to implement the Project. (Mr. Tavinjil, Director of Integrated policy, planning department)
- Explanation of proposed pilot activities No. 3 and 4 is given as follows. (Ms. Dolgorsuren)

  No. 4 Value chain on dairy production in the remote local areas: In 2017, MOFALI took JICA's training on the agricultural value chain in Hokkaido (Tokachi-city). With the hope of making use of the knowledge and experience acquired in Japan, basic research has been conducted since 2018 with funding from the Science and Technology Fund. A study team from Mongolian University of Science and Technology was commissioned to collect basic data on the development of dairy value chains in remote areas. Based on the results, we would like to conduct a demonstration project in this project. We would like to clarify necessary measures to add value to dairy products in remote areas.

  No. 3 Concept development for agricultural sector products and commodities national logistics network: In the socialist era, there was a system for collecting and shipping raw materials, but this system disappeared after the transition to a market economy. We hope to establish a new collection and shipping system suitable for the market economy in order to increase the added value of raw materials. It is considered that the collection and shipping system of livestock products (cashmere, wool, meat, milk, leather) is indispensable for the increase of added value. As for agricultural products, we would like to focus on the system of transportation and sales of vegetables.
- The Mongolian side is willing to cooperate actively while the travel of Japanese consultants will be restricted until the end of September. If a list of necessary information is submitted, the relevant actors will be asked to present necessary information. (Mr. Tavinjil, Director of Integrated policy, planning department)
  → We appreciate your cooperation. JICA Consultant Team will submit a list of information to the person in charge. (Mr. Kotegawa, Leader of Consultant)

- The 24 pilot activities were listed in the Inception Report, however, similar pilot activities such as No. 6 and 7 were proposed. Rather than having a large number of similar pilot activities, we would like to increase the size of the budget for each pilot activity so that we can make best efforts toward achieving the expected results. (Mr. Tavinjil, Director of Integrated policy, planning department)
  → The 24 pilot activities were prepared before the start of the Project and it will be investigated to determine what kind of pilot activities will be implemented. It is understandable that the Mongolian side would like to increase the size of the budget per a pilot activity. Since the budget required for each pilot activity differs, we would like to set a budget for each activity. (Mr. Kotegawa, Leader of Consultant)
  → Similar pilot activities have been also implemented in projects other than JICA. It is required to organize activities appropriately so that there is as little overlap as possible. (Mr. Tavinjil, Director of Integrated policy, planning department)
  → Noted, ideas will be proposed from the Japanese side as appropriate and discussed together. (Mr. Kotegawa, Leader of Consultant)
- Has COVID-19 changed market needs in Mongolia? (Mr. Saito, Consultant)
  → The demand for meat continues to be high. Market prices have been stabilized by restricting export of meat. Prices of wheat, milk and meat which are produced in Mongolia have been stable. On the other hand, prices of imported agricultural products such as fruits and vegetables are on the rise. For cashmere, market price is less than half since the demand from major buyers China and Italian have plummeted due to COVID-19. The Mongolian government provides a subsidy of 20,000 Tg/kg of cashmere to nomads. (Mr. Tavinjil, Director of Integrated policy, planning department)
- We would like to ask Mongolian side to sign Minutes of Meetings. (Mr. Kotegawa, Leader of Consultant)
  → No problem. (Mr. Tavinjil, Director of Integrated policy, planning department)
- Mr. Davaanyam and Mr. Tserendorj will be working as local staffs for the Project. Regarding the project office, we would like to make the ARMONO office proposed by MOFALI available from next week. (Mr. Hotta, JICA Mongolia Office)
- If you share the agenda in advance for the meetings, we will gather the related actors and coordinate. Today, we were able to deepen our understanding of the outline of the project, and I believe the plenary session was successful. (Mr. Tavinjil, Director of Integrated policy, planning department)

This Minutes of Meetings is prepared in English and Mongolian. When there are discrepancies, the English version precedes.

Annex 2

Minutes of Meetings
of
First Joint Coordinating Committee Meeting
on
the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

The Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia (hereinafter referred to as "the Project") has been implemented under a technical assistance of the Japan International Cooperation Agency (hereinafter referred as "JICA") and Ministry of Food, Agriculture and Light Industry (hereinafter referred as "MoFALI") of Mongolia and the Government Regulatory Agency National Development Agency (hereinafter referred as "NDA") in accordance with the Record of Discussions (R/D) which established on September 26, 2019.

The JICA Consultant Team and Mongolian counterparts, have carried out a series of the works by using online communication tools since April 2020. The first Joint Coordinating Committee (JCC) meeting was held with officials concerned in attendance at MoFALI and online on December 17, 2020.

In the meeting, the Project implementation plan and some important issues were explained by the JICA Consultant Team. In response to these presentations, animated discussion was made by the attendants. The main discussion points in the meeting are described in the attached document.

December 17, 2020

田村 えり子

Ms. TAMURA Eriko (Witness)
Chief Representative
JICA Mongolia Office

Jambaltseren. T

MR. T.JAMBALTSEREN
STATE SECRETARY AND THE
CHAIRMAN OF THE JCC
MINISTRY OF FOOD, AGRICULTURE
AND LIGHT INDUSTRY

Mr. D.Erdenebayar
Director General
Policy and Planning Department
National Development Agency

Mr. I. Batkhuu
Director General
Development Financing Department
Ministry of Finance

Minutes of Meetings of First Joint Coordinating Committee Meeting on the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

The first Joint Coordinating Committee meeting of the Project was held on December 17, 2020, at the meeting room of MoFALI in Ulaanbaatar for the Mongolian side and online for the Japanese side. The agenda and attendants are listed in Attachment 1 and 2.

1. Opening Speech

Mr. T.Jambaltseren, State Secretary of MoFALI and the Chairman of the Project JCC delivered an opening speech. The State Secretary expressed words of gratitude to Japanese Government for implementing a number of technical cooperation projects in the field of agriculture and livestock since the rapid development of bilateral relations between Mongolia and Japan since 1990. The State Secretary also explained that Mongolia is aiming to become an exporter country in the future by promoting the production of organic agricultural and livestock products of Mongolia in order to diversify its economic structure. In order to achieve this goal, the Project is expected to contribute to the promotion of production of high value-added agricultural and livestock products derived from the regional characteristics and the introduction of modern technology. The State Secretary also mentioned that the Mongolian side has also built the necessary system and considered that collaboration with private companies is important for the success of the Project. Lastly, the State Secretary mentioned that Mongolia expects JICA's further cooperation for the implementation of a mega-project of Value Chain Development after the completion of the Master Plan through the pilot activities.

2. About the Project

The JICA Consultant Team gave an explanation of the Project. The JCC members discussed the following issues related to the Project.

(1) Master Plan (M/P)

- The Project formulates the M/P and the Action Plan (A/P) with the aim of realizing a sustainable Mongolian agriculture and livestock industry by strengthening its market competitiveness of agricultural and livestock products.
- Among the plans currently being formulated, Vision 2050, the five-year general guidelines for the development of Mongolia (2021-2025), and the Action Plan of the Government of Mongolia (2020-2024) are the principal policies. The five-year general guidelines and the Action Plan will be completed from 2024 to 2025, and the plan for the next phase will be prepared. For that reason, the Project should pay attention to the M/P creation schedule so that the contents of the M/P formulated in this Project to be reflected in the forthcoming government policies. Then, the Project will proceed with the preparation of the M/P in consultation with the MoFALI policymakers as it is possible to connect the plan to the next

phase of State Policy on Food and Agriculture (2015-2025) and other important government policies and plans.

- Although there are abundant livestock raw materials, there are weaknesses such as poor processing systems and unstable raw material prices. To achieve the Mongolian goal of becoming an exporter, the Project will conduct a survey on the export potential of commodities and reflect it in the M/P. The Project will also investigate quality control and traceability as they are important for exports.

(2) Pilot Activities (PAs)

- The Project will reflect the knowledge and lessons learned from PAs implemented based on market needs in the M/P and A/P.
- The PAs consist of ones proposed by Mongolian C/P and JICA and the others proposed by local government. Approximately 20 activities will be implemented throughout the Project period. Although there was an opinion that 20 activities are too many, the Project will reconsider the number of the activities and carry out the ones highly feasible.
- The scales of each PAs are not uniformly the same. The scales will be determined according to the content of each PA. The Project also handles niche products in the PAs to broadly consider development possibilities.
- MoFALI will exchange opinions on Food and Agriculture Development Partners Group Meeting organized by MoFALI, FAO and ADB. The content of the PAs will be well considered so as not to overlap with the activities of other development partners, since many donors have been already implementing projects in the field of agriculture and livestock.
- The Project implement PAs that will promote Mongolian exports, including the support for exports of honey to China. The Project will implement cooperation making use of the strengths of JICA's project (network with Japanese and Asian markets) while utilizing the results of the activities of other development partners.

(3) Agricultural Marketing Platform (AMP)

- The Project establishes AMP and set up a place for public-private consultations in each sector and region. Also, the Project carries out activities including matching with external markets (export development). The Project will conduct a survey on business matching to foreign countries and the export potential of each product handled in the PAs of the Project since MoFALI and the private sectors have already been in the cooperative relationship.
- Many development partners have already been implementing activities such as cluster formation, and Mongolian National Chamber of Commerce and Industry (MNCCI) and industry groups are playing key roles on the Mongolian side. The Project will build a public-private partnership system as utilizing the existing clusters.

- The Project will reconsider the appropriate implementation system of AMP because the Public-Private Partnership Committee, which was under the jurisdiction of NDA, is now under the direct control of the Deputy Prime Minister.

(4) Schedule of the Project

- Schedule will be changed from the one in the Inception Report due to the influence of COVID-19. The Project will consider extending the Project period for about one year in the future.
- The Project will use local staff and online communication tools to carry out the Project until the JICA Consultant Team can travel to Mongolia.
- Training in Japan and third countries is a very important component of the Project. If the situation in which traveling overseas is not allowed continues due to the influence of COVID-19, the Project will consider different forms of the training and its schedule.

(5) Implementation Structure

- The Project Implementation Unit (PIU) was renamed Project Management Unit (PMU).
- Members of Project Steering Committee (PSC) and PMU were selected as listed below.

No.	Category	Organization	Position	Name
1	PSC	MOFALI	State Secretary (Project Director)	T.Jambaltseren
2	PSC, PMU	MOFALI	Director-General, Policy and Planning Department (Project Manager)	Ts.Bolorchuluun
3	PSC, PMU	NDA	Director-General, Sector Development Policy and Regulation Department (Co-Project Manager)	D.Erdenebayar
4	PSC	MOFALI	Director-General, Light Industry Policy Implementation Coordination Department	M. Dondogdorj
5	PSC	MOFALI	Director-General, Livestock Policy Implementation Coordination Department	D.Batmunkh
6	PSC	MOFALI	Director-General, Crop Production Policy Implementation Coordination Department	V.Unenbat
7	PSC	MOFALI	Director-General, Food Production Policy Implementation and Coordination Department	L.Choi-Ish
8	PSC	MOFALI	Head, International Cooperation Division	Ganzorig
9	PSC, PMU	NDA	Senior Officer of Sector Development Policy and Regulation Department	D. Munkhjargal
10	PSC, PMU	NDA	Foreign Affairs Specialist of Sector Development Policy and Regulation Department	Kh. Erdenebulgan
11	PSC	MOF	Director-General, Development Financing Department	I. Batkhuu

No.	Category	Organization	Position	Name
12	PMU	MOF	Senior Specialist, Development Finacing Department	A. Achbold
13	PMU	MOFALI	Officer, Light Industry Policy Implementation Coordination Department	B.Erkhembayar
14	PMU	MOFALI	Officer, Livestock Policy Implementation Coordination Department	N.Byambadorj
15	PMU	MOFALI	Officer, Crop Production Policy Implementation Coordination Department	J.Tumurhuyag
16	PMU	MOFALI	Officer, Food Production Policy Implementation and Coordination Department	D. Tungalag
17	PMU	MOFALI	Officer, International Cooperation Division	B. Zaya

- Although PMU has a sufficient system, the Project will consider collaborating with the Food, Agriculture and Light Industry Research and Development Center and the Small and Medium Enterprises Agency to promote the PAs and AMP.

3. Closing Speech

Ms. TAMURA Eriko, Chief Representative of JICA Mongolia Office, delivered a closing speech. The Project is considered to be a particularly important project among the cooperation in the field of agriculture and livestock carried out by JICA. In some PAs, we would like to promote marketing while involving Japanese companies and companies in third countries. The Project would like to find out the direction of new support and business opportunities in the field of agriculture and livestock through the formulation of the M/P.

This Minutes of Meetings is prepared in English and Mongolian. When there are discrepancies, the English version precedes.

End

Attachment 1

Program of 1st Joint Coordination Committee (JCC) Meeting

Objective: 1) Share Project plan and Project implementation structure
2) Get consensus in terms of the Project plan
3) Get consensus in terms of the Project implementation structure

Date: 17th, December 2020 (Thursday)

Venue: Meeting Room (9th floor) of MOFALI

Agenda

Time (in Mongolia)	Item	Person in Charge
10:00 - 10:10	Introduction of Participants	Project Manager
10:10 - 10:20	Opening Address	Project Director
10:20 - 10:50	Presentation of Outline of the Project • Background & Objectives of the Project • Master Plan and Action Plan development • Pilot Activities • Agricultural Marketing Platform • Other Activities (Study Tour) • Implementation Schedule • Implementation Structure	Takashi Kotegawa
10:50 – 11:00	Tea break	
11:00 - 11:50	Discussions • Implementation Schedule • Implementation Structure • Pilot Activities	Project Manager

	• Agricultural Marketing Platform • Study Tour • Next JCC meetings	
11:50 - 12:00	Closing Address	JICA

Attachment 2

Participant List of 1st Meeting of Joint Coordination Committee

No.	Category	Organization	Position	Name
1	PSC	MOFALI	State Secretary (Project Director)	T.Jambaltseren
2	PSC, PMU	MOFALI	Director-General, Policy and Planning Department (Project Manager)	Ts.Bolorchuluun
3	PSC, PMU	NDA	Director-General, Sector Development Policy and Regulation Department (Co-Project Manager)	D.Erdenebayar
4	PSC	MOFALI	Director-General, Light Industry Policy Implementation Coordination Department	M. Dondogdorj
5	PSC	MOFALI	Director-General, Livestock Policy Implementation Coordination Department	D.Batmunkh
6	PSC	MOFALI	Director-General, Crop Production Policy Implementation Coordination Department	V.Unenbat
7	PSC	MOFALI	Director-General, Food Production Policy Implementation and Coordination Department	L.Choi-Ish
8	PSC	MOFALI	Head, International Cooperation Division	B.Ganzorig
9	PSC, PMU	NDA	Senior Officer of Sector Development Policy and Regulation Department	D. Munkhjargal
10	PSC, PMU	NDA	Foreign Affairs Specialist of Sector Development Policy and Regulation Department	Kh. Erdenebulgan
11	PSC	MOF	Director-General, Development Financing Department	I. Batkhuu
12	PSC	MOF	Senior Specialist, Development Financing Department	A. Achbold
13	PMU	MOFALI	Officer, Light Industry Policy Implementation Coordination Department	B.Erkhembayar
14	PMU	MOFALI	Officer, Livestock Policy Implementation Coordination Department	N.Byambadorj
15	PMU	MOFALI	Officer, Crop Production Policy Implementation Coordination Department	J.Tumurhuyag
16	PMU	MOFALI	Officer, Food Production Policy Implementation and Coordination Department	D. Tungalag
17	PMU	MOFALI	Officer, International Cooperation Division	B. Zaya
18	MOFA	Embassy of Japan in Mongolia	Second Secretary	Mr. Tomoyuki Matsuhashi
19	JICA	Mongolia Office	Chief Representative, JICA Mongolia office	Ms. Eriko Tamura
20	JICA	Mongolia Office	Administrative Officer, JICA Mongolia office	Mr. P. Altansukh
21	JICA	Mongolia	Program Officer, JICA Mongolia	Ms. B. Binderiya

		Office	office	
22	JICA	Headquarters	Officer, Economic Development Department	Mr. Keiji Matsuba
23	JICA	Consultant	Leader/Institutional Development 1	Dr. Takashi Kotegawa
24	JICA	Consultant	Co-Leader/Institutional Development 2	Mr. Mitsuo Nishiya
25	JICA	Consultant	Agricultural Development	Mr. Shohei Sendo
26	JICA	Consultant	Livestock Development	Dr. Hideki Saito
27	JICA	Consultant	Marketing	Ms. Akiyo Nishiyama
28	JICA	Consultant	Business Promotion 1/ Project Evaluation	Mr. Ryuji Shishito
29	JICA	Consultant	Business Promotion 2/ Project Management	Ms. Hoshie Kato
30	JICA	Consultant	Local Staff	Davaanyam Damdin
31	JICA	Consultant	Local Staff	Enkhzul Bayarkhuu
32	JICA	Consultant	Local Staff	Banzragch Bayartsetseg

Annex 3

Minutes of Meetings
of
Second Joint Coordinating Committee Meeting
on
the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

The Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia (hereinafter referred to as "the Project") has been implemented under a technical assistance of the Japan International Cooperation Agency (hereinafter referred as "JICA") and Ministry of Food, Agriculture and Light Industry (hereinafter referred as "MOFALI") of Mongolia and the Government Regulatory Agency National Development Agency (hereinafter referred as "NDA") in accordance with the Record of Discussions (R/D) which established on September 26, 2019.

The second Joint Coordinating Committee (JCC) meeting was held online on May 11, 2021. In the meeting, the progress of the project since December 2020 and the changes from the original plan were explained by the JICA Consultant Team. In response to these explanations, discussion was made by the attendants.

May 11, 2021

For Ms. TAMURA Eriko (Witness)
Chief Representative
JICA Mongolia Office

Mr. T.Jambaltseren
State Secretary
The Chairman of The JCC
Ministry of Food, Agriculture and Light Industry

Mr. D.Erdenebayar
Director General
Regional and Local Development Policy and Planning Division
National Development Agency

Mr. I. Batkhuu
Director General
Development Financing Department
Ministry of Finance

Minutes of Meetings of Second Joint Coordinating Committee Meeting on the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

The second Joint Coordinating Committee meeting of the Project was held online on May 11,2021. The agenda and last of attendees are attached.

1. Opening Speech

Mr. T.Jambaltseren, State Secretary of MOFALI and the Chairman of the Project JCC delivered an opening speech. He stated that the development of the agricultural sector is essential for economic development and that the project will play an important role in this area. It was also mentioned that the project is expected to help solve the problems to achieve the goals, such as setting national standards in accordance with international ones, promoting export of meat and organic products, and livestock hygiene management. He expressed his expectation for a lively discussion in this meeting on the direction of the project in the face of the delay and restriction of activities due to COVID-19 outbreak.

2. About the Project

The JICA Consultant Team gave an explanation of the Project. The JCC members discussed the following issues related to the Project.

(1) Master Plan (M/P)

- The collection of basic information on the current situation and issues in the value chain of Mongolian agricultural and pastoral products has been mostly completed and a progress report has been compiled.
- Interviews with Japanese companies interested in Mongolian agricultural and livestock products and needs gathering are underway. It is also planned to conduct research on the impact of COVID-19 on the value chain of agricultural and livestock products and changes in the consumption behavior of domestic consumers.
- The core of the M/P is "Realizing a strong Mongolian agricultural and livestock industry through enhancing the market competitiveness of its products" as stated in the progress Report, and it is important for the value chain development to strengthen the market competitiveness and to improve the process from production to marketing for achieving this.
- Since agriculture and livestock industries are strongly affected by climate change, it is necessary to prepare the M/P that deals with climate change. As other developing partners have already conducted studies and initiatives on climate change, the M/P will be formulated based on those results and reports.
- The research topics required in the future and their priorities will be determined in discussion with MOFALI. The basis of value chain development is improvement based on market needs (including the development of various infrastructures), and we consider that understanding the market, including the demands of consumers in other countries, is particularly paramount.
- As the M/P will be reflected in national policy, its approval must be given by an appropriate person, with the decision and advice of MOFALI. In other projects, the approval is given by a Director General

or a Minister.

- It is very important to indicate in the M/P the measures by which the effects of the project will be sustainable after the end of the project.
- By incorporating feedback from other development partners via the Food and Agriculture Development Partner Group (FADPG) and others, the M/P can be used by them as well.

(2) Pilot Activities (PAs)

- Based on the discussions at the first JCC meeting, the number of PAs to implement will be 11 in total: 9 PAs proposed by Mongolian C/P and JICA, and 2 PAs proposed by local entities.
- In the " PAs proposed by Mongolian C/P and JICA", the project will be planned by the C/P staff and JICA experts, and the selection will be made by the JCC meeting or PMU meeting. Some PAs have already been started as they had got ready.
- The PAs proposed by the local entities are planned by local organizations, chambers of commerce and industry, and private companies, and the final decision on the implementation will be made at the PMU meeting. The projects will be selected this year and will be implemented next year.
- For meat, mainly the disposal parts of goats and sheep is currently targeted, but this is due to the limitations of on-site access and the fact that the Project is currently working on the parts of the animal (hoof, sheep intestines). It is hoped that this will eventually be extended to cover the whole of meat sector.
- As the PAs are carried out in collaboration with a specific company, they will be a demonstration test within the scope of the company's operation. However, as the possibility of applying the PAs to other areas will also be considered, the results of the PAs will be reflected in the M/P.

(3) Formation of industrial clusters

- In collaboration with the Mongolian National Chamber of Commerce and Industry (MNCCI), industrial clusters of export-oriented business commodities will be set up, aiming to strengthen the market competitiveness of each commodity and the support and capacity building of cluster activities. For example, the honey cluster to be set up under this project is expected to develop a production and supply system that will eventually export honey products to China.

(4) Training in Japan and third countries

- As it is difficult to move to other countries due to the impact of COVID-19, the number of training implemented between March 2020 and February 2022 will be reduced to one training in Japan and another training in a third country. Instead those cancelled training will be conducted after March 2022.

(5) Schedule of the Project

- Due to the delay of dispatching Japanese experts and the start of the PAs due to COVID-19, the implementation period of the project will be extended until December 2023. As a result, the drafting of the M/P is expected to take place around February 2022.

(6) Other opinions.

- It is assumed that the M/P will be formulated with particular attention to the market. It is expected that the M/P will be as reflective as possible of products not covered by this project.
- There are many producers exhibiting their products, such as slippers and cheeses, but it is necessary to examine the actual needs and value of these local products and specialties in the market.
- The safety and hygiene of the food must be carefully considered.
- It is important to unify products (create standards), as the same product sometimes has different labels and packaging. It is also important to support local production sites to be able to meet the same technical and hygiene standards.
- It is strongly recommended that the JICA Consultant Team visits slaughterhouses, dairy processing plants and sales outlets.
- It is also important to understand and strengthen the market and supply situation for dairy products during the winter (e.g. improving calving frequency).
- There must be more consideration of how local products should be consumed in the countryside (for example in school lunches).
- A project is about to be implemented between the Tokachi Agricultural Machinery Council in Hokkaido and the Mongolian University of Science and Technology on the formation of a contractor organization for grass-fed production. Organized agricultural production may also help to reduce the effects of climate change.
- Mongolia-Japan Center for human resources development is working to connect Mongolian producers and companies with Japanese agricultural and livestock companies. The cooperation between Japan and Mongolia can be strengthened by using this center well.

3. Closing Speech

Ms. TAMURA Eriko, Chief Representative of JICA Mongolia Office, delivered a closing speech. She expressed appreciation to all participants for attending the meeting and for the lively discussions that took place. It was noted that industrial diversification is a great challenge for Mongolia, and that the development of agriculture and livestock industry is an important sector which is directly linked to economic and industrial development. She also added that JICA will keep close collaboration with the related parties to contribute to the development of Mongolia.

This Minutes of Meetings is prepared in English and Mongolian. When there are discrepancies, the English version precedes.

End

Annex 4

Minutes of Meetings
of
Third Joint Coordinating Committee Meeting
on
the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

The Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia (hereinafter referred to as "the Project") has been implemented under a technical assistance of the Japan International Cooperation Agency (hereinafter referred as "JICA") and Ministry of Food, Agriculture and Light Industry (hereinafter referred as "MOFALI") of Mongolia and the Government Regulatory Agency National Development Agency (hereinafter referred as "NDA") in accordance with the Record of Discussions (R/D) which established on September 26, 2019.

The third Joint Coordinating Committee (JCC) meeting was held online on February 7, 2022. In this meeting, the JICA consultant team reported on the progress of the project and the policy for future Master Plan preparation, and discussions took place among the participants.

February 7, 2022

Ms. TAMURA ERIKO
Chief Representative
JICA Mongolia Office

Mr. T. Jambaltseren
State Secretary
The Chairperson of The JCC
Ministry of Food, Agriculture and Light Industry

Mr. D. Erdenebayar
Director General
Regional and Local Development Policy and Planning Division
Ministry of Economic Development

Mr. I. Batkhuu
Director General
Development Financing Department
Ministry of Finance

Minutes of Meetings of Third Joint Coordinating Committee Meeting on the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

The third Joint Coordinating Committee meeting of the Project was held online on February 7, 2022. The agenda and list of attendees are attached.

1. Opening Speech (Mr. Jambaltseren, State Secretary of MOFALI)

Thank you for joining us today at the MONMAP-AVC 3rd JCC meeting. The project started in March 2020 and although the spread of Covid-19 has had no small impact on the project, up to today we have continued with the preparation and implementation of pilot activities and the development of industrial clusters. The progress and direction of the project has been reviewed through six Project Management Unit (PMU) meetings so far. Today, we would like to review the project activities, share the final draft master plan to be prepared and agree on the direction of the project activities for the remaining two years. I would very much like to receive your candid feedback. Once again, I would like to thank all participants for your participation.

2. Discussion

The JICA consultant team provided an explanation based on the presentation material. The results of the discussions on key issues are given below.

(1) Pilot Activity (PA)

- Despite some delays due to Covid-19, 11 PAs are currently underway.
- The vegetable PA aims to increase vegetable production and import substitution by introducing greenhouse nursery, mulching and drip irrigation systems. the results of cucumber cultivation in 2021 showed that flood damage in the fields of the targeted areas made direct comparison of effects difficult, but based on the FAO STAT (2020) Unit yield data and interviews with farmers revealed that profitability and unit yields were average or above average. The effectiveness of the PA was also confirmed by the fact that harvesting started approximately one week earlier. However, the initial cost is an issue.
- In the sea-buckthorn PA, component analysis was conducted to identify the characteristics and strong points of Mongolian sea-buckthorn. The results showed that the quality of the pure juice was good and there was potential to develop sales channels in overseas markets, but the powder was found to contain EU banned pesticides, making market entry impossible at this stage. As 'Mongolian Sea-buckthorn (Uvs Province)' has recently been registered in the EU market, it is reasonable to aim for the EU first to develop overseas markets.
- The honey PA aims to export by establishing a more stable quality honey production system: in 2021, veterinary training, the exchange of contracts with beekeepers and veterinarians, and quality control through manufacturers (the volume of honey handled by two partner companies increased by 170% compared to the previous year) were conducted.
- In the local proposal-based PA, two PAs (yak wool in Khuvsgul Province and raw fish in Uvs Province)

were selected from 18 proposals. The project will be implemented this year.

(2) Industrial clusters

- Discussions have continued in a joint public-private working group including the Mongolian Chamber of Commerce and Industry (MNCCI) in preparation for the launch of the honey cluster in March 2022. A traceability system and information database have been established, the vision and activities of the cluster have been confirmed, and legal procedures related to its establishment are currently being undertaken. In addition, a survey on the domestic production of honey and the size of the market was conducted.
- The honey cluster also conducted a study on exports to Japan. Through the project's efforts, two research institutes in Mongolia have been registered as official honey inspection bodies in Japan and can carry out component testing and analysis in Mongolia to obtain permission to export to Japan. Coordination with the counterpart country is important when exporting, and it is necessary to train personnel who can carry out such work.

(3) The others

- The online training was organised over three days from 30 November to 2 December. Approximately 40 participants took part. For the planned two additional training sessions, it is planned to invite the trainees to Japan, depending on the status of Covid-19.

(4) The following four development guidelines were formulated.

Development guideline 1: Increase the supply of food-safe and diversified domestic agricultural products.

→Development and dissemination of standards and certification systems for agricultural and pastoral products.

Development guideline 2: Promote the development of Mongolian pastoral products for export, backed by a rich natural environment.

→Strengthening of the capacity of the analytical institutions and exporting companies required for animal and plant quarantine, etc.

Development guideline 3: Establish a distribution infrastructure for pastoral products to ensure raw material quality and traceability.

→Promoting the development of raw material storage warehouses in compliance with the Mongolian Commodity Exchange (MCE) regulations and the establishment of a traceability system, etc.

Development guideline 4: Promote the development of agro-pastoral industry clusters in Mongolia and build a foundation for creating innovation and strengthening product marketing in the food, textile and fabric industries through industry-government-academia collaboration.

→Training for cluster development for development officers in each province, etc.

- In the above four development guidelines, study teams (MOFALI Policy and Planning Department and relevant departmental officials and project members) will be appointed for each of the above four

development guidelines, and the teams will proceed with drafting. The drafts will be reviewed at the end of the year.

(5) Discussion

- Tungalag: Regarding Development Guideline 1, the calorie intake of the Mongolian is set at 2300 Kcal, but in reality it exceeds 2500 Kcal. Should an indicator on nutritional balance be set? Are there statistical methodologies to establish standards?

  →Kotegawa: Development guideline 1 emphasises nutritional balance. It is reported that 60% of Mongolian men (20-50s) meet Minimum Dietary Diversity. We would like to examine the extent to which this value can be improved in the future. We would like to discuss the indicators separately.

- Tungalag : As Development Guidelines 1-3 are related to food safety, the Food Production Policy Coordination Bureau of MOFALI would be a good member of the Study team.

  →Kotegawa: I would encourage them to join the Study Team. However, as too many members may dilute the density of the discussion, the team should be composed of the minimum number of members required. We would like to discuss this further.

- Yusun-Erdene : How many companies did the vegetable PA work with? Also, the amount of seeds seems to be high, but is there a mistake in the units?

  →Kotegawa: There is only one cooperating company, GBT trading. The seed quantity is to be checked again. If there are any discrepancies in the figures, we would like to know the basis for the discrepancies at a later date.

- Yusun-Erdene : Mongolian farmers are accustomed to growing cucumbers. Are there any plans to test with other vegetables (e.g. Chinese cabbage, radishes, and peppers)? In addition, the distribution of seedlings by nurseries is considered important and should be a priority consideration when preparing MPs.

  →Kotegawa: The development of professional seedling growers is considered important. The key is whether the traders can make a profit from the sale of seedlings. We understand that the revised National Seed Act will make it easier to procure foreign seed, but farmers tend to use inexpensive Chinese seed, making it difficult for the seedling growers to plan for seedling sales. We would like to examine what measures the government should take to realise profits for seed growers and high yields for farmers.

  →Yusun-Erdene : The new National Seed Act has been in force since 1 January. Breeder's rights for varieties are stipulated and a registration system for seed sales is underway.

- Byambadorj : I would like to know the progress and future plans for the goat and sheep PAs and the milk and dairy PAs.

  →Kotegawa: Goat meat jerky was appreciated by 70-80% of people who tasted it. The company is considering exporting the jerky to a third country (Vietnam) in the future, and is working with Vietnamese companies interested in the jerky to prepare for export, including quarantine procedures.

  →Kotegawa: With regard to the use of livestock products for pet food, last year, samples were unsuccessfully brought into Japan because they failed to pass quarantine. Based on the results of this, sufficient checks will be carried out with the Japanese quarantine office to attempt to re-import the

samples.

→Kotegawa: The yak cheese PA was suspended after discussions with partner company. On the other hand, the milk PA will be carried out in cooperation with two related companies to improve the milk collection system.

- Tumurhuyag: I would like to reconfirm the export potential of sea-buckthorn products.

→Kotegawa: German company SGS carried out the component analysis. As EU banned pesticides were detected in the powder product, the powder product cannot be exported. It is considered to be an overall problem because if pesticide residues are detected in one product (company), the safety of other products (companies) may also be in doubt. In order to export, it is necessary to set and manage standards at each stage of production, processing and export.

- Oyunzul: The yak wool and fish that are handled in the two local proposal-based PAs are considered to be in line with development guideline 2. In addition, under Development Guidelines 3 and 4, the inclusion of MNCCI branches in the study team would contribute to reflecting the PA results in the MP and when deploying cluster development departments in the provinces.
- Erkhembayar: What has happened to research on natural dyes for wool and cashmere?

→Kotegawa: With regard to the project to improve the quality of wool products using natural dyes, although there is potential for its implementation, the upstream supply chain (raw material procurement and distribution system) is a bottleneck when exporting wool and cashmere products. The first focus would be on strengthening the warehouse-based raw material procurement and supply system to the market.

- Altansukh: I will later share the project completion report up to the end of 2021. The report includes information on MP development guidelines. Please comment and give us your opinions after reviewing the contents, as we believe that reflecting the opinions of you and the international organisations will make the MP even better.
- Dondogdorj: There is still room to reconsider the structure and content of the MP, so it should be discussed further. Also, it is hoped that the MP can be linked to ongoing projects of other donors (traceability systems for livestock products such as wool, cashmere and leather, recognition and promotion of 'responsible nomadism', and sustainable green production standards). It is also necessary to discuss how issues in the Japan-Mongolia Economic Partnership Agreement (EPA) (trade in livestock products) should be handled within the MP.
- Tamura: Traceability ensuring is mentioned in development guideline 3, but the development objective says that the storage and warehousing system for raw materials should be improved. Since ensuring traceability in Mongolia is difficult due to the existence of changes, I think it is important to make improvements there first, but why warehouse improvements?

→Kotegawa: It is difficult to ensure traceability in the current situation where change is responsible for the majority of distribution. Therefore, the aim is to ensure traceability by establishing warehouses for storing raw materials and managing incoming and outgoing shipments. Raw materials are supposed to be traded through warehouses and distributors authorised by MCE, but this is not currently happening. The aim is to realise this.

- Tamura: Development guideline 4 mentions industry-government-academia collaboration, and I assume universities will be involved, but how will universities such as Mongolian University of Life Sciences be involved?

  →Kotegawa: There is a staff member at MED who studied the principles of cluster development under Michael Porter, an authority on cluster development, and I have heard that there are others at the university who are also related with him. I am planning to talk to them first. However, we do not yet know to what extent we will specifically work with the university, as this is a matter of national policy. I would like to discuss this point with you in the future.

3. Closing speech (Ms. Tamura, Chief Representative of JICA Mongolia Office)

I would like to thank all the attendees for your presence today and for your expert and valuable opinions. The MP will be drafted over the next one year of consideration. I hope that the MP will be shared with the Mongolian government and private sectors, as well as non-JICA donors, so that they can all take action and invest based on the MP. I would be very grateful for your continued cooperation in this regard.

End

Annex

Program of 3rd Joint Coordination Committee (JCC) Meeting

Objective: 1) Share the progress of the Project
2) Share the draft master plan
3) Get consensus in terms of the revised implementation plan of the Project

Date: 12:00-13:30 (Mongolian time), 7th, February (Monday) 2022

Venue: Meeting Room (9th floor), MOFALI
Online (https://zoom.us/j/95023613231)

Agenda

Time (in Mongolia)	Item	Person in Charge
12:00 - 12:05	Introduction of Participants	Project Manager
12:05 - 12:10	Opening Address	Project Director
12:10 – 12:50	Presentation of progress and revised plan of the Project • Background & Objectives of the Project • Pilot Activities • Cluster development activities (Presented by MNCCI) • Other Activities • Draft master plan • Implementation plan and schedule of the project	Takashi Kotegawa Sugar Oyunzul
12:50 – 13:20	Discussions • Direction of Master Plan • Revised implementation plan of the project • Revised project implementation schedule	Project Manager
13:20 - 13:30	Closing Address	JICA

Annex

Participant List of 3rd Meeting of Joint Coordination Committee

No.	Category	Organization	Position	Name	Attendance
1	PSC	MOFALI	State Secretary (Project Director)	Mr. T.Jambaltseren	✓
2	PSC, PMU	MOFALI	Director-General, Policy and Planning Department (Project Manager)	Mr. Ts.Bolorchuluun	✓
3	PSC, PMU	MED	Director-General, Regional and Local Development Policy and Planning Division (Co-Project Manager)	Mr. D.Erdenebayar	✓
4	PSC	MOFALI	Director-General, Light Industry Policy Implementation Coordination Department	Mr. M. Dondogdorj	✓
5	PSC	MOFALI	Director-General, Livestock Policy Implementation Coordination Department	Mr. D.Batmunkh	-
6	PSC	MOFALI	Director-General, Crop Production Policy Implementation Coordination Department	Mr. V.Unenbat	✓
7	PSC	MOFALI	Director-General, Food Production Policy Implementation and Coordination Department	Mr. L.Choi-Ish	✓
8	PSC	MOFALI	Head, International Cooperation Division	Mr. B. Ganzorig	✓
9	PSC	MOF	Director-General, Development Financing Department	Mr. I. Batkhuu	-
10	PSC	MOF	Senior Specialist, Development Financing Department	Mr. A. Achbold	-
11	PMU	MOFALI	Officer, Light Industry Policy Implementation Coordination Department	Mr. B.Erkhembayar	✓
12	PMU	MOFALI	Officer, Livestock Policy Implementation Coordination Department	Mr. N.Byambadorj	✓
13	PMU	MOFALI	Officer, Crop Production Policy Implementation Coordination Department	Mr. J.Tumurhuyag	✓
14	PMU	MOFALI	Officer, Food Production Policy Implementation and Coordination Department	Ms. D. Tungalag	✓
15	PMU	MOFALI	Officer, International Cooperation Division	Mr.G. Enkhmisheel	✓
16	PSC, PMU	MED	Senior Officer of Regional and Local Development Policy and Planning Division	Mr. D. Munkhjargal	✓
17	PSC, PMU	MED	Senior Officer of Regional and Local Development Policy and Planning Division	Mr. Kh. Erdenebulgan	✓
18	MOFA	Embassy of Japan in Mongolia	First Secretary	Mr. Satoshi Matoba	✓

Annex

No.	Category	Organization	Position	Name	Attendance
19	JICA	Mongolia Office	Chief Representative, JICA Mongolia office	Ms. Eriko Tamura	✓
20	JICA	Mongolia Office	Program Officer, JICA Mongolia office	Mr. P. Altansukh	✓
21	JICA	Mongolia Office	Program Officer, JICA Mongolia office	Dr. Keigo Nakamura	✓
22	JICA	Headquarters	Officer, Economic Development Department	Mr. Atsushi Suzuki	-
23	JICA	Consultant	Leader/Institutional Development 1	Dr. Takashi Kotegawa	✓
24	JICA	Consultant	Co-Leader/Institutional Development 2	Mr. Mitsuo Nishiya	✓
25	JICA	Consultant	Agricultural Development	Mr. Shohei Sendo	✓
26	JICA	Consultant	Livestock Development	Dr. Hideki Saito	-
27	JICA	Consultant	Marketing	Ms. Akiyo Nishiyama	✓
28	JICA	Consultant	Business Promotion 1/ Project Evaluation	Mr. Ryuji Shishito	✓
29	JICA	Consultant	Business Promotion 2/ Project Management	Mr. Satoru Ohno	✓
30	JICA	Consultant	Local Staff	Mr.Davaanyam Damdin	✓
31	JICA	Consultant	Local Staff	Mr. N.Tserendorj	✓
32	JICA	Consultant	Local Staff	Ms. B. Munkhtuya	✓
33	JICA	Consultant	Local Staff	Ms. Ch. Orkhon	-
34	Observer	Mongolia-Japan center	Expert in Business Exchange	Mr. Ko Nakamura	-
35	Observer	MNCCI	Head of Project and Programme Department	Ms. Sugar Oyunzul	✓
36		MOFALI	Head of Soil, Plant Protection and Seed Division	Mr. D. Yuson-Erdene	✓

Annex 5

Minutes of Meetings
of
Fourth Joint Coordinating Committee Meeting
on
the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

The Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia (hereinafter referred to as "the Project") has been implemented under the technical assistance of the Japan International Cooperation Agency (hereinafter referred to as "JICA") and Ministry of Food, Agriculture and Light Industry (hereinafter referred as "MOFALI") of Mongolia and the Ministry of Economy and Development (hereinafter referred to as "MED") in accordance with the Record of Discussions (R/D) which established on September 26, 2019.

The fourth Joint Coordinating Committee (JCC) meeting was held online on December 9, 2022. In this meeting, the JICA consultant team reported on the progress of the project and the Master Plan formulation plan, and discussions took place among the participants.

December 9, 2022

吉村徳二

Mr. T. YOSHIMURA
Senior Representative
JICA Mongolia office

Mr. Ts. Bolorchuluun (Project Manager)
Director-General, Policy and Planning Department
Ministry of Food, Agriculture and Light Industry

Mr. D. Erdenebayar
Director General
of the Regional and industry Policy Department,
Ministry of Economy and Development

Mr. Ch. Chimidsuren (Witness)
Director General
Development Financing and Public Investment Department Ministry of Finance

Minutes of Meetings of Fourth Joint Coordinating Committee Meeting on the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

The fourth Joint Coordinating Committee meeting of the Project was held online on December 9, 2022. The agenda and list of attendees are attached. The agenda and list of participants are given in the Annex.

1. Discussion on the project

(1) Pilot Activity (PA)

- 11 PAs are currently underway.
- In the vegetable PA, introduction trials of Japanese varieties were conducted in cucumber, tomato and onion. The Japanese cucumber varieties "Alya F1", "Staratos F1" and "Burmaz F1", all produced yields higher than that of the Russian variety "Niioh 412 F1" which is commonly grown in Mongolia, and the average yield in Mongolia of 116 kg/10 m^2. Factors behind the increase in yield will be analysed and the registration process for the Japanese varieties in Mongolia will be pursued.
- The goat meat PA is promoting the transformation of hoof and horn into pet food. The Japanese pet food market has grown rapidly in recent years and raw materials are in short supply. Therefore, the PA is surveying the feasibility of using unused hooves and horns of goats and sheep as pet food ingredients in Mongolia. Specifically, an evaluation of the samples provided to Japanese pet food companies and an opinion exchange meeting between the National Pet Food and Supplies Wholesalers Association of Japan and the Mongolian livestock industry have been held.
- The Mushroom PA is strengthening technologies and systems to expand the domestic production and distribution of mushrooms, for which demand is expected to increase. In particular, the following three activities are being carried out: "verification of the commercial production of Shiitake mushrooms (Lentinula edodes)"; "support for the production of PR content to promote the sale of Hiratake (Oyster mushrooms) and other mushrooms"; and "preparation for the application of three standards for mycelia production, mycorrhizal cultivation and sales".
- The Fish PA (Local Proposal-Based) installed fish processing equipment in a company running a campsite on Lake Khyargas in Uvs province, to make effective use of fish resources. The five soums adjacent to Lake Khyargas have decided that the fishing quota in Lake Khyargas, which used to be shared among them annually, will be managed by a single soum based on this PA. In addition, the development of fish products using the equipment is already underway on site
- The Yak wool PA (Local Proposal-Based) upgraded equipment used by a company that produces yak wool products in Khuvsgul province. The updated equipment includes a washing machine, a dryer and an iron used in the finishing of the products. This has resulted in a 2-3 times increase in work efficiency and improved productivity. The company will now develop new products for export to Germany and open its own shop to promote domestic sales.

(2) Cluster development, training in Japan, training in Kyrgyzstan

- The progress of honey cluster development was explained by the JICA Project team with a report from Ms Ibukuro, CEO of the 'Mihachi Company', the resident of the cluster members. In addition, Mr E. Sugarbayar (MOFALI), a participant in the training in Japan in October, reported on the training and Ms D. Baasanjargal (MOFALI), a participant in the training in Kyrgyzstan in November, reported on the training respectively.

(3) Formulation of Master Plan (MP: Master Plan)

- The overall vision of the MP was explained by presenting four development policies and 18 draft Action Plans (AP: Action Plan). Regarding APs, a specific action plan and rationale were explained, using 'the Wool and cashmere AP' as an example.
- The work on PAs and cluster development is supposed to continue until around September 2023. The MP and APs will be completed on the basis of the results of each work by December 2023. A series of meetings with relevant parties in each sector will be held in the process of formulation.

(4) Discussion

- Byambadorj (MOFALI): Regarding the export of raw materials to the pet food industry in Japan, is it possible for the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) to send inspectors to meat processing factories in Mongolia to verify the feasibility of export? Also, who will it be who pays the costs incurred in this process?

  →Kotegawa (JICA PJ team): In the case of the export of intestines for the casing, there are three approved factories in Mongolia, and the Japan Casing Association (a private sector) has paid for the costs. Our project does not have the budget to cover travel expenses for the inspectors. However, it is possible to examine the possibility of the pet food industry gathering together and achieving approval of factories in the future only by the private sector. What is JICA's opinion on this matter?

  →Nakamura (JICA): We have the same understanding as the Project team. We recognise that the reason why the export volume of Mongolian products to Japan has not increased is the lack of approved factories in Mongolia. As for the payment of inspection costs, I think there are several ways, for example, if there is demand on Japan's side, as in the case of the casing, the companies will pay for the costs. JICA will consider what we can do in the future by approaching the Japanese private sector and discussing the matter with the Japanese embassy.
- Esen-Erdene (MOFALI): How many varieties were tested in the vegetable PA? Why were these varieties selected? Early planting and post-harvest technology (packing and temperature control) are important for expanding the supply period of vegetables, and these are things lacking in Mongolia. Is there any plan to implement Japanese technology in this regard?

  →Kotegawa (JICA PJ team): In our trial cultivation, we selected high 'resistance' and 'storage stability' varieties recommended by a Japanese seed company. Next year is the year for the compilation of MP, so no trial cultivation will be conducted. But a cucumber processing trial is planned instead. The results

of the trials so far will be reflected in the MP.

- Esen-Erdene (MOFALI): What are the themes for training in Japan and a third country next year? There are requests for training on the cultivation of mushrooms and oil crops.

→Kotegawa (JICA PJ team): The theme of next year's training will again be on the improvement of the distribution of agricultural products, targeting vegetables and meat. Partially, a visit to a cluster development is being considered to include.

→Bolorchuluun (MOFALI): We have no objection to the timing of training in a third country as June next year. whereas the training in Japan should take place after 15 November, as September is the busy season (for harvesting and overwintering preparations).

- Bolorchuluun (MOFALI): Mongolia aims to achieve 100% self-sufficiency in vegetables. The self-sufficiency rate of onions is low and there have been no successful cases in the past measures, so we have high expectations for this trial cultivation. It is hoped that the high-yielding cucumber variety will be registered and disseminated in Mongolia.
- →Nakamura (JICA): The trial cultivation of onion has not succeeded in this project, but an onion seed production project conducted by JICA Partnership Program (with Takigawa City and Jargalant Village) has shown good results in terms of both yield and quality. Seed registration of this variety can be carried out in conjunction with the project. Promoting high-yielding varieties in Mongolia will lead to a higher self-sufficiency rate.
- Nakamura (JICA): Regarding the MP, there are currently 18 draft APs. The goal of the project is to brush up these APs by sector and formulate the MP. The MP will be formulated by reflecting the suggestions from MOFALI and MED, in accordance with the policies indicated in the "Decision of the Grand National Council of Mongolia (No. 36)". As in the case of the wool and cashmere AP presented today, it is expected that strategic plans will be proposed after identifying strengths and challenges in other items as well, then participants will express their honest opinions and debate actively on each APs.
- Esen-Erdene (MOFALI): Next year, it would be better to hold open consultation meetings in each sector, so that more effective MP could be made. If there is a plan on how to proceed with the consultations in the future, please let us know.

→Kotegawa (JICA PJ team): We will make drafts of each AP by March next year. Then, it is planned to set up a meeting for each AP to discuss and review it with the parties concerned, including donors.

→Esen-Erdene (MOFALI): Wouldn't it be good to have a discussion meeting including outside experts beside ourselves?

→Byambadorj (MOFALI): I agree with Mr. Esen-Erdene. It would be more effective to plan and formulate plans in consultation with outside experts and other relevant parties. Looking the past examples, it seems that there is a limitation in planning only by Japanese experts. It would be better to set up several discussion meetings with experts, such as university professors and researchers from research institutions.

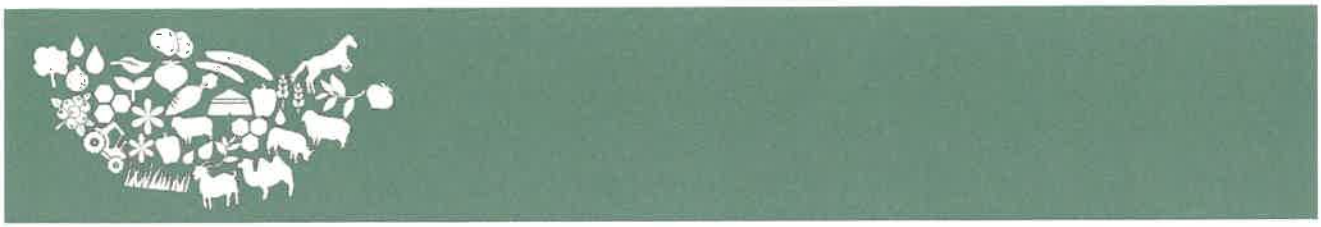
→Bolorchuluun (MOFALI): I agree with the above two, and consider that a precise and long-term implementable MP can be created by involving representatives from various fields, not just those within the project activities.

→Kotegawa (JICA PJ team): I understood that the opinions from not only MOFALI but also those who are actually in the field should be taken into account.

- Bolorchuluun (MOFALI): ' Decision of the Grand National Council of Mongolia (No. 36)' mentions that 19 items will be covered by domestic production in the future. These 19 items are further divided into 56 categories. There are experts in MOFALI who are in charge of research on each of these items and it is recommended for the Project team to meet with them as well. In addition, please refer to the budget for 2023, which has been distributed according to these 19 items. There is only one year left for the project, but there is much work to be done. Let us work systematically and in mutual co-operation.
- Bolorchuluun (MOFALI): Regarding the translated Mongolian documents (Japanese to Mongolian), there are words and phrases that are prescribed for official documents, please translate them correctly in accordance with them.
- Yoshimura (JICA): Today's meeting was a meaningful opportunity to exchange many opinions while keeping up with the progress of the project. JICA will now consider the dispatch of inspectors from the Japanese MAFF. Also, it is hoped that the remaining one year will be spent on discussing AP formulation, involving organisations and experts from outside MOFALI, so that a realistic AP as well as the MP can be created. Please continue to support the project until its end.

End

Annex



Program of 4th Joint Coordination Committee (JCC) Meeting

Objective: 1) Share the progress of the Project
2) Share the draft master plan
Date: 10:00-12:00 (Mongolian time), 9th, December (Friday) 2022
Venue: Meeting Room (9th floor), MOFALI

Agenda

Time (in Mongolia)	Item	Person in Charge
10:00 - 10:05	Introduction of Participants	Project Manager
10:05 - 10:10	Opening Address	Project Director
10:10 – 10:30	Presentation on progress of the Project • Background & Objectives of the Project • Pilot Activities • Cluster development activities • Training in Japan and Third country	Takashi Kotegawa
10:30 – 10:40	Presentation on Pilot Activities and Cluster Development (Honey)	Ms. Tomoko Ibukuro
10:40 – 10:50	Presentation on Training in Japan	Mr. E. Sugarbayar
10:50 – 11:00	Presentation on Training in Kyrgyztan	Ms. Baasanjargal
11:00 – 11:20	Presentation on Master Plan development	Takashi Kotegawa
11:20 – 11:50	Discussion	
11:50 – 12:00	Closing Remarks	JICA

Annex

Participant List of 4th Meeting of Joint Coordination Committee

No.	Category	Organization	Position	Name	
1	PSC	MOFALI	State Secretary (Project Director)	Mr. T.Jambaltseren	-
2	PSC, PMU	MOFALI	Director-General, Policy and Planning Department (Project Manager)	Mr. Ts.Bolorchuluun	✓
3	PSC, PMU	MED	Director-General of the Regional and Industrial Policy Department. (Co-Project Manager)	Mr. D.Erdenebayar	-
4	PSC	MOFALI	Director-General, Light Industry Policy Implementation Coordination Department	Mr. M. Dondogdorj	✓
5	PSC	MOFALI	Director-General, Livestock Policy Implementation Coordination Department	Mr. D.Batmunkh	-
6	PSC	MOFALI	Director-General, Crop Production Policy Implementation Coordination Department	Mr. Esen-Erdene	✓
7	PSC	MOF	Senior Specialist, Development Financing Department	Mr. A. Achbold	-
8	PMU	MOFALI	Officer, Light Industry Policy Implementation Coordination Department	Mr. B.Erkhembayar	✓
9	PMU	MOFALI	Officer, Livestock Policy Implementation Coordination Department	Mr. N.Byambadorj	✓
10	PMU	MOFALI	Officer, Crop Production Policy Implementation Coordination Department	Mr. J.Tumurhuyag	-
11	PMU	MOFALI	Officer, Food Production Policy Implementation and Coordination Department	Ms. D. Tungalag	-
12	PMU	MOFALI	Officer, International Cooperation Division	Mr.G. Enkhmisheel	✓
13	PSC, PMU	MED	Senior Officer of Regional and Industrial Policy Department	Mr. D. Munkhjargal	-
14	PSC, PMU	MED	Senior Officer of Regional and Industrial Policy Department	Mr. Kh. Erdenebulgan	✓
15	MOFA	Embassy of Japan in Mongolia	First Secretary	Mr. Satoshi Matoba	-
16	JICA	Mongolia Office	Senior Representative, JICA Mongolia office	Mr. Tokuji Yoshimura	✓
17	JICA	Mongolia Office	Administrative Officer, JICA Mongolia office	Ms. U. Javkhlan	✓

Annex

No.	Category	Organization	Position	Name	
18	JICA	Mongolia Office	Program Officer, JICA Mongolia office	Dr. Keigo Nakamura	✓
19	JICA	Headquarters	Officer, Economic Development Department	Mr. Atsushi Suzuki	✓
20	JICA	Headquarters	Officer, Economic Development Department	Mr. Puntsagsuren, Altansukh	-
21	JICA	Consultant	Leader/Institutional Development 1	Dr. Takashi Kotegawa	✓
22	JICA	Consultant	Business Promotion 2/ Project Management	Mr. Satoru Ohno	✓
23	JICA	Consultant	Local Staff	Mr.Davaanyam Damdin	✓
24	JICA	Consultant	Local Staff	Mr. N.Tserendorj	✓
25	JICA	Consultant	Local Staff	Ms. B. Munkhtuya	✓
26	JICA	Consultant	Local Staff	Ms. Ch. Orkhon	✓

Annex 6

Minutes of Meetings
of
Fifth Joint Coordinating Committee Meeting
on
the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

The Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia (hereinafter referred to as "the Project") has been implemented under the technical assistance of the Japan International Cooperation Agency (hereinafter referred to as "JICA") and Ministry of Food, Agriculture and Light Industry (hereinafter referred as "MOFALI") of Mongolia and the Ministry of Economy and Development (hereinafter referred to as "MED") in accordance with the Record of Discussions (R/D) which established on September 26, 2019.

The fifth Joint Coordinating Committee (JCC) meeting was held at MOFALI on 27 June 2023. In this meeting, the JICA consultant team reported on the progress of the project and explain the draft Master Plan, and discussions took place among the participants.

27 June 2023

Mr. T. YOSHIMURA
Senior Representative
JICA Mongolia office

Mr. T. Jambaltseren
State Secretary
The Chairperson of The JCC
Ministry of Food, Agriculture and Light Industry

Mr. D. Erdenebayar
Director General
Department of the Regional and Industry Policy Development
Ministry of Economy and Development

Mr. Ch. Chimidsuren (witness)
Director General
Development Financing and Public Investment Department Ministry of Finance

Minutes of Meetings of Fifth Joint Coordinating Committee Meeting on the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

The fifth Joint Coordinating Committee meeting of the Project was held at a meeting room of MOFALI on 27 June 2023. The agenda and list of attendees are given in the Annex.

Matters discussed

1. Introduction of participants (Mr. Bolorchuluun, MOFALI: Chairperson)

2. An opening Address (Mr. Jambaltseren, MOFALI)

The agro-pastoral industry is very important to Mongolia and we thank JICA and the project on behalf of our sector. We would like to hear opinions on a draft of the Master Plan (hereinafter referred to as "MP") of participants from each Ministry and reflect them in the MP, as this will lead to the effectiveness of the project and good plan-making is expected to bring good results, so we would like to have a thorough exchange of opinions at today's JCC. It is planned to hold a national consultation meeting of agro-pastoral sector stakeholders in August. Now, I would like to open the fifth session of the JCC.

3. Explanation of the draft MP and future schedule (Mr Kotegawa, JICA PJ team)

Thank you all for your attendance today. Last week, I could successfully hold discussion meetings on MP with the support of the State secretary. I have received a lot of feedback and comments from the attendees at the meetings, which has been very helpful. I have been told that I can again receive your comments and opinions today, and I will try to respond to these as sincerely as possible. The project has about six months left to run, but we need your continued support. Let me again share the progress of the draft MP on this occasion.

1) The position of MP
2) Prospects for agro-pastoral value chain (hereafter referred to as "VC") development
3) Development strategy of the agro-pastoral industry in Mongolia
4) Agro-pastoral VC development programme
5) Action Plan (hereafter referred to as "AP") of the development programme
6) Implementation schedule and project budget of the development programme
7) Summary, opinions, etc.

Lastly, I would like to explain future initiatives. Today, 27 June, the fifth JCC meeting is been held and the second draft MP will be made up based on the comments from last week's consultation meeting and today's JCC Meeting. Following this, we would like to organise a workshop pertaining to MP and APs at the beginning of September. It is particularly expected that officials from MOFALI will participate in this workshop. In October, a briefing on the draft MP for private companies is considered to be held in collaboration with MOFALI and MED. The third draft MP will be made in November, reflecting the comments and other information received up to that time. A final JCC meeting of the project is planned in December, at which a revised MP is expected to be reported. Thank you for your kind attention.

Mr. Bolorchuluun (MOFALI : Cherperson)

Thank you for the detailed presentation on the progress of MP. Ministry officials gathered during a consultation meeting last week to exchange views on MP. The state secretary told that the basic structure of the draft MP should remain unchanged and revised based on the opinions and comments. Some participants pointed out the structure of the text, but the content will be discussed. In May, officials involved in the project, including the state -Secretary, participated in a study tour in Japan. Mr. D.Bayarsaikhan, Senior Officer of Food production policy implementation and Coordination department, will report on the study tour.

4. Report on the study tour in Japan (Mr. D. Bayarsaikhan, MOFALI)

Today I would like to report on the study tour in Japan of this MONMAP-AVC project. I participated in the study tour in JICA Tsukuba from 13 to 20 May this year. Six persons participated in the study tour (Mr. T.Jambaltseren, State Secretary, MOFALI; Mr. B.Dashpurev, State Secretary (Substitute), MED; Mr. D.Erdenebayar, Director-General, Department of the Regional and Industry Policy Development, MED; Ms. A.Gerelzaya, Head, Policy Coordination Division, Small and medium enterprises agency, MOFALI; Mr. J.Tumurkhuyag, Senior Officer, MOFALI; Mr. D.Bayarsaikhan, Senior Officer, MOFALI).

The study tour consisted of lectures, visits to agricultural and livestock facilities and interviews with agricultural and livestock industry officials. First, lecturer Mr. Harada, who has more than 20 years of work experience in Japan Agricultural Cooperatives (hereafter referred to as "JA"), explained the role and the characteristics of JA. We, the participants, conveyed to Mr. Harada that we are interested in the policy direction, the regulatory environment and the legal documents concerning JA. We look forward to the opportunity to learn them more through JICA and the project. In addition, Professor Yukio MORITA of Azabu University gave a lecture on the hygiene management of livestock products. The main content of the lecture was on the supply chain of meat products in Japan, in particular. Regarding the visit to industrial facilities, in Japan, the wholesale of agricultural products takes place in markets and there are laws in this field. We observed the flower auction at Ota Market in Tokyo Metropolitan Government Central Wholesale Market.in Tokyo, where 42.5% of the flower trade and 15.3% of the fruit trade in Japan takes place. We also observed the slaughtering process, grading and auctioning of meat at a slaughterhouse in Gunma Prefecture. Beef in Japan is graded into three yield grades, A to C, and meat grades, 1 to 5. It is therefore divided into a total of 15 grades, with the highest grade given as A5. New grading of meat is introduced in AP of the project, but the new grading needs to be Mongolia-specific when it is implemented. The study tour participants met with Mr Ogawa, a senior official of Ministry of Agriculture, Forestry and Fisheries in Japan (hereafter referred to as "MAFF"). The project member presented the draft MP and exchanged views on the objectives, activities, effectiveness and costs of the APs. The study tour was well organised and fruitful, and it created exchanges with the people we met, as well as links between MOFALI and MAFF. We hope that our opinions on the draft MP will be reflected in the revision. It will be necessary in the future to discuss the content of the study tour with the participants in advance. Thank you for your kind attention.

Mr. Bolorchuluun (MOFALI : Cherperson)

Thank you for sharing information on the Japanese meat industry. I would now like to move on to discussion.

5. Discussion

- Mr. D.Yesun-Erdene (MOFALI):

It would be necessary to have a trading centre or wholesale market to support competition in the sale of vegetables and other agricultural products, but is any plan to sell vegetables and other products via the trading centre being considered? Also, mechanisation is considered to be necessary for vegetable and fruit cultivation, but MP does not seem to mention mechanisation or irrigation very much. After the installation of the machinery, repairs and maintenance are also required, are there any APs for these? Is the description in 1.2.4 relevant only to the livestock sector? In addition, MP mentions the International Plant Protection Convention (IPPC), and I would like to add that Mongolia is a signatory to this convention and has already prepared the necessary documents and is in the process of drafting legislation.

→Mr. Kotegawa (JICA PJ team):

Agricultural products are auctioned in markets in Japan, but such auctions are currently shrinking and direct(negotiation) trading is becoming the mainstream. It is acknowledged that increasing the number of agricultural cooperatives that can supply appropriate products in order to create a competitive environment is important for creating a competitive environment. Regarding mechanisation in the agricultural sector, there are APs for the introduction of greenhouse cultivation and drip irrigation. Access to water is expected to become increasingly difficult in the future due to climate change, and there is a need to investigate where water sources are located and how much water can be extracted. MP would also orient to create an environment where agricultural enterprises and cooperatives would have better access to finance for the purchase of agricultural equipment. Regarding the IPPC, please provide us with the progress on the Mongolian side again at a later date.

- Mr. D.Yesun-Erdene (MOFALI):

Instead of competing with some specific product, please consider ways to ensure a stable supply of agricultural produce. Also, what I expect you to consider is not about high or low quality of vegetables and meat or the standards, but about improving the situation of distribution chain where Brokers (changes) infesting in. In addition, please tell us your view on the production of vegetable seeds and seedlings. I would like MP to include content for increasing exports of agricultural products, for example, the development of new varieties, etc., considering the future market environment. I recognise that awareness-raising activities for export promotion are also necessary to strengthen our competitiveness. I recognise that raising awareness for export promotion is also necessary to strengthen our competitiveness.

→Mr. Kotegawa (JICA PJ team):

OK, understood. We will reflect on MP as such. However, we do not consider that auctions are the only form of competition. For example, supermarkets can wholesale more produce than others if it is a good product in line with market needs. It is important how much produce can be sold in one market, which leads to competition. If many producers produce products that meet the needs of consumers, competition will naturally arise. The current challenge in Mongolia is that very few organisations can supply good products. Forming a large number of organisations that can supply good products, like agricultural cooperatives, will create a competitive environment.

- Mr. G.Naranchuluun (MOFALI):

In recent years, there has been a trend to consider the livestock and veterinary sectors separately in donor projects. It is necessary to consider both at the same time, as the industry cannot be viable with only one of them. The VC development plan for the livestock industry mentions the training of veterinarians, can this be rewritten as livestock specialist staff? In addition, support for pastoralists to reduce their labour is needed. 1.1 and 1.2 of the development strategy seem to have mixed issues so they need to be sorted out. The PAs of meat and milk do not mention livestock health and focus on improving the work of livestock technicians, such as breeding and rearing, but they need to be considered as a set, as both will lead to effectiveness.

→Mr. Kotegawa (JICA PJ team):

I agree that livestock technicians are needed as well as veterinarians. It shall be reflected in MP.

- Mr. Onon (MOFALI):

Please mention SMEs in the development strategy for export promotion. Quality and price are important so they should be looked at in the whole process. In the MP, it would be desirable to mention what results can be obtained by implementing the training. Some outcome indicators are unclear. For example, the number of training required to establish the structure we are aiming for needs to be sorted out. In addition, a solution to losses incurred during the sale of agricultural products should be considered.

→Mr. Kotegawa (JICA PJ team):

We shall check the situation from sale to consumption and the food/material will be mentioned in MP.

- Mr. J.Tumorkhuyag (MOFALI):

Mechanisation is important for the improvement of the vegetable supply chain. As learned about the Ota market in the study tour in Japan, it would be good to mention inputs, investments and the establishment of a wholesale market for vegetables. A quality control system may also need to be introduced. Projects related to Research & Development on the breeding and introduction of new varieties of fruit are also needed. Storage management and processing should be included in MP. To stabilise the export of sea buckthorn, a needs assessment of overseas markets and promotion activities should also be included in the MP.

- Mr. B.Erkhembayar (MOFALI):

There are three APs on wool and other products. Although it was previously commented that it is leather that increases pastoralists' incomes, it has not been added. In the processing of wool and cashmere, a more impactful value addition and economic effect can be obtained by carrying out the process up to the yarn-making process. Weaving and spinning are the processes that create added value the most, so the technology to manufacture yarns and textiles is important. In addition, One AP mentions the establishment of 20 processing plants, but it is recognised that this is a private-sector initiative. So is there any consideration of what the government will do to support value addition?

→Mr. Kotegawa (JICA PJ team):

For wool and leather, we believe that it is necessary for farmers to do primary processing to increase its value and sell it to processing plants to increase their income. This is stated in both MP and AP. For the wool and cashmere industry, the need for a spinning process is obvious, but there is the problem that yarns produced from a single fibre alone are often too expensive. For instance, yarn produced only from cashmere would be too expensive and demand would be limited. On the other hand, it is necessary to discuss whether it would be possible to compete with China if yarns were produced together with cheaper fibres.

- Mr. Bolorchuluun (MOFALI : Cherperson)

This time, consultation meetings were held in advance of this JCC meeting to ensure information sharing. I hope that the opinions and comments from the various relevant departments will be reflected in the revision of MP. Today's discussions were well organised in terms of content.

- Mr. T.Jambaltseren (MOFALI)

I will ask JICA to make a closing address, but I would like to add one additional point before. I have listened to the opinions and comments made by each department at the consultation meeting. As MP is concerning value addition, it is necessary to consider the installation of cutting-edge technology and know-how. It is important to progress the industry to the next stage, Looking not just a few years ahead, but also ten years into the future.

6. An closing Address (Mr. Yoshsimura, Senior Representitive, JICA Mongolia office)

Thank you for the many active comments. The project is progressing well, and I believe this is due to the leadership of the state secretary. The suggestion for improvement of the study tour in Japan pointed out today will be taken into account in the future. The project is now in an important phase and we are glad to have exchanged views on the draft MP. It is necessary to have further discussions and realistic suggestions based on the current situation in Mongolia will continuously be much welcomed. And we hope that the finalised MP will be reflected in the agro-pastoral policy document of Mongolia in the end. The agro-pastoral sector needs to develop in order for Mongolia's manufacturing sector to account for 27.4% of GDP. Although the time left for the project is short, we would appreciate your continuous cooperation.

Annex

Program of 5th Joint Coordination Committee (JCC) Meeting

Objective: 1) Share the draft master plan
2) Share the report on study tour in Japan
Date: 9:00-10:30 (Mongolian time), 27th, June (Friday) 2023
Venue: Meeting Room (9th floor), MOFALI

Agenda

Time (in Mongolia)	Item	Person in Charge
09:00 - 09:05	Introduction of Participants	Project Manager
09:05 - 09:10	Opening Address	Project Director
09:10 - 09:40	Presentation on draft master plan	Mr.Takashi Kotegawa
09:40 – 09:50	Presentation on the study tour in Japan	Mr. Bayarsaikhan
09:50 – 10:25	Discussion	Project Director
10:25 – 10:30	Closing Remarks	JICA

Participant List of 5th Meeting of Joint Coordination Committee

No.	Category	Organization	Position	Name
1	PSC	MOFALI	State Secretary (Project Director)	Mr. T.Jambaltseren
2	PSC, PMU	MOFALI	Director-General, Policy and Planning Department (Project Manager)	Mr. Ts.Bolorchuluun
3	PSC	MOFALI	Director-General, Light Industry Policy Implementation Coordination Department	Mr. M. Dondogdorj
4	PSC	MOFALI	Director-General, Livestock Policy Implementation Coordination Department	Ms. G.Naranchuluun
5	PSC	MOFALI	Director-General, Crop Production Policy Implementation Coordination Department	Mr. D. Yesun-Erdene
6	PSC	MOFALI	Director of Division, Food Production Policy Implementation Coordination Department	Ms.O.Onon
7	PSC	MOFALI	Director of International Cooperation Division,	Mr.E.Anar
8	PMU	MOFALI	Officer, Light Industry Policy Implementation Coordination Department	Mr. B.Erkhembayar
9	PMU	MOFALI	Officer, Livestock Policy Implementation Coordination Department	Mr. N.Byambadorj
10	PMU	MOFALI	Officer, Crop Production Policy Implementation Coordination Department	Mr. J.Tumurhuyag
11	PMU	MOFALI	Officer, Food Production Policy Implementation and Coordination Department	Mr. Bayarsaikhan
12	PMU	MOFALI	Officer, International Cooperation Division	Mr.G. Enkhmisheel

No.	Category	Organization	Position	Name
13	JICA	Mongolia Office	Senior Representitive, JICA Mongolia office	Mr. Tokuji Yoshimura
14	JICA	Mongolia Office	Program Officer, JICA Mongolia office	Ms. U. Javkhlan
15	JICA	Consultant	Leader/Institutional Development 1	Dr. Takashi Kotegawa
16	JICA	Consultant	Business Promotion and Activity-Appraisal	Dr. Keitaro Watanabe
17	JICA	Consultant	Local Staff	Ms. B. Munkhtuya

Minutes of Meetings
of
Sixth (Final) Joint Coordinating Committee Meeting
on
the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

The Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia (hereinafter referred to as "the Project") has been implemented under the technical assistance of the Japan International Cooperation Agency (hereinafter referred to as “JICA”) and Ministry of Food, Agriculture and Light Industry (hereinafter referred as “MOFALI”) of Mongolia and the Ministry of Economy and Development (hereinafter referred to as “MED”) in accordance with the Record of Discussions (R/D) which established on September 26, 2019.

The sixth Joint Coordinating Committee (JCC) meeting was held at Millennium Plaza Hotel on 12 December 2023. In this meeting, the JICA consultant team explained the completed draft of the Master Plan (hereinafter referred to as "MP"), and then MOFALI explained the Action Plan (hereinafter referred to as "AP"). Participants then exchanged opinions on the MP and AP.

12 December 2023

Mr. S. Tanaka
Chief Representative
JICA Mongolia office

Mr. T. Jambaltseren
State Secretary
The Chairperson of The JCC
Ministry of Food, Agriculture and Light Industry

Mr. D. Erdenebayar
Director General
Department of the Regional and Industry Policy Development
Ministry of Economy and Development

Mr. Ch. Chimidsuren (witness)
Director General
Development Financing and Public Investment Department
Ministry of Finance

Minutes of Meetings of Sixth Joint Coordinating Committee Meeting on the Project for Formulation of Master Plan on the Agricultural Value Chain in Mongolia

The sixth Joint Coordinating Committee meeting of the Project was held at Millennium Plaza Hotel on 12 December 2023. The agenda and list of attendees are given in the Annex.

Details of discussions

1. Opening Address (Mr. Jambaltseren, MOFALI)

Mr. Jambaltseren, the State Secretary of MOFALI, delivered the opening address as follows.

I would like to thank you for gathering here today to participate in the final meeting of the Joint Coordination Committee of the JICA-supported Project on the Development of the Mongolian Agro-Pastoral Industry Value Chain MP.
The project was launched in 2020 to develop a plan to improve the competitiveness and value chain development of Mongolian agro-pastoral products. Shortly after its launch, the project became difficult to manage due to the global outbreak of COVID-19. However, the project was able to proceed to date through close collaboration between Japanese experts and MOFALI and MED officials in charge of the project, and through PMU meetings to confirm the project's policy and progress.
In the meantime, several pilot projects have also been implemented to reflect on the MP. We hope that this MP will be reflected in the Government's policy and MOFALI's action plan in the future and contribute to the development of the agro-pastoral sector in Mongolia.
I hope that today you will receive an overview of the MP, exchange views and be proactive in this meeting in your efforts.

2. Explanation of the draft MP (Mr. Kotegawa, JICA Project team)

Mr. Kotegawa, the project leader, provided an overview of the draft MP. The explanations were as follows.

(1) Outline of the MP
(2) Development strategy of the Mongolian agro-pastoral industry
(3) Agro-pastoral VC development programmes
(4) Action Plans
(5) Implementation structure of the MP
(6) Summary and recommendations

3. Explanation of APs

(1) Livestock Policy Implementation Coordination Department (Mr. Byambadorj, MOFALI)

The APs related to meat production for the livestock sector were explained.
The AP with the highest priority is the project on the establishment of a livestock breeding system, which is expected to reduce the number of livestock, increase livestock quality and income, and prevent infectious diseases in livestock through the implementation of this project. This project also aims to increase productivity through the establishment of livestock breeding farms.
The second is a project to promote the rearing of young livestock, which will reduce labour, costs and environmental impact, reduce the number of male livestock and conserve natural resources by implementing this project.
The third is a project to improve slaughterhouses. Production activities that meet hygienic conditions and the introduction of a traceability system are expected to improve the quality and

safety of meat.

(2) Policy and Planning Department (Mr. Altangerel, MOFALI)

AP prioritisation in the agricultural sector prioritised plans to achieve sustainable agro-pastoralism and the plans in line with the policies of Diet Resolution No. 36 and Vision 2050.
The first plan is to increase the volume and duration of vegetable supply through the introduction of superior varieties and seeds and the use of promoted cultivation. The aim is to expand the production of commodities for which domestic self-sufficiency has not been achieved and to improve the production of oilseed crops.
The second is a plan to establish an agricultural product distribution system through farmer associations. The plan aims to strengthen farmers' organisations, build a system for agricultural product distribution and primary processing, reduce costs, improve profitability and diversify sales channels.
The third is a plan to promote the export of sea buckthorn. The aim is to promote exports through existing sea buckthorn clusters. The cluster will be strengthened through an international market needs assessment and identification of target markets, as well as marketing activities.
In addition to these APs, AP1-2:Action Plan on promoting market-oriented agriculture, which is to be implemented by JICA is also promising. It is hoped that the APs that were not considered high priority will also be implemented in the future, at which point it is likely that other development donors and JICA will be asked to cooperate. In that case, it would again be appreciated for support.

(3) Light Industry Policy Implementation Coordination Department (Mr. Erkhembayar, MOFALI)

Three priority APs in the light industry sector are explained in this section.
The first is a plan to strengthen the supply chain of raw wool and hides based on herders' associations. This is an initiative to shift the current system whereby herders individually trade raw wool and hides with changes to a system whereby the herders' cooperatives collect and ship the raw wool and hides, and the herders' cooperatives directly add value to the raw wool and hides. In the Project's Pilot Activity to introduce shearing equipment in Bayan-Ovoo Soum, Khentii Aimag, about 12 t of raw wool was collected and sold to a wool washing company. It was confirmed that strengthening the cooperative allowed nomads to cooperate, resulting in an increase in their income and improved material quality.
The second is a plan to form an industrial cluster in the textile sector. This involves the formation of a textile industry cluster to promote the processing of raw materials and the production and export of finished products and to strengthen cooperation between actors, such as domestic universities, research and financial institutions. In addition, the government will strengthen its support for the spinning sector, which is directly linked to the productivity of textile products in its processing steps.
The third is a plan to strengthen the management infrastructure of agro-pastoral cooperatives. The plan aims to strengthen the organisation of agro-pastoral associations by providing training on value addition of agro-pastoral products, improvement of trading conditions and management.

(4) Department of Industrial Inspection (Ms. Munguntsatsal, MOFALI)

Plans for the development of hygiene and quality management staff will be explained.
There is a lack of specialised quality control departments and personnel in enterprises, and there is a need to strengthen cooperation between the relevant institutions. This is related to MOFALI's reorganisation establishing the Department of Industrial Inspection where the agricultural and pastoral inspection is carried out instead of the GASI, following the dismantling of the GASI.
In summary of the current issues, it can be said that the following activities, 'establishment of a

trainer system for quality and hygiene management', 'development of training, teaching materials and tests for quality and hygiene management', 'creation of a registration system for quality and hygiene managers' and 'training of quality and hygiene management leaders', are needed.
Therefore, the APs with the highest priority are the 'Plan on training human resources in sanitation and quality control', which will lead to strengthening the capacity of national inspectors, and the 'Plan on strengthening export competitiveness through acquisition of international certification' to create an environment that facilitates SMEs to acquire international certifications such as HACCP and FSSC 22000.
As a suggestion to the MP, it is considered that the description of 'hygiene and quality management' could be changed to 'quality and hygiene management of agricultural and pastoral products/food' to encompass the entire agricultural and pastoral sector. In addition, the project implementation structure should include the Department of Industrial Inspection. This is because the control function of food safety is carried out by the Department of Industrial Inspection, whose role is different from that of the Department of Monitoring, Evaluation and Internal Audit.

4. Question and Answer

- Ms. Jugamo (Member of the Management Board and representative of the Business Organisation)

First of all, I would like to thank you for making the MP in response to the Mongolian Government's request. I would like to express my opinion from my point of view as an exporter, having read through the AP on meat. In the trade industry these days, great emphasis is placed on the stable production and value of products and on environmental considerations. Support for enterprises is important to increase revenues from exports to augment the economic impact. I would like to request a consultative meeting on exports that responds to the needs of the market. Furthermore, I would like to request that the following issues are also considered: sending the draft MP to the various professional bodies to collect their opinions; establishing a structure in which research institutions also participate; procuring raw materials and developing storage facilities to stabilise the production and delivery of agricultural and pastoral products; and providing interest-free loans like in Japan, in addition to subsidies.

- Ms. AmgalanPPD (Policy and Planning Department, MOFALI)

Thank you for holding the final briefing on the MP today. I would like to comment on the following four points regarding the MP.

(1) Target period.
The target period of the AP is 2025-2034, but it would be better to make it more detailed and every year, or every 4-5 years in line with the national development plan.

(2) Implementation structure
The implementation structure should include not only the relevant departments of the ministries and agencies but also provincial and local authorities. In addition, as the main actors will be the private sector, including nomads and business people, the opinions of enterprises should be reflected to maximise business effects. In line with this, the AP should be in the form of a business plan that can be used immediately by associations and enterprises, and should also include the profit margin and scale.

(3) Project budget
The business effects, municipal tax credit and interest reduction measures as a result of implementing the AP should also be mentioned.

(4) Development of local specialities
It is desirable to state the target local authorities clearly. It is necessary to indicate which regions

and what will be implemented.

→Mr. Kotegawa (JICA PJ team)

Regarding the implementation structure, the administrative bodies of the Crop Production Policy Implementation Coordination Department are set up in each local government, so it is considered that they are in charge of policy implementation. Regarding the business perspective, it is difficult to align private-sector business plans with national policies.

The MP mentions private business in the BOX column. The state budget and business effects are already organised in the MP.

5. Closing Address (Mr. Tanaka, Chief Representative, JICA Mongolia office)

Mr. Tanaka, Chief Representative, JICA Mongolia office, delivered a closing address as follows.

Thank you to Mr. Jambaltseren, the State Secretary of MOFALI, and other senior officers of the ministries, as well as all stakeholders, for taking time out of your busy schedules to attend today's meeting.

The project started in March 2020 and today marks the final JCC meeting. Project activities started in the middle of the pandemic of COVID-19, but today's report suggests that the project was generally implemented successfully.

I believe that today's final report was a fulfilling occasion with reports and an exchange of views from the Mongolian side. I would like to thank the State Secretary and all the counterparts for their efforts and commitment to the project.

This MP is prepared in accordance with Mongolia's Development Policy Plan and its Management Act, and its legal status as a plan is only meaningful when it is reflected in the Five-Year National Development Plan and the Government Action Plan as stipulated by the Act. I strongly request that MOFALI, the leading ministry for this MP, mainly the Policy Planning Department, reflect this MP in the national plan while adjusting policy priorities and shading activities. In addition, it is also hoped that the Government will not keep the MP in the plan, but will appropriately budget for it and implement it in cooperation with companies, universities and other relevant institutions.

The agro-pastoral sector is very important and Japan would like to continue to ask for cooperation and understanding from the Mongolian side.

Annex

Program of 6th Joint Coordination Committee (JCC) Meeting

Objective: Share the draft master plan
Date: 10:00-12:00 (Mongolian time), 12th (Tuesday), December 2023
Venue: 15th Floor, Millennium Plaza Mall and Hotel, Tokyo Street 3rd Khoroo, Bayanzurkh District, Bayanzurkh, 013381, Ulaanbaatar, Mongolia
Language: Mongolian - Japanese

Agenda

Time	Contents	Responsible
09:30-10:00	Reception	MONMAP-AVC
10:00-10:10	Opening Remarks	Project Director
10:10-10:40	Presentation on Draft Master Plan for the Development of Agricultural Value Chain in Mongolia	MONMAP-AVC Kotegawa
10:40-11:30	Presentation on Action Plan 1. Dept. for Coordination of Agricultural Policy Implementation：10 min. 2. Dept. for Coordination of Livestock Policy Implementation：10 min. 3. Dept. for Coordination of Light Industry Policy Implementation：10 min. 4. Dept. for Coordination of Food Industry Policy Implementation：10 min. 5. Dept. for Industrial Auditing and Inspection：10 min	MOFALI
11:30-12:00	Q & A Session	Project Manager
12:00-12:10	Closing Remarks	JICA
12:10-	Lunch	MONMAP-AVC

Participant List of 6th Meeting of Joint Coordination Committee

No.	Category	Organization	Position	Name	Attendance
1	PSC	MOFALI	State Secretary （Project Director）	Mr. T.Jambaltseren	✓
2	PSC, PMU	MOFALI	Director-General, Policy and Planning Department (Project Manager)	Mr. Ts. Bolorchuluun	
3	PSC, PMU	MED	Director-General, Regional and Local Development Policy and Planning Division (Co-Project Manager)	Mr. D.Erdenebayar	
4	PSC	MOFALI	Director-General, Light Industry Policy Implementation Coordination Department	Mr. M. Dondogdorj	
5	PSC	MOFALI	Director-General, Livestock Policy Implementation Coordination Department	Ms.G.Naranchuluun	
6	PSC	MOFALI	Director-General, Crop Production Policy Implementation Coordination Department	Mr. Yesun-Erdene	
7	PSC	MOFALI	Director-General, Food Production Policy Implementation and Coordination Department	Mr. Dovchinsuren	
8	PSC	MOFALI	Head, International Cooperation Division	Mr. E.Anar	
9	PSC	MOF	Director-General, Development Financing Department	Mr. Ch. Chimidsuren	
10	PSC	MOF	Senior Specialist, Development Financing Department	Mr. B. Gerelmaa	
11	PMU	MOFALI	Officer, Dept. for Coordination of Light Industry Policy Implementation	Mr. B.Erkhembayar	✓
12	PMU	MOFALI	Officer, Dept. for Coordination of Livestock Policy Implementation	Mr. N.Byambadorj	✓
13	PMU	MOFALI	Officer, Dept. for Coordination of Agricultural Policy Implementation	Mr.B.Altangerel	✓
14	PMU	MOFALI	Officer, Dept. for Coordination of Food Industry Policy Implementation	Mr. Bayarsaikhan	
15	PMU	MOFALI	Officer, Dept. for Coordination of Food Industry Policy Implementation	Ms D.Tungalag	
16	PMU	MOFALI	Officer, International Cooperation Division	Mr. G.Enkhmisheel	
17	-	MOFALI	Officer, Dept. for Industrial Auditing and Inspection	Ms.Munguntsatsal	✓
18	-	MOFALI	Officer, Dept. for Policy and Planning	Ms Ts.Amgalan	✓
19	-	MOFALI	Director, SME Agency	Ms A.Gerelzaya	
20	PSC, PMU	MED	Senior Officer of Regional and Local Development Policy and Planning Division	Mr. D. Munkhjargal	✓
21	PSC, PMU	MED	General Director of Regional and Local Development Policy and Planning Division	Mr. D. Erdenebayar	✓
22	Embassy of Japan	Embassy of Japan	Second secretary, Embassy of Japan in Mongolia	Ms. Yukino Yamakami	✓
23	JICA	Mongolia Office	Chief Representative, JICA Mongolia office	Mr. Shinichi Tanaka	✓
24	JICA	Mongolia Office	Senior Representative, JICA Mongolia office	Mr. Tokuji Yoshimura	
25	JICA	Mongolia Office	Representative, JICA Mongolia office	Mr. Keigo Nakamura	✓
26	JICA	Mongolia Office	Program Officer, JICA Mongolia office	Ms. U. Javkhlan	✓

27	JICA	Consultant	Leader/Institutional Development 1	Mr. Takashi Kotegawa	✓
28	JICA	Consultant	Sub-Leader/ Institutional Development 2	Mr. Mitsuo Nishiya	✓
29	JICA	Consultant	Agricultural Development	Mr. Shohei Sendo	✓
30	JICA	Consultant	Project Coordinator	Mr. Satoru Ohno	✓
31	JICA	Consultant	Project Local Staff	Ms. B. Munkhtuya	✓
32	JICA	Consultant	Project Local Staff	Ms. Ch. Orkhon	✓